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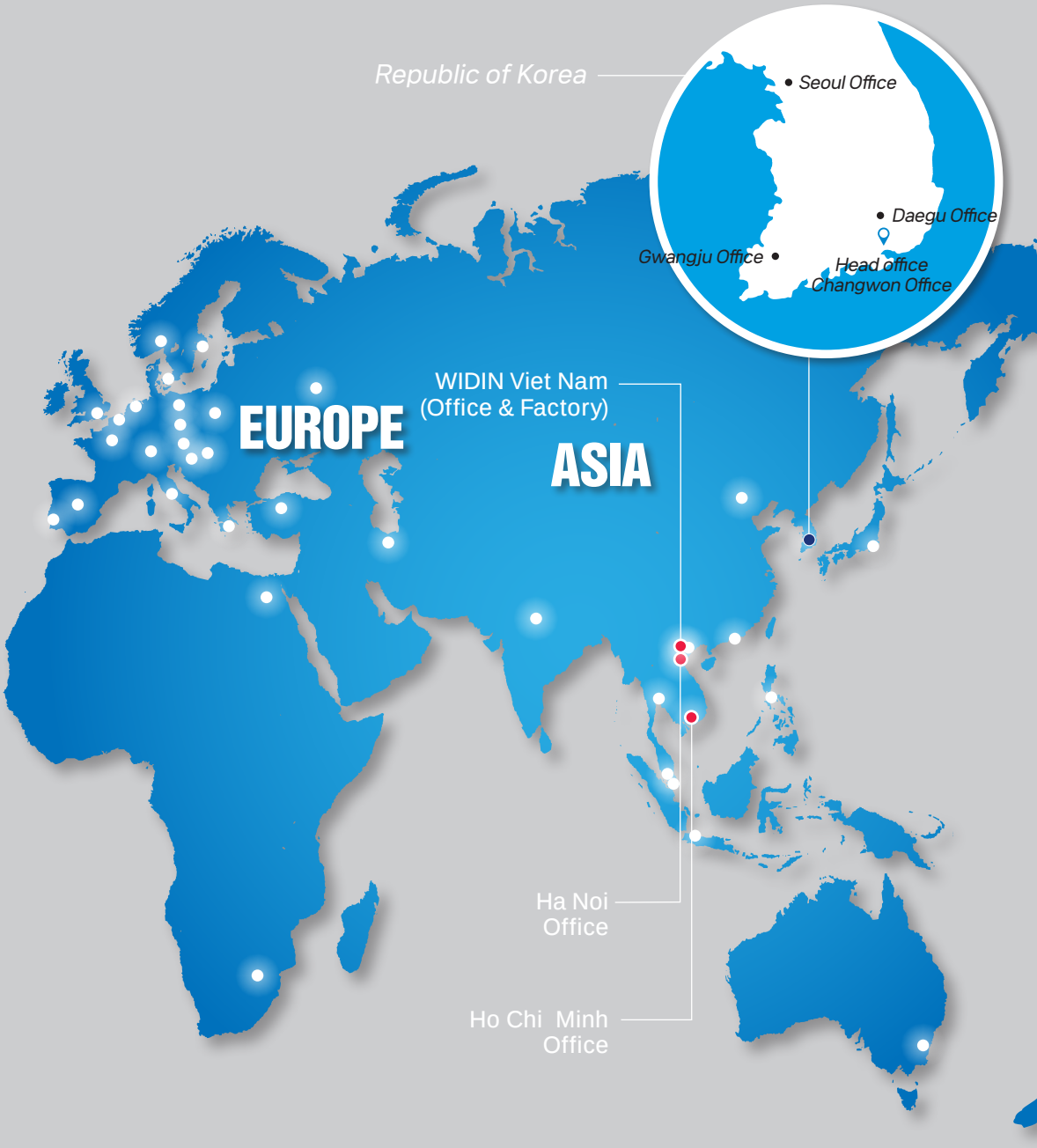
Endmill
Drill
Tap
Center
Reamer

2023 ▸ 2024
WIDIN PRODUCTS



WIDIN
DINE GROUP

GLOBAL NETWORK



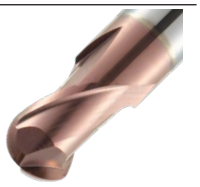

WIDIN USA
(Chicago Office)
AMERICA

GUIDE LINE TO ICONS

Section	Icon	Name	Description
Tool Material		CARBIDE	Carbide
		HSSE	HSSE
Surface Treatment		AlTiN	Excellent wear resistance and heat resistance
		TiAlN	Excellent oxidation resistance for high-speed processing
		AlCrN	Excellent wear resistance and heat resistance
		D.L.C	High surface hardness and excellent wear resistance
		Diamond	Good wear resistance
		CrN	Excellent wear resistance and welding resistance to copper and non-ferrous metals
		TiN	Excellent welding resistance and wear resistance
		TiCN	Excellent welding resistance, wear resistance, and heat resistance
		Steam HOMO	Surface treatment with excellent welding resistance
		Uncoated	Non coated
No. of Flute		-	Indicates the number of flutes of the tool.

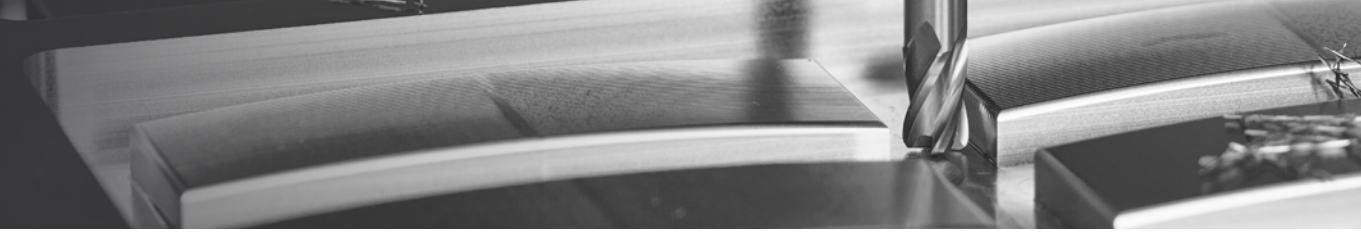
Section	Icon	Name	Description
DIN Standard		DIN 371-374 376	DIN371, 374, 376
		DIN 6537K	DIN6537K
		DIN 6537L	DIN3567L
Roughing Shape		FINE PITHC	For roughing
		COARSE PITHC	For roughing (Wide pitch)
		CHAMFERED PITCH	For finishing
Helix Angle		-	The helix angle of the end mill
		-	the helix angle of end mill and the variable helix angle
		-	The helix angle of the drill
End Face Shape / Tolerance of Radius		Ball Shape / R tolerance	R tolerance of ball end mill
		Corner R Shape / R tolerance	Corner R tolerance of radius end mill
		Chamfered end face	Chamfered end face
Shape of Cutting edge		SHARP EDGE	Sharped cutting edge
Depth		-	This indicates the drilling depth * 3D, 5D, 8D, 10D, 20D
Point Angle		-	Point angle on flute
Cutting Condition		DATA	Refers to the indicated page for the cutting conditions reference table

Content

ENDMILL SERIES	16	
DRILL SERIES	366	
TAP SERIES	448	
CENTERING TOOL SERIES	534	
REAMER SERIES	548	
TECHNICAL DATA	557	

ENDMILL SERIES

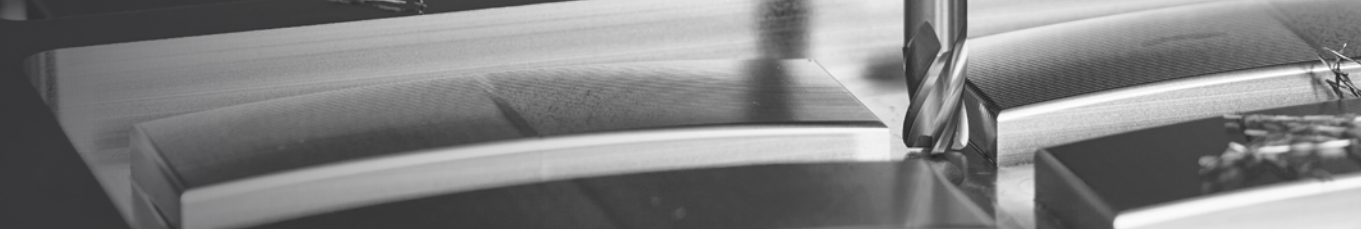
Series	Type	EDP No	Geometry	Flutes	Length			Neck	Multi Helix	Diameter(mm)		Page
					Short	Middle	Long			Min	Max	
ZAMUS STAR P. 18	SQUARE	ZE702		2F		○		○		D0.1	D20	21
		ZE704		4F		○		○		D1	D20	22
		ZE712		2F		○				D1	D12	23
		ZE714		4F		○				D1	D12	24
		ZE716		6F		○				D6	D20	25
		ZE724(6)		4&6F		○		○		D1	D12	26
		ZS124		4F			○		○	D2	D12	27
		ZSLNS20		2F	○			○		D0.1	D5	28
		ZSLNS40		4F	○			○		D1	D5	33
	RADIUS	ZR702		2F		○		○		D1	D12	36
		ZR704		4F		○		○		D1	D12	39
		ZR706		6F	○			○		D6	D12	41
		ZR714		4F		○				D3	D12	42
		ZR724		4F	○			○		D6	D12	43
		ZR732		2F		○		○		D1	D12	44
		ZR734		4F		○				D1	D12	45
		ZR736		6F		○				D6	D12	46
		ZS1(2)04		4F		○		○	○	D1	D12	47
		ZS204		4F		○		○	○	D2	D12	48
		ZSLNR20		2F	○			○		D0.1	D5	49
		ZSTNR20		2F	○			○		D2	D3	53
		ZSPM4		4F	○			○		D3	D12	56
	BALL	DB702		2F	○			○		R0.05	R6	57
		DB703		3F		○		○		R1	R6	58
		DB712		2F		○				R0.5	R6	59
		DB734		4F		○		○		R1	R5	60
		ZSLNB20		2F	○			○		R0.05	R2.5	61
		ZSTNB20		2F	○			○		R0.1	R5	65
		ZSTNB30		3F	○			○		R0.5	R2.5	69
E-STAR P. 72	SQUARE	ESE702		2F		○		○		D0.1	D20.0	76
		ESE712		2F		○				D1.0	D12.0	77



Series	Type	EDP No	Geometry	Flutes	Length			Neck	Multi Helix	Diameter(mm)		Page
					Short	Middle	Long			Min	Max	
E-STAR P. 72	SQUARE	ESE704		4F		○		○		D1.0	D20.0	78
		ESE714		4F		○				D1.0	D12.0	79
		ESE724(6)		4&6F		○		○		D1.0	D12.0	80
		ESE744		4F		○				D1.0	D12.0	81
		ESE716		6F		○				D6.0	D20.0	82
		ESRE712		2F	○			○		D0.1	D12.0	83
		ESRE714		4F	○			○		D0.5	D12.0	86
		ESXE704		4F		○		○	○	D1.0	D12.0	89
		ESXE714		4F		○			○	D2.0	D12.0	90
		ESLNS20		2F	○			○		D0.1	D5.0	91
		ESLNS40		4F	○			○		D1.0	D5.0	96
	RADIUS	ESR702		2F		○		○		D1.0	D12.0	99
		ESR732		2F		○		○		D1.0	D12.0	102
		ESR704		4F		○		○		D1.0	D12.0	103
		ESR714		4F		○				D3.0	D12.0	105
		ESR724		4F	○			○		D6.0	D12.0	106
		ESR734		4F		○				D1.0	D12.0	107
		ESR706		6F	○			○		D6.0	D12.0	108
		ESR736		6F		○				D6.0	D12.0	109
		ESRR712		2F	○			○		D0.2	D16.0	111
		ESRR714		4F	○			○		D0.5	D2.0	117
		ESXR704		4F		○		○	○	D1.0	D12.0	124
		ESLNR20		2F	○			○		D0.2	D3.0	126
		ESTNR20		2F	○			○		D0.2	D3.0	130
		ESPM4		4F	○			○		D3.0	D12.0	133
	BALL	ESB702		2F	○			○		R0.5	R6.0	134
		ESB712		2F		○				R0.5	R6.0	135
		ESB703		3F		○		○		R1.0	R6.0	136
		ESB734		4F		○		○		R1.0	R5.0	137
		ESRB712		2F	○			○		R0.05	R6.0	138
		ESLNB20		2F	○			○		R0.05	R2.5	143

ENDMILL SERIES

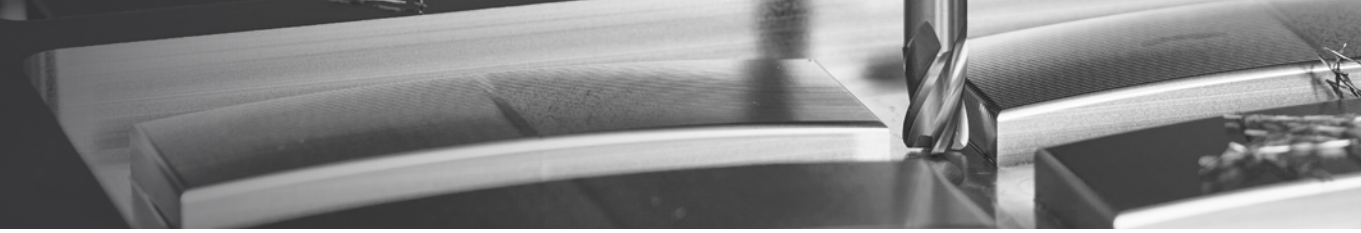
Series	Type	EDP No	Geometry	Flutes	Length			Neck	Multi Helix	Diameter(mm)		Page
					Short	Middle	Long			Min	Max	
E-STAR P. 72	BALL	ESTNB20		2F	○			○		R0.1	R5.0	147
		ESTNB30		3F	○			○		R1.0	R2.5	151
New U-WING P. 154	SQUARE	UE502		2F		○				D0.1	D25	160
		UE512		2F	○			○		D0.1	D12	162
		UE522		2F			○			D1	D25	165
		UXE502		2F	○					D0.1	D20	168
		UE504H		4F		○				D1	D20	170
		UE514		4F	○			○		D1	D12	171
		UE524		4F			○			D1	D25	173
		ULE504		4F						D3	D16	176
		UE504		4F		○			○	D0.8	D25	177
		UXE504		4F	○	○	○		○	D1	D20	178
		UE506		6F		○	○			D6	D20	180
		UTE502		2F		○				D0.3	D10	181
		UTE504		4F			○			D0.8	D10	183
	RADIUS	UR502		2F	○	○				D0.2	D20	186
		UR512		2F		○		○		D0.2	D20	190
		UR542		2F						D0.2	D4	196
		UR504		4F		○			○	D3	D20	207
		UR544		4F	○			○		D1	D4	209
		UXR504		4F		○			○	D1	D20	216
		UXR514		4F		○		○	○	D1	D20	219
		UR506		6F		○				D6	D20	224
		UDR503		3F		○				D6	D20	225
		USPM4		4F		○				D1	D20	226
		UTR504		4F	○	○	○			D0.8	D2.5	228
	BALL	UB502		2F	○	○				R0.1	R25	233
		UB502-P		2F		○				R0.1	R12	236
		UB512		2F	○			○		R0.1	R12	237
		UB512 S6		2F	○			○		R0.5	R2	241
		UB532		2F		○		○		R3	R12	243



Series	Type	EDP No	Geometry	Flutes	Length			Neck	Multi Helix	Diameter(mm)		Page
					Short	Middle	Long			Min	Max	
New U-WING P. 154	BALL	UB542		2F		○		○		R0.1	R12	244
		USB502		2F		○				R3	R20	256
		UB503		3F		○				R1	R12	257
		UB504		4F		○				R1	R12	258
		UTB502		2F		○				R0.3	R2	259
	Roughing	UF50		3~5F		○				D3	D25	261
		UF51		3~5F		○				D3	D25	262
		UF51-H		3~5F		○				D3	D25	263
ZAMUS THUNDER P. 264	SQUARE	TX202		2F		○				D1	D20	267
		TX204		4F		○				D1	D20	268
		TX222		2F			○			D3	D20	269
		TX224		4F			○			D3	D20	270
		TX302		2F		○				D1	D20	271
		TX304		4F		○				D1	D20	272
		TX304H		4F		○				D3	D20	273
		ZE302P		2F		○				D1	D20	274
		ZE304P		4F		○				D1	D20	275
		ZE322		2F			○			D3	D20	276
		ZE324		4F			○			D3	D20	277
	RADIUS	ZR304H		4F		○				D3	D12	278
		ZR322		2F		○				D3	D12	279
		ZR324		4F		○				D3	D12	280
		ZR324H		4F		○				D6	D12	281
	BALL	DB312		2F		○				R0.5	R10	282
		DB342		2F		○		○		R0.5	R6	283
		TXB202		2F		○				R0.5	R10	284
		TXB204		4F		○				R1	R10	285
		TXB222		2F			○			R1.5	R10	286
		TXB232		2F		○				R1.5	R10	287
		TXB302		2F			○			R0.5	R10	288
		TXB304		4F		○				R0.5	R10	289

ENDMILL SERIES

Series	Type	EDP No	Geometry	Flutes	Length			Neck	Multi Helix	Diameter(mm)		Page
					Short	Middle	Long			Min	Max	
X-STAR P. 290	SQUARE	XCE503		3F		○			○	D2	D25	292
		XCE504		4F		○			○	D6	D25	293
		XE504		4F		○			○	D1	D25	294
		XE505		5F		○			○	D6	D25	295
		XE514		4F	○			○	○	D1	D20	296
		XE515		5F		○			○	D6	D20	297
		XE524		4F	○			○	○	D6	D16	298
	RADIUS	XCR503		3F		○			○	D5	D25	299
		XCR504		4F		○			○	D6	D25	300
		XR504		4F		○			○	D2	D25	301
		XR505		5F		○			○	D6	D25	302
		XR514		4F		○			○	D2	D20	303
	BALL	XXB504		4F		○			○	R2	R6	304
	CHAMFER	XCC503		3F		○			○	D2	D25	305
		XCC504		4F		○			○	D6	D25	306
New S-WING P. 308	SQUARE	SE502		2F		○			○	D1	D20	311
		SE503		3F		○			○	D1	D20	312
		SE504		4F		○			○	D1	D20	313
		SE506		6F		○			○	D6	D20	315
	RADIUS	SR504		4F		○			○	D1	D20	316
		SR505		5F		○			○	D6	D20	318
		SR507		7F		○			○	D6	D20	319
	BALL	SB502		2F		○			○	R1	R12	320
		SB504		4F		○			○	R3	R20	321
	ROUGHING	SF51H		3~5F		○			○	D3	D20	322
ALU-WAVE P. 324	SQUARE	WAE301		1F		○				D0.2	D12	326
		WAE302		2F		○				D1	D25	327
		WAE30(2)3		3F			○			D1	D25	328
	RADIUS	WAR302		2F		○				D6	D20	330
		WAR303		3F		○				D6	D20	331
		WAR502		2F		○				D1	D12	332



Series	Type	EDP No	Geometry	Flutes	Length			Neck	Multi Helix	Diameter(mm)		Page
					Short	Middle	Long			Min	Max	
ALU-WAVE P. 324	RADIUS	WAR503		3F		○				D4	D20	333
	BALL	WAB312		2F	○			○		R3	R10	334
	ROUGHING	WAF303		3F		○				D4	D20	335
STANDARD P. 336	SQUARE	E302		2F		○				D1	D25	338
		E304		4F		○	○			D2	D25	339
		E322		2F			○			D3	D20	340
		EL422		2F			○			D3	D10	341
		E324		4F						D3	D20	342
		EB302-W		2F		○				D14	D50	343
		EB304-W		4F		○				D14	D50	344
		EB322-W		2F			○			D14	D45	345
		EB324-W		4F			○			D14	D50	346
	BALL	B302		2F		○				R0.5	R12.5	347
		B304		4F		○				R1.5	R12.5	348
		BL422		2F			○			R1.5	R10	349
		BB302-W		2F		○				R7.5	R16	350
COPPER -MATE P. 352	RADIUS	RC502		2F		○		○		D2	D12	353
	BALL	BC502		2F		○		○		R0.5	R6	354
GRA-MATE P. 356	SQUARE	GE		2F		○		○		D0.5	D12	357
		WGE504		4F	○	○	○			D2	D20	358
	RADIUS	WGR502		2F		○		○		D0.2	D6	359
		WGR504		4F		○				D3	D20	360
	BALL	G		2F		○		○		R0.25	R6	361
		WGB504		4F		○		○		R0.5	R10	363

DRILL SERIES

Series	EDP No	Geometry	Flutes	Length							P	M	K	N	S	H	Internal coolant	Cutting Edge Tolerance	Page
				3D	4D	5D	7D	8D	10D	20D									
New NEW DOLPHIN P. 368	NDPG503		2F	○							◎	◎	○		○		External	h7	372
	NDPG504		2F		○						◎	◎	○		○		External	h7	375
	NDPG507		2F				○				◎	◎	○		○		External	h7	378
	NDPK504 (NDPR/L)		2F		○						○		◎				External	h7	381
	NDPK507 (NDPR/L)		2F				○				○		◎				External	h7	384
POWER MAX P. 388	PF503		2F	○							◎	○	◎				External	h8	390
	PF505		2F			○					◎	○	◎				External	h8	393
	SF503		2F	○							◎	◎	◎		○		Internal	h8	396
	SF505		2F			○					◎	◎	◎		○		Internal	h8	399
	SF508		2F					○			◎	◎	◎		○		Internal	h7	402
	SF510		2F						○		◎	○	◎				Internal	h8	405
	SF520		2F							○	◎	○	◎				Internal	h8	407
	HP503		2F	○							◎	○	◎				External	m7	409
	HPI503		2F	○							◎	◎	◎		○		Internal	m7	411
	HPI505		2F			○					◎	◎	◎		○		Internal	m7	414
	HPI508-N		2F					○			◎	◎	◎		○		Internal	m7	417
	P503A(F)		2F	○							◎	○	◎				External	m7	420
	P505A(F)		2F			○					◎	○	◎				External	m7	423
	PI503A(F)		2F	○							◎	◎	◎		○		Internal	m7	426
	PI505A(F)		2F			○					◎	◎	◎		○		Internal	m7	429
	PI508		2F					○			◎	◎	◎		○		Internal	m7	432
SOLID SPIRAL P. 434	SSD		2F		○						○		○	◎			External	h8	436
	SSDL		2F				○				○		○	◎			External	h8	439
	SSTD		2F		○						○		○	◎			External	h8	441
	SSTDL		2F				○				○		○	◎			External	h8	443
	APF		3F			○					○			◎			External	0 ~ -0.012	445

TAP SERIES

Series		Type	EDP No	Geometry	Coating		Diameter(mm)		Page
					Coating	UnCoating	Min	Max	
CARBIDE TAP P. 450	JIS	SPIRAL	WPOM			○	M3	M12	452
			WPCM		TiCN		M3	M12	453
		STRAIGHT	WSOM			○	M3	M12	454
			WSCM		TiCN		M3	M12	455
		ROLL	WROM			○	M3	M12	456
			WRCM		TiCN		M3	M12	457
		SPIRAL ROLL	WFOM			○	M3	M6	458
			WFCM		TiCN		M3	M6	459
	DIN	SPIRAL	WQOM			○	M3	M12	461
			WQCM		TiCN		M3	M12	462
		STRAIGHT	WGOM			○	M3	M12	463
			WGCM		TiCN		M3	M12	464
		ROLL	WMOM			○	M3	M12	465
			WMCM		TiCN		M3	M12	467
HSSE TAP P. 470	JIS	SPIRAL	VPOM			○	M3	M24	471
			VPTM		TiN		M3	M24	473
			VPCM		TiCN		M3	M24	475
			VPHM		HOMO		M3	M24	477
		POINT	VNOM			○	M3	M24	479
			VNTM		TiN		M3	M24	481
			VNCM		TiCN		M3	M24	483
			VNHM		HOMO		M3	M24	485
		STRAIGHT	VSOM			○	M3	M24	487
			VSTM		TiN		M3	M24	489
			VSCM		TiCN		M3	M24	491
			VSHM		HOMO		M3	M24	493
		ROLL	VROM			○	M3	M12	495
			VRTM		TiN		M3	M12	496
			VRCM		TiCN		M3	M12	497
		SPIRAL ROLL	VFOM			○	M3	M6	498
			VFTM		TiN		M3	M6	499

TAP SERIES

Series		Type	EDP No	Geometry	Coating		Diameter(mm)		Page
					Coating	UnCoating	Min	Max	
HSSE TAP P. 470	JIS	SPIRAL ROLL	VFCM		TiCN		M3	M6	500
	DIN	SPIRAL	VQOM			○	M3	M24	503
			VQTM		TiN		M3	M24	505
			VQCM		TiCN		M3	M24	507
			VQHM		HOMO		M3	M24	509
		POINT	VDOM			○	M3	M24	511
			VDTM		TiN		M3	M24	513
			VDCM		TiCN		M3	M24	515
			VDHM		HOMO		M3	M24	517
		STRAIGHT	VGOM			○	M3	M24	519
			VGTM		TiN		M3	M24	521
			VGCM		TiCN		M3	M24	523
			VGHM		HOMO		M3	M24	525
		ROLL	VMOM			○	M3	M12	527
			VMTM		TiN		M3	M12	529
			VMCM		TiCN		M3	M12	531

CENTERING TOOL & REAMER SERIES

Series	Type	EDP No	Geometry	Flutes	Diameter(mm)		Page
					Min	Max	
CENTERING TOOL P. 536	-	CDS		2F	D1	D5	538
	-	LDS		2F	D3	D20	539
	-	LDF---W		2F	D3	D12	540
	-	CES302 (60°)		2F	D3	D20	541
	-	CES302 (90°)		2F	D3	D20	542
	-	CEM---W		2F	D10	D20	543
	-	CRC		2F	D2	D20	544
	-	CFT---W		3~4F	D6	D12	545
	-	CCT		2F	D3	D12	546
	-	CCF		2F	D2	D12	547
REAMER P. 550	STRAIGHT	SSR		4&6F	D2	D12	551
	7˚Left Helix	SHR		4&6F	D2	D12	552
		HRS---W		4&6F	D1.98	D12.05	553
	60˚ Left Helix	SBR		4&6F	D3	D20	555

ENDMILL SERIES



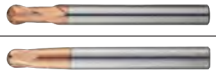
ZAMUS STAR ENDMILL High Hardness HRc 50 ~ 70	18	
E-STAR ENDMILL new High Hardness HRc 50 ~ 63	72	
U-WING ENDMILL new Mid Hardness HRc 30 ~ 50	154	
ZAMUS THUNDER ENDMILL Low Hardness HRc 10 ~ 30	264	
X-STAR ENDMILL Difficult To Cut Material and Low Hardness Material HRc ~ 35	290	
S-WING ENDMILL new Difficult To Cut Material (STS, Ti, Ni and Inconel)	308	
ALU-WAVE ENDMILL Aluminum, Aluminum Alloy and Non-ferrous Materials	324	
STANDARD ENDMILL Low Hardness Materials under HRc 30	336	
COPPER-MATE ENDMILL Copper, Bronze and Non-ferrous Materials	352	
GRA-MATE ENDMILL Graphite, Reinforced Plastics, Non-ferrous Materials	356	

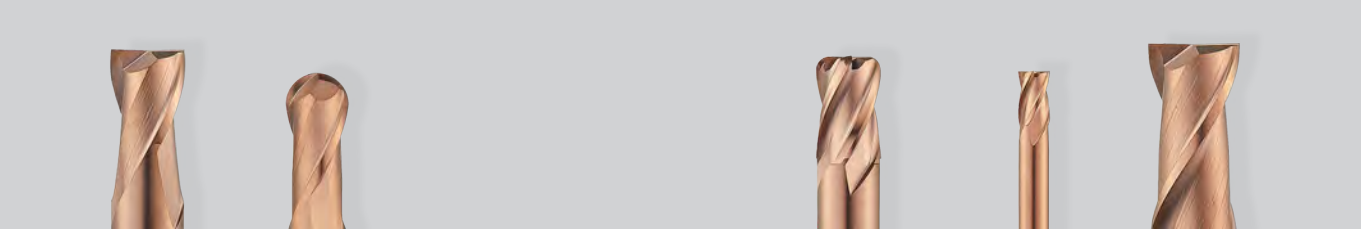
ZAMUS STAR ENDMILL

High Hardness HRc 50 ~ 70



Contents

Section		EDP No	Geometry	Type	Diameter(mm)		Page
Type	Flutes				Min	Max	
SQUARE	2F	ZE702		2 FLUTES NECK SQUARE ENDMILL	D0.1	D20	21
	4F	ZE704		4 FLUTES NECK SQUARE ENDMILL	D1	D20	22
	2F	ZE712		2 FLUTES SQUARE ENDMILL	D1	D12	23
	4F	ZE714		4 FLUTES SQUARE ENDMILL	D1	D12	24
	6F	ZE716		6 FLUTES SQUARE ENDMILL	D6	D20	25
	4F&6F	ZE724(6)		4&6 FLUTES NECK SQUARE ENDMILL	D1	D12	26
	4F	ZS124		4 FLUTES SQUARE ENDMILL	D2	D12	27
	2F	ZSLNS20		2 FLUTES LONG NECK SQUARE ENDMILL	D0.1	D5	28
	4F	ZSLNS40		4 FLUTES LONG NECK SQUARE ENDMILL	D1	D5	33
RADIUS	2F	ZR702		2 FLUTES NECK RADIUS ENDMILL	D1	D12	36
	4F	ZR704		4 FLUTES NECK RADIUS ENDMILL	D1	D12	39
	6F	ZR706		6 FLUTES NECK RADIUS ENDMILL	D6	D12	41
	4F	ZR714		4 FLUTES RADIUS ENDMILL	D3	D12	42
	4F	ZR724		4 FLUTES NECK RADIUS ENDMILL	D6	D12	43
	2F	ZR732		2 FLUTES LONG SHANK RADIUS ENDMILL	D1	D12	44
	4F	ZR734		4 FLUTES LONG SHANK RADIUS ENDMILL	D1	D12	45
	6F	ZR736		6 FLUTES RADIUS ENDMILL	D6	D12	46
	4F	ZS1(2)04		4 FLUTES NECK RADIUS ENDMILL	D1	D12	47
	4F	ZS204		4 FLUTES NECK RADIUS ENDMILL	D2	D12	48
	2F	ZSLNR20		2 FLUTES LONG NECK RADIUS ENDMILL	D0.1	D5	49
	2F	ZSTNR20		2 FLUTES TAPERED NECK RADIUS ENDMILL	D2	D3	53
	4F	ZSPM4		4 FLUTES NECK RADIUS ENDMILL	D3	D12	56
BALL	2F	DB702		2 FLUTES NECK BALL NOSE ENDMILL	R0.05	R6	57
	3F	DB703		3 FLUTES NECK BALL NOSE ENDMILL	R1	R6	58
	2F	DB712		2 FLUTES BALL NOSE ENDMILL	R0.5	R6	59
	4F	DB734		4 FLUTES 15° HELIX BALL NOSE ENDMILL	R1	R5	60
	2F	ZSLNB20		2 FLUTES LONG NECK BALL NOSE ENDMILL	R0.05	R2.5	61
	2F	ZSTNB20		2 FLUTES TAPERED NECK BALL NOSE ENDMILL	R0.1	R5	65
	3F	ZSTNB30		3 FLUTES TAPERED NECK BALL NOSE ENDMILL	R0.5	R2.5	69



EDP No System

*If expressed as an integer, the decimal point is omitted.

Z	R	7	0	4	020	03	06	S04

Section	Appearance	Grade	Length, Shank Type	Flute	Cutting Dia	Corner R	Effective Length	Shank Dia
Z : Zamus	E : Square	7 : Grade	0 : Neck	2 : 2 Flutes	0.05	0.05		4
D : Dynamic	R : Radius		1 : Straight, Neck	3 : 3 Flutes	~	~		~
ZS : Zamus Star	B : Ball		2 : Long Neck	4 : 4 Flutes	20	3	For more information, Refer to the detail pages.	20
	LNS : Long Neck Square		3 : Long Shank	6 : 6 Flutes				
	LNR : Long Neck Radius							
	LNB : Long Neck Ball							
	PM : Power Mill							

Ex) 4 Flutes / Cutting Dia Ø2 / Corner R 0.3 / Effective Length 6mm / Shank Dia 4 / 70 Grade / Corner Radius Neck Type Zamus Endmill

ZAMUS STAR ENDMILL

High Hardness HRc 50 ~ 70



Characteristics

· Suitable for high-speed processing of high-hardness workpieces (recommended: HRc 50 ~ 70) such as heat treated steel, alloy steel, and carbon steel

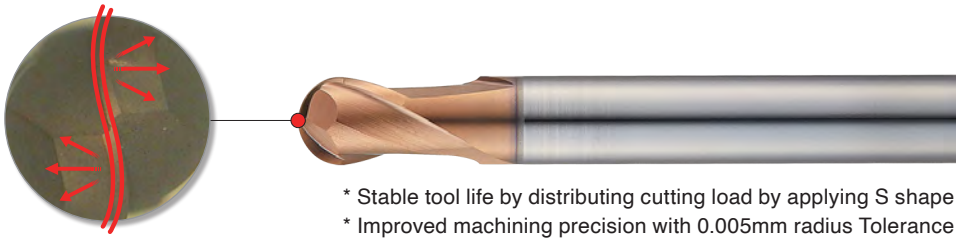
· Suitable for various type of machining with diverse specifications such as long neck, rib, and tapered neck

Features

· Improved cutting edge strength of tools by using ultra-fine material

· Maintains hardness of the blade and has high temperature oxidation resistance and during high-speed processing by applying AlTiN coating

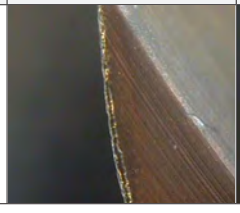
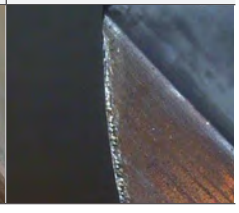
· Stable performance with designed cutting edge suitable for high-speed machining of high-hardness workpieces



* Stable tool life by distributing cutting load by applying S shape

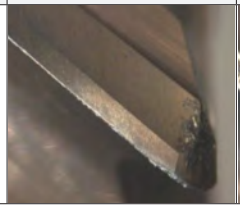
* Improved machining precision with 0.005mm radius Tolerance

Case Study

	Zamus Star	Competitor
BALL		

TEST TOOL : DB702120

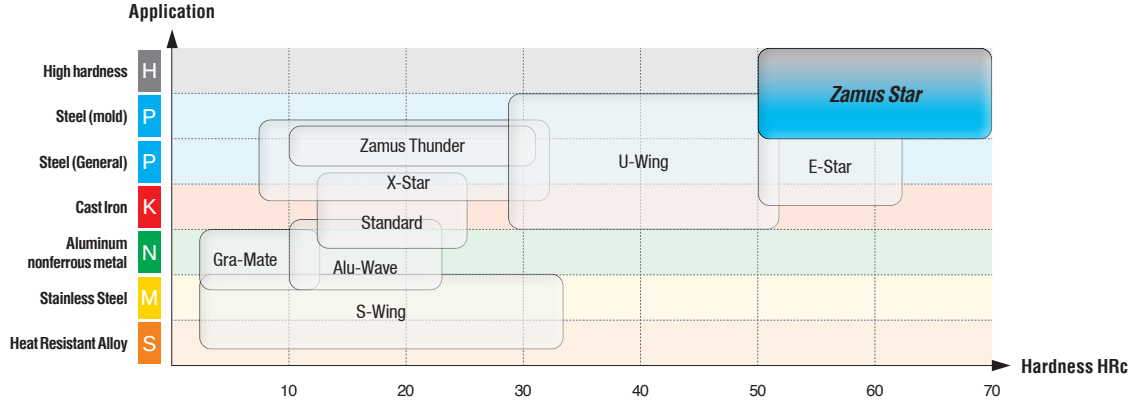
· MATERIAL : SKD11 Heat treatment / RPM : 5,950 / FEED : 1,870 / ap : 0.25 / ae : 0.6

	Zamus Star	Competitor
CONER RADIUS		

TEST TOOL : ZS2041001032

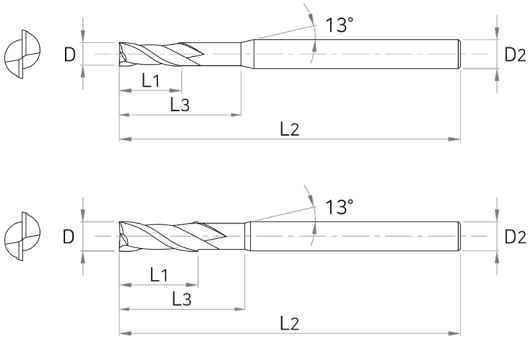
· MATERIAL : SKD11 Heat treatment / RPM : 5,500 / FEED : 1,100 / ap : 10 / ae : 0.5

Applications



ZE702 | 2 FLUTES NECK SQUARE ENDMILL





■ Tolerance

D		Shank Dia
~D6	0~-0.012	h5
D8~20	0~-0.015	

CARBIDE | AlTiN | 2 | 30° HELIX | DATA P.561

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
ZE702 001	0.1	0.2	-	40	4
ZE702 002	0.2	0.4	-	40	4
ZE702 003	0.3	0.5	-	40	4
ZE702 004	0.4	0.7	-	40	4
ZE702 005	0.5	1	-	40	4
ZE702 006	0.6	1.2	-	40	4
ZE702 007	0.7	1.4	-	40	4
ZE702 008	0.8	1.6	-	40	4
ZE702 009	0.9	2	-	40	4
ZE702 010 S4	1	1.5	-	40	4
ZE702 010	1	1.5	-	40	6
ZE702 015	1.5	2.2	-	40	6
ZE702 020 S4	2	3	6	40	4

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
ZE702 020	2	3	6	40	6
ZE702 025	2.5	4	6	40	6
ZE702 030	3	4	7	45	6
ZE702 035	3.5	6	9	45	6
ZE702 040	4	6	9	45	6
ZE702 045	4.5	6	10	45	6
ZE702 050	5	6	11	50	6
ZE702 060	6	7	14	50	6
ZE702 080	8	9	18	60	8
ZE702 100	10	12	25	75	10
ZE702 120	12	15	30	75	12
ZE702 160	16	18	38	90	16
ZE702 200	20	24	45	100	20

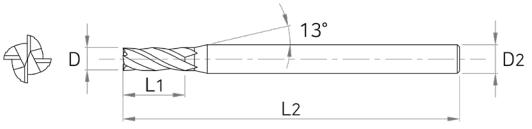
■ Applicable Working Material

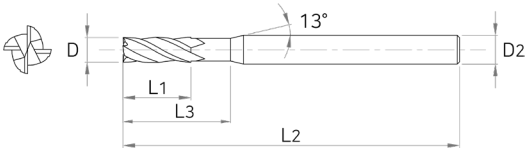
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZE704 | 4 FLUTES NECK SQUARE ENDMILL







■ Tolerance

D		Shank Dia
~D6	0~-0.012	h5
D8~20	0~-0.015	

CARBIDE | AlTiN | 4 | 30° HELIX | DATA P.562

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
ZE704 010 S4	1	1.5	-	40	4
ZE704 010	1	1.5	-	40	6
ZE704 015	1.5	2.2	-	40	6
ZE704 020 S4	2	3	6	40	4
ZE704 020	2	3	6	40	6
ZE704 025	2.5	4	6	40	6
ZE704 030	3	4	7	45	6
ZE704 035	3.5	5	9	45	6
ZE704 040	4	5	9	45	6
ZE704 045	4.5	6	10	45	6
ZE704 050	5	6	11	50	6
ZE704 060	6	7	14	50	6
ZE704 080	8	9	18	60	8
ZE704 100	10	12	25	75	10
ZE704 120	12	15	30	75	12
ZE704 160	16	18	38	90	16
ZE704 200	20	24	45	100	20

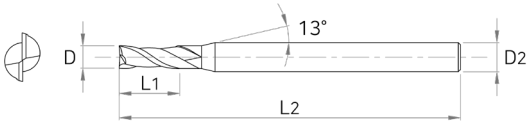
■ Applicable Working Material

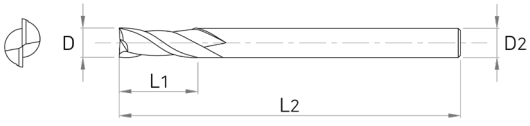
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZE712 | 2 FLUTES SQUARE ENDMILL







■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.02	h5

CARBIDE | AlTiN | 2 | 35° HELIX | DATA P.561

EDP No	SIZES (mm)			
	D	L1	L2	D2
ZE712 010-02	1	2	40	6
ZE712 010	1	3	40	6
ZE712 010-04	1	4	40	6
ZE712 012	1.2	3	40	6
ZE712 015	1.5	4	40	6
ZE712 015-06	1.5	6	40	6
ZE712 015-08	1.5	8	40	6
ZE712 020	2	5	40	6
ZE712 020-08	2	8	40	6
ZE712 020-10	2	10	50	6
ZE712 025	2.5	6	40	6
ZE712 030	3	8	45	6
ZE712 030-10	3	10	50	6
ZE712 030-12	3	12	50	6
ZE712 035	3.5	10	45	6

EDP No	SIZES (mm)			
	D	L1	L2	D2
ZE712 040	4	10	45	6
ZE712 040-12	4	12	50	6
ZE712 040-16	4	16	60	6
ZE712 045	4.5	11	45	6
ZE712 050	5	13	50	6
ZE712 055	5.5	13	50	6
ZE712 060	6	13	50	6
ZE712 060-15	6	15	60	6
ZE712 065	6.5	16	60	8
ZE712 070	7	18	60	8
ZE712 080	8	19	60	8
ZE712 100	10	22	70	10
ZE712 120	12	26	75	12
ZE712 120-30	12	30	75	12

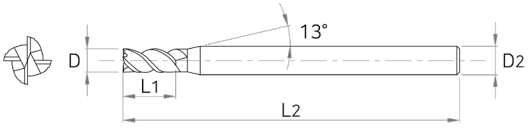
■ Applicable Working Material

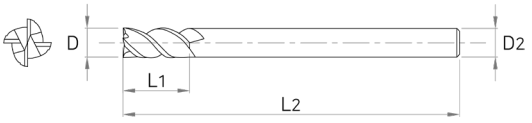
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZE714 | 4 FLUTES SQUARE ENDMILL







■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.02	h5

CARBIDE | AlTiN | 4 | 45° HELIX | DATA P.562

EDP No	SIZES (mm)			
	D	L1	L2	D2
ZE714 010	1	2.5	40	6
ZE714 012	1.2	3	40	6
ZE714 015	1.5	4	40	6
ZE714 020	2	5	40	6
ZE714 025	2.5	6	40	6
ZE714 030	3	8	45	6
ZE714 035	3.5	9	45	6
ZE714 040	4	10	45	6
ZE714 050	5	13	50	6
ZE714 060	6	13	50	6
ZE714 060-15	6	15	60	6
ZE714 080	8	19	60	8
ZE714 100	10	22	70	10
ZE714 100-25	10	25	70	10
ZE714 120	12	26	75	12
ZE714 120-30	12	30	80	12

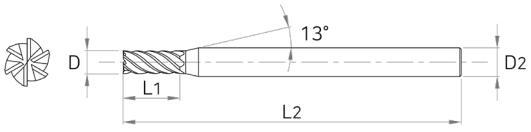
■ Applicable Working Material

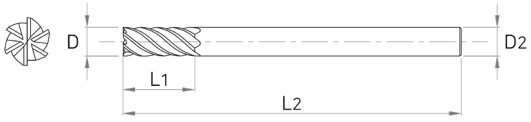
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZE716 | 6 FLUTES SQUARE ENDMILL







■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.02	h5

CARBIDE | AlTiN | 6 | 50° HELIX | DATA P.563

EDP No	SIZES (mm)			
	D	L1	L2	D2
ZE716 060	6	13	50	6
ZE716 080	8	18	60	8
ZE716 100	10	22	70	10
ZE716 120	12	26	75	12
ZE716 160	16	35	90	16
ZE716 200	20	44	100	20

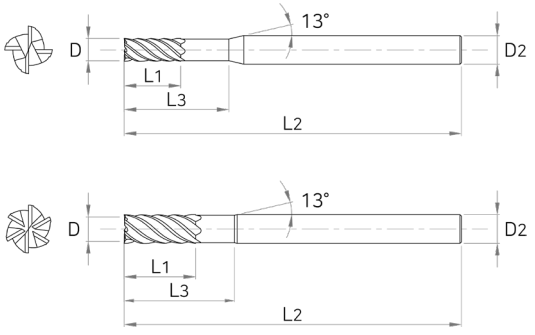
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZE724(6) | 4&6 FLUTES NECK SQUARE ENDMILL





■ Tolerance

D		Shank Dia
~D6	0 ~ -0.012	h5
D8 ~ 12	0 ~ -0.015	

CARBIDE | AlTiN | 4 | 6 | 45° HELIX Z=4 | 60° HELIX Z=6 | DATA P.562

EDP No	SIZES (mm)					
	D	L1	L3	L2	D2	Z
ZE724 010	1	1.5	5	45	6	4
ZE724 015	1.5	2.2	6	45	6	4
ZE724 020	2	3	8	45	6	4
ZE724 030	3	4	9	50	6	4
ZE724 040	4	5	12	50	6	4
ZE724 050	5	6	15	50	6	4
ZE726 060	6	7	20	60	6	6
ZE726 080	8	9	25	70	8	6
ZE726 100	10	12	32	75	10	6
ZE726 120	12	15	38	80	12	6

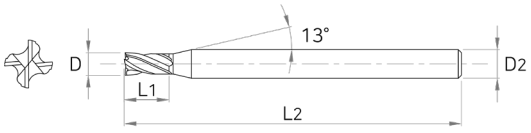
■ Applicable Working Material

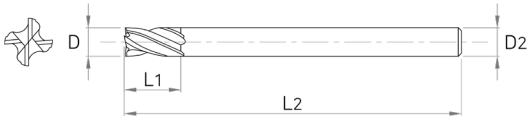
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZS124 | 4 FLUTES SQUARE ENDMILL







■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.02	h5

CARBIDE | AlTiN | 4 | M HELIX | DATA P.565

EDP No	SIZES (mm)			
	D	L1	L2	D2
ZS124 020	2	5	45	4
ZS124 030	3	8	45	6
ZS124 040	4	10	45	6
ZS124 060	6	16	50	6
ZS124 080	8	20	60	8
ZS124 100	10	25	75	10
ZS124 120	12	35	85	12

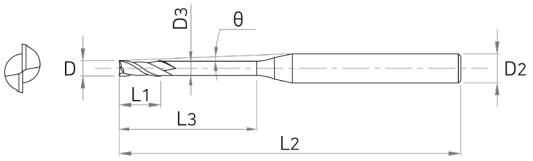
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZSLNS20 | 2 FLUTES LONG NECK SQUARE ENDMILL





■ Tolerance

D		Shank Dia
D0.1 ~ 0.5	0 ~ -0.012	h5
D0.6 ~ 5	0 ~ -0.015	

CARBIDE | AlTiN | 2 | 30° HELIX | DATA P.563

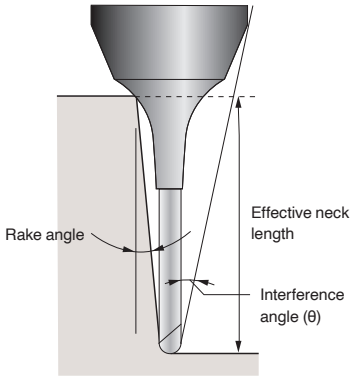
EDP No	SIZES (mm)							Effective length by inclination angle				
	D	L1	L3	D3	L2	D2	θ	0.5°	1°	1.5°	2°	3°
ZSLNS 2001-0.3	0.1	0.15	0.3	0.08	45	4	11.6	0.4	0.4	0.5	0.5	0.5
ZSLNS 2001-0.5	0.1	0.15	0.5	0.08	45	4	11.4	0.6	0.7	0.7	0.7	0.8
ZSLNS 2001-1	0.1	0.15	1	0.08	45	4	10.9	1.2	1.2	1.2	1.3	1.4
ZSLNS 2002-0.5	0.2	0.3	0.5	0.17	50	4	11.3	1.2	1.3	1.5	1.7	2
ZSLNS 2002-1	0.2	0.3	1	0.17	50	4	10.8	1.7	1.9	2.2	2.4	2.7
ZSLNS 2002-1.5	0.2	0.3	1.5	0.17	50	4	10.3	2.3	2.5	2.8	3	3.4
ZSLNS 2003-1	0.3	0.45	1	0.27	50	4	10.8	1.7	1.9	2.2	2.4	2.7
ZSLNS 2003-1.5	0.3	0.45	1.5	0.27	50	4	10.3	2.3	2.5	2.8	3	3.4
ZSLNS 2003-2	0.3	0.45	2	0.27	50	4	9.8	2.8	3.1	3.4	3.6	4.1
ZSLNS 2003-2.5	0.3	0.45	2.5	0.27	50	4	9.4	3.4	3.7	4	4.3	4.7
ZSLNS 2003-3	0.3	0.45	3	0.27	50	4	9	3.9	4.3	4.6	4.9	5.4
ZSLNS 2004-1	0.4	0.6	1	0.37	50	4	10.7	1.7	1.9	2.2	2.4	2.7
ZSLNS 2004-1.5	0.4	0.6	1.5	0.37	50	4	10.2	2.3	2.5	2.8	3	3.4
ZSLNS 2004-2	0.4	0.6	2	0.37	50	4	9.7	2.8	3.1	3.4	3.6	4.1
ZSLNS 2004-2.5	0.4	0.6	2.5	0.37	50	4	9.3	3.4	3.7	4	4.3	4.7
ZSLNS 2004-3	0.4	0.6	3	0.37	50	4	8.9	3.9	4.3	4.6	4.9	5.4
ZSLNS 2004-3.5	0.4	0.6	3.5	0.37	50	4	8.6	4.5	4.9	5.2	5.5	6
ZSLNS 2004-4	0.4	0.6	4	0.37	50	4	8.2	5	5.4	5.8	6.1	6.6
ZSLNS 2004-5	0.4	0.6	5	0.37	50	4	7.6	6.1	6.6	6.9	7.3	7.8
ZSLNS 2004-6	0.4	0.6	6	0.37	50	4	7.1	7.2	7.7	8.1	8.4	9
ZSLNS 2005-1	0.5	0.75	1	0.47	50	4	10.7	1.7	1.9	2.2	2.4	2.7
ZSLNS 2005-1.5	0.5	0.75	1.5	0.47	50	4	10.2	2.3	2.5	2.8	3	3.4
ZSLNS 2005-2	0.5	0.75	2	0.47	50	4	9.7	2.8	3.1	3.4	3.6	4.1
ZSLNS 2005-2.5	0.5	0.75	2.5	0.47	50	4	9.3	3.4	3.7	4	4.3	4.7

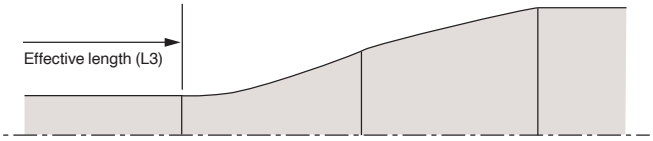
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZSLNS20 | 2 FLUTES LONG NECK SQUARE ENDMILL





※ The marked effective neck length is the default value to prevent interference with the workpiece.
Proper control of the processing environment is required

EDP No	SIZES (mm)							Effective length by inclination angle				
	D	L1	L3	D3	L2	D2	θ	0.5°	1°	1.5°	2°	3°
ZSLNS 2005-3	0.5	0.75	3	0.47	50	4	8.9	3.9	4.3	4.6	4.9	5.4
ZSLNS 2005-4	0.5	0.75	4	0.47	50	4	8.1	5	5.4	5.8	6.1	6.6
ZSLNS 2005-5	0.5	0.75	5	0.47	50	4	7.5	6.1	6.6	6.9	7.3	7.8
ZSLNS 2005-6	0.5	0.75	6	0.47	50	4	7	7.2	7.7	8.1	8.4	9
ZSLNS 2005-8	0.5	0.75	8	0.47	50	4	6.2	9.3	9.9	10.3	10.7	11.4
ZSLNS 2006-2	0.6	0.9	2	0.57	50	4	9.6	2.8	3.1	3.4	3.6	4.1
ZSLNS 2006-4	0.6	0.9	4	0.57	50	4	8.1	5	5.4	5.8	6.1	6.6
ZSLNS 2006-6	0.6	0.9	6	0.57	50	4	6.9	7.2	7.7	8.1	8.4	9
ZSLNS 2006-8	0.6	0.9	8	0.57	50	4	6.1	9.3	9.9	10.3	10.7	11.4
ZSLNS 2006-10	0.6	0.9	10	0.57	50	4	5.4	11.5	12.1	12.6	13	13.7
ZSLNS 2007-2	0.7	1.05	2	0.67	50	4	9.6	2.8	3.1	3.4	3.6	4.1
ZSLNS 2007-4	0.7	1.05	4	0.67	50	4	8	5	5.4	5.8	6.1	6.6
ZSLNS 2007-6	0.7	1.05	6	0.67	50	4	6.9	7.2	7.7	8.1	8.4	9
ZSLNS 2007-8	0.7	1.05	8	0.67	50	4	6	9.3	9.9	10.3	10.7	11.4
ZSLNS 2007-10	0.7	1.05	10	0.67	50	4	5.3	11.5	12.1	12.6	13	13.7
ZSLNS 2008-4	0.8	1.2	4	0.77	50	4	7.9	5	5.4	5.8	6.1	6.6
ZSLNS 2008-6	0.8	1.2	6	0.77	50	4	6.8	7.2	7.7	8.1	8.4	9
ZSLNS 2008-8	0.8	1.2	8	0.77	50	4	5.9	9.3	9.9	10.3	10.7	11.4
ZSLNS 2008-10	0.8	1.2	10	0.77	50	4	5.2	11.5	12.1	12.6	13	13.7
ZSLNS 2008-12	0.8	1.2	12	0.77	55	4	4.7	13.6	14.2	14.8	15.2	16
ZSLNS 2009-6	0.9	1.35	6	0.86	50	4	6.7	7.2	7.7	8.1	8.4	9.1
ZSLNS 2009-8	0.9	1.35	8	0.86	50	4	5.8	9.4	9.9	10.4	10.7	11.4
ZSLNS 2009-10	0.9	1.35	10	0.86	50	4	5.1	11.5	12.1	12.6	13	13.7
ZSLNS 2009-12	0.9	1.35	12	0.86	55	4	4.6	13.6	14.3	14.8	15.2	16

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZSLNS20 | 2 FLUTES LONG NECK SQUARE ENDMILL

EDP No	SIZES (mm)							Effective length by inclination angle				
	D	L1	L3	D3	L2	D2	θ	0.5°	1°	1.5°	2°	3°
ZSLNS 2010-2	1	1.5	2	0.96	50	4	9.4	2.9	3.2	3.4	3.7	4.1
ZSLNS 2010-4	1	1.5	4	0.96	50	4	7.7	5.1	5.5	5.8	6.1	6.6
ZSLNS 2010-6	1	1.5	6	0.96	50	4	6.6	7.2	7.7	8.1	8.4	9.1
ZSLNS 2010-8	1	1.5	8	0.96	50	4	5.7	9.4	9.9	10.4	10.7	11.4
ZSLNS 2010-10	1	1.5	10	0.96	50	4	5	11.5	12.1	12.6	13	13.7
ZSLNS 2010-12	1	1.5	12	0.96	55	4	4.5	13.6	14.3	14.8	15.2	16
ZSLNS 2010-14	1	1.5	14	0.96	55	4	4.1	15.7	16.4	17	17.4	18.7
ZSLNS 2010-16	1	1.5	16	0.96	60	4	3.8	17.8	18.6	19.1	19.6	21.3
ZSLNS 2010-20	1	1.5	20	0.96	60	4	3.2	22	22.8	23.5	24	26.6
ZSLNS 2012-6	1.2	1.8	6	1.15	50	4	6.3	7.3	7.7	8.1	8.5	9.1
ZSLNS 2012-8	1.2	1.8	8	1.15	50	4	5.5	9.4	9.9	10.4	10.8	11.4
ZSLNS 2012-10	1.2	1.8	10	1.15	50	4	4.8	11.5	12.1	12.6	13	13.7
ZSLNS 2012-12	1.2	1.8	12	1.15	55	4	4.3	13.6	14.3	14.8	15.2	16
ZSLNS 2012-16	1.2	1.8	16	1.15	55	4	3.6	17.8	18.6	19.2	19.7	21.3
ZSLNS 2014-6	1.4	2.1	6	1.34	50	4	6.1	7.3	7.8	8.1	8.5	9.1
ZSLNS 2014-8	1.4	2.1	8	1.34	50	4	5.3	9.4	10	10.4	10.8	11.5
ZSLNS 2014-10	1.4	2.1	10	1.34	50	4	4.6	11.6	12.1	12.6	13	13.8
ZSLNS 2014-12	1.4	2.1	12	1.34	55	4	4.1	13.7	14.3	14.8	15.3	16.1
ZSLNS 2014-14	1.4	2.1	14	1.34	55	4	3.7	15.8	16.5	17	17.5	18.7
ZSLNS 2014-16	1.4	2.1	16	1.34	55	4	3.4	17.9	18.6	19.2	19.7	21.4
ZSLNS 2015-4	1.5	2.25	4	1.44	50	4	7.2	5.2	5.5	5.9	6.2	6.7
ZSLNS 2015-6	1.5	2.25	6	1.44	50	4	6	7.3	7.8	8.1	8.5	9.1
ZSLNS 2015-8	1.5	2.25	8	1.44	50	4	5.1	9.4	10	10.4	10.8	11.5
ZSLNS 2015-10	1.5	2.25	10	1.44	50	4	4.5	11.6	12.1	12.6	13	13.8
ZSLNS 2015-12	1.5	2.25	12	1.44	55	4	4	13.7	14.3	14.8	15.3	16.1
ZSLNS 2015-14	1.5	2.25	14	1.44	55	4	3.6	15.8	16.5	17	17.5	18.7
ZSLNS 2015-16	1.5	2.25	16	1.44	55	4	3.3	17.9	18.6	19.2	19.7	-
ZSLNS 2015-18	1.5	2.25	18	1.44	60	4	3	20	20.7	21.3	21.9	-
ZSLNS 2015-20	1.5	2.25	20	1.44	60	4	2.8	22	22.9	23.5	24.1	-
ZSLNS 2015-25	1.5	2.25	25	1.44	65	4	2.4	27.3	28.1	28.8	30	-
ZSLNS 2016-6	1.6	2.4	6	1.54	50	4	5.9	7.3	7.8	8.1	8.5	9.1
ZSLNS 2016-8	1.6	2.4	8	1.54	50	4	5	9.4	10	10.4	10.8	11.5
ZSLNS 2016-10	1.6	2.4	10	1.54	50	4	4.4	11.6	12.1	12.6	13	13.8
ZSLNS 2016-12	1.6	2.4	12	1.54	55	4	3.9	13.7	14.3	14.8	15.3	16.1
ZSLNS 2016-14	1.6	2.4	14	1.54	55	4	3.5	15.8	16.5	17	17.5	18.7
ZSLNS 2016-16	1.6	2.4	16	1.54	55	4	3.2	17.9	18.6	19.2	19.7	21.4
ZSLNS 2016-18	1.6	2.4	18	1.54	60	4	2.9	20	20.7	21.3	21.9	-
ZSLNS 2016-20	1.6	2.4	20	1.54	60	4	2.7	22	22.9	23.5	24.1	-
ZSLNS 2018-6	1.8	2.7	6	1.73	50	4	5.6	7.4	7.8	8.2	8.5	9.1
ZSLNS 2018-8	1.8	2.7	8	1.73	50	4	4.8	9.5	10	10.4	10.8	11.5
ZSLNS 2018-10	1.8	2.7	10	1.73	50	4	4.2	11.6	12.2	12.6	13	13.8

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZSLNS20 | 2 FLUTES LONG NECK SQUARE ENDMILL

EDP No	SIZES (mm)							Effective length by inclination angle				
	D	L1	L3	D3	L2	D2	θ	0.5°	1°	1.5°	2°	3°
ZSLNS 2018-12	1.8	2.7	12	1.73	55	4	3.7	13.7	14.3	14.8	15.3	16.1
ZSLNS 2018-14	1.8	2.7	14	1.73	55	4	3.3	15.8	16.5	17	17.5	18.8
ZSLNS 2018-16	1.8	2.7	16	1.73	55	4	3	17.9	18.6	19.2	19.7	-
ZSLNS 2018-18	1.8	2.7	18	1.73	60	4	2.7	20	20.7	21.3	21.9	-
ZSLNS 2018-20	1.8	2.7	20	1.73	60	4	2.5	22.1	22.9	23.5	24.1	-
ZSLNS 2020-4	2	3	4	1.92	50	4	6.5	5.3	5.6	5.9	6.2	6.7
ZSLNS 2020-6	2	3	6	1.92	50	4	5.3	7.4	7.8	8.2	8.5	9.1
ZSLNS 2020-8	2	3	8	1.92	50	4	4.5	9.5	10	10.4	10.8	11.5
ZSLNS 2020-10	2	3	10	1.92	50	4	3.9	11.6	12.2	12.7	13.1	13.8
ZSLNS 2020-12	2	3	12	1.92	55	4	3.4	13.7	14.3	14.9	15.3	16.1
ZSLNS 2020-14	2	3	14	1.92	55	4	3.1	15.8	16.5	17	17.5	18.8
ZSLNS 2020-16	2	3	16	1.92	55	4	2.8	17.9	18.6	19.2	19.7	-
ZSLNS 2020-18	2	3	18	1.92	60	4	2.6	20	20.8	21.4	21.9	-
ZSLNS 2020-20	2	3	20	1.92	60	4	2.4	22.1	22.9	23.5	24.1	-
ZSLNS 2020-25	2	3	25	1.92	65	4	2	27.3	28.2	28.9	-	-
ZSLNS 2020-30	2	3	30	1.92	70	4	1.7	32.5	33.4	34.4	-	-
ZSLNS 2025-8	2.5	3.75	8	2.4	50	4	3.7	9.6	10.1	10.5	10.9	11.5
ZSLNS 2025-10	2.5	3.75	10	2.4	50	4	3.1	11.7	12.2	12.7	13.1	13.8
ZSLNS 2025-12	2.5	3.75	12	2.4	55	4	2.7	13.8	14.4	14.9	15.3	-
ZSLNS 2025-14	2.5	3.75	14	2.4	55	4	2.4	15.9	16.5	17.1	17.5	-
ZSLNS 2025-16	2.5	3.75	16	2.4	55	4	2.2	18	18.7	19.2	19.7	-
ZSLNS 2025-18	2.5	3.75	18	2.4	60	4	2	20.1	20.8	21.4	-	-
ZSLNS 2025-20	2.5	3.75	20	2.4	60	4	1.8	22.1	22.9	23.5	-	-
ZSLNS 2025-25	2.5	3.75	25	2.4	65	4	1.5	27.3	28.2	-	-	-
ZSLNS 2025-30	2.5	3.75	30	2.4	70	4	1.3	32.6	33.5	-	-	-
ZSLNS 2030-8	3	4.5	8	2.88	55	6	5.6	9.6	10.1	10.5	10.9	11.5
ZSLNS 2030-10	3	4.5	10	2.88	55	6	5	11.7	12.3	12.7	13.1	13.8
ZSLNS 2030-12	3	4.5	12	2.88	60	6	4.5	13.8	14.4	14.9	15.4	16.3
ZSLNS 2030-14	3	4.5	14	2.88	60	6	4.1	15.9	16.6	17.1	17.6	18.9
ZSLNS 2030-16	3	4.5	16	2.88	60	6	3.7	18	18.7	19.3	19.8	21.6
ZSLNS 2030-18	3	4.5	18	2.88	60	6	3.4	20.1	20.8	21.4	21.9	24.2
ZSLNS 2030-20	3	4.5	20	2.88	65	6	3.2	22.2	23	23.6	24.2	26.9
ZSLNS 2030-25	3	4.5	25	2.88	70	6	2.7	27.4	28.2	28.9	30.2	-
ZSLNS 2030-30	3	4.5	30	2.88	75	6	2.4	32.6	33.5	34.5	36.2	-
ZSLNS 2030-35	3	4.5	35	2.88	80	6	2.1	37.7	38.7	40.2	42.2	-
ZSLNS 2030-40	3	4.5	40	2.88	90	6	1.9	42.9	43.9	45.9	-	-
ZSLNS 2040-12	4	6	12	3.85	60	6	3.4	13.9	14.5	15	15.4	16.3
ZSLNS 2040-16	4	6	16	3.85	60	6	2.8	18.1	18.8	19.3	19.8	-
ZSLNS 2040-20	4	6	20	3.85	70	6	2.3	22.3	23	23.6	24.3	-
ZSLNS 2040-25	4	6	25	3.85	70	6	2	27.4	28.3	28.9	-	-
ZSLNS 2040-30	4	6	30	3.85	80	6	1.7	32.6	33.5	34.6	-	-

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZSLNS20 | 2 FLUTES LONG NECK SQUARE ENDMILL

EDP No	SIZES (mm)							Effective length by inclination angle				
	D	L1	L3	D3	L2	D2	θ	0.5°	1°	1.5°	2°	3°
ZSLNS 2040-35	4	6	35	3.85	80	6	1.5	37.8	38.8	-	-	-
ZSLNS 2040-40	4	6	40	3.85	90	6	1.3	42.9	44	-	-	-
ZSLNS 2040-45	4	6	45	3.85	90	6	1.2	48.1	49.4	-	-	-
ZSLNS 2040-50	4	6	50	3.85	100	6	1.1	53.2	54.8	-	-	-
ZSLNS 2050-16	5	7.5	16	4.85	60	6	1.5	18.1	18.8	-	-	-
ZSLNS 2050-20	5	7.5	20	4.85	60	6	1.3	22.3	23	-	-	-
ZSLNS 2050-25	5	7.5	25	4.85	70	6	1.1	27.4	28.3	-	-	-
ZSLNS 2050-30	5	7.5	30	4.85	70	6	0.9	32.6	-	-	-	-
ZSLNS 2050-35	5	7.5	35	4.85	80	6	0.8	37.8	-	-	-	-
ZSLNS 2050-40	5	7.5	40	4.85	90	6	0.7	42.9	-	-	-	-
ZSLNS 2050-50	5	7.5	50	4.85	100	6	0.6	53.2	-	-	-	-

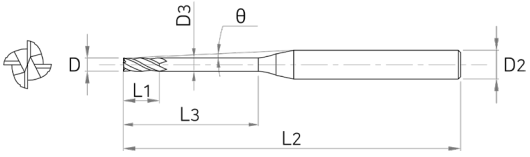
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZSLNS40 | 4 FLUTES LONG NECK SQUARE ENDMILL





■ Tolerance

D		Shank Dia
D1 ~ 5	0 ~ -0.015	h5

CARBIDE | AlTiN | 4 | 30° HELIX | DATA P.563

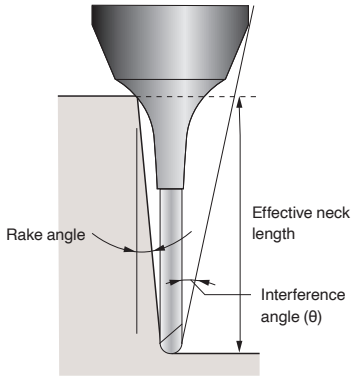
EDP No	SIZES (mm)							Effective length by inclination angle				
	D	L1	L3	D3	L2	D2	θ	0.5°	1°	1.5°	2°	3°
ZSLNS 4010-4	1	1.5	4	0.96	50	4	7.7	5.1	5.5	5.8	6.1	6.6
ZSLNS 4010-6	1	1.5	6	0.96	50	4	6.6	7.2	7.7	8.1	8.4	9.1
ZSLNS 4010-8	1	1.5	8	0.96	50	4	5.7	9.4	9.9	10.4	10.7	11.4
ZSLNS 4010-10	1	1.5	10	0.96	50	4	5	11.5	12.1	12.6	13	13.7
ZSLNS 4015-4	1.5	2.25	4	1.44	50	4	7.2	5.2	5.5	5.9	6.2	6.7
ZSLNS 4015-6	1.5	2.25	6	1.44	50	4	6	7.3	7.8	8.1	8.5	9.1
ZSLNS 4015-8	1.5	2.25	8	1.44	50	4	5.1	9.4	10	10.4	10.8	11.5
ZSLNS 4015-10	1.5	2.25	10	1.44	50	4	4.5	11.6	12.1	12.6	13	13.8
ZSLNS 4015-12	1.5	2.25	12	1.44	55	4	4	13.7	14.3	14.8	15.3	16.1
ZSLNS 4015-14	1.5	2.25	14	1.44	55	4	3.6	15.8	16.5	17	17.5	18.7
ZSLNS 4015-16	1.5	2.25	16	1.44	55	4	3.3	17.9	18.6	19.2	19.7	-
ZSLNS 4015-18	1.5	2.25	18	1.44	60	4	3	20	20.7	21.3	21.9	-
ZSLNS 4015-20	1.5	2.25	20	1.44	60	4	2.8	22	22.9	23.5	24.1	-
ZSLNS 4015-25	1.5	2.25	25	1.44	65	4	2.4	27.3	28.1	28.8	30	-
ZSLNS 4020-4	2	3	4	1.92	50	4	6.5	5.3	5.6	5.9	6.2	6.7
ZSLNS 4020-6	2	3	6	1.92	50	4	5.3	7.4	7.8	8.2	8.5	9.1
ZSLNS 4020-8	2	3	8	1.92	50	4	4.5	9.5	10	10.4	10.8	11.5
ZSLNS 4020-10	2	3	10	1.92	50	4	3.9	11.6	12.2	12.7	13.1	13.8
ZSLNS 4020-12	2	3	12	1.92	55	4	3.4	13.7	14.3	14.9	15.3	16.1
ZSLNS 4020-14	2	3	14	1.92	55	4	3.1	15.8	16.5	17	17.5	18.8
ZSLNS 4020-16	2	3	16	1.92	55	4	2.8	17.9	18.6	19.2	19.7	-
ZSLNS 4020-18	2	3	18	1.92	60	4	2.6	20	20.8	21.4	21.9	-
ZSLNS 4020-20	2	3	20	1.92	60	4	2.4	22.1	22.9	23.5	24.1	-
ZSLNS 4020-25	2	3	25	1.92	65	4	2	27.3	28.2	28.9	-	-

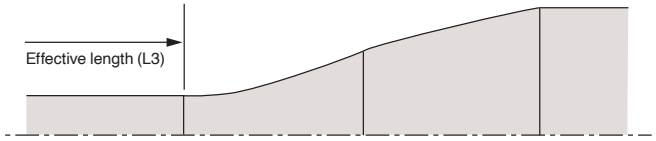
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZSLNS40 | 4 FLUTES LONG NECK SQUARE ENDMILL





※ The marked effective neck length is the default value to prevent interference with the workpiece.
Proper control of the processing environment is required

EDP No	SIZES (mm)							Effective length by inclination angle				
	D	L1	L3	D3	L2	D2	θ	0.5°	1°	1.5°	2°	3°
ZSLNS 4020-30	2	3	30	1.92	70	4	1.7	32.5	33.4	34.4	-	-
ZSLNS 4025-8	2.5	3.75	8	2.4	50	4	3.7	9.6	10.1	10.5	10.9	11.5
ZSLNS 4025-10	2.5	3.75	10	2.4	50	4	3.1	11.7	12.2	12.7	13.1	13.8
ZSLNS 4025-12	2.5	3.75	12	2.4	55	4	2.7	13.8	14.4	14.9	15.3	-
ZSLNS 4025-14	2.5	3.75	14	2.4	55	4	2.4	15.9	16.5	17.1	17.5	-
ZSLNS 4025-16	2.5	3.75	16	2.4	55	4	2.2	18	18.7	19.2	19.7	-
ZSLNS 4025-18	2.5	3.75	18	2.4	60	4	2	20.1	20.8	21.4	-	-
ZSLNS 4025-20	2.5	3.75	20	2.4	60	4	1.8	22.1	22.9	23.5	-	-
ZSLNS 4025-25	2.5	3.75	25	2.4	65	4	1.5	27.3	28.2	-	-	-
ZSLNS 4025-30	2.5	3.75	30	2.4	70	4	1.3	32.6	33.5	-	-	-
ZSLNS 4030-8	3	4.5	8	2.88	55	6	5.6	9.6	10.1	10.5	10.9	11.5
ZSLNS 4030-10	3	4.5	10	2.88	55	6	5	11.7	12.3	12.7	13.1	13.8
ZSLNS 4030-12	3	4.5	12	2.88	60	6	4.5	13.8	14.4	14.9	15.4	16.3
ZSLNS 4030-14	3	4.5	14	2.88	60	6	4.1	15.9	16.6	17.1	17.6	18.9
ZSLNS 4030-16	3	4.5	16	2.88	60	6	3.7	18	18.7	19.3	19.8	21.6
ZSLNS 4030-18	3	4.5	18	2.88	60	6	3.4	20.1	20.8	21.4	21.9	24.2
ZSLNS 4030-20	3	4.5	20	2.88	65	6	3.2	22.2	23	23.6	24.2	26.9
ZSLNS 4030-25	3	4.5	25	2.88	70	6	2.7	27.4	28.2	28.9	30.2	-
ZSLNS 4030-30	3	4.5	30	2.88	75	6	2.4	32.6	33.5	34.5	36.2	-
ZSLNS 4030-35	3	4.5	35	2.88	80	6	2.1	37.7	38.7	40.2	42.2	-
ZSLNS 4030-40	3	4.5	40	2.88	90	6	1.9	42.9	43.9	45.9	-	-
ZSLNS 4040-12	4	6	12	3.85	60	6	3.4	13.9	14.5	15	15.4	16.3
ZSLNS 4040-16	4	6	16	3.85	60	6	2.8	18.1	18.8	19.3	19.8	-
ZSLNS 4040-20	4	6	20	3.85	70	6	2.3	22.3	23	23.6	24.3	-

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZSLNS40 | 4 FLUTES LONG NECK SQUARE ENDMILL

EDP No	SIZES (mm)							Effective length by inclination angle				
	D	L1	L3	D3	L2	D2	θ	0.5°	1°	1.5°	2°	3°
ZSLNS 4040-25	4	6	25	3.85	70	6	2	27.4	28.3	28.9	-	-
ZSLNS 4040-30	4	6	30	3.85	80	6	1.7	32.6	33.5	34.6	-	-
ZSLNS 4040-35	4	6	35	3.85	80	6	1.5	37.8	38.8	-	-	-
ZSLNS 4040-40	4	6	40	3.85	90	6	1.3	42.9	44	-	-	-
ZSLNS 4040-45	4	6	45	3.85	90	6	1.2	48.1	49.4	-	-	-
ZSLNS 4040-50	4	6	50	3.85	100	6	1.1	53.2	54.8	-	-	-
ZSLNS 4050-16	5	7.5	16	4.85	60	6	1.5	18.1	18.8	-	-	-
ZSLNS 4050-20	5	7.5	20	4.85	60	6	1.3	22.3	23	-	-	-
ZSLNS 4050-25	5	7.5	25	4.85	70	6	1.1	27.4	28.3	-	-	-
ZSLNS 4050-30	5	7.5	30	4.85	60	6	0.9	32.6	-	-	-	-
ZSLNS 4050-35	5	7.5	35	4.85	80	6	0.8	37.8	-	-	-	-
ZSLNS 4050-40	5	7.5	40	4.85	90	6	0.7	42.9	-	-	-	-
ZSLNS 4050-50	5	7.5	50	4.85	100	6	0.6	53.2	-	-	-	-

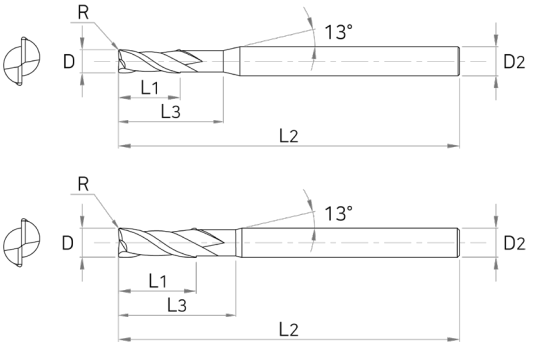
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZR702 | 2 FLUTES NECK RADIUS ENDMILL





■ Tolerance

D		Shank Dia
~D6	0 ~ -0.012	h5
D8 ~ 12	0 ~ -0.015	

CARBIDE | AlTiN | 2 | 30° HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.564

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ZR702 010 005 03 S4	1	0.05	1.5	3	50	4
ZR702 010 005 04 S4	1	0.05	1.5	4	50	4
ZR702 010 005 06 S4	1	0.05	1.5	6	50	4
ZR702 010 005 08 S4	1	0.05	1.5	8	50	4
ZR702 010 005 10 S4	1	0.05	1.5	10	50	4
ZR702 010 01 03 S4	1	0.1	1.5	3	50	4
ZR702 010 01 04 S4	1	0.1	1.5	4	50	4
ZR702 010 01 06 S4	1	0.1	1.5	6	50	4
ZR702 010 01 08 S4	1	0.1	1.5	8	50	4
ZR702 010 01 10 S4	1	0.1	1.5	10	50	4
ZR702 010 02 03 S4	1	0.2	1.5	3	50	4
ZR702 010 02 04 S4	1	0.2	1.5	4	50	4
ZR702 010 02 06 S4	1	0.2	1.5	6	50	4
ZR702 010 02 08 S4	1	0.2	1.5	8	50	4
ZR702 010 02 10 S4	1	0.2	1.5	10	50	4
ZR702 010 03 03 S4	1	0.3	1.5	3	50	4
ZR702 010 03 04 S4	1	0.3	1.5	4	50	4
ZR702 010 03 06 S4	1	0.3	1.5	6	50	4
ZR702 010 03 08 S4	1	0.3	1.5	8	50	4
ZR702 010 03 10 S4	1	0.3	1.5	10	50	4
ZR702 010 01 04	1	0.1	1.5	4	50	6
ZR702 010 01 06	1	0.1	1.5	6	50	6
ZR702 010 02 04	1	0.2	1.5	4	50	6
ZR702 010 02 06	1	0.2	1.5	6	50	6

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ZR702 010 02 10	1	0.2	1.5	10	50	6
ZR702 010 02 12	1	0.2	1.5	12	50	6
ZR702 012 02 08	1.2	0.2	2	8	50	6
ZR702 012 02 12	1.2	0.2	2	12	50	6
ZR702 015 005 04 S4	1.5	0.05	2.5	4	50	4
ZR702 015 005 06 S4	1.5	0.05	2.5	6	50	4
ZR702 015 005 08 S4	1.5	0.05	2.5	8	50	4
ZR702 015 005 10 S4	1.5	0.05	2.5	10	50	4
ZR702 015 005 12 S4	1.5	0.05	2.5	12	50	4
ZR702 015 01 04 S4	1.5	0.1	2.5	4	50	4
ZR702 015 01 06 S4	1.5	0.1	2.5	6	50	4
ZR702 015 01 08 S4	1.5	0.1	2.5	8	50	4
ZR702 015 01 10 S4	1.5	0.1	2.5	10	50	4
ZR702 015 01 12 S4	1.5	0.1	2.5	12	50	4
ZR702 015 02 04 S4	1.5	0.2	2.5	4	50	4
ZR702 015 02 06 S4	1.5	0.2	2.5	6	50	4
ZR702 015 02 08 S4	1.5	0.2	2.5	8	50	4
ZR702 015 02 10 S4	1.5	0.2	2.5	10	50	4
ZR702 015 02 12 S4	1.5	0.2	2.5	12	50	4
ZR702 015 03 04 S4	1.5	0.3	2.5	4	50	4
ZR702 015 03 06 S4	1.5	0.3	2.5	6	50	4
ZR702 015 03 08 S4	1.5	0.3	2.5	8	50	4
ZR702 015 03 10 S4	1.5	0.3	2.5	10	50	4
ZR702 015 03 12 S4	1.5	0.3	2.5	12	50	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZR702 | 2 FLUTES NECK RADIUS ENDMILL

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ZR702 015 05 04 S4	1.5	0.5	2.5	4	50	4
ZR702 015 05 06 S4	1.5	0.5	2.5	6	50	4
ZR702 015 05 08 S4	1.5	0.5	2.5	8	50	4
ZR702 015 05 10 S4	1.5	0.5	2.5	10	50	4
ZR702 015 05 12 S4	1.5	0.5	2.5	12	50	4
ZR702 015 02 04	1.5	0.2	2.5	4	50	6
ZR702 015 02 06	1.5	0.2	2.5	6	50	6
ZR702 015 02 08	1.5	0.2	2.5	8	50	6
ZR702 015 02 10	1.5	0.2	2.5	10	50	6
ZR702 015 02 15	1.5	0.2	2.5	15	50	6
ZR702 020 01 06 S4	2	0.1	3	6	50	4
ZR702 020 01 08 S4	2	0.1	3	8	50	4
ZR702 020 01 10 S4	2	0.1	3	10	50	4
ZR702 020 01 12 S4	2	0.1	3	12	50	4
ZR702 020 01 16 S4	2	0.1	3	16	50	4
ZR702 020 01 20 S4	2	0.1	3	20	50	4
ZR702 020 02 06 S4	2	0.2	3	6	50	4
ZR702 020 02 08 S4	2	0.2	3	8	50	4
ZR702 020 02 10 S4	2	0.2	3	10	50	4
ZR702 020 02 12 S4	2	0.2	3	12	50	4
ZR702 020 02 16 S4	2	0.2	3	16	50	4
ZR702 020 02 20 S4	2	0.2	3	20	50	4
ZR702 020 03 06 S4	2	0.3	3	6	50	4
ZR702 020 03 08 S4	2	0.3	3	8	50	4
ZR702 020 03 10 S4	2	0.3	3	10	50	4
ZR702 020 03 12 S4	2	0.3	3	12	50	4
ZR702 020 03 16 S4	2	0.3	3	16	50	4
ZR702 020 03 20 S4	2	0.3	3	20	50	4
ZR702 020 05 06 S4	2	0.5	3	6	50	4
ZR702 020 05 08 S4	2	0.5	3	8	50	4
ZR702 020 05 10 S4	2	0.5	3	10	50	4
ZR702 020 05 12 S4	2	0.5	3	12	50	4
ZR702 020 05 16 S4	2	0.5	3	16	50	4
ZR702 020 05 20 S4	2	0.5	3	20	50	4
ZR702 020 01 08	2	0.1	3	8	50	6
ZR702 020 01 12	2	0.1	3	12	50	6
ZR702 020 02 06	2	0.2	3	6	50	6
ZR702 020 02 09	2	0.2	3	9	50	6
ZR702 020 02 16	2	0.2	3	16	50	6
ZR702 020 03 06	2	0.3	3	6	50	6
ZR702 020 05 06	2	0.5	3	6	50	6

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ZR702 020 05 09	2	0.5	3	9	50	6
ZR702 020 05 12	2	0.5	3	12	50	6
ZR702 020 05 16	2	0.5	3	16	50	6
ZR702 025 02 08 S4	2.5	0.2	3.5	8	50	4
ZR702 025 02 10 S4	2.5	0.2	3.5	10	50	4
ZR702 025 02 12 S4	2.5	0.2	3.5	12	50	4
ZR702 025 02 16 S4	2.5	0.2	3.5	16	50	4
ZR702 025 03 08 S4	2.5	0.3	3.5	8	50	4
ZR702 025 03 10 S4	2.5	0.3	3.5	10	50	4
ZR702 025 03 12 S4	2.5	0.3	3.5	12	50	4
ZR702 025 03 16 S4	2.5	0.3	3.5	16	50	4
ZR702 025 05 08 S4	2.5	0.5	3.5	8	50	4
ZR702 025 05 10 S4	2.5	0.5	3.5	10	50	4
ZR702 025 05 12 S4	2.5	0.5	3.5	12	50	4
ZR702 025 05 16 S4	2.5	0.5	3.5	16	50	4
ZR702 030 01 08	3	0.1	4.5	8	55	6
ZR702 030 01 10	3	0.1	4.5	10	55	6
ZR702 030 01 12	3	0.1	4.5	12	55	6
ZR702 030 01 16	3	0.1	4.5	16	55	6
ZR702 030 01 20	3	0.1	4.5	20	60	6
ZR702 030 02 08	3	0.2	4.5	8	55	6
ZR702 030 02 09	3	0.2	4.5	9	55	6
ZR702 030 02 10	3	0.2	4.5	10	55	6
ZR702 030 02 12	3	0.2	4.5	12	55	6
ZR702 030 02 16	3	0.2	4.5	16	55	6
ZR702 030 02 20	3	0.2	4.5	20	60	6
ZR702 030 03 08	3	0.3	4.5	8	55	6
ZR702 030 03 09	3	0.3	4.5	9	55	6
ZR702 030 03 10	3	0.3	4.5	10	55	6
ZR702 030 03 12	3	0.3	4.5	12	55	6
ZR702 030 03 14	3	0.3	4.5	14	55	6
ZR702 030 03 16	3	0.3	4.5	16	55	6
ZR702 030 03 20	3	0.3	4.5	20	60	6
ZR702 030 05 08	3	0.5	4.5	8	55	6
ZR702 030 05 09	3	0.5	4.5	9	55	6
ZR702 030 05 10	3	0.5	4.5	10	55	6
ZR702 030 05 12	3	0.5	4.5	12	55	6
ZR702 030 05 16	3	0.5	4.5	16	55	6
ZR702 030 05 20	3	0.5	4.5	20	60	6
ZR702 030 10 08	3	1	4.5	8	55	6
ZR702 030 10 10	3	1	4.5	10	55	6

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZR702 | 2 FLUTES NECK RADIUS ENDMILL

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ZR702 030 10 12	3	1	4.5	12	55	6
ZR702 030 10 16	3	1	4.5	16	55	6
ZR702 030 10 20	3	1	4.5	20	60	6
ZR702 030 10 25	3	1	4.5	25	60	6
ZR702 040 01 10	4	0.1	6	10	55	6
ZR702 040 01 12	4	0.1	6	12	55	6
ZR702 040 01 16	4	0.1	6	16	55	6
ZR702 040 01 20	4	0.1	6	20	60	6
ZR702 040 01 25	4	0.1	6	25	60	6
ZR702 040 02 10	4	0.2	6	10	55	6
ZR702 040 02 12	4	0.2	6	12	55	6
ZR702 040 02 16	4	0.2	6	16	55	6
ZR702 040 02 20	4	0.2	6	20	60	6
ZR702 040 02 25	4	0.2	6	25	60	6
ZR702 040 03 10	4	0.3	6	10	55	6
ZR702 040 03 12	4	0.3	6	12	55	6
ZR702 040 03 16	4	0.3	6	16	55	6
ZR702 040 03 20	4	0.3	6	20	60	6
ZR702 040 03 25	4	0.3	6	25	60	6
ZR702 040 05 10	4	0.5	6	10	55	6
ZR702 040 05 12	4	0.5	6	12	55	6
ZR702 040 05 16	4	0.5	6	16	55	6
ZR702 040 05 20	4	0.5	6	20	60	6
ZR702 040 05 25	4	0.5	6	25	60	6
ZR702 040 05 30	4	0.5	6	30	70	6
ZR702 040 10 10	4	1	6	10	55	6
ZR702 040 10 12	4	1	6	12	55	6

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ZR702 040 10 16	4	1	6	16	55	6
ZR702 040 10 20	4	1	6	20	60	6
ZR702 040 10 25	4	1	6	25	60	6
ZR702 040 10 30	4	1	6	30	70	6
ZR702 050 03 18	5	0.3	8	18	60	6
ZR702 060 02 20	6	0.2	9	20	60	6
ZR702 060 03 20	6	0.3	9	20	60	6
ZR702 060 05 20	6	0.5	9	20	60	6
ZR702 060 10 20	6	1	9	20	60	6
ZR702 060 15 20	6	1.5	9	20	60	6
ZR702 060 20 20	6	2	9	20	60	6
ZR702 080 02 25	8	0.2	12	25	60	8
ZR702 080 03 25	8	0.3	12	25	60	8
ZR702 080 05 25	8	0.5	12	25	60	8
ZR702 080 10 25	8	1	12	25	60	8
ZR702 080 15 25	8	1.5	12	25	60	8
ZR702 100 02 32	10	0.2	15	32	70	10
ZR702 100 03 32	10	0.3	15	32	70	10
ZR702 100 05 32	10	0.5	15	32	70	10
ZR702 100 10 32	10	1	15	32	70	10
ZR702 100 15 32	10	1.5	15	32	70	10
ZR702 100 20 32	10	2	15	32	70	10
ZR702 120 03 38	12	0.3	18	38	80	12
ZR702 120 05 38	12	0.5	18	38	80	12
ZR702 120 10 38	12	1	18	38	80	12
ZR702 120 15 38	12	1.5	18	38	80	12
ZR702 120 20 38	12	2	18	38	80	12

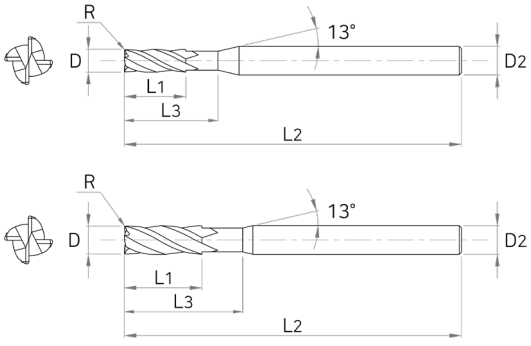
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZR704 | 4 FLUTES NECK RADIUS ENDMILL





■ Tolerance

D		Shank Dia
~D6	0~-0.012	h5
D8~12	0~-0.015	

CARBIDE | AlTiN | 4 | 30° HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.565

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ZR704 010 01 03 S4	1	0.1	2	3	50	4
ZR704 010 01 04 S4	1	0.1	2	4	50	4
ZR704 010 01 06 S4	1	0.1	2	6	50	4
ZR704 010 02 03 S4	1	0.2	2	3	50	4
ZR704 010 02 04 S4	1	0.2	2	4	50	4
ZR704 010 02 06 S4	1	0.2	2	6	50	4
ZR704 010 03 03 S4	1	0.3	2	3	50	4
ZR704 010 03 04 S4	1	0.3	2	4	50	4
ZR704 010 03 06 S4	1	0.3	2	6	50	4
ZR704 015 01 04 S4	1.5	0.1	2.5	4	50	4
ZR704 015 01 06 S4	1.5	0.1	2.5	6	50	4
ZR704 015 02 04 S4	1.5	0.2	2.5	4	50	4
ZR704 015 02 06 S4	1.5	0.2	2.5	6	50	4
ZR704 015 03 04 S4	1.5	0.3	2.5	4	50	4
ZR704 015 03 06 S4	1.5	0.3	2.5	6	50	4
ZR704 020 01 06 S4	2	0.1	3	6	50	4
ZR704 020 01 08 S4	2	0.1	3	8	50	4
ZR704 020 02 06 S4	2	0.2	3	6	50	4
ZR704 020 02 08 S4	2	0.2	3	8	50	4
ZR704 020 03 06 S4	2	0.3	3	6	50	4
ZR704 020 03 08 S4	2	0.3	3	8	50	4
ZR704 020 05 06 S4	2	0.5	3	6	50	4
ZR704 020 05 08 S4	2	0.5	3	8	50	4
ZR704 020 02 08	2	0.2	3	8	50	6

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ZR704 020 02 10	2	0.2	3	10	50	6
ZR704 020 02 12	2	0.2	3	12	50	6
ZR704 025 01 06 S4	2.5	0.1	3.5	6	50	4
ZR704 030 01 08	3	0.1	4	8	55	6
ZR704 030 01 10	3	0.1	4	10	55	6
ZR704 030 01 12	3	0.1	4	12	55	6
ZR704 030 01 16	3	0.1	4	16	55	6
ZR704 030 01 20	3	0.1	4	20	60	6
ZR704 030 02 08	3	0.2	4	8	55	6
ZR704 030 02 10	3	0.2	4	10	55	6
ZR704 030 02 12	3	0.2	4	12	55	6
ZR704 030 02 16	3	0.2	4	16	55	6
ZR704 030 02 20	3	0.2	4	20	60	6
ZR704 030 03 08	3	0.3	4	8	55	6
ZR704 030 03 09	3	0.3	4	9	55	6
ZR704 030 03 10	3	0.3	4	10	55	6
ZR704 030 03 12	3	0.3	4	12	55	6
ZR704 030 03 16	3	0.3	4	16	55	6
ZR704 030 03 20	3	0.3	4	20	60	6
ZR704 030 05 08	3	0.5	4	8	55	6
ZR704 030 05 09	3	0.5	4	9	55	6
ZR704 030 05 10	3	0.5	4	10	55	6
ZR704 030 05 12	3	0.5	4	12	55	6
ZR704 030 05 16	3	0.5	4	16	55	6

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZR704 | 4 FLUTES NECK RADIUS ENDMILL

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ZR704 030 05 20	3	0.5	4	20	60	6
ZR704 030 10 08	3	1	4	8	55	6
ZR704 030 10 10	3	1	4	10	55	6
ZR704 030 10 12	3	1	4	12	55	6
ZR704 030 10 16	3	1	4	16	55	6
ZR704 030 10 20	3	1	4	20	60	6
ZR704 040 01 10	4	0.1	6	10	55	6
ZR704 040 01 12	4	0.1	6	12	55	6
ZR704 040 01 16	4	0.1	6	16	55	6
ZR704 040 01 20	4	0.1	6	20	60	6
ZR704 040 01 25	4	0.1	6	25	60	6
ZR704 040 02 10	4	0.2	6	10	55	6
ZR704 040 02 12	4	0.2	6	12	55	6
ZR704 040 02 16	4	0.2	6	16	55	6
ZR704 040 02 20	4	0.2	6	20	60	6
ZR704 040 02 25	4	0.2	6	25	60	6
ZR704 040 03 10	4	0.3	6	10	55	6
ZR704 040 03 12	4	0.3	6	12	55	6
ZR704 040 03 16	4	0.3	6	16	55	6
ZR704 040 03 20	4	0.3	6	20	60	6
ZR704 040 03 25	4	0.3	6	25	55	6
ZR704 040 05 10	4	0.5	6	10	55	6
ZR704 040 05 12	4	0.5	6	12	55	6
ZR704 040 05 16	4	0.5	6	16	55	6
ZR704 040 05 20	4	0.5	6	20	60	6
ZR704 040 05 25	4	0.5	6	25	60	6
ZR704 040 10 10	4	1	6	10	55	6

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ZR704 040 10 12	4	1	6	12	55	6
ZR704 040 10 16	4	1	6	16	55	6
ZR704 040 10 20	4	1	6	20	60	6
ZR704 040 10 25	4	1	6	25	60	6
ZR704 060 02 20	6	0.2	9	20	60	6
ZR704 060 03 20	6	0.3	9	20	60	6
ZR704 060 05 20	6	0.5	9	20	60	6
ZR704 060 10 20	6	1	9	20	60	6
ZR704 060 15 20	6	1.5	9	20	60	6
ZR704 060 20 20	6	2	9	20	60	6
ZR704 080 02 25	8	0.2	12	25	60	8
ZR704 080 03 25	8	0.3	12	25	60	8
ZR704 080 05 25	8	0.5	12	25	60	8
ZR704 080 10 25	8	1	12	25	60	8
ZR704 080 15 25	8	1.5	12	25	60	8
ZR704 080 20 25	8	2	12	25	60	8
ZR704 100 02 32	10	0.2	15	32	70	10
ZR704 100 03 32	10	0.3	15	32	70	10
ZR704 100 05 32	10	0.5	15	32	70	10
ZR704 100 10 32	10	1	15	32	70	10
ZR704 100 15 32	10	1.5	15	32	70	10
ZR704 100 20 32	10	2	15	32	70	10
ZR704 120 03 38	12	0.3	18	38	80	12
ZR704 120 05 38	12	0.5	18	38	80	12
ZR704 120 10 38	12	1	18	38	80	12
ZR704 120 15 38	12	1.5	18	38	80	12
ZR704 120 20 38	12	2	18	38	80	12

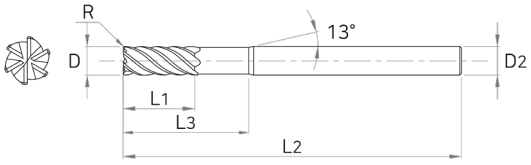
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZR706 | 6 FLUTES NECK RADIUS ENDMILL





■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.02	h5

CARBIDE | AlTiN | 6 | 45° HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.563

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ZR706 060 03 14	6	0.3	6	14	50	6
ZR706 060 05 14	6	0.5	6	14	50	6
ZR706 080 05 24	8	0.5	8	24	60	8
ZR706 080 10 24	8	1	8	24	60	8
ZR706 100 05 30	10	0.5	10	30	70	10
ZR706 100 10 30	10	1	10	30	70	10
ZR706 120 05 30	12	0.5	12	30	75	12
ZR706 120 10 30	12	1	12	30	75	12

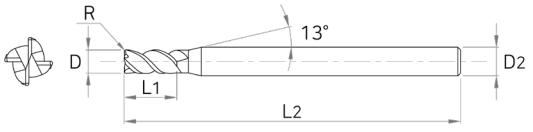
■ Applicable Working Material

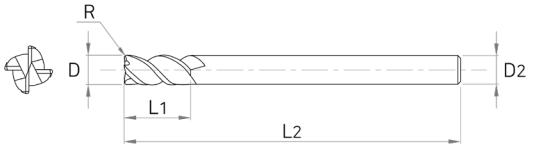
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZR714 | 4 FLUTES RADIUS ENDMILL







■ Tolerance

D		Shank Dia
~D6	0~-0.012	h5
D8~12	0~-0.015	

CARBIDE | AlTiN | 4 | 45° HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.565

EDP No	SIZES (mm)				
	D	R	L1	L3	L2
ZR714 0303	3	0.3	8	50	6
ZR714 0305	3	0.5	8	50	6
ZR714 0403	4	0.3	11	50	6
ZR714 0405	4	0.5	11	50	6
ZR714 0410	4	1	11	50	6
ZR714 0603	6	0.3	15	60	6
ZR714 0605	6	0.5	15	60	6
ZR714 0610	6	1	15	60	6
ZR714 0803	8	0.3	20	60	8
ZR714 0805	8	0.5	20	60	8
ZR714 0810	8	1	20	60	8
ZR714 0815	8	1.5	20	60	8
ZR714 0820	8	2	20	60	8
ZR714 1003	10	0.3	25	70	10

EDP No	SIZES (mm)				
	D	R	L1	L3	L2
ZR714 1005	10	0.5	25	70	10
ZR714 1010	10	1	25	70	10
ZR714 1015	10	1.5	25	70	10
ZR714 1020	10	2	25	70	10
ZR714 1025	10	2.5	25	70	10
ZR714 1030	10	3	25	70	10
ZR714 1203	12	0.3	30	80	12
ZR714 1205	12	0.5	30	80	12
ZR714 1210	12	1	30	80	12
ZR714 1215	12	1.5	30	80	12
ZR714 1220	12	2	30	80	12
ZR714 1225	12	2.5	30	80	12
ZR714 1230	12	3	30	80	12

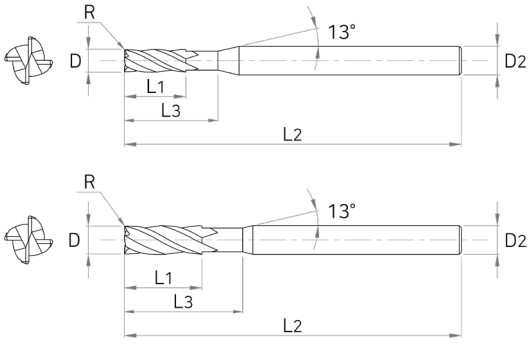
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZR724 | 4 FLUTES NECK RADIUS ENDMILL





■ Tolerance

D		Shank Dia
~D6	0~-0.012	h5
D8~12	0~-0.015	

CARBIDE | AlTiN | 4 | 30° HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.565

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ZR724 060 05 20	6	0.5	9	20	90	6
ZR724 060 10 20	6	1	9	20	90	6
ZR724 080 05 25	8	0.5	12	25	100	8
ZR724 080 10 25	8	1	12	25	100	8
ZR724 100 05 32	10	0.5	15	32	100	10
ZR724 100 10 32	10	1	15	32	100	10
ZR724 100 20 32	10	2	15	32	100	10
ZR724 120 05 38	12	0.5	18	38	110	12
ZR724 120 10 38	12	1	18	38	110	12
ZR724 120 20 38	12	2	18	38	110	12

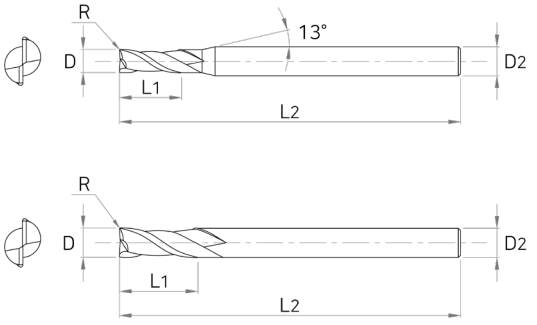
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZR732 | 2 FLUTES LONG SHANK RADIUS ENDMILL





■ Tolerance

D		Shank Dia
~D6	0 ~ -0.012	h5
D8 ~ 12	0 ~ -0.015	

CARBIDE | AlTiN | 2 | 30° HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.565

EDP No	SIZES (mm)				
	D	R	L1	L3	L2
ZR732 010 01	1	0.1	2	50	6
ZR732 010 02	1	0.2	2	50	6
ZR732 010 03	1	0.3	2	50	6
ZR732 015 01	1.5	0.1	3	50	6
ZR732 015 02	1.5	0.2	3	50	6
ZR732 015 03	1.5	0.3	3	50	6
ZR732 015 05	1.5	0.5	3	50	6
ZR732 020 01	2	0.1	5	50	6
ZR732 020 02	2	0.2	5	50	6
ZR732 020 03	2	0.3	5	50	6
ZR732 020 05	2	0.5	5	50	6
ZR732 025 01	2.5	0.1	7	60	6
ZR732 025 02	2.5	0.2	7	60	6
ZR732 025 03	2.5	0.3	7	60	6
ZR732 025 05	2.5	0.5	7	60	6
ZR732 030 01	3	0.1	8	60	6
ZR732 030 02	3	0.2	8	60	6
ZR732 030 03	3	0.3	8	60	6
ZR732 030 05	3	0.5	8	60	6
ZR732 040 01	4	0.1	10	70	6
ZR732 040 02	4	0.2	10	70	6
ZR732 040 03	4	0.3	10	70	6
ZR732 040 05	4	0.5	10	70	6
ZR732 040 10	4	1	10	70	6
ZR732 050 01	5	0.1	13	80	6

EDP No	SIZES (mm)				
	D	R	L1	L3	L2
ZR732 050 02	5	0.2	13	80	6
ZR732 050 03	5	0.3	13	80	6
ZR732 050 05	5	0.5	13	80	6
ZR732 050 10	5	1	13	80	6
ZR732 060 01	6	0.1	15	90	6
ZR732 060 02	6	0.2	15	90	6
ZR732 060 03	6	0.3	15	90	6
ZR732 060 05	6	0.5	15	90	6
ZR732 060 10	6	1	15	90	6
ZR732 080 01	8	0.1	20	100	8
ZR732 080 02	8	0.2	20	100	8
ZR732 080 03	8	0.3	20	100	8
ZR732 080 05	8	0.5	20	100	8
ZR732 080 10	8	1	20	100	8
ZR732 080 20	8	2	20	100	8
ZR732 100 02	10	0.2	25	100	10
ZR732 100 03	10	0.3	25	100	10
ZR732 100 05	10	0.5	25	100	10
ZR732 100 10	10	1	25	100	10
ZR732 100 20	10	2	25	100	10
ZR732 120 02	12	0.2	30	110	12
ZR732 120 03	12	0.3	30	110	12
ZR732 120 05	12	0.5	30	110	12
ZR732 120 10	12	1	30	110	12
ZR732 120 20	12	2	30	110	12

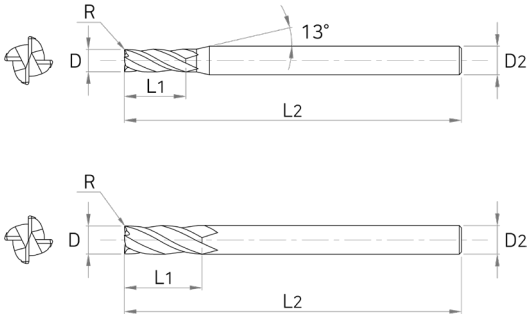
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZR734 | 4 FLUTES LONG SHANK RADIUS ENDMILL





■ Tolerance

D		Shank Dia
~D6	0~-0.012	h5
D8~12	0~-0.015	

CARBIDE | AlTiN | 4 | 30° HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.565

EDP No	SIZES (mm)				
	D	R	L1	L3	L2
ZR734 010 01	1	0.1	2	50	6
ZR734 010 02	1	0.2	2	50	6
ZR734 010 03	1	0.3	2	50	6
ZR734 015 01	1.5	0.1	3	50	6
ZR734 015 02	1.5	0.2	3	50	6
ZR734 015 03	1.5	0.3	3	50	6
ZR734 015 05	1.5	0.5	3	50	6
ZR734 020 01	2	0.1	5	50	6
ZR734 020 02	2	0.2	5	50	6
ZR734 020 03	2	0.3	5	50	6
ZR734 020 05	2	0.5	5	50	6
ZR734 025 01	2.5	0.1	7	60	6
ZR734 025 02	2.5	0.2	7	60	6
ZR734 025 03	2.5	0.3	7	60	6
ZR734 025 05	2.5	0.5	7	60	6
ZR734 030 01	3	0.1	8	60	6
ZR734 030 02	3	0.2	8	60	6
ZR734 030 03	3	0.3	8	60	6
ZR734 030 05	3	0.5	8	60	6
ZR734 040 01	4	0.1	10	70	6
ZR734 040 02	4	0.2	10	70	6
ZR734 040 03	4	0.3	10	70	6
ZR734 040 05	4	0.5	10	70	6
ZR734 040 10	4	1	10	70	6
ZR734 050 01	5	0.1	13	80	6

EDP No	SIZES (mm)				
	D	R	L1	L3	L2
ZR734 050 02	5	0.2	13	80	6
ZR734 050 03	5	0.3	13	80	6
ZR734 050 05	5	0.5	13	80	6
ZR734 050 10	5	1	13	80	6
ZR734 060 01	6	0.1	15	90	6
ZR734 060 02	6	0.2	15	90	6
ZR734 060 03	6	0.3	15	90	6
ZR734 060 05	6	0.5	15	90	6
ZR734 060 10	6	1	15	90	6
ZR734 080 01	8	0.1	20	100	8
ZR734 080 02	8	0.2	20	100	8
ZR734 080 03	8	0.3	20	100	8
ZR734 080 05	8	0.5	20	100	8
ZR734 080 10	8	1	20	100	8
ZR734 080 20	8	2	20	100	8
ZR734 100 02	10	0.2	25	100	10
ZR734 100 03	10	0.3	25	100	10
ZR734 100 05	10	0.5	25	100	10
ZR734 100 10	10	1	25	100	10
ZR734 100 20	10	2	25	100	10
ZR734 120 02	12	0.2	30	110	12
ZR734 120 03	12	0.3	30	110	12
ZR734 120 05	12	0.5	30	110	12
ZR734 120 10	12	1	30	110	12
ZR734 120 20	12	2	30	110	12

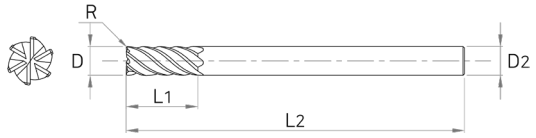
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZR736 | 6 FLUTES RADIUS ENDMILL





■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.02	h5

CARBIDE | AlTiN | 6 | 45° HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.563

EDP No	SIZES (mm)				
	D	R	L1	L3	L2
ZR736 060 05	6	0.5	15	90	6
ZR736 060 10	6	1	15	90	6
ZR736 080 05	8	0.5	20	100	8
ZR736 080 10	8	1	20	100	8
ZR736 100 05	10	0.5	25	100	10
ZR736 100 10	10	1	25	100	10
ZR736 120 05	12	0.5	30	110	12
ZR736 120 10	12	1	30	110	12

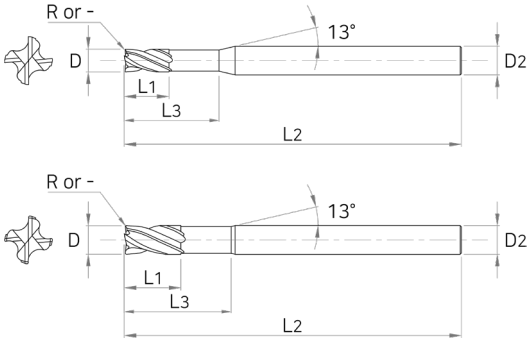
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZS1(2)04 | 4 FLUTES NECK RADIUS ENDMILL





■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.02	h5

CARBIDE | AlTiN | 4 | M HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.565

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ZS104 010	1	-	1.5	4	45	4
ZS204 010	1	0.05	1.5	4	45	4
ZS104 020	2	-	3	6	45	4
ZS204 020	2	0.05	3	6	45	4
ZS104 030	3	-	4	7	45	6
ZS204 030	3	0.1	4	7	45	6
ZS104 040	4	-	5	9	45	6
ZS204 040	4	0.1	5	9	45	6
ZS104 060	6	-	7	14	50	6
ZS204 060	6	0.2	7	14	50	6
ZS104 080	8	-	9	18	60	8
ZS204 080	8	0.2	9	18	60	8
ZS104 100	10	-	12	25	75	10
ZS204 100	10	0.2	12	25	75	10
ZS104 120	12	-	15	30	75	12
ZS204 120	12	0.3	15	30	75	12

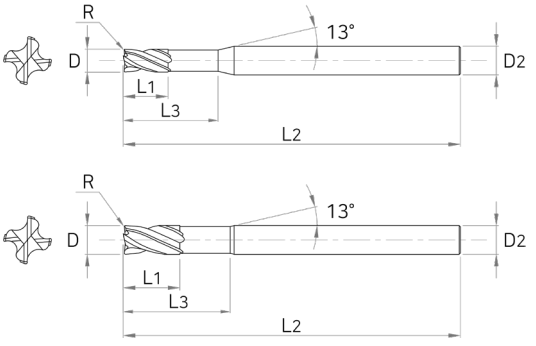
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZS204 | 4 FLUTES NECK RADIUS ENDMILL





■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.02	h5

CARBIDE | AlTiN | 4 | M HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.565

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ZS204 020 005 07	2	0.05	2.5	7	50	4
ZS204 020 01 07	2	0.1	2.5	7	50	4
ZS204 030 01 09	3	0.1	4	9	55	6
ZS204 030 02 09	3	0.2	4	9	55	6
ZS204 030 03 09	3	0.3	4	9	55	6
ZS204 030 03 12	3	0.3	4	12	55	6
ZS204 030 03 16	3	0.3	4	16	55	6
ZS204 040 02 12	4	0.2	5	12	55	6
ZS204 040 03 12	4	0.3	5	12	55	6
ZS204 040 03 16	4	0.3	5	16	55	6
ZS204 040 03 20	4	0.3	5	20	55	6
ZS204 040 05 12	4	0.5	5	12	55	6
ZS204 040 05 16	4	0.5	5	16	55	6
ZS204 040 05 20	4	0.5	5	20	55	6
ZS204 040 10 12	4	1	5	12	55	6
ZS204 050 01 16	5	0.1	6	16	60	6
ZS204 050 02 16	5	0.2	6	16	60	6
ZS204 050 03 16	5	0.3	6	16	60	6
ZS204 050 05 16	5	0.5	6	16	60	6
ZS204 050 10 16	5	1	6	16	60	6
ZS204 060 01 20	6	0.1	7	20	60	6
ZS204 060 02 20	6	0.2	7	20	60	6
ZS204 060 03 20	6	0.3	7	20	60	6

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ZS204 060 05 20	6	0.5	7	20	60	6
ZS204 060 10 20	6	1	7	20	60	6
ZS204 060 15 20	6	1.5	7	20	60	6
ZS204 080 01 25	8	0.1	9	25	60	8
ZS204 080 02 25	8	0.2	9	25	60	8
ZS204 080 03 25	8	0.3	9	25	60	8
ZS204 080 05 25	8	0.5	9	25	60	8
ZS204 080 10 25	8	1	9	25	60	8
ZS204 080 15 25	8	1.5	9	25	60	8
ZS204 080 20 25	8	2	9	25	60	8
ZS204 100 02 32	10	0.2	11	32	75	10
ZS204 100 03 32	10	0.3	11	32	75	10
ZS204 100 05 32	10	0.5	11	32	75	10
ZS204 100 10 32	10	1	11	32	75	10
ZS204 100 15 32	10	1.5	11	32	75	10
ZS204 100 20 32	10	2	11	32	75	10
ZS204 120 02 38	12	0.2	12	38	75	12
ZS204 120 03 38	12	0.3	12	38	75	12
ZS204 120 05 38	12	0.5	12	38	75	12
ZS204 120 10 38	12	1	12	38	75	12
ZS204 120 15 38	12	1.5	12	38	75	12
ZS204 120 20 38	12	2	12	38	75	12

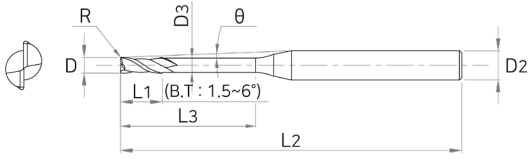
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZSLNR20 | 2 FLUTES LONG NECK RADIUS ENDMILL





■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.015	h5

CARBIDE | AlTiN | 2 | 30° HELIX | R ±0.01 All Sizes | DATA P.567

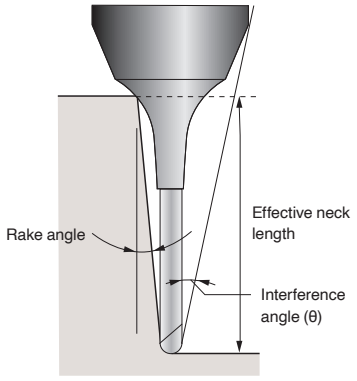
EDP No	SIZES (mm)								Effective length by inclination angle				
	D	R	L1	L3	D3	L2	D2	θ	0.5°	1°	1.5°	2°	3°
ZSLNR 2002-0.5-005	0.2	0.05	0.15	0.5	0.17	50	4	11.4	0.9	1	1	1.1	12
ZSLNR 2002-1-005	0.2	0.05	0.15	1	0.17	50	4	10.9	1.6	1.7	1.9	2	2.3
ZSLNR 2002-1.5-005	0.2	0.05	0.15	1.5	0.17	50	4	10.3	2.1	2.3	2.5	2.7	3
ZSLNR 2002-2-005	0.2	0.05	0.15	2	0.17	50	4	9.9	2.8	3.1	3.4	3.6	4.1
ZSLNR 2003-1-005	0.3	0.05	0.25	1	0.27	50	4	10.8	1.4	1.5	1.6	1.7	1.9
ZSLNR 2003-1.5-005	0.3	0.05	0.25	1.5	0.27	50	4	10.3	2.1	2.3	2.5	2.7	3
ZSLNR 2003-2-005	0.3	0.05	0.25		0.27	50	4	9.8	2.7	2.9	3.1	3.3	3.6
ZSLNR 2003-2.5-005	0.3	0.05	0.25	2.5	0.27	50	4	9.4	3.2	3.5	3.7	3.9	4.3
ZSLNR 2003-3-005	0.3	0.05	0.25	3	0.27	50	4	9	3.9	4.3	4.6	4.9	5.4
ZSLNR 2004-1-005	0.4	0.05	0.3	1	0.37	50	4	10.8	1.4	1.5	1.6	1.7	1.9
ZSLNR 2004-1.5-005	0.4	0.05	0.3	1.5	0.37	50	4	10.3	2	2.1	2.2	2.3	2.5
ZSLNR 2004-2-005	0.4	0.05	0.3	2	0.37	50	4	9.8	2.7	2.9	3.1	3.3	3.6
ZSLNR 2004-2.5-005	0.4	0.05	0.3	2.5	0.37	50	4	9.4	3.2	3.5	3.7	3.9	4.3
ZSLNR 2004-3-005	0.4	0.05	0.3	3	0.37	50	4	9	3.8	4	4.3	4.5	4.9
ZSLNR 2004-3.5-005	0.4	0.05	0.3	3.5	0.37	50	4	8.6	4.3	4.6	4.9	5.1	5.5
ZSLNR 2004-4-005	0.4	0.05	0.3	4	0.37	50	4	8.3	5	5.4	5.8	6.1	6.6
ZSLNR 2004-2-01	0.4	0.1	0.3	2	0.37	50	4	9.8	2.7	2.9	3.1	3.3	3.6
ZSLNR 2004-3-01	0.4	0.1	0.3	3	0.37	50	4	9	3.8	4	4.3	4.5	4.9
ZSLNR 2004-4-01	0.4	0.1	0.3	4	0.37	50	4	8.3	5	5.4	5.8	6.1	6.6
ZSLNR 2005-1-005	0.5	0.05	0.35	1	0.47	50	4	10.8	1.4	1.5	1.6	1.7	1.9
ZSLNR 2005-2-005	0.5	0.05	0.35	2	0.47	50	4	9.7	2.5	2.6	2.8	2.9	3.1
ZSLNR 2005-3-005	0.5	0.05	0.35	3	0.47	50	4	8.9	3.8	4	4.3	4.5	4.9
ZSLNR 2005-4-005	0.5	0.05	0.35	4	0.47	50	4	8.2	4.8	5.2	5.4	5.7	6.1
ZSLNR 2005-5-005	0.5	0.05	0.35	5	0.47	50	4	7.6	6.1	6.6	6.9	7.3	7.8

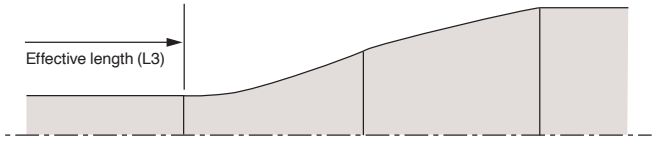
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZSLNR20 | 2 FLUTES LONG NECK RADIUS ENDMILL





※ The marked effective neck length is the default value to prevent interference with the workpiece.
Proper control of the processing environment is required

EDP No	SIZES (mm)								Effective length by inclination angle				
	D	R	L1	L3	D3	L2	D2	θ	0.5°	1°	1.5°	2°	3°
ZSLNR 2005-6-005	0.5	0.05	0.35	6	0.47	50	4	7	7.2	7.7	8.1	8.4	9
ZSLNR 2005-1-01	0.5	0.1	0.35	1	0.47	50	4	10.8	1.4	1.5	1.6	1.7	1.9
ZSLNR 2005-2-01	0.5	0.1	0.35	2	0.47	50	4	9.8	2.5	2.6	2.8	2.9	3.1
ZSLNR 2005-3-01	0.5	0.1	0.35	3	0.47	50	4	8.9	3.8	4	4.3	4.5	4.9
ZSLNR 2005-4-01	0.5	0.1	0.35	4	0.47	50	4	8.2	4.8	5.2	5.4	5.7	6.1
ZSLNR 2005-5-01	0.5	0.1	0.35	5	0.47	50	4	7.6	6.1	6.5	6.9	7.2	7.8
ZSLNR 2005-6-01	0.5	0.1	0.35	6	0.47	50	4	7.1	7.2	7.7	8.1	8.4	9
ZSLNR 2006-2-01	0.6	0.1	0.4	2	0.57	50	4	9.7	2.5	2.6	2.8	2.9	3.1
ZSLNR 2006-4-01	0.6	0.1	0.4	4	0.57	50	4	8.1	4.8	5.2	5.4	5.7	6.1
ZSLNR 2006-6-01	0.6	0.1	0.4	6	0.57	50	4	7	7.2	7.7	8.1	8.4	9
ZSLNR 2006-8-01	0.6	0.1	0.4	8	0.57	50	4	6.1	9.3	9.9	10.3	10.7	11
ZSLNR 2006-10-01	0.6	0.1	0.4	10	0.57	50	4	5.5	11.5	12.1	12.5	13	13.7
ZSLNR 2008-4-01	0.8	0.1	0.5	4	0.77	50	4	8	4.8	5.2	5.4	5.7	6.1
ZSLNR 2008-6-01	0.8	0.1	0.5	6	0.77	50	4	6.8	7	7.4	7.7	7.9	8.4
ZSLNR 2008-8-01	0.8	0.1	0.5	8	0.77	50	4	5.9	9.3	9.9	10.3	10.7	11.4
ZSLNR 2008-12-01	0.8	0.1	0.5	12	0.77	50	4	4.7	13.6	14.2	14.7	15.2	16
ZSLNR 2008-4-02	0.8	0.2	0.5	4	0.77	50	4	8	4.8	5.1	5.4	5.6	6.1
ZSLNR 2008-6-02	0.8	0.2	0.5	6	0.77	50	4	6.9	7	7.3	7.7	7.9	8.4
ZSLNR 2010-6-03	1	0.3	0.8	6	0.94	50	4	6.7	7.1	7.4	7.7	8	8.4
ZSLNR 2010-10-03	1	0.3	0.8	10	0.94	50	4	5.1	11.5	12.1	12.6	13	13.7
ZSLNR 2010-16-03	1	0.3	0.8	16	0.94	60	4	3.8	17.9	18.6	19.1	19.6	21.3
ZSLNR 2010-20-03	1	0.3	0.8	20	0.94	60	4	3.2	22	22.8	23.5	24	26.6
ZSLNR 2015-4-01	1.5	0.1	1.35	4	1.42	50	4	7.2	4.8	4.9	5.1	5.3	5.5
ZSLNR 2015-8-01	1.5	0.1	1.35	8	1.42	50	4	5.2	9.2	9.6	10	10.3	10.8

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZSLNR20 | 2 FLUTES LONG NECK RADIUS ENDMILL

EDP No	SIZES (mm)								Effective length by inclination angle				
	D	R	L1	L3	D3	L2	D2	θ	0.5°	1°	1.5°	2°	3°
ZSLNR 2015-12-01	1.5	0.1	1.35	12	1.42	55	4	4	13.4	13.9	14.3	14.7	16.1
ZSLNR 2015-15-01	1.5	0.1	1.35	15	1.42	55	4	3.5	16.9	17.6	18.1	18.6	20.1
ZSLNR 2015-20-01	1.5	0.1	1.35	20	1.42	60	4	2.8	22.1	22.9	23.5	24.1	-
ZSLNR 2015-4-02	1.5	0.2	1.35	4	1.42	50	4	7.3	4.7	4.9	5.1	5.3	5.5
ZSLNR 2015-8-02	1.5	0.2	1.35	8	1.42	50	4	5.2	9.2	9.6	10	10.3	10.8
ZSLNR 2015-12-02	1.5	0.2	1.35	12	1.42	55	4	4.1	13.4	13.9	14.3	14.7	16.1
ZSLNR 2015-15-02	1.5	0.2	1.35	15	1.42	55	4	3.5	16.9	17.5	18.1	18.6	20
ZSLNR 2015-20-02	1.5	0.2	1.35	20	1.42	60	4	2.8	22.1	22.9	23.5	24.1	-
ZSLNR 2015-8-03	1.5	0.3	1.35	8	1.42	50	4	5.2	9.2	9.6	10	10.3	10.8
ZSLNR 2015-15-03	1.5	0.3	1.35	15	1.42	55	4	3.5	16.9	17.5	18.1	18.6	20
ZSLNR 2015-20-03	1.5	0.3	1.35	20	1.42	60	4	2.8	22.1	22.9	23.5	24	-
ZSLNR 2020-6-02	2	0.2	1.7	6	1.92	50	4	5.4	6.8	7.1	7.3	7.5	8.1
ZSLNR 2020-8-02	2	0.2	1.7	8	1.92	50	4	4.6	8.9	9.2	9.4	9.7	10.8
ZSLNR 2020-12-02	2	0.2	1.7	12	1.92	55	4	3.5	13.4	13.9	14.3	14.7	16.1
ZSLNR 2020-16-02	2	0.2	1.7	16	1.92	55	4	2.8	17.6	18.1	18.6	19.3	-
ZSLNR 2020-20-02	2	0.2	1.7	20	1.92	60	4	2.4	22.1	22.9	23.5	24.1	-
ZSLNR 2020-25-02	2	0.2	1.7	25	1.92	65	4	2	27.3	28.2	28.8	-	-
ZSLNR 2020-30-02	2	0.2	1.7	30	1.92	70	4	1.7	32.5	33.4	34.4	-	-
ZSLNR 2020-8-03	2	0.3	1.7	8	1.92	50	4	4.6	8.9	9.2	9.4	9.7	10.7
ZSLNR 2020-16-03	2	0.3	1.7	16	1.92	55	4	2.8	17.6	18.1	18.6	19.3	-
ZSLNR 2020-20-03	2	0.3	1.7	20	1.92	60	4	2.4	22.1	22.9	23.5	24	-
ZSLNR 2020-6-05	2	0.5	1.7	6	1.92	50	4	5.5	6.8	7.1	7.3	7.4	8
ZSLNR 2020-8-05	2	0.5	1.7	8	1.92	50	4	4.7	8.9	9.2	9.4	9.6	10.7
ZSLNR 2020-12-05	2	0.5	1.7	12	1.92	55	4	3.5	13.4	13.9	14.3	14.6	16
ZSLNR 2020-16-05	2	0.5	1.7	16	1.92	55	4	2.9	17.6	18.1	18.6	19.2	-
ZSLNR 2020-20-05	2	0.5	1.7	20	1.92	60	4	2.4	22.1	22.9	23.5	24	-
ZSLNR 2020-25-05	2	0.5	1.7	25	1.92	65	4	2	27.3	28.1	28.8	-	-
ZSLNR 2020-30-05	2	0.5	1.7	30	1.92	70	4	1.7	32.5	33.4	34.3	-	-
ZSLNR 2020-8-08	2	0.8	1.7	8	1.92	50	4	4.8	8.9	9.2	9.4	9.6	10.6
ZSLNR 2020-16-08	2	0.8	1.7	16	1.92	55	4	2.9	17.6	18.1	18.6	19.2	-
ZSLNR 2020-20-08	2	0.8	1.7	20	1.92	60	4	2.4	22.1	22.8	23.5	24	-
ZSLNR 2030-8-02	3	0.2	2.5	8	2.86	55	6	5.7	9	9.3	9.5	9.9	10.9
ZSLNR 2030-12-02	3	0.2	2.5	12	2.86	60	6	4.5	13.1	13.5	14	14.7	16.2
ZSLNR 2030-16-02	3	0.2	2.5	16	2.86	60	6	3.8	17.7	18.2	18.7	19.5	21.6
ZSLNR 2030-20-02	3	0.2	2.5	20	2.86	65	6	3.2	21.8	22.4	23.1	24.2	26.9
ZSLNR 2030-30-02	3	0.2	2.5	30	2.86	75	6	2.4	32.6	33.5	34.5	36.2	-
ZSLNR 2030-35-02	3	0.2	2.5	35	2.86	80	6	2.1	37.7	38.7	40.2	42.2	-
ZSLNR 2030-8-03	3	0.3	2.5	8	2.86	55	6	5.7	9	9.3	9.5	9.9	10.9
ZSLNR 2030-16-03	3	0.3	2.5	16	2.86	60	6	3.8	17.7	18.2	18.7	19.4	21.5
ZSLNR 2030-20-03	3	0.3	2.5	20	2.86	65	6	3.2	21.8	22.4	23.1	24.2	26.8
ZSLNR 2030-30-03	3	0.3	2.5	30	2.86	75	6	2.4	32.6	33.5	34.5	36.2	-

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZSLNR20 | 2 FLUTES LONG NECK RADIUS ENDMILL

EDP No	SIZES (mm)								Effective length by inclination angle				
	D	R	L1	L3	D3	L2	D2	θ	0.5°	1°	1.5°	2°	3°
ZSLNR 2030-8-05	3	0.5	2.5	8	2.86	55	6	5.8	9	9.3	9.5	9.8	10.8
ZSLNR 2030-12-05	3	0.5	2.5	12	2.86	60	6	4.6	13.1	13.5	13.9	14.6	16.2
ZSLNR 2030-16-05	3	0.5	2.5	16	2.86	60	6	3.8	17.7	18.2	18.7	19.4	21.5
ZSLNR 2030-20-05	3	0.5	2.5	20	2.86	65	6	3.2	21.8	22.4	23.1	24.2	26.8
ZSLNR 2030-30-05	3	0.5	2.5	30	2.86	75	6	2.4	32.6	33.5	34.5	36.1	-
ZSLNR 2030-35-05	3	0.5	2.5	35	2.86	80	6	2.1	37.7	38.7	40.2	42.1	-

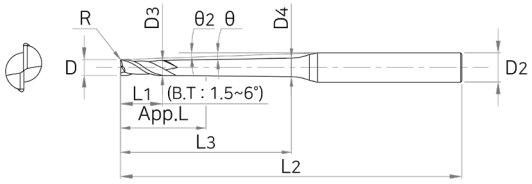
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZSTNR20 | 2 FLUTES TAPERED NECK RADIUS ENDMILL





■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.015	h5

CARBIDE | AlTiN | 2 | 30° HELIX | R ±0.01 All Sizes | DATA P.567

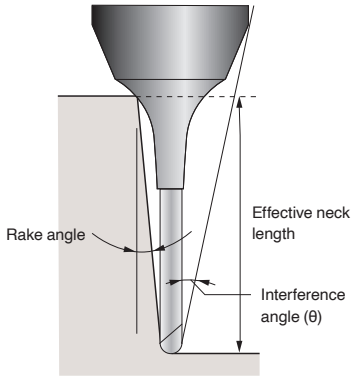
EDP No	SIZES (mm)											Effective length by inclination angle				
	D	R	L1	L3	θ2	D3	D4	L2	D2	App.L	θ	0.5°	1°	1.5°	2°	3°
ZSTNR 2002-2-09005	0.2	0.05	0.15	2	0.9	0.17	0.23	50	4	1.1	10	x	2.8	3.1	3.4	3.9
ZSTNR 2004-4-09005	0.4	0.05	0.3	4	0.9	0.37	0.49	50	4	1.25	8.4	x	4.9	5.3	5.7	6.3
ZSTNR 2004-5-09005	0.4	0.05	0.3	5	0.9	0.37	0.52	50	4	1.25	7.8	x	5.9	6.4	6.8	7.5
ZSTNR 2004-4-0901	0.4	0.1	0.3	4	0.9	0.37	0.49	50	4	1.25	8.5	x	4.9	5.3	5.7	6.3
ZSTNR 2004-5-0901	0.4	0.1	0.3	5	0.9	0.37	0.52	50	4	1.25	7.9	x	5.9	6.4	6.8	7.5
ZSTNR 2005-5-0901	0.5	0.1	0.35	5	0.9	0.47	0.62	50	4	1.3	7.8	x	5.9	6.4	6.8	7.5
ZSTNR 2005-8-0901	0.5	0.1	0.35	8	0.9	0.47	0.71	50	4	1.3	6.4	x	9	9.7	10.2	11
ZSTNR 2005-10-0901	0.5	0.1	0.35	10	0.9	0.47	0.77	55	4	1.3	5.8	x	11	11.8	12.4	13.2
ZSTNR 2006-12-0901	0.6	0.1	0.4	12	0.9	0.57	0.93	55	4	1.35	5.1	x	13	13.9	14.5	15.5
ZSTNR 2006-15-0901	0.6	0.1	0.4	15	0.9	0.57	1.03	55	4	1.35	4.5	x	16.1	17.1	17.8	18.8
ZSTNR 2008-6-0402	0.8	0.2	0.5	6	0.4	0.77	0.85	50	4	2.64	7	6.6	7.1	7.5	7.8	8.3
ZSTNR 2008-12-0902	0.8	0.2	0.5	12	0.9	0.77	1.13	55	4	1.45	5	x	13	13.9	14.5	15.5
ZSTNR 2010-8-0402	1	0.2	0.8	8	0.4	0.94	1.04	55	6	5.09	7.4	8.8	9.3	9.7	10.1	10.6
ZSTNR 2010-10-0902	1	0.2	0.8	10	0.9	0.94	1.23	55	6	5.09	6.8	x	11.2	11.9	12.4	13.3
ZSTNR 2010-15-0902	1	0.2	0.8	15	0.9	0.94	1.39	60	6	2.7	5.6	x	16.3	17.2	17.8	18.8
ZSTNR 2010-20-0902	1	0.2	0.8	20	0.9	0.94	1.54	65	6	2.7	4.8	x	21.3	22.4	23.2	24.7
ZSTNR 2010-25-0902	1	0.2	0.8	25	0.9	0.94	1.7	70	6	2.7	4.1	x	26.4	27.6	28.5	30.9
ZSTNR 2010-30-0902	1	0.2	0.8	30	0.9	0.94	1.86	75	6	2.7	3.7	x	31.5	32.8	33.7	37
ZSTNR 2010-35-0902	1	0.2	0.8	35	0.9	0.94	2.02	80	6	2.7	3.3	x	36.5	38	39	43.2
ZSTNR 2010-8-0403	1	0.3	0.8	8	0.4	0.94	1.04	55	6	2.7	7.4	8.8	9.3	9.7	10	10.6
ZSTNR 2010-15-0903	1	0.3	0.8	15	0.9	0.94	1.39	60	6	2.7	5.6	x	16.3	17.2	17.8	18.8
ZSTNR 2010-25-0903	1	0.3	0.8	25	0.9	0.94	1.7	70	6	2.7	4.2	x	26.4	27.6	28.5	30.8
ZSTNR 2010-30-0903	1	0.3	0.8	30	0.9	0.94	1.86	75	6	2.7	3.7	x	31.5	32.8	33.7	37
ZSTNR 2015-10-0402	1.5	0.2	1.35	10	0.4	1.42	1.54	55	6	7.07	6.4	11	11.5	11.9	12.3	13

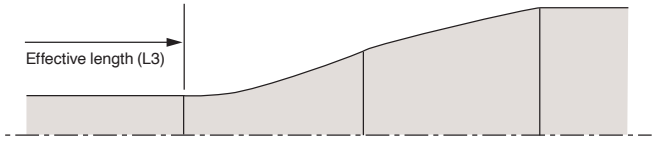
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZSTNR20 | 2 FLUTES TAPERED NECK RADIUS ENDMILL





※ The marked effective neck length is the default value to prevent interference with the workpiece.
Proper control of the processing environment is required

EDP No	SIZES (mm)											Effective length by inclination angle				
	D	R	L1	L3	θ2	D3	D4	L2	D2	App.L	θ	0.5°	1°	1.5°	2°	3°
ZSTNR 2015-15-0902	1.5	0.2	1.35	15	0.9	1.42	1.85	60	6	7.07	5.3	x	16.4	17.3	17.9	18.9
ZSTNR 2015-20-0902	1.5	0.2	1.35	20	0.9	1.42	2.01	65	6	3.89	4.5	x	21.5	22.5	23.2	24.9
ZSTNR 2015-25-0902	1.5	0.2	1.35	25	0.9	1.42	2.16	70	6	3.89	3.9	x	26.6	27.7	28.5	31
ZSTNR 2015-30-0902	1.5	0.2	1.35	30	0.9	1.42	2.32	75	6	3.89	3.4	x	31.6	32.9	33.8	37.1
ZSTNR 2015-10-0403	1.5	0.3	1.35	10	0.4	1.42	1.54	55	6	3.89	6.4	11	11.5	11.9	12.3	13
ZSTNR 2015-20-0903	1.5	0.3	1.35	20	0.9	1.42	2.01	65	6	3.89	4.5	x	21.5	22.5	23.2	24.8
ZSTNR 2015-25-0903	1.5	0.3	1.35	25	0.9	1.42	2.16	70	6	3.89	3.9	x	26.5	27.7	28.5	31
ZSTNR 2015-30-0903	1.5	0.3	1.35	30	0.9	1.42	2.32	75	6	3.89	3.4	x	31.6	32.9	33.8	37.1
ZSTNR 2020-30-0902	2	0.2	1.7	30	0.9	1.92	2.81	70	6	7.42	3.1	x	31.6	32.9	33.8	37.2
ZSTNR 2020-40-0902	2	0.2	1.7	40	0.9	1.92	3.12	80	6	7.42	2.5	x	41.8	43.3	44.6	-
ZSTNR 2020-50-0902	2	0.2	1.7	50	0.9	1.92	3.44	90	6	7.42	2.1	x	51.9	53.6	55.7	-
ZSTNR 2020-12-0403	2	0.3	1.7	12	0.4	1.92	2.06	55	6	7.42	5.5	13	13.6	14.1	14.5	15.6
ZSTNR 2020-20-0903	2	0.3	1.7	20	0.9	1.92	2.5	65	6	4.24	4.1	x	21.5	22.5	23.2	24.9
ZSTNR 2020-30-0903	2	0.3	1.7	30	0.9	1.92	2.81	70	6	4.24	3.1	x	31.6	32.9	33.8	37.1
ZSTNR 2020-40-0903	2	0.3	1.7	40	0.9	1.92	3.12	80	6	4.24	2.5	x	41.7	43.3	44.6	-
ZSTNR 2020-50-0903	2	0.3	1.7	50	0.9	1.92	3.44	90	6	4.24	2.1	x	51.8	53.6	55.7	-
ZSTNR 2020-8-0405	2	0.5	1.7	8	0.4	1.92	2.01	50	6	4.24	6.8	8.7	9	9.3	9.5	10.4
ZSTNR 2020-12-0405	2	0.5	1.7	12	0.4	1.92	2.06	55	6	4.24	5.6	13	13.6	14.1	14.4	15.5
ZSTNR 2020-16-0405	2	0.5	1.7	16	0.4	1.92	2.12	60	6	4.24	4.7	17	17.8	18.3	18.7	20.7
ZSTNR 2020-20-0905	2	0.5	1.7	20	0.9	1.92	2.5	65	6	4.24	4.2	x	21.5	22.5	23.2	24.8
ZSTNR 2020-25-0905	2	0.5	1.7	25	0.9	1.92	2.65	65	6	4.24	3.6	x	26.6	27.7	28.5	30.9
ZSTNR 2020-30-0905	2	0.5	1.7	30	0.9	1.92	2.81	70	6	4.24	3.1	x	31.6	32.9	33.8	37.1
ZSTNR 2020-40-0905	2	0.5	1.7	40	0.9	1.92	3.12	80	6	4.24	2.5	x	41.7	43.2	44.6	-
ZSTNR 2020-50-0905	2	0.5	1.7	50	0.9	1.92	3.44	90	6	4.24	2.1	x	51.8	53.6	55.6	-

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZSTNR20 | 2 FLUTES TAPERED NECK RADIUS ENDMILL

EDP No	SIZES (mm)											Effective length by inclination angle				
	D	R	L1	L3	θ2	D3	D4	L2	D2	App.L	θ	0.5°	1°	1.5°	2°	3°
ZSTNR 2030-40-0902	3	0.2	2.5	40	0.9	2.86	4.04	80	6	6.95	2	x	42	43.4	-	-
ZSTNR 2030-50-0902	3	0.2	2.5	50	0.9	2.86	4.35	90	6	6.95	1.6	x	52.1	53.7	-	-
ZSTNR 2030-60-0902	3	0.2	2.5	60	0.9	2.86	4.67	100	6	6.95	1.4	x	62.2	-	-	-
ZSTNR 2030-40-0903	3	0.3	2.5	40	0.9	2.86	4.04	80	6	6.95	2	x	42	43.4	-	-
ZSTNR 2030-50-0903	3	0.3	2.5	50	0.9	2.86	4.35	90	6	6.95	1.7	x	52.1	53.7	-	-
ZSTNR 2030-60-0903	3	0.3	2.5	60	0.9	2.86	4.67	100	6	6.95	1.4	x	62.2	-	-	-
ZSTNR 2030-40-0905	3	0.5	2.5	40	0.9	2.86	4.04	80	6	6.95	2	x	42	43.4	-	-
ZSTNR 2030-50-0905	3	0.5	2.5	50	0.9	2.86	4.35	90	6	6.95	1.7	x	52.1	53.7	-	-
ZSTNR 2030-60-0905	3	0.5	2.5	60	0.9	2.86	4.67	100	6	6.95	1.4	x	62.1	-	-	-

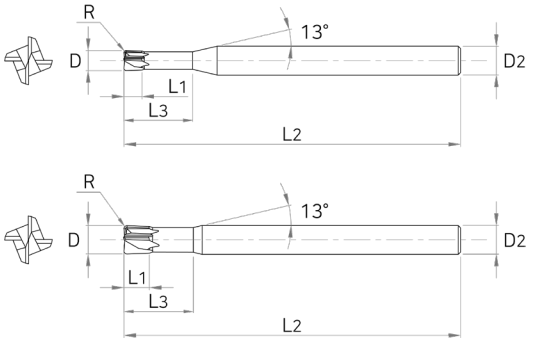
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZSPM4 | 4 FLUTES NECK RADIUS ENDMILL





■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.02	h5

CARBIDE | AlTiN | 4 | 0° HELIX | R ±0.015 All Sizes | DATA P.566

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ZSPM4 030-05	3	0.5	1.2	8	50	6
ZSPM4 040-05	4	0.5	1.5	10	50	6
ZSPM4 060-05	6	0.5	2.5	12	60	6
ZSPM4 060-10	6	1	2.5	12	60	6
ZSPM4 060-15	6	1.5	2.5	12	60	6
ZSPM4 060-15L	6	1.5	2.5	12	90	6
ZSPM4 080-10	8	1	3.5	16	60	8
ZSPM4 080-20	8	2	3.5	16	60	8
ZSPM4 080-20L	8	2	3.5	16	100	8
ZSPM4 100-10	10	1	4	20	70	10
ZSPM4 100-20	10	2	4	20	70	10
ZSPM4 100-20L	10	2	4	20	100	10
ZSPM4 120-20	12	2	5	25	80	12
ZSPM4 120-30	12	3	5	25	80	12
ZSPM4 120-30L	12	3	5	25	110	12

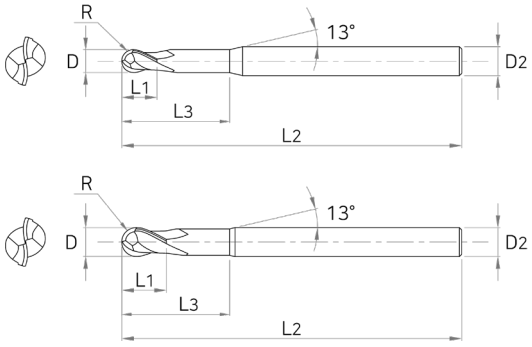
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

DB702 | 2 FLUTES NECK BALL ENDMILL





■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.02	h5

CARBIDE | AlTiN | 2 | 30° HELIX | R ±0.005 R3 OR UNDER | R ±0.01 ABOVE R3 | DATA P.570

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
DB702 001	0.1	0.05	0.15	-	40	4
DB702 002	0.2	0.1	0.3	-	40	4
DB702 003	0.3	0.15	0.5	-	40	4
DB702 004	0.4	0.2	0.6	-	40	4
DB702 005	0.5	0.25	0.7	-	40	4
DB702 006	0.6	0.3	0.9	-	40	4
DB702 007	0.7	0.35	1.1	-	40	4
DB702 008	0.8	0.4	1.2	-	40	4
DB702 009	0.9	0.45	1.4	-	40	4
DB702 010 S4	1	0.5	1.5	-	45	4
DB702 010	1	0.5	1.5	3	50	6
DB702 015 S4	1.5	0.75	2	-	45	4
DB702 015	1.5	0.75	2	4	50	6
DB702 020 S4	2	1	2.5	-	45	4
DB702 020	2	1	2.5	5	50	6
DB702 025	2.5	1.25	3	7	50	6
DB702 030S4	3	1.5	4	-	45	4

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
DB702 030S	3	1.5	4	10	50	6
DB702 030	3	1.5	4	10	60	6
DB702 031	3	1.5	4	10	70	6
DB702 040 S4	4	2	5	-	45	4
DB702 040 S	4	2	5	10	50	6
DB702 040	4	2	5	10	60	6
DB702 041	4	2	5	10	70	6
DB702 050	5	2.5	6	12	60	6
DB702 060	6	3	7	12	60	6
DB702 061	6	3	7	12	90	6
DB702 080	8	4	9	15	70	8
DB702 081	8	4	9	15	100	8
DB702 100	10	5	11	25	75	10
DB702 101	10	5	11	25	100	10
DB702 120	12	6	12	25	80	12
DB702 121	12	6	12	25	110	12

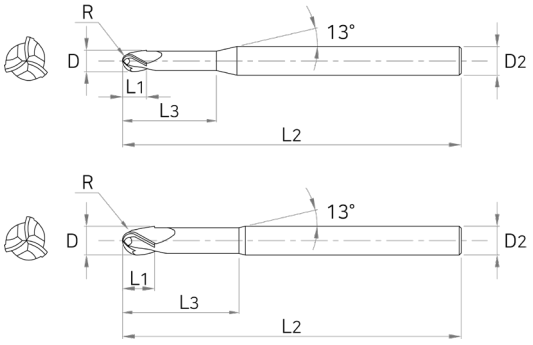
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

DB703 | 3 FLUTES NECK BALL ENDMILL





■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.015	h5

CARBIDE | AlTiN | 3 | 30° HELIX | R ±0.005 R3 OR UNDER | R ±0.01 ABOVE R3 | DATA P.570

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
DB703 025	2.5	1.25	3	7	50	6
DB703 030 S	3	1.5	4	10	50	6
DB703 030	3	1.5	4	10	60	6
DB703 031	3	1.5	4	10	70	6
DB703 040 S	4	2	5	10	50	6
DB703 040	4	2	5	10	60	6
DB703 041	4	2	5	10	70	6
DB703 050	5	2.5	6	12	60	6
DB703 060	6	3	7	12	60	6
DB703 061	6	3	7	12	90	6
DB703 080	8	4	9	15	70	8
DB703 081	8	4	9	15	100	8
DB703 100	10	5	11	25	75	10
DB703 101	10	5	11	25	100	10
DB703 120	12	6	12	25	80	12
DB703 121	12	6	12	25	110	12

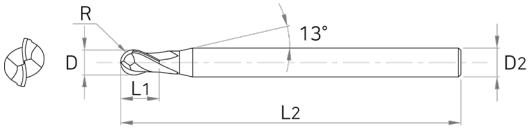
■ Applicable Working Material

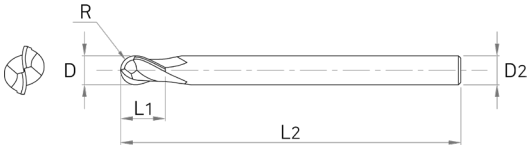
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

DB712 | 2 FLUTES BALL ENDMILL







■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.02	h5

CARBIDE | AlTiN | 2 | 30° HELIX | R ±0.005 R3 OR UNDER | R ±0.01 ABOVE R3 | DATA P.570

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
DB712 010 S	1	0.5	1.5	40	6
DB712 010 S4	1	0.5	2.5	50	4
DB712 010	1	0.5	2.5	50	6
DB712 012	1.2	0.6	3	50	6
DB712 015 S	1.5	0.75	2.5	40	6
DB712 015 S4	1.5	0.75	4	50	4
DB712 015	1.5	0.75	4	50	6
DB712 020 S	2	1	3	40	6
DB712 020 S4	2	1	5	50	4
DB712 020	2	1	5	50	6
DB712 025	2.5	1.25	7	60	6
DB712 030 S	3	1.5	4.5	50	6
DB712 030 S4	3	1.5	8	60	4

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
DB712 030	3	1.5	8	60	6
DB712 040 S	4	2	6	50	6
DB712 040	4	2	8	70	6
DB712 050 S	5	2.5	7.5	50	6
DB712 050	5	2.5	10	80	6
DB712 060 S	6	3	9	50	6
DB712 060	6	3	12	90	6
DB712 080 S	8	4	12	50	8
DB712 081	8	4	14	100	8
DB712 100 S	10	5	15	60	10
DB712 100	10	5	18	100	10
DB712 120 S	12	6	18	60	12
DB712 120	12	6	22	110	12

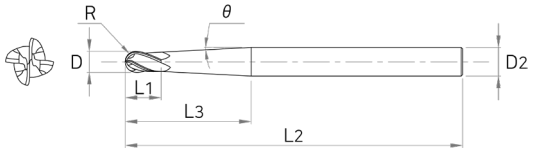
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

DB734 | 4 FLUTES 15° HELIX BALL ENDMILL





■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.015	h5

CARBIDE | AlTiN | 4 | 15° HELIX | R ±0.01 All Sizes | DATA P.571

EDP No	SIZES (mm)						
	D	R	L1	L3	L2	θ	D2
DB734 020-2.5	2	1	2	25	60	2.5	4
DB734 020-3.5	2	1	2	18	60	3.5	4
DB734 025-2.5	2.5	1.25	3	20	60	2.5	4
DB734 025-3.0	2.5	1.25	3	17	60	3	4
DB734 030-2.0	3	1.5	3	46	70	2	6
DB734 030-2.5	3	1.5	3	37	70	2.5	6
DB734 040-2.0	4	2	4	33	70	2	6
DB734 040-2.5	4	2	4	27	70	2.5	6
DB734 050-2.5	5	2.5	5	16	70	2.5	6
DB734 060-1.5	6	3	6	44	100	1.5	8
DB734 060-2.5	6	3	6	29	100	2.5	8
DB734 080-1.5	8	4	8	46	100	1.5	10
DB734 080-2.5	8	4	8	31	100	2.5	10
DB734 100-1.5	10	5	10	48	110	1.5	12
DB734 100-2.5	10	5	10	33	110	2.5	12

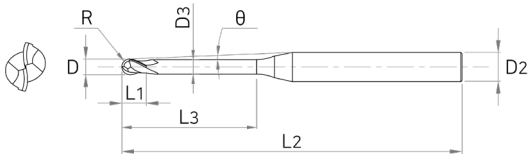
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZSLNB20 | 2 FLUTES LONG NECK BALL ENDMILL





■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.015	h5

CARBIDE | AlTiN | 2 | 30° HELIX | R ±0.005 All Sizes | DATA P.571

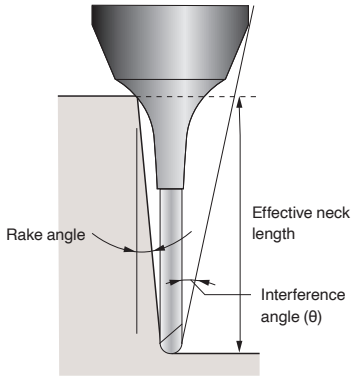
EDP No	SIZES (mm)								Effective length by inclination angle				
	D	R	L1	L3	D3	L2	D2	θ	0.5°	1°	1.5°	2°	3°
ZSLNB 2001-0.2	0.1	0.05	0.08	0.2	0.08	45	4	11.8	0.3	0.3	0.3	0.4	0.4
ZSLNB 2001-0.3	0.1	0.05	0.08	0.3	0.08	45	4	11.7	0.4	0.4	0.5	0.5	0.5
ZSLNB 2001-0.5	0.1	0.05	0.08	0.5	0.08	45	4	11.4	0.6	0.7	0.7	0.7	0.8
ZSLNB 2002-0.5	0.2	0.1	0.15	0.5	0.17	50	4	11.5	1.2	1.3	1.5	1.6	2
ZSLNB 2002-1	0.2	0.1	0.15	1	0.17	50	4	10.9	1.7	1.9	2.1	2.3	2.7
ZSLNB 2002-1.5	0.2	0.1	0.15	1.5	0.17	50	4	10.4	2.3	2.5	2.8	3	3.4
ZSLNB 2002-2	0.2	0.1	0.15	2	0.17	50	4	9.9	2.8	3.1	3.4	3.6	4.1
ZSLNB 2002-2.5	0.2	0.1	0.15	2.5	0.17	50	4	9.5	3.4	3.7	4	4.2	4.7
ZSLNB 2002-3.0	0.2	0.1	0.15	3	0.17	50	4	9.1	3.9	4.3	4.6	4.9	5.4
ZSLNB 2003-1	0.3	0.15	0.25	1	0.27	50	4	10.9	1.7	1.9	2.1	2.3	5.4
ZSLNB 2003-1.5	0.3	0.15	0.25	1.5	0.27	50	4	10.4	2.3	2.5	2.7	3	3.4
ZSLNB 2003-2	0.3	0.15	0.25	2	0.27	50	4	9.9	2.8	3.1	3.4	3.6	4
ZSLNB 2003-2.5	0.3	0.15	0.25	2.5	0.27	50	4	9.5	3.4	3.7	4	4.2	4.7
ZSLNB 2003-3	0.3	0.15	0.25	3	0.27	50	4	9.1	3.9	4.3	4.6	4.8	5.3
ZSLNB 2004-1	0.4	0.2	0.3	1	0.37	50	4	11	1.7	1.9	2.1	2.3	2.7
ZSLNB 2004-1.5	0.4	0.2	0.3	1.5	0.37	50	4	10.4	2.3	2.5	2.7	2.9	3.4
ZSLNB 2004-2	0.4	0.2	0.3	2	0.37	50	4	9.9	2.8	3.1	3.4	3.6	4
ZSLNB 2004-2.5	0.4	0.2	0.3	2.5	0.37	50	4	9.5	3.4	3.7	4	4.2	4.7
ZSLNB 2004-3	0.4	0.2	0.3	3	0.37	50	4	9.1	3.9	4.3	4.6	4.8	5.3
ZSLNB 2004-3.5	0.4	0.2	0.3	3.5	0.37	50	4	8.7	4.5	4.8	5.2	5.4	6
ZSLNB 2004-4	0.4	0.2	0.3	4	0.37	50	4	8.3	5	5.4	5.7	6	6.6
ZSLNB 2004-4.5	0.4	0.2	0.3	4.5	0.37	50	4	8	5.6	6	6.3	6.6	7.2
ZSLNB 2005-1	0.5	0.25	0.35	1	0.47	50	4	11	1.7	1.9	2.1	2.3	2.6
ZSLNB 2005-2	0.5	0.25	0.35	2	0.47	50	4	9.9	2.8	3.1	3.3	3.6	4

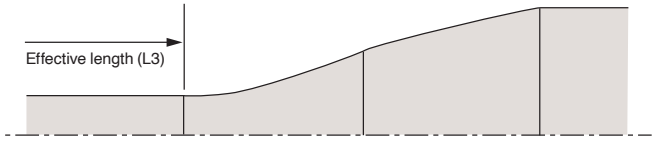
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZSLNB20 | 2 FLUTES LONG NECK BALL ENDMILL





※ The marked effective neck length is the default value to prevent interference with the workpiece.
Proper control of the processing environment is required

EDP No	SIZES (mm)								Effective length by inclination angle				
	D	R	L1	L3	D3	L2	D2	θ	0.5°	1°	1.5°	2°	3°
ZSLNB 2005-3	0.5	0.25	0.35	3	0.47	50	4	9	3.9	4.3	4.6	4.8	5.3
ZSLNB 2005-4	0.5	0.25	0.35	4	0.47	50	4	8.3	5	5.4	5.7	6	6.6
ZSLNB 2005-5	0.5	0.25	0.35	5	0.47	50	4	7.7	6.1	6.5	6.9	7.2	7.8
ZSLNB 2005-6	0.5	0.25	0.35	6	0.47	50	4	7.1	7.2	7.6	8	8.4	9
ZSLNB 2005-8	0.5	0.25	0.35	8	0.47	50	4	6.3	9.3	9.9	10.3	10.7	11.4
ZSLNB 2006-1	0.6	0.3	0.4	1	0.57	50	4	11	1.7	1.9	2.1	2.3	2.6
ZSLNB 2006-2	0.6	0.3	0.4	2	0.57	50	4	9.9	2.8	3.1	3.3	3.6	4
ZSLNB 2006-3	0.6	0.3	0.4	3	0.57	50	4	9	3.9	4.3	4.5	4.8	5.3
ZSLNB 2006-4	0.6	0.3	0.4	4	0.57	50	4	8.3	5	5.4	5.7	6	6.6
ZSLNB 2006-5	0.6	0.3	0.4	5	0.57	50	4	7.6	6.1	6.5	6.9	7.2	7.8
ZSLNB 2006-6	0.6	0.3	0.4	6	0.57	50	4	7.1	7.2	7.6	8	8.4	9
ZSLNB 2006-7	0.6	0 .3	0.4	7	0.57	50	4	6.6	8.3	8.8	9.2	9.5	10.2
ZSLNB 2006-8	0.6	0.3	0.4	8	0.57	50	4	6.2	9.3	9.9	10.3	10.7	11.4
ZSLNB 2006-9	0.6	0.3	0.4	9	0.57	50	4	5.8	10.4	10.9	11.4	11.8	12.5
ZSLNB 2006-10	0.6	0.3	0.4	10	0.57	50	4	5.5	11.4	12	12.5	12.9	13.7
ZSLNB 2006-12	0.6	0.3	0.4	12	0.57	50	4	5	13.6	14.2	14.7	15.2	16
ZSLNB 2008-2	0.8	0.4	0.5	2	0.77	50	4	9.9	2.8	3.1	3.3	3.5	4
ZSLNB 2008-4	0.8	0.4	0.5	4	0.77	50	4	8.2	5	5.4	5.7	6	6.5
ZSLNB 2008-5	0.8	0.4	0.5	5	0.77	50	4	7.5	6.1	6.5	6.9	7.2	7.8
ZSLNB 2008-6	0.8	0.4	0.5	6	0.77	50	4	7	7.2	7.6	8	8.4	9
ZSLNB 2008-8	0.8	0.4	0.5	8	0.77	50	4	6.1	9.3	9.8	10.3	10.7	11.3
ZSLNB 2008-10	0.8	0.4	0.5	10	0.77	50	4	5.4	11.4	12	12.5	12.9	13.7
ZSLNB 2010-2	1	0.5	0.8	2	0.96	50	4	9.9	2.9	3.1	3.3	3.5	4
ZSLNB 2010-3	1	0.5	0.8	3	0.96	50	4	8.9	4	4.3	4.5	4.8	5.3

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZSLNB20 | 2 FLUTES LONG NECK BALL ENDMILL

EDP No	SIZES (mm)								Effective length by inclination angle				
	D	R	L1	L3	D3	L2	D2	θ	0.5°	1°	1.5°	2°	3°
ZSLNB 2010-4	1	0.5	0.8	4	0.96	50	4	8.1	5	5.4	5.7	6	6.5
ZSLNB 2010-5	1	0.5	0.8	5	0.96	50	4	7.4	6.1	6.5	6.9	7.2	7.8
ZSLNB 2010-6	1	0.5	0.8	6	0.96	50	4	6.8	7.2	7.7	8	8.4	9
ZSLNB 2010-7	1	0.5	0.8	7	0.96	50	4	6.3	8.3	8.8	9.2	9.5	10.2
ZSLNB 2010-8	1	0.5	0.8	8	0.96	50	4	5.9	9.3	9.9	10.3	10.7	11.3
ZSLNB 2010-9	1	0.5	0.8	9	0.96	50	4	5.5	10.4	11	11.4	11.8	12.5
ZSLNB 2010-10	1	0.5	0.8	10	0.96	50	4	5.2	11.5	12	12.5	12.9	13.7
ZSLNB 2010-12	1	0.5	0.8	12	0.96	55	4	4.6	13.6	14.2	14.7	15.2	15.9
ZSLNB 2010-14	1	0.5	0.8	14	0.96	55	4	4.2	15.7	16.4	16.9	17.4	18.5
ZSLNB 2010-16	1	0.5	0.8	16	0.96	55	4	3.8	17.8	18.5	19.1	19.6	21.2
ZSLNB 2010-18	1	0.5	0.8	18	0.96	60	4	3.5	19.9	20.7	21.3	21.8	23.8
ZSLNB 2010-20	1	0.5	0.8	20	0.96	60	4	3.3	22	22.8	23.4	24	26.5
ZSLNB 2012-4	1.2	0.6	1.1	4	1.15	50	4	7.9	5.1	5.4	5.7	6	6.5
ZSLNB 2012-6	1.2	0.6	1.1	6	1.15	50	4	6.6	7.2	7.7	8	8.4	9
ZSLNB 2012-8	1.2	0.6	1.1	8	1.15	50	4	5.7	9.4	9.9	10.3	10.7	11.3
ZSLNB 2012-10	1.2	0.6	1.1	10	1.15	50	4	5	11.5	12.1	12.5	12.9	13.7
ZSLNB 2012-12	1.2	0.6	1.1	12	1.15	55	4	4.5	13.6	14.2	14.7	15.2	15.9
ZSLNB 2014-8	1.4	0.7	1.3	8	1.34	50	4	5.5	9.4	9.9	10.3	10.7	11.3
ZSLNB 2014-12	1.4	0.7	1.3	12	1.34	55	4	4.3	13.6	14.2	14.7	15.2	15.9
ZSLNB 2014-16	1.4	0.7	1.3	16	1.34	55	4	3.5	17.8	18.5	19.1	19.6	21.2
ZSLNB 2015-4	1.5	0.75	1.35	4	1.44	50	4	7.7	5.1	5.4	5.7	6	6.5
ZSLNB 2015-6	1.5	0.75	1.35	6	1.44	50	4	6.4	7.3	7.7	8	8.4	9
ZSLNB 2015-8	1.5	0.75	1.35	8	1.44	50	4	5.4	9.4	9.9	10.3	10.7	11.3
ZSLNB 2015-10	1.5	0.75	1.35	10	1.44	50	4	4.7	11.5	12.1	12.5	12.9	13.7
ZSLNB 2015-12	1.5	0.75	1.35	12	1.44	55	4	4.2	13.6	14.2	14.7	15.2	15.9
ZSLNB 2015-14	1.5	0.75	1.35	14	1.44	55	4	3.8	15.7	16.4	16.9	17.4	18.5
ZSLNB 2015-16	1.5	0.75	1.35	16	1.44	55	4	3.4	17.8	18.5	19.1	19.6	21.1
ZSLNB 2015-20	1.5	0.75	1.35	20	1.44	60	4	2.9	22	22.8	23.4	24	-
ZSLNB 2016-8	1.6	0.8	1.4	8	1.54	50	4	5.3	9.4	9.9	10.3	10.7	11.3
ZSLNB 2016-10	1.6	0.8	1.4	10	1.54	50	4	4.6	11.5	12.1	12.5	12.9	13.7
ZSLNB 2016-12	1.6	0.8	1.4	12	1.54	55	4	4.1	13.6	14.2	14.7	15.2	15.9
ZSLNB 2016-16	1.6	0.8	1.4	16	1.54	55	4	3.3	17.8	18.5	19.1	19.6	21.1
ZSLNB 2016-20	1.6	0.8	1.4	20	1.54	60	4	2.8	22	22.8	23.4	24	-
ZSLNB 2018-8	1.8	0.9	1.6	8	1.73	50	4	5.1	9.4	9.9	10.3	10.7	11.3
ZSLNB 2018-12	1.8	0.9	1.6	12	1.73	55	4	3.9	13.7	14.3	14.7	15.2	15.9
ZSLNB 2018-16	1.8	0.9	1.6	16	1.73	55	4	3.1	17.9	18.6	19.1	19.6	21.1
ZSLNB 2018-20	1.8	0.9	1.6	20	1.73	60	4	2.6	22	22.8	23.4	24	-
ZSLNB 2020-3	2	1	1.7	3	1.92	50	4	8.3	4.1	4.4	4.6	4.8	5.2
ZSLNB 2020-4	2	1	3	4	1.92	50	4	7.3	5.2	5.5	5.8	6	6.5
ZSLNB 2020-6	2	1	3	6	1.92	50	4	5.8	7.3	7.7	8.1	8.4	9
ZSLNB 2020-8	2	1	3	8	1.92	50	4	4.9	9.5	9.9	10.3	10.7	11.3

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZSLNB20 | 2 FLUTES LONG NECK BALL ENDMILL

EDP No	SIZES (mm)								Effective length by inclination angle				
	D	R	L1	L3	D3	L2	D2	θ	0.5°	1°	1.5°	2°	3°
ZSLNB 2020-10	2	1	3	10	1.92	50	4	4.2	11.6	12.1	12.6	12.9	13.6
ZSLNB 2020-12	2	1	3	12	1.92	55	4	3.7	13.7	14.3	14.8	15.2	15.9
ZSLNB 2020-14	2	1	3	14	1.92	55	4	3.2	15.8	16.4	16.9	17.4	18.5
ZSLNB 2020-16	2	1	3	16	1.92	55	4	2.9	17.9	18.6	19.1	19.6	-
ZSLNB 2020-18	2	1	3	18	1.92	60	4	2.7	20	20.7	21.3	21.8	-
ZSLNB 2020-20	2	1	3	20	1.92	60	4	2.4	22.1	22.8	23.4	24	-
ZSLNB 2020-22	2	1	3	22	1.92	60	4	2.3	24.1	24.9	25.6	26.3	-
ZSLNB 2020-25	2	1	3	25	1.92	65	4	2	27.3	28.1	28.8	-	-
ZSLNB 2020-30	2	1	3	30	1.92	70	4	1.7	32.4	33.4	34.2	-	-
ZSLNB 2020-35	2	1	3	35	1.92	75	4	1.5	37.6	38.6	-	-	-
ZSLNB 2020-40	2	1	3	40	1.92	80	4	1.4	42.8	43.8	-	-	-
ZSLNB 2025-10	2.5	1.25	4	10	2.4	50	4	3.4	11.6	12.1	12.6	13	13.6
ZSLNB 2025-16	2.5	1.25	4	16	2.4	55	4	2.3	17.9	18.6	19.1	19.6	-
ZSLNB 2025-20	2.5	1.25	4	20	2.4	60	4	1.9	22.1	22.8	23.5	-	-
ZSLNB 2030-8	3	1.5	4	8	2.88	55	6	6.2	9.6	10	10.4	10.7	11.3
ZSLNB 2030-10	3	1.5	4	10	2.88	55	6	5.5	11.7	12.2	12.6	13	13.6
ZSLNB 2030-13	3	1.5	4	13	2.88	60	6	4.6	14.8	15.4	15.9	16.3	17.1
ZSLNB 2030-16	3	1.5	4	16	2.88	60	6	4	18	18.6	19.1	19.6	21.1
ZSLNB 2030-18	3	1.5	4	18	2.88	60	6	3.6	20	20.7	21.3	21.8	23.7
ZSLNB 2030-20	3	1.5	4	20	2.88	65	6	3.4	22.1	22.9	23.5	24	26.4
ZSLNB 2030-25	3	1.5	4	25	2.88	70	6	2.8	27.3	28.2	28.8	29.9	-
ZSLNB 2030-30	3	1.5	4	30	2.88	75	6	2.5	32.5	33.4	34.3	35.9	-
ZSLNB 2030-35	3	1.5	4	35	2.88	80	6	2.2	37.7	38.7	40	41.9	-
ZSLNB 2040-10	4	2	5	10	3.9	55	6	4.5	11.6	12.1	12.5	12.9	13.5
ZSLNB 2040-13	4	2	5	13	3.9	60	6	3.6	14.7	15.3	15.8	16.2	17
ZSLNB 2040-16	4	2	5	16	3.9	60	6	3.1	17.9	18.5	19.1	19.5	20.9
ZSLNB 2040-20	4	2	5	20	3.9	65	6	2.5	22.1	22.8	23.4	23.9	-
ZSLNB 2040-25	4	2	5	25	3.9	70	6	2.1	27.3	28.1	28.8	29.8	-
ZSLNB 2040-30	4	2	5	30	3.9	75	6	1.8	32.4	33.4	34.2	-	-
ZSLNB 2040-35	4	2	5	35	3.9	80	6	1.6	37.6	38.6	39.9	-	-
ZSLNB 2040-40	4	2	5	40	3.9	80	6	1.4	42.8	43.8	-	-	-
ZSLNB 2040-45	4	2	5	45	3.9	90	6	1.2	47.9	49.1	-	-	-
ZSLNB 2040-50	4	2	5	50	3.9	100	6	1.1	53.1	54.5	-	-	-
ZSLNB 2050-20	5	2.5	6	20	4.9	65	6	1.4	22	22.8	-	-	-
ZSLNB 2050-25	5	2.5	6	25	4.9	70	6	1.2	27.2	28.1	-	-	-
ZSLNB 2050-30	5	2.5	6	30	4.9	75	6	1	32.4	-	-	-	-
ZSLNB 2050-35	5	2.5	6	35	4.9	80	6	0.8	42.8	-	-	-	-
ZSLNB 2050-40	5	2.5	6	40	4.9	90	6	0.7	42.8	-	-	-	-

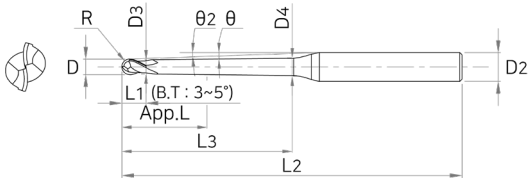
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZSTNB20 | 2 FLUTES TAPERED NECK BALL ENDMILL





※ R2 and below are not back draft Type

■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.015	h5

CARBIDE | AlTiN | 2 | 30° HELIX | R ±0.005 R3 OR UNDER | R ±0.01 ABOVE R3 | DATA P.572

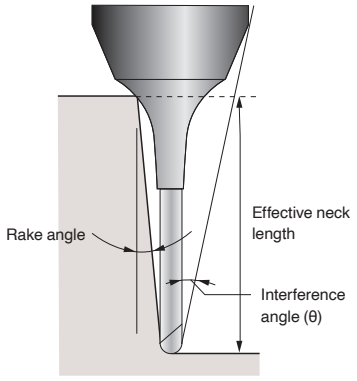
EDP No	SIZES (mm)											Effective length by inclination angle				
	D	R	L1	L3	θ2	D3	D4	L2	D2	App.L	θ	0.5°	1°	1.5°	2°	3°
ZSTNB 2002-1-04	0.2	0.1	0.15	1	0.4	0.17	0.18	50	4	1.35	10.9	1.5	1.7	1.8	2	2.3
ZSTNB 2002-1.5-04	0.2	0.1	0.15	1.5	0.4	0.17	0.19	50	4	1.77	10.4	2	2.2	2.4	2.6	2.9
ZSTNB 2002-2-09	0.2	0.1	0.15	2	0.9	0.17	0.23	50	4	1.1	10.1	x	2.8	3.1	3.4	3.9
ZSTNB 2002-2.5-09	0.2	0.1	0.15	2.5	0.9	0.17	0.24	50	4	1.1	9.6	x	3.3	3.7	4	4.5
ZSTNB 2003-2-04	0.3	0.15	0.25	2	0.4	0.27	0.29	50	4	2.19	10	2.5	2.8	3	3.2	3.5
ZSTNB 2003-3-09	0.3	0.15	0.25	3	0.9	0.27	0.36	50	4	1.2	9.3	x	3.8	4.2	4.5	5.1
ZSTNB 2003-4-09	0.3	0.15	0.25	4	0.9	0.27	0.39	50	4	1.2	8.6	x	4.8	5.3	5.7	6.3
ZSTNB 2004-2-04	0.4	0.2	0.3	2	0.4	0.37	0.39	50	4	2.2	10	2.5	2.8	3	3.2	3.5
ZSTNB 2004-3-04	0.4	0.2	0.3	3	0.4	0.37	0.41	50	4	2.44	9.1	3.6	3.9	4.1	4.4	4.8
ZSTNB 2004-4-04	0.4	0.2	0.3	4	0.4	0.37	0.42	50	4	2.44	8.4	4.7	5.2	5.6	5.9	6.5
ZSTNB 2004-4-09	0.4	0.2	0.3	4	0.9	0.37	0.49	50	4	1.25	8.5	x	4.8	5.3	5.7	6.3
ZSTNB 2004-5-04	0.4	0.2	0.3	5	0.4	0.37	0.44	50	4	2.44	7.8	5.7	6.3	6.7	7.1	7.7
ZSTNB 2004-5-09	0.4	0.2	0.3	5	0.9	0.37	0.52	50	4	1.25	7.9	x	5.9	6.4	6.8	7.5
ZSTNB 2005-4-04	0.5	0.25	0.35	4	0.4	0.47	0.52	50	4	2.49	8.4	4.6	5	5.3	5.5	5.9
ZSTNB 2005-8-09	0.5	0.25	0.35	8	0.9	0.47	0.71	50	4	1.3	6.5	x	8.9	9.6	10.1	10.9
ZSTNB 2005-12-09	0.5	0.25	0.35	12	0.9	0.47	0.84	50	4	1.3	5.3	x	13	13.9	14.5	15.4
ZSTNB 20054-2-04	0.54	0.27	0.37	2	0.4	0.51	0.53	50	4	1.8	10	2.3	2.5	2.7	2.8	3
ZSTNB 20054-4-04	0.54	0.27	0.37	4	0.4	0.51	0.56	50	4	1.8	8.4	4.5	4.9	5.2	5.5	5.9
ZSTNB 20054-5-04	0.54	0.27	0.37	5	0.4	0.51	0.58	50	4	1.8	7.8	5.5	6	6.3	6.6	7.1
ZSTNB 20054-6-04	0.54	0.27	0.37	6	0.4	0.51	0.59	50	4	1.8	7.2	6.7	7.3	7.8	8.2	8.8
ZSTNB 20054-6.5-04	0.54	0.27	0.37	6.5	0.4	0.51	0.6	50	4	1.8	7	7.2	7.9	8.3	8.7	9.4
ZSTNB 20054-7-04	0.54	0.27	0.37	7	0.4	0.51	0.6	50	4	1.8	6.8	7.7	8.4	8.9	9.3	10
ZSTNB 2006-2-04	0.6	0.3	0.4	2	0.4	0.57	0.59	50	4	2.17	10	2.4	2.5	2.7	2.8	3
ZSTNB 2006-4-04	0.6	0.3	0.4	4	0.4	0.57	0.62	50	4	2.54	8.4	4.6	5	5.2	5.5	5.9

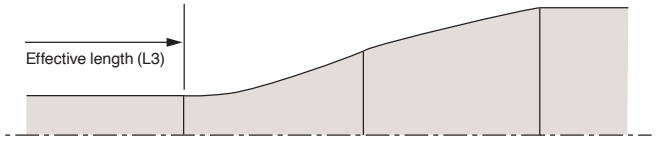
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZSTNB20 | 2 FLUTES TAPERED NECK BALL ENDMILL





※ The marked effective neck length is the default value to prevent interference with the workpiece.
Proper control of the processing environment is required

EDP No	SIZES (mm)											Effective length by inclination angle				
	D	R	L1	L3	θ2	D3	D4	L2	D2	App.L	θ	0.5°	1°	1.5°	2°	3°
ZSTNB 2006-6-04	0.6	0.3	0.4	6	0.4	0.57	0.65	50	4	2.54	7.2	6.8	7.4	7.8	8.2	8.8
ZSTNB 2006-6-09	0.6	0.3	0.4	6	0.9	0.57	0.75	50	4	1.35	7.3	x	6.9	7.5	7.9	8.6
ZSTNB 2006-8-09	0.6	0.3	0.4	8	0.9	0.57	0.81	50	4	1.35	6.4	x	8.9	9.6	10.1	10.9
ZSTNB 2006-10-04	0.6	0.3	0.4	10	0.4	0.57	0.7	50	4	2.54	5.6	10.8	11.7	12.2	12.7	13.5
ZSTNB 2006-10-09	0.6	0.3	0.4	10	0.9	0.57	0.87	50	4	1.35	5.7	x	11	11.8	12.3	13.2
ZSTNB 2006-12-09	0.6	0.3	0.4	12	0.9	0.57	0.93	55	4	1.35	5.2	x	13	13.9	14.5	15.4
ZSTNB 2006-15-04	0.6	0.3	0.4	15	0.4	0.57	0.77	55	4	2.54	4.4	15.9	17	17.6	18.2	19.2
ZSTNB 2006-15-09	0.6	0.3	0.4	15	0.9	0.57	1.03	55	4	1.35	4.5	x	16.1	17.1	17.7	18.8
ZSTNB 2008-4-04	0.8	0.4	0.5	4	0.4	0.77	0.82	50	4	2.64	8.3	4.6	4.9	5.2	5.5	5.9
ZSTNB 2008-6-04	0.8	0.4	0.5	6	0.4	0.77	0.85	50	4	2.64	7.1	6.6	7.1	7.5	7.7	8.3
ZSTNB 2008-8-09	0.8	0.4	0.5	8	0.9	0.77	1.01	50	4	1.45	6.3	x	8.9	9.6	10.1	10.9
ZSTNB 2008-12-09	0.8	0.4	0.5	12	0.9	0.77	1.13	55	4	1.45	5	x	13	13.9	14.5	15.4
ZSTNB 2008-16-09	0.8	0.4	0.5	16	0.9	0.77	1.26	55	4	1.45	4.2	x	17.1	18.1	18.8	19.9
ZSTNB 2009-4-04	0.9	0.45	0.6	4	0.4	0.86	0.91	50	4	3.46	8.2	4.5	4.7	4.9	5.1	5.4
ZSTNB 2009-8-04	0.9	0.45	0.6	8	0.4	0.86	0.96	55	4	3.46	6.1	8.7	9.3	9.7	10	10.6
ZSTNB 2009-12-04	0.9	0.45	0.6	12	0.4	0.86	1.02	55	4	3.46	4.8	12.9	13.8	14.4	14.9	15.7
ZSTNB 2009-16-04	0.9	0.45	0.6	16	0.4	0.86	1.08	60	4	3.46	4	17	18	18.7	19.3	20.5
ZSTNB 2009-18-04	0.9	0.45	0.6	18	0.4	0.86	1.1	65	4	3.46	3.7	19.1	20.1	20.9	21.5	23.1
ZSTNB 2009-20-04	0.9	0.45	0.6	20	0.4	0.86	1.13	65	4	3.46	3.4	21.1	22.2	23	23.6	25.6
ZSTNB 2009-22-04	0.9	0.45	0.6	22	0.4	0.86	1.16	65	4	3.46	3.2	23.1	24.3	25.1	25.8	28.2
ZSTNB 2009-24-04	0.9	0.45	0.6	24	0.4	0.86	1.19	70	4	3.46	3	25.2	26.4	27.2	27.9	-
ZSTNB 2010-6-04	1	0.5	0.8	6	0.4	0.94	1.01	50	6	5.09	8.3	6.8	7.2	7.5	7.8	8.3
ZSTNB 2010-8-04	1	0.5	0.8	8	0.4	0.94	1.04	55	6	5.09	7.5	8.8	9.3	9.7	10	10.6
ZSTNB 2010-10-04	1	0.5	0.8	10	0.4	0.94	1.07	55	6	5.09	6.8	11	11.7	12.3	12.7	13.5

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZSTNB20 | 2 FLUTES TAPERED NECK BALL ENDMILL

EDP No	SIZES (mm)											Effective length by inclination angle				
	D	R	L1	L3	θ2	D3	D4	L2	D2	App.L	θ	0.5°	1°	1.5°	2°	3°
ZSTNB 2010-10-09	1	0.5	0.8	10	0.9	0.94	1.23	55	6	2.7	6.9	x	11.2	11.9	12.4	13.2
ZSTNB 2010-15-09	1	0.5	0.8	15	0.9	0.94	1.39	60	6	2.7	5.7	x	16.2	17.1	17.8	18.8
ZSTNB 2010-20-04	1	0.5	0.8	20	0.4	0.94	1.21	65	6	5.09	4.7	21.2	22.3	23	23.6	25.7
ZSTNB 2010-20-09	1	0.5	0.8	20	0.4	0.94	1.54	65	6	2.7	4.8	x	21.3	22.4	23.1	24.6
ZSTNB 2010-25-09	1	0.5	0.8	25	0.4	0.94	1.7	70	6	2.7	4.2	x	26.4	27.6	28.4	30.8
ZSTNB 2010-30-04	1	0.5	0.8	30	0.4	0.94	1.35	75	6	5.09	3.6	31.3	32.7	33.6	34.8	38.5
ZSTNB 2010-30-09	1	0.5	0.8	30	0.9	0.94	1.86	75	6	2.7	3.7	x	31.4	32.8	33.7	36.9
ZSTNB 2010-35-09	1	0.5	0.8	35	0.9	0.94	2.02	80	6	2.7	3.3	x	36.5	38	39	43.1
ZSTNB 2010-40-09	1	0.5	0.8	40	0.9	0.94	2.17	85	6	2.7	3	x	41.6	43.2	44.4	-
ZSTNB 2010-50-09	1	0.5	0.8	50	0.9	0.94	2.49	95	6	2.7	2.5	x	51.7	53.5	55.5	-
ZSTNB 2010-60-09	1	0.5	0.8	60	0.9	0.94	2.8	105	6	2.7	2.2	x	61.8	63.8	66.6	-
ZSTNB 2010-70-09	1	0.5	0.8	70	0.9	0.94	3.11	115	6	2.7	1.9	x	71.9	74	-	-
ZSTNB 2015-8-04	1.5	0.75	1.35	8	0.4	1.42	1.51	55	6	7.07	7.3	8.9	9.4	9.7	10	10.6
ZSTNB 2015-10-04	1.5	0.75	1.35	10	0.4	1.42	1.54	55	6	7.07	6.6	10.9	11.5	11.9	12.2	12.9
ZSTNB 2015-12-04	1.5	0.75	1.35	12	0.4	1.42	1.57	55	6	7.07	6	13	13.6	14	14.4	15.4
ZSTNB 2015-15-09	1.5	0.75	1.35	15	0.9	1.42	1.85	60	6	3.89	5.4	x	16.4	17.2	17.8	18.8
ZSTNB 2015-20-09	1.5	0.75	1.35	20	0.9	1.42	2.01	65	6	3.89	4.5	x	21.4	22.4	23.2	24.7
ZSTNB 2015-30-09	1.5	0.75	1.35	30	0.9	1.42	2.32	75	6	3.89	3.4	x	31.5	32.9	33.7	37
ZSTNB 2018-4-04	1.8	0.9	1.6	4	0.4	1.73	1.76	50	6	4.38	9.2	4.6	4.8	4.9	5.1	5.4
ZSTNB 2018-8-04	1.8	0.9	1.6	8	0.4	1.73	1.82	50	6	6.61	7.1	8.6	9	9.2	9.4	10.2
ZSTNB 2018-12-04	1.8	0.9	1.6	12	0.4	1.73	1.88	55	6	6.61	5.8	12.9	13.5	14	14.4	15.4
ZSTNB 2018-16-04	1.8	0.9	1.6	16	0.4	1.73	1.93	60	6	6.61	4.9	17	17.7	18.3	18.7	20.5
ZSTNB 2018-20-04	1.8	0.9	1.6	20	0.4	1.73	1.99	65	6	6.61	4.3	21.2	22.3	23	23.6	25.6
ZSTNB 2018-24-04	1.8	0.9	1.6	24	0.4	1.73	2.04	65	6	6.61	3.8	25.3	26.5	27.3	27.9	30.8
ZSTNB 2018-28-04	1.8	0.9	1.6	28	0.4	1.73	2.1	70	6	6.61	3.4	29.4	30.6	31.5	32.4	35.9
ZSTNB 2018-32-04	1.8	0.9	1.6	32	0.4	1.73	2.15	70	6	6.61	3	33.4	34.8	35.7	37.1	-
ZSTNB 2018-36-04	1.8	0.9	1.6	36	0.4	1.73	2.21	75	6	6.61	2.8	37.5	38.9	39.9	41.7	-
ZSTNB 2018-38-04	1.8	0.9	1.6	38	0.4	1.73	2.24	80	6	6.61	2.7	39.5	41	42	44	-
ZSTNB 2018-40-04	1.8	0.9	1.6	40	0.4	1.73	2.27	80	6	6.61	2.6	41.5	43.1	44.2	46.3	-
ZSTNB 2020-8-04	2	1	1.7	8	0.4	1.92	2.01	50	6	7.42	7	8.7	9	9.2	9.5	10.2
ZSTNB 2020-12-04	2	1	1.7	12	0.4	1.92	2.06	55	6	7.42	5.7	13	13.6	14	14.4	15.4
ZSTNB 2020-16-04	2	1	1.7	16	0.4	1.92	2.12	60	6	7.42	4.8	17	17.7	18.3	18.7	20.5
ZSTNB 2020-20-04	2	1	1.7	20	0.4	1.92	2.18	65	6	7.42	4.1	21.3	22.3	23	23.6	25.6
ZSTNB 2020-20-09	2	1	1.7	20	0.9	1.92	2.5	65	6	4.24	4.2	x	21.4	22.4	23.2	24.6
ZSTNB 2020-25-09	2	1	1.7	25	0.9	1.92	2.65	65	6	4.24	3.6	x	26.5	27.7	28.5	30.8
ZSTNB 2020-30-04	2	1	1.7	30	0.4	1.92	2.32	70	6	7.42	3.1	31.4	32.7	33.6	34.8	38.5
ZSTNB 2020-30-09	2	1	1.7	30	0.9	1.92	2.81	70	6	4.24	3.2	x	31.6	32.9	33.7	36.9
ZSTNB 2020-35-09	2	1	1.7	35	0.9	1.92	2.97	75	6	4.24	2.8	x	36.6	38	39	-
ZSTNB 2020-40-04	2	1	1.7	40	0.4	1.92	2.46	80	6	7.42	2.5	41.5	43.1	44.2	46.3	-
ZSTNB 2020-40-09	2	1	1.7	40	0.9	1.92	3.12	80	6	4.24	2.6	x	41.7	43.2	44.5	-
ZSTNB 2020-50-09	2	1	1.7	50	0.9	1.92	3.44	90	6	4.24	2.1	x	51.5	53.5	55.5	-

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZSTNB20 | 2 FLUTES TAPERED NECK BALL ENDMILL

EDP No	SIZES (mm)											Effective length by inclination angle				
	D	R	L1	L3	θ2	D3	D4	L2	D2	App.L	θ	0.5°	1°	1.5°	2°	3°
ZSTNB 2020-60-09	2	1	1.7	60	0.9	1.92	3.75	100	6	4.24	1.8	x	61.9	63.8	-	-
ZSTNB 2020-70-09	2	1	1.7	70	0.9	1.92	4.07	110	6	4.24	1.8	x	72	74.1	-	-
ZSTNB 2030-8-04	3	1.5	2.5	8	0.4	2.86	2.94	50	6	8.5	6.3	8.8	9.1	9.3	9.5	10.3
ZSTNB 2030-16-04	3	1.5	2.5	16	0.4	2.86	3.05	55	6	12.52	4.1	17.2	17.8	18.3	18.7	20.6
ZSTNB 2030-20-04	3	1.5	2.5	20	0.4	2.86	3.1	60	6	12.52	3.4	21.2	22	22.6	23.3	25.7
ZSTNB 2030-30-04	3	1.5	2.5	30	0.4	2.86	3.24	70	6	12.52	2.5	31.6	32.8	33.7	34.9	-
ZSTNB 2030-30-09	3	1.5	2.5	30	0.9	2.86	3.72	70	6	6.95	2.6	x	31.8	33	33.8	-
ZSTNB 2030-40-04	3	1.5	2.5	40	0.4	2.86	3.38	80	6	12.52	2	41.7	43.2	44.3	-	-
ZSTNB 2030-40-09	3	1.5	2.5	40	0.9	2.86	4.04	80	6	6.95	2	x	41.9	43.3	-	-
ZSTNB 2030-50-09	3	1.5	2.5	50	0.9	2.86	4.35	90	6	6.95	1.7	x	52	53.6	-	-
ZSTNB 2030-60-09	3	1.5	2.5	60	0.9	2.86	4.67	100	6	6.95	1.4	x	62.1	-	-	-
ZSTNB 2030-70-09	3	1.5	2.5	70	0.9	2.86	4.98	110	6	6.95	1.2	x	72.1	-	-	-
ZSTNB 2040-20-10	4	2	8	20	1	3.86	4.28	70	8	12.01	5	20.5	21.6	22.3	22.8	23.5
ZSTNB 2040-30-10	4	2	8	30	1	3.86	4.63	80	8	12.01	3.51	22	31.6	32.5	33.2	34.16
ZSTNB 2040-40-10	4	2	8	40	1	3.86	4.98	90	8	12.01	2.7	22	42	43.4	44.3	-
ZSTNB 2040-50-10	4	2	8	50	1	3.86	5.33	100	8	12.01	2.2	22	52	53.6	54.7	-
ZSTNB 2040-60-10	4	2	8	60	1	3.86	5.68	110	8	12.01	1.9	22	62	63.8	-	-
ZSTNB 2050-30-10	5	2.5	10	30	1	4.86	5.56	80	8	14.01	2.8	25.5	31.7	32.6	33.2	-
ZSTNB 2050-40-10	5	2.5	10	40	1	4.86	5.91	90	8	14.01	2.1	25.5	41.7	42.8	43.5	-
ZSTNB 2050-60-10	5	2.5	10	60	1	4.86	6.61	110	8	14.01	1.5	25.5	62.1	-	-	-
ZSTNB 2060-30-10	6	3	12	30	1	5.86	6.49	80	8	16.01	1.9	29	31.8	32.6	-	-
ZSTNB 2060-40-10	6	3	12	40	1	5.86	6.84	90	8	16.01	1.5	29	41.8	-	-	-
ZSTNB 2060-50-10	6	3	12	50	1	5.86	7.19	100	8	16.01	1.2	29	51.8	-	-	-
ZSTNB 2060-60-10	6	3	12	60	1	5.86	7.54	110	10	16.01	1.9	29	62.2	63.9	-	-
ZSTNB 2060-70-10	6	3	12	70	1	5.86	7.89	120	10	16.01	1.7	29	72.2	74.1	-	-
ZSTNB 2060-80-10	6	3	12	80	1	5.86	8.23	130	10	16.01	1.5	29	82.2	-	-	-
ZSTNB 2080-50-10	8	4	14	50	1	7.86	9.12	110	10	18.01	1.2	32	51.9	-	-	-
ZSTNB 2080-60-10	8	4	14	60	1	7.86	9.47	120	10	18.01	1	32	-	-	-	-
ZSTNB 2080-70-10	8	4	14	70	1	7.86	9.82	130	10	18.01	0.9	32	-	-	-	-
ZSTNB 2080-80-10	8	4	14	80	1	7.86	10.16	140	12	18.01	1.5	32	82.3	-	-	-
ZSTNB 2100-60-10	10	5	18	60	1	9.86	11.33	130	12	22.01	1.1	39	62.1	-	-	-
ZSTNB 2100-75-10	10	5	18	75	1	9.86	11.85	140	12	22.01	0.9	39	-	-	-	-

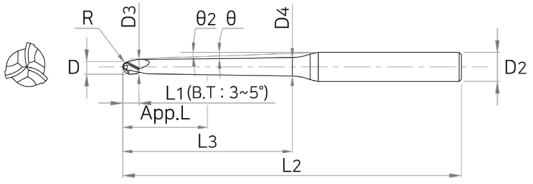
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZSTNB30 | 3 FLUTES TAPERED NECK BALL ENDMILL





※ R2 and below are not back draft Type

■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.015	h5

CARBIDE | AlTiN | 3 | 30° HELIX | R ±0.005 All Sizes | DATA P.572

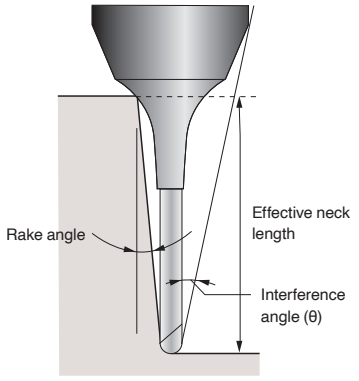
EDP No	SIZES (mm)											Effective length by inclination angle				
	D	R	L1	L3	θ2	D3	D4	L2	D2	App.L	θ	0.5°	1°	1.5°	2°	3°
ZSTNB 3020-8-04	2	1	1.7	8	0.4	1.92	2.01	50	6	7.42	7	8.7	9	9.2	9.5	10.2
ZSTNB 3020-12-04	2	1	1.7	12	0.4	1.92	2.06	55	6	7.42	5.7	13	13.6	14	14.4	15.4
ZSTNB 3020-16-04	2	1	1.7	16	0.4	1.92	2.12	60	6	7.42	4.8	17	17.7	18.3	18.7	20.5
ZSTNB 3020-20-04	2	1	1.7	20	0.4	1.92	2.18	65	6	7.42	4.1	21.3	22.3	23	23.6	25.6
ZSTNB 3020-20-09	2	1	1.7	20	0.9	1.92	2.5	65	6	4.24	4.2	x	21.4	22.4	23.2	24.6
ZSTNB 3020-25-09	2	1	1.7	25	0.9	1.92	2.65	65	6	4.24	3.6	x	26.5	27.7	28.5	30.8
ZSTNB 3020-30-04	2	1	1.7	30	0.4	1.92	2.32	70	6	7.42	3.1	31.4	32.7	33.6	34.8	38.5
ZSTNB 3020-30-09	2	1	1.7	30	0.9	1.92	2.81	70	6	4.24	3.2	x	31.6	32.9	33.7	36.9
ZSTNB 3020-35-09	2	1	1.7	35	0.9	1.92	2.97	75	6	4.24	2.8	x	36.6	38	39	-
ZSTNB 3020-40-04	2	1	1.7	40	0.4	1.92	2.46	80	6	7.42	2.5	41.5	43.1	44.2	46.3	-
ZSTNB 3020-40-09	2	1	1.7	40	0.9	1.92	3.12	80	6	4.24	2.6	x	41.7	43.2	44.5	-
ZSTNB 3020-50-09	2	1	1.7	50	0.9	1.92	3.44	90	6	4.24	2.1	x	51.8	53.5	55.5	-
ZSTNB 3020-60-09	2	1	1.7	60	0.9	1.92	3.75	100	6	4.24	1.8	x	61.9	63.8	-	-
ZSTNB 3020-70-09	2	1	1.7	70	0.9	1.92	4.07	110	6	4.24	1.6	x	72	74.1	-	-
ZSTNB 3030-8-04	3	1.5	2.5	8	0.4	2.86	2.94	50	6	8.5	6.3	8.8	9.1	9.3	9.5	10.3
ZSTNB 3030-16-04	3	1.5	2.5	16	0.4	2.86	3.05	55	6	12.52	4.1	17.2	17.8	18.3	18.7	20.6
ZSTNB 3030-20-04	3	1.5	2.5	20	0.4	2.86	3.1	60	6	12.52	3.4	21.2	22	22.6	23.3	25.7
ZSTNB 3030-30-04	3	1.5	2.5	30	0.4	2.86	3.24	70	6	12.52	2.5	31.6	32.8	33.7	34.9	-
ZSTNB 3030-30-09	3	1.5	2.5	30	0.9	2.86	3.72	70	6	6.95	2.6	x	31.8	33	33.8	-
ZSTNB 3030-40-04	3	1.5	2.5	40	0.4	2.86	3.38	80	6	12.52	2	41.7	43.2	44.3	-	-
ZSTNB 3030-40-09	3	1.5	2.5	40	0.9	2.86	4.04	80	6	6.95	2	x	41.9	43.3	-	-
ZSTNB 3030-50-09	3	1.5	2.5	50	0.9	2.86	4.35	90	6	6.95	1.7	x	52	53.6	-	-
ZSTNB 3030-60-09	3	1.5	2.5	60	0.9	2.86	4.67	100	6	6.95	1.4	x	62.1	-	-	-
ZSTNB 3030-70-09	3	1.5	2.5	70	0.9	2.86	4.98	110	6	6.95	1.2	x	72.1	-	-	-

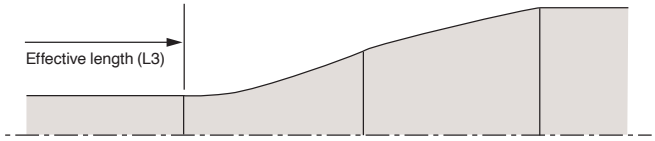
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

○ : GOOD ◎ : EXCELLENT

ZSTNB30 | 3 FLUTES TAPERED NECK BALL ENDMILL





※ The marked effective neck length is the default value to prevent interference with the workpiece.
Proper control of the processing environment is required

EDP No	SIZES (mm)											Effective length by inclination angle				
	D	R	L1	L3	θ2	D3	D4	L2	D2	App.L	θ	0.5°	1°	1.5°	2°	3°
ZSTNB 3040-20-10	4	2	8	20	1	3.86	4.28	70	8	12.01	5	20.5	21.6	22.3	22.8	23.5
ZSTNB 3040-30-10	4	2	8	30	1	3.86	4.63	80	8	12.01	3.6	22	31.6	32.5	33.2	34.1
ZSTNB 3040-40-10	4	2	8	40	1	3.86	4.98	90	8	12.01	2.7	22	42	43.4	44.3	-
ZSTNB 3040-50-10	4	2	8	50	1	3.86	5.33	100	8	12.01	2.2	22	52	53.6	54.7	-
ZSTNB 3040-60-10	4	2	8	60	1	3.86	5.68	110	8	12.01	1.9	22	62	63.8	-	-
ZSTNB 3050-30-10	5	2.5	10	30	1	4.86	5.56	80	8	14.01	2.8	25.5	31.7	32.6	33.2	-
ZSTNB 3050-40-10	5	2.5	10	40	1	4.86	5.91	90	8	14.01	2.1	25.5	41.7	42.8	43.5	-
ZSTNB 3050-60-10	5	2.5	10	60	1	4.86	6.61	110	8	12.52	1.5	25.5	62.1	-	-	-

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	○	◎	◎	○				

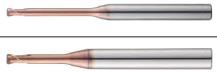
○ : GOOD ◎ : EXCELLENT

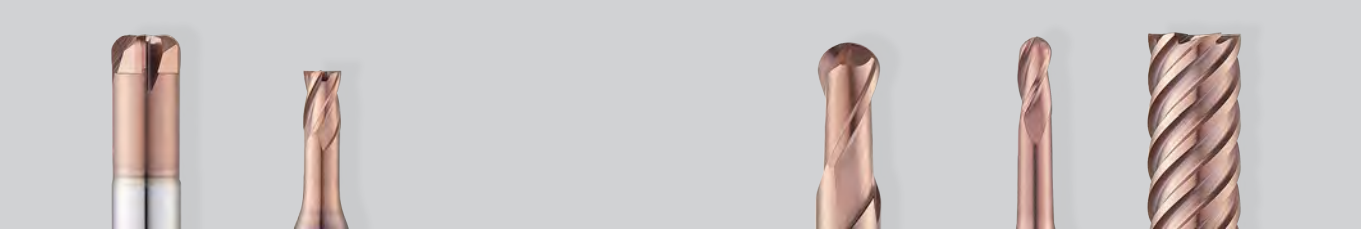
E-STAR ENDMILL

High Hardness HRc 50 ~ 63



Contents

Section		EDP No	Geometry	Type	Diameter(mm)		Page
Type	Flutes				Min	Max	
SQUARE	2F	ESE702		2 FLUTES NECK SQUARE ENDMILL	D0.1	D20.0	76
	2F	ESE712		2 FLUTES SQUARE ENDMILL	D1.0	D12.0	77
	4F	ESE704		4 FLUTES NECK SQUARE ENDMILL	D1.0	D20.0	78
	4F	ESE714		4 FLUTES HIGH HELIX SQUARE ENDMILL	D1.0	D12.0	79
	4&6F	ESE724(6)		4 & 6 FLUTES HIGH HELIX SQUARE ENDMILL	D1.0	D12.0	80
	4F	ESE744		4 FLUTES 35° HELIX SQUARE ENDMILL	D1.0	D12.0	81
	6F	ESE716		6 FLUTES HIGH HELIX SQUARE ENDMILL	D6.0	D20.0	82
	2F	ESRE712		2 FLUTES RIB SQUARE ENDMILL	D0.1	D12.0	83
	4F	ESRE714		4 FLUTES RIB SQUARE ENDMILL	D0.5	D12.0	86
	4F	ESXE704		4 FLUTES NECK SQUARE ENDMILL	D1.0	D12.0	89
	4F	ESXE714		4 FLUTES SQUARE ENDMILL	D2.0	D12.0	90
	2F	ESLNS20		2 FLUTES LONG NECK SQAURE ENDMILL	D0.1	D5.0	91
	4F	ESLNS40		4 FLUTES LONG NECK SQAURE ENDMILL	D1.0	D5.0	96
RADIUS	2F	ESR702		2 FLUTES NECK RADIUS ENDMILL	D1.0	D12.0	99
	2F	ESR732		2 FLUTES LONG SHANK RADIUS ENDMILL	D1.0	D12.0	102
	4F	ESR704		4 FLUTES NECK RADIUS ENDMILL	D1.0	D12.0	103
	4F	ESR714		4 FLUTES RADIUS ENDMILL	D3.0	D12.0	105
	4F	ESR724		4 FLUTES NECK RADIUS ENDMILL	D6.0	D12.0	106
	4F	ESR734		4 FLUTES LONG SHANK RADIUS ENDMILL	D1.0	D12.0	107
	6F	ESR706		6 FLUTES NECK RADIUS ENDMILL	D6.0	D12.0	108
	6F	ESR736		6 FLUTES RADIUS ENDMILL	D6.0	D12.0	109
	2F	ESRR712		2 FLUTES RIB RADIUS ENDMILL	D0.2	D16.0	111
	4F	ESRR714		4 FLUTES RIB RADIUS ENDMILL	D0.5	D2.0	117
	4F	ESXR704		4 FLUTES NECK RADIUS ENDMILL	D1.0	D12.0	124
	2F	ESLNR20		2 FLUTES LONG NECK RADIUS ENDMILL	D0.2	D3.0	126
	2F	ESTNR20		2 FLUTES TAPER NECK RADIUS ENDMILL	D0.2	D3.0	130
	4F	ESPM4		4 FLUTES NECK RADIUS ENDMILL	D3.0	D12.0	133
BALL	2F	ESB702		2 FLUTES NECK BALL ENDMILL	R0.5	R6.0	134
	2F	ESB712		2 FLUTES BALL ENDMILL	R0.5	R6.0	135



Contents

Section		EDP No	Geometry	Type	Diameter		Page
Type	Flutes				Min	Max	
BALL	3F	ESB703		3 FLUTES NECK BALL ENDMILL	R1.0	R6.0	136
	4F	ESB734		4 FLUTES 15° HELIX BALL ENDMILL	R1.0	R5.0	137
	2F	ESRB712		2 FLUTES RIB BALL ENDMILL	R0.05	R6.0	138
	2F	ESLNB20		2 FLUTES LONG NECK BALL ENDMILL	R0.05	R2.5	143
	2F	ESTNB20		2 FLUTES TAPER NECK BALL ENDMILL	R0.1	R5.0	147
	3F	ESTNB30		3 FLUTES TAPER NECK BALL ENDMILL	R1.0	R2.5	151

EDP No. System

*If expressed as an integer, the decimal point is omitted.

ES	R	7	0	4	100	15	32	10
Section	Appearance	Grade	Length, Shank Type	Flutes	Cutting Dia	Corner R	Effective length	Shank Dia
ES : E-STAR	B : Ball	7 : Grade	0 : Neck	2 : 2 Flutes	010 : Ø1.0	05 : R0.5	10 : 10mm	06 : Ø6.0
	E : Square		1 : Straight, Neck	3 : 3 Flutes	060 : Ø6.0	15 : R1.5	12 : 12mm	10 : Ø10.0
	R : Radius		2 : Long Shank Neck	4 : 4 Flutes	065 : Ø6.5	20 : R2.0	32 : 32mm	12 : Ø12.0
	XE : Square (Unequal)		3 : Long Shank	6 : 6 Flutes	100 : Ø10.0			
	XR : Radius (Unequal)		4 : Helix 35°					
	PM : Power Mill							
	RB : Rib Ball							
	RE : Rib Square							
	RR : Rib Radius							
	LNB : Long Neck Ball							
	TNB : Taper Neck Ball							
	LNS : Long Neck Square							
	LNR : Long Neck Radius							

Ex) 4 Flute / Cutting Dia Ø2 / Corner R 0.3 / Neck Length 6mm / Shank Dia 10 / 70Grade / Corner Radius Neck Type E-Star Endmill

E-STAR ENDMILL

High Hardness HRc 50 ~ 63



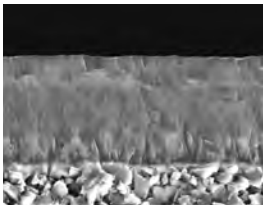
Characteristics

· Suitable for High Hardness HRc 50 ~ 63
· Excellent Coating in high temperature hardness and heat resistance
· High precision Tolerance for precision machining

Features

· HRc50~63 Carbide endmill for high hardness steel
· Appropriate for precision machining by applying high precision tolerance on Cutting Diameter and radius

Adopt a high hardness coating

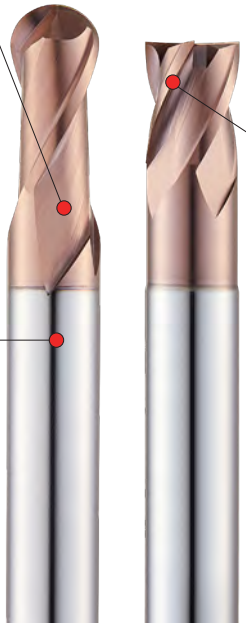


1) Improved wear resistance
2) improved heat resistance

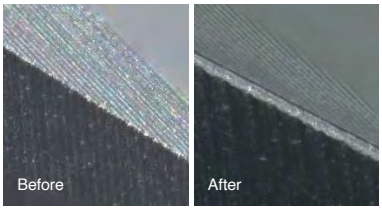
Adopt a high hardness raw-material



1) Expansion of versatility by special toughness

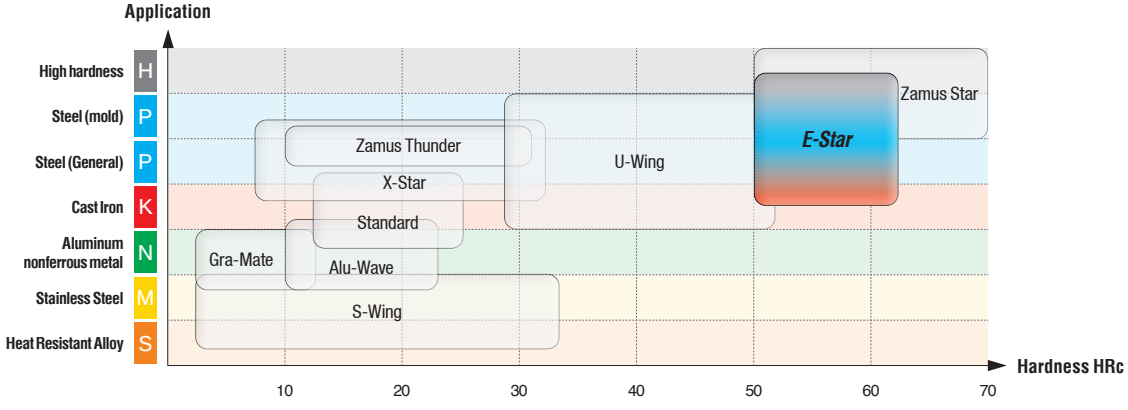


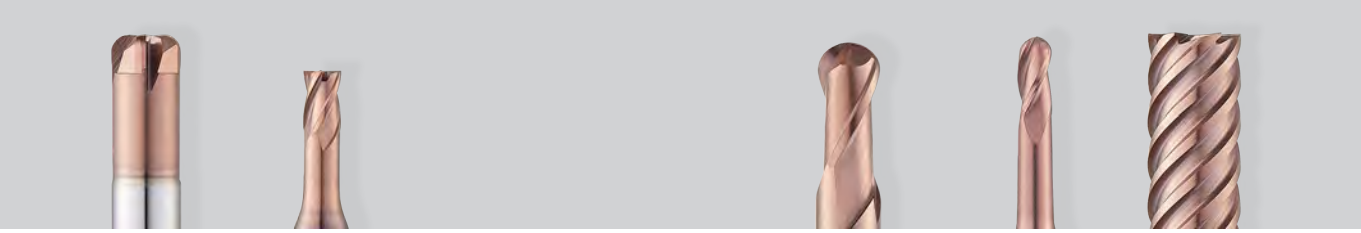
Treatment of Cutting Edge



1) Improved chipping resistance
2) Improved wear resistance, induce to stable work

Applications

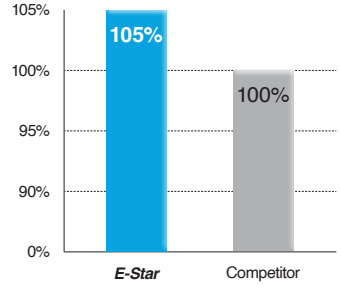




Case Study

2F D12.0 BALL ENDMILL

STD61 (HRc50~55)

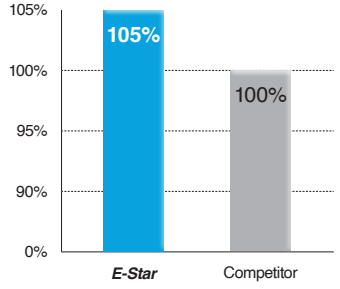


E-Star	Competitor

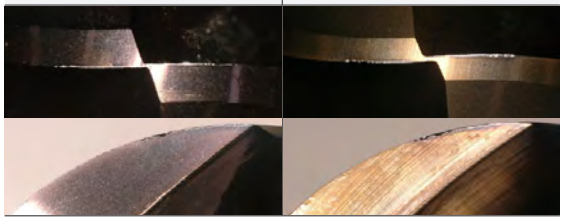


· Cutting Condition
· rpm : 3,450 / vc : 130 / vf : 828 / fz : 0.06 / ap : 12 / ae : 0.4 / o claont : AIR

STD11 (HRc60~63)



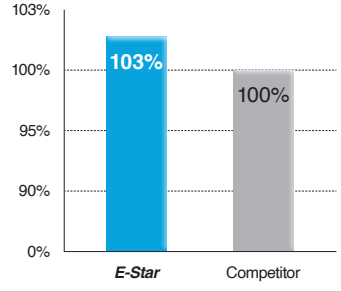
E-Star	Competitor



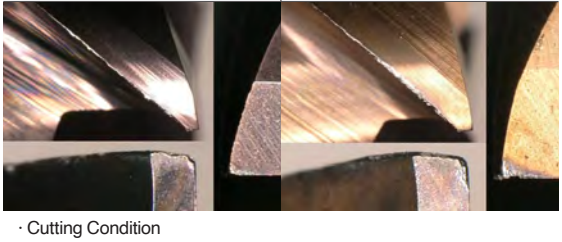
· Cutting Condition
· rpm : 3,981 / vc : 150 / vf : 955 / fz : 0.12 / ap : 0.4 / ae : 0.6 / o claont : AIR

4F D12.0 SQUARE ENDMILL

STD61 (HRc50~55)

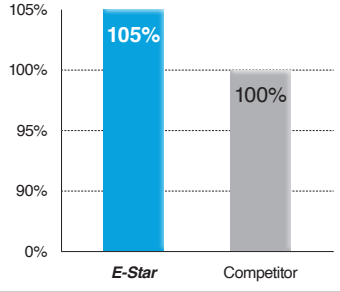


E-Star	Competitor

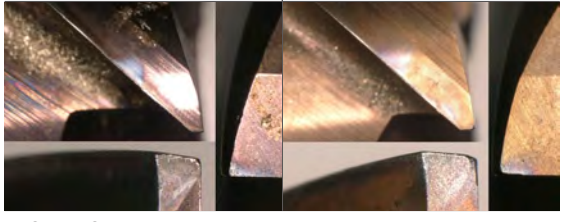


· Cutting Condition
· rpm : 3,450 / vc : 130 / vf : 828 / fz : 0.06 / ap : 12 / ae : 0.4 / o claont : AIR

STD11 (HRc60~63)



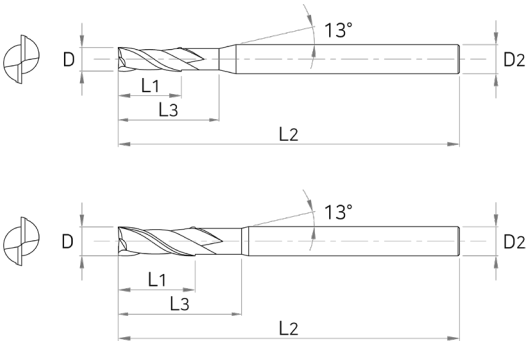
E-Star	Competitor



· Cutting Condition
· rpm : 1,858 / vc : 70 / vf : 297 / fz : 0.04 / ap : 12 / ae : 0.4 / o claont : AIR

ESE702 | 2 FLUTES NECK SQUARE ENDMILL





■ Tolerance

D		Shank Dia
~D6	0 ~ -0.012	h5
D8 ~ 20	0 ~ -0.015	

CARBIDE | AlTiN | 2 | 30° HELIX | DATA P.575

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
ESE702 001	0.1	0.2	-	40	4
ESE702 002	0.2	0.4	-	40	4
ESE702 003	0.3	0.5	-	40	4
ESE702 004	0.4	0.7	-	40	4
ESE702 005	0.5	1	-	40	4
ESE702 006	0.6	1.2	-	40	4
ESE702 007	0.7	1.4	-	40	4
ESE702 008	0.8	1.6	-	40	4
ESE702 009	0.9	2	-	40	4
ESE702 010	1	1.5	-	40	6
ESE702 010S4	1	1.5	-	40	4
ESE702 015	1.5	2.2	-	40	6
ESE702 020	2	3	6	40	6

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
ESE702 020S4	2	3	6	40	4
ESE702 025	2.5	4	6	40	6
ESE702 030	3	4	7	45	6
ESE702 035	3.5	6	9	45	6
ESE702 040	4	6	9	45	6
ESE702 045	4.5	6	10	45	6
ESE702 050	5	6	11	50	6
ESE702 060	6	7	14	50	6
ESE702 080	8	9	18	60	8
ESE702 100	10	12	25	75	10
ESE702 120	12	15	30	75	12
ESE702 160	16	18	38	90	16
ESE702 200	20	24	45	100	20

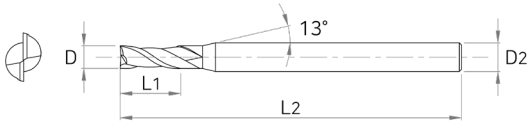
■ Applicable Working Material

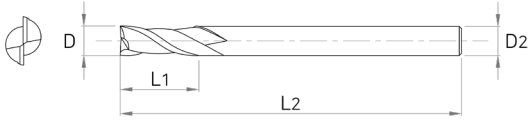
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESE712 | 2 FLUTES SQUARE ENDMILL







■ Tolerance

D		Shank Dia
~D6	0~-0.012	h5
D8~12	0~-0.015	

CARBIDE | AlTiN | 2 | 35° HELIX | DATA P.577

EDP No	SIZES (mm)			
	D	L1	L2	D2
ESE712 010	1	3	40	6
ESE712 010-02	1	2	40	6
ESE712 010-02S4	1	2	40	4
ESE712 010-04	1	4	40	6
ESE712 012	1.2	3	40	6
ESE712 015	1.5	4	40	6
ESE712 015S4	1.5	4	40	4
ESE712 015-06	1.5	6	40	6
ESE712 015-08	1.5	8	40	6
ESE712 020	2	5	40	6
ESE712 020S4	2	5	40	4
ESE712 020-08	2	8	40	6
ESE712 020-10	2	10	50	6
ESE712 025	2.5	6	40	6
ESE712 025S4	2.5	6	40	4
ESE712 030	3	8	45	6
ESE712 030S4	3	8	45	4
ESE712 030-10	3	10	50	6

EDP No	SIZES (mm)			
	D	L1	L2	D2
ESE712 030-12	3	12	50	6
ESE712 035	3.5	10	45	6
ESE712 040	4	10	45	6
ESE712 040S4	4	10	45	4
ESE712 040-12	4	12	50	6
ESE712 040-16	4	16	60	6
ESE712 045	4.5	11	45	6
ESE712 050	5	13	50	6
ESE712 055	5.5	13	50	6
ESE712 060	6	13	50	6
ESE712 060-15	6	15	60	6
ESE712 065	6.5	16	60	8
ESE712 070	7	18	60	8
ESE712 080	8	19	60	8
ESE712 100	10	22	70	10
ESE712 100-25	10	25	70	10
ESE712 120	12	26	75	12
ESE712 120-30	12	30	75	12

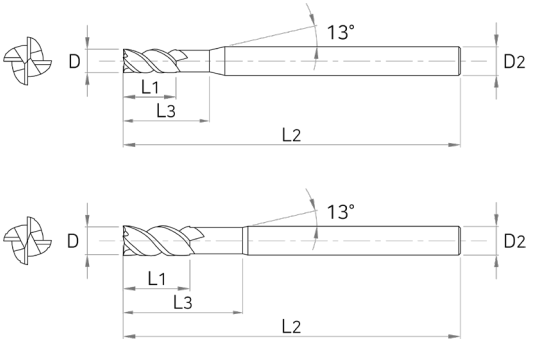
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESE704 | 4 FLUTES NECK SQUARE ENDMILL





■ Tolerance

D		Shank Dia
~D6	0 ~ -0.012	h5
D8 ~ 20	0 ~ -0.015	

CARBIDE | AlTiN | 4 | 30° HELIX | DATA P.579

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
ESE704 010	1	1.5	-	40	6
ESE704 010S4	1	1.5	-	40	4
ESE704 015	1.5	2.2	-	40	6
ESE704 015S4	1.5	2.2	-	40	4
ESE704 020	2	3	6	40	6
ESE704 020S4	2	3	6	40	4
ESE704 025	2.5	4	6	40	6
ESE704 025S4	2.5	4	6	40	4
ESE704 030	3	4	7	45	6
ESE704 030S4	3	4	7	45	4
ESE704 035	3.5	5	9	45	6
ESE704 040	4	5	9	45	6
ESE704 040S4	4	5	9	45	4
ESE704 045	4.5	6	10	45	6
ESE704 050	5	6	11	50	6
ESE704 060	6	7	14	50	6
ESE704 080	8	9	18	60	8
ESE704 100	10	12	25	75	10
ESE704 120	12	15	30	75	12
ESE704 160	16	18	38	90	16
ESE704 200	20	24	45	100	20

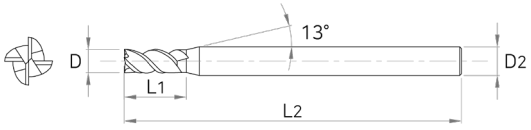
■ Applicable Working Material

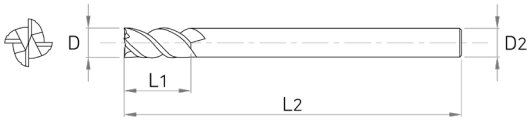
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESE714 | 4 FLUTES HIGH HELIX SQUARE ENDMILL







■ Tolerance

D		Shank Dia
~D6	0~-0.012	h5
D8~12	0~-0.015	

CARBIDE | AlTiN | 4 | 45° HELIX | DATA P.579

EDP No	SIZES (mm)			
	D	L1	L2	D2
ESE714 010	1	2.5	40	6
ESE714 010S4	1	2.5	40	4
ESE714 012	1.2	3	40	6
ESE714 015	1.5	4	40	6
ESE714 015S4	1.5	4	40	4
ESE714 020	2	5	40	6
ESE714 020S4	2	5	40	4
ESE714 025	2.5	6	40	6
ESE714 025S4	2.5	6	40	4
ESE714 030	3	8	45	6
ESE714 030S4	3	8	45	4
ESE714 035	3.5	9	45	6
ESE714 040	4	10	45	6

EDP No	SIZES (mm)			
	D	L1	L2	D2
ESE714 040S4	4	10	45	4
ESE714 050	5	13	50	6
ESE714 060	6	13	50	6
ESE714 060-15	6	15	60	6
ESE714 060-15L	6	15	90	6
ESE714 080	8	19	60	8
ESE714 080L	8	19	100	8
ESE714 100	10	22	70	10
ESE714 100-25	10	25	70	10
ESE714 100-25L	10	25	100	10
ESE714 120	12	26	75	12
ESE714 120-30	12	30	80	12
ESE714 120-30L	12	30	100	12

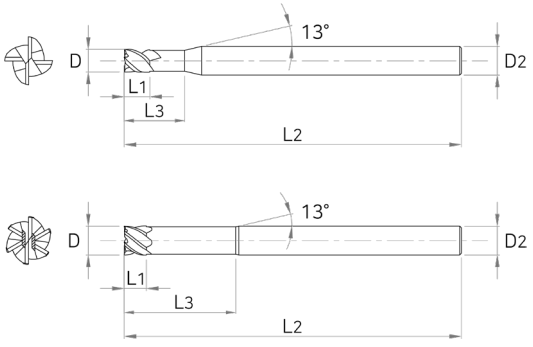
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESE724(6) | 4&6 FLUTES NECK SQUARE ENDMIL





■ Tolerance

D		Shank Dia
~D6	0 ~ -0.012	h5
D8 ~ 12	0 ~ -0.015	

CARBIDE | AlTiN | 4 | 6 | 45° HELIX | 60° HELIX | DATA P.579,580

EDP No	SIZES (mm)					
	D	L1	L3	L2	D2	Z
ESE724 010	1	1.5	5	45	6	4
ESE724 015	1.5	2.2	6	45	6	4
ESE724 020	2	3	8	45	6	4
ESE724 030	3	4	9	50	6	4
ESE724 040	4	5	12	50	6	4
ESE724 040S4L	4	5	12	75	4	4
ESE724 050	5	6	15	50	6	4
ESE726 060	6	7	20	60	6	6
ESE726 080	8	9	25	70	8	6
ESE726 100	10	12	32	75	10	6
ESE726 120	12	15	38	80	12	6

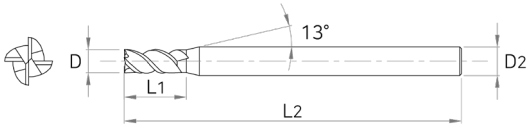
■ Applicable Working Material

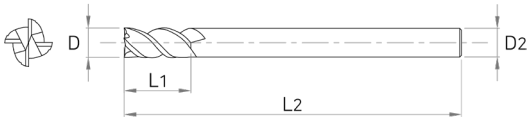
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESE744 | 4 FLUTES HIGH HELIX SQUARE ENDMILL







■ Tolerance

D		Shank Dia
~D6	0~-0.012	h5
D8~12	0~-0.015	

CARBIDE | AlTiN | 4 | 35° HELIX | DATA P.579

EDP No	SIZES (mm)			
	D	L1	L2	D2
ESE744 010S3	1	2.5	40	3
ESE744 010S4	1	2.5	40	4
ESE744 010	1	2.5	40	6
ESE744 012S3	1.2	3	40	3
ESE744 012S4	1.2	3	40	4
ESE744 015S3	1.5	4	40	3
ESE744 015S4	1.5	4	40	4
ESE744 015	1.5	4	40	6
ESE744 020S3	2	6	40	3
ESE744 020S4	2	6	40	4
ESE744 020	2	6	40	6
ESE744 025S3	2.5	8	45	3
ESE744 025S4	2.5	8	45	4
ESE744 025	2.5	8	45	6

EDP No	SIZES (mm)			
	D	L1	L2	D2
ESE744 030S3	3	8	50	3
ESE744 030S4	3	8	45	4
ESE744 030	3	8	45	6
ESE744 035	3.5	10	45	6
ESE744 040S4	4	11	45	4
ESE744 040	4	11	45	6
ESE744 045	4.5	11	45	6
ESE744 050	5	13	50	6
ESE744 055	5.5	13	50	6
ESE744 060	6	13	50	6
ESE744 080	8	19	60	8
ESE744 100	10	22	70	10
ESE744 120	12	26	75	12

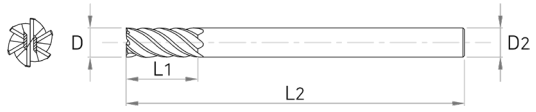
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESE716 | 6 FLUTES HIGH HELIX SQUARE ENDMILL





■ Tolerance

D		Shank Dia
~D6	0 ~ -0.012	h5
D8 ~ 20	0 ~ -0.015	

CARBIDE | AlTiN | 6 | 50° HELIX | DATA P.580

EDP No	SIZES (mm)			
	D	L1	L2	D2
ESE716 060	6	13	50	6
ESE716 080	8	18	60	8
ESE716 100	10	22	70	10
ESE716 120	12	26	75	12
ESE716 160	16	35	90	16
ESE716 200	20	44	100	20

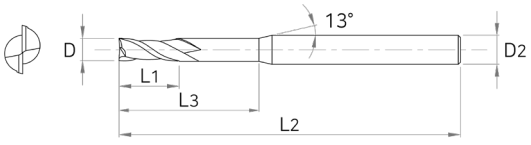
■ Applicable Working Material

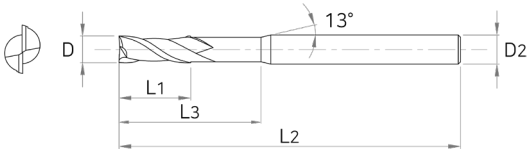
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESRE712 | 2 FLUTES RIB SQUARE ENDMILL







■ Tolerance

D		Shank Dia
~D6	0~-0.012	h5
D8~12	0~-0.015	

CARBIDE | AlTiN | 2 | 30° HELIX | DATA P.581

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
ESRE712 001003	0.1	0.15	0.3	40	4
ESRE712 001005	0.1	0.15	0.5	40	4
ESRE712 00101	0.1	0.15	1	40	4
ESRE712 002005	0.2	0.3	0.5	40	4
ESRE712 002015	0.2	0.3	1.5	40	4
ESRE712 00201	0.2	0.3	1	40	4
ESRE712 00202	0.2	0.3	2	40	4
ESRE712 003015	0.3	0.5	1.5	40	4
ESRE712 00301	0.3	0.5	1	40	4
ESRE712 003025	0.3	0.5	2.5	40	4
ESRE712 00302	0.3	0.5	2	40	4
ESRE712 00303	0.3	0.5	3	40	4
ESRE712 00304	0.3	0.5	4	40	4
ESRE712 00305	0.3	0.5	5	40	4
ESRE712 004015	0.4	0.6	1.5	40	4
ESRE712 00401	0.4	0.6	1	40	4
ESRE712 004025	0.4	0.6	2.5	40	4
ESRE712 00402	0.4	0.6	2	40	4
ESRE712 00403	0.4	0.6	3	40	4
ESRE712 00404	0.4	0.6	4	40	4
ESRE712 00405	0.4	0.6	5	40	4
ESRE712 00406	0.4	0.6	6	40	4
ESRE712 00408	0.4	0.6	8	40	4
ESRE712 00410	0.4	0.6	10	40	4

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
ESRE712 005015	0.5	0.7	1.5	45	4
ESRE712 00501	0.5	0.7	1	45	4
ESRE712 005025	0.5	0.7	2.5	45	4
ESRE712 00502	0.5	0.7	2	45	4
ESRE712 00503	0.5	0.7	3	45	4
ESRE712 00504	0.5	0.7	4	45	4
ESRE712 00505	0.5	0.7	5	45	4
ESRE712 00506	0.5	0.7	6	45	4
ESRE712 00508	0.5	0.7	8	45	4
ESRE712 00510	0.5	0.7	10	45	4
ESRE712 00512	0.5	0.7	12	45	4
ESRE712 00514	0.5	0.7	14	45	4
ESRE712 00516	0.5	0.7	16	45	4
ESRE712 00602	0.6	0.9	2	45	4
ESRE712 00603	0.6	0.9	3	45	4
ESRE712 00604	0.6	0.9	4	45	4
ESRE712 00605	0.6	0.9	5	45	4
ESRE712 00606	0.6	0.9	6	45	4
ESRE712 00608	0.6	0.9	8	45	4
ESRE712 00610	0.6	0.9	10	45	4
ESRE712 00612	0.6	0.9	12	45	4
ESRE712 00614	0.6	0.9	14	45	4
ESRE712 00616	0.6	0.9	16	45	4
ESRE712 00702	0.7	1.2	2	45	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESRE712 | 2 FLUTES RIB SQUARE ENDMILL

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
ESRE712 00704	0.7	1.2	4	45	4
ESRE712 00706	0.7	1.2	6	45	4
ESRE712 00708	0.7	1.2	8	45	4
ESRE712 00710	0.7	1.2	10	45	4
ESRE712 00712	0.7	1.2	12	45	4
ESRE712 00802	0.8	1.2	2	45	4
ESRE712 00803	0.8	1.2	3	45	4
ESRE712 00804	0.8	1.2	4	45	4
ESRE712 00805	0.8	1.2	5	45	4
ESRE712 00806	0.8	1.2	6	45	4
ESRE712 00808	0.8	1.2	8	45	4
ESRE712 00810	0.8	1.2	10	45	4
ESRE712 00812	0.8	1.2	12	45	4
ESRE712 00814	0.8	1.2	14	45	4
ESRE712 00816	0.8	1.2	16	45	4
ESRE712 00820	0.8	1.2	20	50	4
ESRE712 00906	0.9	1.3	6	45	4
ESRE712 00908	0.9	1.3	8	45	4
ESRE712 00910	0.9	1.3	10	45	4
ESRE712 01002	1	1.5	2	50	4
ESRE712 01003	1	1.5	3	50	4
ESRE712 01004	1	1.5	4	50	4
ESRE712 01005	1	1.5	5	50	4
ESRE712 01006	1	1.5	6	50	4
ESRE712 01007	1	1.5	7	50	4
ESRE712 01008	1	1.5	8	50	4
ESRE712 01010	1	1.5	10	50	4
ESRE712 01012	1	1.5	12	50	4
ESRE712 01014	1	1.5	14	50	4
ESRE712 01016	1	1.5	16	50	4
ESRE712 01018	1	1.5	18	50	4
ESRE712 01020	1	1.5	20	50	4
ESRE712 01022	1	1.5	22	60	4
ESRE712 01026	1	1.5	26	60	4
ESRE712 01030	1	1.5	30	70	4
ESRE712 01040	1	1.5	40	80	4
ESRE712 01050	1	1.5	50	100	4
ESRE712 01204	1.2	1.8	4	50	4
ESRE712 01206	1.2	1.8	6	50	4
ESRE712 01208	1.2	1.8	8	50	4
ESRE712 01210	1.2	1.8	10	50	4

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
ESRE712 01212	1.2	1.8	12	50	4
ESRE712 01214	1.2	1.8	14	50	4
ESRE712 01216	1.2	1.8	16	50	4
ESRE712 01220	1.2	1.8	20	50	4
ESRE712 01226	1.2	1.8	26	60	4
ESRE712 01230	1.2	1.8	30	70	4
ESRE712 01406	1.4	2.1	6	50	4
ESRE712 01408	1.4	2.1	8	50	4
ESRE712 01410	1.4	2.1	10	50	4
ESRE712 01414	1.4	2.1	14	50	4
ESRE712 01416	1.4	2.1	16	50	4
ESRE712 01420	1.4	2.1	20	50	4
ESRE712 01504	1.5	2.3	4	50	4
ESRE712 01505	1.5	2.3	5	50	4
ESRE712 01506	1.5	2.3	6	50	4
ESRE712 01507	1.5	2.3	7	50	4
ESRE712 01508	1.5	2.3	8	50	4
ESRE712 01510	1.5	2.3	10	50	4
ESRE712 01512	1.5	2.3	12	50	4
ESRE712 01514	1.5	2.3	14	50	4
ESRE712 01516	1.5	2.3	16	50	4
ESRE712 01518	1.5	2.3	18	50	4
ESRE712 01520	1.5	2.3	20	50	4
ESRE712 01522	1.5	2.3	22	60	4
ESRE712 01526	1.5	2.3	26	60	4
ESRE712 01530	1.5	2.3	30	70	4
ESRE712 01608	1.6	2.3	8	50	4
ESRE712 01610	1.6	2.3	10	50	4
ESRE712 01612	1.6	2.3	12	50	4
ESRE712 01616	1.6	2.3	16	50	4
ESRE712 01620	1.6	2.3	20	50	4
ESRE712 01808	1.8	2.7	8	50	4
ESRE712 01810	1.8	2.7	10	50	4
ESRE712 01812	1.8	2.7	12	50	4
ESRE712 01816	1.8	2.7	16	50	4
ESRE712 01820	1.8	2.7	20	50	4
ESRE712 02006	2	3	6	50	4
ESRE712 02008	2	3	8	50	4
ESRE712 02010	2	3	10	50	4
ESRE712 02012	2	3	12	50	4
ESRE712 02014	2	3	14	50	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESRE712 | 2 FLUTES RIB SQUARE ENDMILL

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
ESRE712 02016	2	3	16	50	4
ESRE712 02018	2	3	18	50	4
ESRE712 02020	2	3	20	50	4
ESRE712 02022	2	3	22	60	4
ESRE712 02026	2	3	26	60	4
ESRE712 02030	2	3	30	70	4
ESRE712 02035	2	3	35	70	4
ESRE712 02040	2	3	40	80	4
ESRE712 02045	2	3	45	90	4
ESRE712 02050	2	3	50	100	4
ESRE712 02060	2	3	60	110	4
ESRE712 02508	2.5	4	8	50	4
ESRE712 02510	2.5	4	10	50	4
ESRE712 02512	2.5	4	12	50	4
ESRE712 02514	2.5	4	14	50	4
ESRE712 02516	2.5	4	16	50	4
ESRE712 02518	2.5	4	18	50	4
ESRE712 02520	2.5	4	20	50	4
ESRE712 02522	2.5	4	22	60	4
ESRE712 02526	2.5	4	26	60	4
ESRE712 02530	2.5	4	30	70	4
ESRE712 02535	2.5	4	35	70	4
ESRE712 02540	2.5	4	40	80	4
ESRE712 02545	2.5	4	45	90	4
ESRE712 02550	2.5	4	50	100	4
ESRE712 03006	3	4.5	6	50	6
ESRE712 03008	3	4.5	8	50	6
ESRE712 03010	3	4.5	10	50	6
ESRE712 03012	3	4.5	12	50	6
ESRE712 03014	3	4.5	14	60	6
ESRE712 03016	3	4.5	16	60	6
ESRE712 03018	3	4.5	18	60	6
ESRE712 03020	3	4.5	20	60	6
ESRE712 03022	3	4.5	22	65	6
ESRE712 03026	3	4.5	26	65	6
ESRE712 03030	3	4.5	30	70	6
ESRE712 03035	3	4.5	35	70	6
ESRE712 03040	3	4.5	40	80	6
ESRE712 03045	3	4.5	45	90	6

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
ESRE712 03050	3	4.5	50	100	6
ESRE712 03060	3	4.5	60	100	6
ESRE712 04008	4	6	8	50	6
ESRE712 04010	4	6	10	50	6
ESRE712 04012	4	6	12	50	6
ESRE712 04014	4	6	14	60	6
ESRE712 04016	4	6	16	60	6
ESRE712 04018	4	6	18	60	6
ESRE712 04020	4	6	20	60	6
ESRE712 04022	4	6	22	65	6
ESRE712 04026	4	6	26	65	6
ESRE712 04030	4	6	30	70	6
ESRE712 04035	4	6	35	70	6
ESRE712 04040	4	6	40	80	6
ESRE712 04045	4	6	45	90	6
ESRE712 04050	4	6	50	100	6
ESRE712 04060	4	6	60	100	6
ESRE712 05016	5	8	16	60	6
ESRE712 05020	5	8	20	60	6
ESRE712 05026	5	8	26	65	6
ESRE712 05030	5	8	30	70	6
ESRE712 05035	5	8	35	75	6
ESRE712 05040	5	8	40	80	6
ESRE712 05050	5	8	50	90	6
ESRE712 05060	5	8	60	100	6
ESRE712 06015	6	9	15	60	6
ESRE712 06020	6	9	20	60	6
ESRE712 06030	6	9	30	70	6
ESRE712 06032	6	9	32	90	6
ESRE712 08025	8	12	25	70	8
ESRE712 08030	8	12	30	80	8
ESRE712 08042	8	12	42	100	8
ESRE712 10030	10	15	30	75	10
ESRE712 10035	10	15	35	80	10
ESRE712 10045	10	15	45	100	10
ESRE712 12035	12	20	35	80	12
ESRE712 12040	12	20	40	90	12
ESRE712 12050	12	20	50	110	12

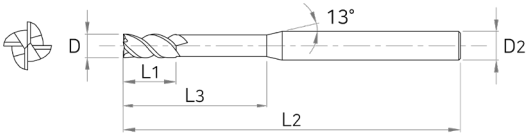
■ Applicable Working Material

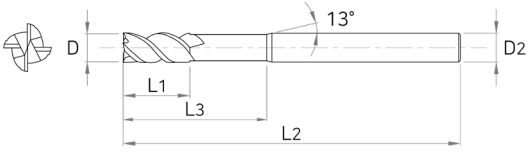
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESRE714 | 4 FLUTES RIB SQUARE ENDMILL







■ Tolerance

D		Shank Dia
~D6	0 ~ -0.012	h5
D8 ~ 12	0 ~ -0.015	

CARBIDE | AlTiN | 4 | 30° HELIX | DATA P.586

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
ESRE714 00501	0.5	0.5	1	40	4
ESRE714 00502	0.5	0.5	2	40	4
ESRE714 00503	0.5	0.5	3	45	4
ESRE714 00504	0.5	0.5	4	45	4
ESRE714 00505	0.5	0.5	5	45	4
ESRE714 00506	0.5	0.5	6	45	4
ESRE714 00508	0.5	0.5	8	45	4
ESRE714 00510	0.5	0.5	10	50	4
ESRE714 00601	0.6	0.6	1	45	4
ESRE714 00602	0.6	0.6	2	45	4
ESRE714 00603	0.6	0.6	3	45	4
ESRE714 00604	0.6	0.6	4	45	4
ESRE714 00605	0.6	0.6	5	45	4
ESRE714 00606	0.6	0.6	6	45	4
ESRE714 00608	0.6	0.6	8	45	4
ESRE714 00610	0.6	0.6	10	50	4
ESRE714 00612	0.6	0.6	12	50	4
ESRE714 00702	0.7	0.7	2	45	4
ESRE714 00704	0.7	0.7	4	45	4
ESRE714 00706	0.7	0.7	6	45	4
ESRE714 00708	0.7	0.7	8	45	4
ESRE714 00710	0.7	0.7	10	50	4
ESRE714 00801	0.8	0.8	1	40	4
ESRE714 00802	0.8	0.8	2	40	4

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
ESRE714 00803	0.8	0.8	3	40	4
ESRE714 00804	0.8	0.8	4	40	4
ESRE714 00805	0.8	0.8	5	40	4
ESRE714 00806	0.8	0.8	6	40	4
ESRE714 00808	0.8	0.8	8	40	4
ESRE714 00810	0.8	0.8	10	50	4
ESRE714 00812	0.8	0.8	12	50	4
ESRE714 00816	0.8	0.8	16	50	4
ESRE714 01002	1	1	2	45	4
ESRE714 01003	1	1	3	45	4
ESRE714 01004	1	1	4	45	4
ESRE714 01006	1	1	6	45	4
ESRE714 01008	1	1	8	45	4
ESRE714 01010	1	1	10	50	4
ESRE714 01012	1	1	12	50	4
ESRE714 01014	1	1	14	50	4
ESRE714 01016	1	1	16	50	4
ESRE714 01018	1	1	18	60	4
ESRE714 01020	1	1	20	60	4
ESRE714 01204	1.2	1.2	4	45	4
ESRE714 01206	1.2	1.2	6	45	4
ESRE714 01208	1.2	1.2	8	45	4
ESRE714 01210	1.2	1.2	10	50	4
ESRE714 01212	1.2	1.2	12	50	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESRE714 | 4 FLUTES RIB SQUARE ENDMILL

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
ESRE714 01216	1.2	1.2	16	50	4
ESRE714 01218	1.2	1.2	18	60	4
ESRE714 01220	1.2	1.2	20	60	4
ESRE714 01406	1.4	1.4	6	45	4
ESRE714 01408	1.4	1.4	8	45	4
ESRE714 01410	1.4	1.4	10	50	4
ESRE714 01412	1.4	1.4	12	50	4
ESRE714 01414	1.4	1.4	14	50	4
ESRE714 01416	1.4	1.4	16	50	4
ESRE714 01504	1.5	1.5	4	45	4
ESRE714 01506	1.5	1.5	6	45	4
ESRE714 01508	1.5	1.5	8	45	4
ESRE714 01510	1.5	1.5	10	50	4
ESRE714 01512	1.5	1.5	12	50	4
ESRE714 01516	1.5	1.5	16	50	4
ESRE714 01518	1.5	1.5	18	60	4
ESRE714 01520	1.5	1.5	20	60	4
ESRE714 01525	1.5	1.5	25	60	4
ESRE714 01530	1.5	1.5	30	70	4
ESRE714 01606	1.6	1.6	6	45	4
ESRE714 01608	1.6	1.6	8	45	4
ESRE714 01610	1.6	1.6	10	50	4
ESRE714 01612	1.6	1.6	12	50	4
ESRE714 01614	1.6	1.6	14	50	4
ESRE714 01616	1.6	1.6	16	50	4
ESRE714 01618	1.6	1.6	18	60	4
ESRE714 01620	1.6	1.6	20	60	4
ESRE714 01625	1.6	1.6	25	70	4
ESRE714 01806	1.8	1.8	6	45	4
ESRE714 01808	1.8	1.8	8	45	4
ESRE714 01810	1.8	1.8	10	50	4
ESRE714 01812	1.8	1.8	12	50	4
ESRE714 01816	1.8	1.8	16	50	4
ESRE714 01820	1.8	1.8	20	60	4
ESRE714 01825	1.8	1.8	25	70	4
ESRE714 02004	2	2	4	45	4
ESRE714 02006	2	2	6	45	4
ESRE714 02008	2	2	8	45	4
ESRE714 02010	2	2	10	50	4
ESRE714 02012	2	2	12	50	4
ESRE714 02014	2	2	14	50	4

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
ESRE714 02016	2	2	16	50	4
ESRE714 02018	2	2	18	50	4
ESRE714 02020	2	2	20	50	4
ESRE714 02022	2	2	22	60	4
ESRE714 02025	2	2	25	60	4
ESRE714 02030	2	2	30	70	4
ESRE714 02510	2.5	2.5	10	50	4
ESRE714 02512	2.5	2.5	12	50	4
ESRE714 02516	2.5	2.5	16	50	4
ESRE714 02520	2.5	2.5	20	50	4
ESRE714 02525	2.5	2.5	25	60	4
ESRE714 02530	2.5	2.5	30	70	4
ESRE714 03006	3	3	6	45	6
ESRE714 03008	3	3	8	45	6
ESRE714 03010	3	3	10	50	6
ESRE714 03012	3	3	12	50	6
ESRE714 03016	3	3	16	55	6
ESRE714 03020	3	3	20	60	6
ESRE714 03025	3	3	25	65	6
ESRE714 03030	3	3	30	70	6
ESRE714 03035	3	3	35	75	6
ESRE714 03040	3	3	40	80	6
ESRE714 03045	3	3	45	90	6
ESRE714 03050	3	3	50	100	6
ESRE714 03060	3	3	60	110	6
ESRE714 03512	3.5	3.5	12	50	6
ESRE714 03516	3.5	3.5	16	55	6
ESRE714 03520	3.5	3.5	20	60	6
ESRE714 03525	3.5	3.5	25	65	6
ESRE714 03530	3.5	3.5	30	70	6
ESRE714 03535	3.5	3.5	35	75	6
ESRE714 03540	3.5	3.5	40	80	6
ESRE714 04006	4	4	6	50	6
ESRE714 04008	4	4	8	50	6
ESRE714 04010	4	4	10	50	6
ESRE714 04012	4	4	12	50	6
ESRE714 04016	4	4	16	55	6
ESRE714 04020	4	4	20	60	6
ESRE714 04025	4	4	25	65	6
ESRE714 04030	4	4	30	70	6
ESRE714 04040	4	4	40	80	6

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESRE714 | 4 FLUTES RIB SQUARE ENDMILL

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
ESRE714 04045	4	4	45	90	6
ESRE714 04050	4	4	50	100	6
ESRE714 04060	4	4	60	110	6
ESRE714 04512	4.5	4.5	12	50	6
ESRE714 04516	4.5	4.5	16	55	6
ESRE714 04520	4.5	4.5	20	60	6
ESRE714 04525	4.5	4.5	25	65	6
ESRE714 04530	4.5	4.5	30	70	6
ESRE714 04540	4.5	4.5	40	80	6
ESRE714 05016	5	5	16	60	6
ESRE714 05020	5	5	20	60	6
ESRE714 05025	5	5	25	65	6
ESRE714 05030	5	5	30	70	6
ESRE714 05040	5	5	40	80	6
ESRE714 05050	5	5	50	100	6

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
ESRE714 05060	5	5	60	110	6
ESRE714 06020	6	6	20	60	6
ESRE714 06030	6	6	30	75	6
ESRE714 06040	6	6	40	80	6
ESRE714 06050	6	6	50	90	6
ESRE714 06060	6	6	60	100	6
ESRE714 08025	8	12	25	65	8
ESRE714 08040	8	12	40	100	8
ESRE714 08050	8	12	50	110	8
ESRE714 10030	10	15	30	70	10
ESRE714 10050	10	15	50	100	10
ESRE714 10060	10	15	60	120	10
ESRE714 12040	12	18	40	80	12
ESRE714 12060	12	18	60	110	12
ESRE714 12070	12	18	70	130	12

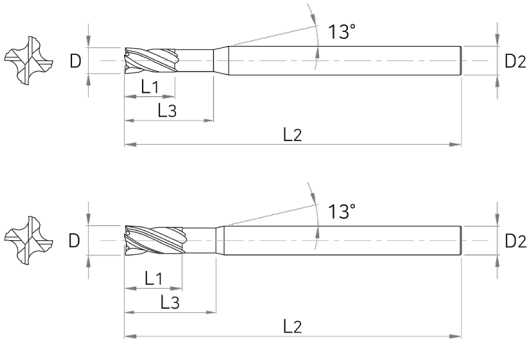
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESXE704 | 4 FLUTES NECK SQUARE ENDMILL





■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.02	h5

CARBIDE | AlTiN | 4 | M HELIX | DATA P.590

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
ESXE704 010	1	1.5	4	45	4
ESXE704 020	2	3	6	45	4
ESXE704 030	3	4	7	45	6
ESXE704 040	4	5	9	45	6
ESXE704 060	6	7	14	50	6
ESXE704 080	8	9	18	60	8
ESXE704 100	10	12	25	75	10
ESXE704 120	12	15	30	75	12

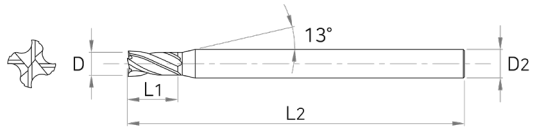
■ Applicable Working Material

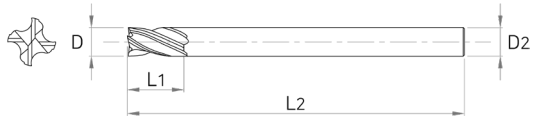
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESXE714 | 4 FLUTES SQUARE ENDMILL







■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.02	h5

CARBIDE | AlTiN | 4 | M HELIX | DATA P.590

EDP No	SIZES (mm)			
	D	L1	L2	D2
ESXE714 020	2	5	45	4
ESXE714 030	3	8	45	6
ESXE714 040	4	10	45	6
ESXE714 040S4	4	10	45	4
ESXE714 060	6	16	50	6
ESXE714 080	8	20	60	8
ESXE714 100	10	25	75	10
ESXE714 120	12	35	85	12

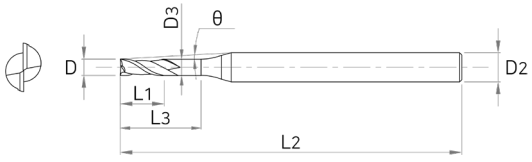
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESLNS20 | 2 FLUTES LONG NECK SQUARE ENDMILL





■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.012	h5

CARBIDE | AlTiN | 2 | 30° HELIX | DATA P.590

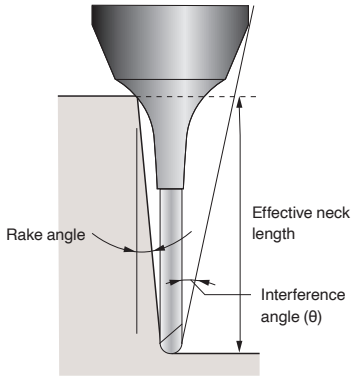
EDP No	SIZES (mm)							Effective length by inclination angle				
	D	L1	L3	D3	L2	D2	θ	0.5°	1°	1.5°	2°	3°
ESLNS20 01-0.3	0.1	0.15	0.3	0.08	45	4	11.6	0.4	0.4	0.5	0.5	0.5
ESLNS20 01-0.5	0.1	0.15	0.5	0.08	45	4	11.4	0.6	0.7	0.7	0.7	0.8
ESLNS20 01-1	0.1	0.15	1	0.08	45	4	10.9	1.2	1.2	1.2	1.3	1.4
ESLNS20 02-0.5	0.2	0.3	0.5	0.17	50	4	11.3	1.2	1.3	1.5	1.7	2
ESLNS20 02-1	0.2	0.3	1	0.17	50	4	10.8	1.7	1.9	2.2	2.4	2.7
ESLNS20 02-1.5	0.2	0.3	1.5	0.17	50	4	10.3	2.3	2.5	2.8	3	3.4
ESLNS20 03-1	0.3	0.45	1	0.27	50	4	10.8	1.7	1.9	2.2	2.4	2.7
ESLNS20 03-1.5	0.3	0.45	1.5	0.27	50	4	10.3	2.3	2.5	2.8	3	3.4
ESLNS20 03-2	0.3	0.45	2	0.27	50	4	9.8	2.8	3.1	3.4	3.6	4.1
ESLNS20 03-2.5	0.3	0.45	2.5	0.27	50	4	9.4	3.4	3.7	4	4.3	4.7
ESLNS20 03-3	0.3	0.45	3	0.27	50	4	9	3.9	4.3	4.6	4.9	5.4
ESLNS20 04-1	0.4	0.6	1	0.37	50	4	10.7	1.7	1.9	2.2	2.4	2.7
ESLNS20 04-1.5	0.4	0.6	1.5	0.37	50	4	10.2	2.3	2.5	2.8	3	3.4
ESLNS20 04-2	0.4	0.6	2	0.37	50	4	9.7	2.8	3.1	3.4	3.6	4.1
ESLNS20 04-2.5	0.4	0.6	2.5	0.37	50	4	9.3	3.4	3.7	4	4.3	4.7
ESLNS20 04-3	0.4	0.6	3	0.37	50	4	8.9	3.9	4.3	4.6	4.9	5.4
ESLNS20 04-3.5	0.4	0.6	3.5	0.37	50	4	8.6	4.5	4.9	5.2	5.5	6
ESLNS20 04-4	0.4	0.6	4	0.37	50	4	8.2	5	5.4	5.8	6.1	6.6
ESLNS20 04-5	0.4	0.6	5	0.37	50	4	7.6	6.1	6.6	6.9	7.3	7.8
ESLNS20 04-6	0.4	0.6	6	0.37	50	4	7.1	7.2	7.7	8.1	8.4	9
ESLNS20 05-1	0.5	0.75	1	0.47	50	4	10.7	1.7	1.9	2.2	2.4	2.7
ESLNS20 05-1.5	0.5	0.75	1.5	0.47	50	4	10.2	2.3	2.5	2.8	3	3.4
ESLNS20 05-2	0.5	0.75	2	0.47	50	4	9.7	2.8	3.1	3.4	3.6	4.1
ESLNS20 05-2.5	0.5	0.75	2.5	0.47	50	4	9.3	3.4	3.7	4	4.3	4.7

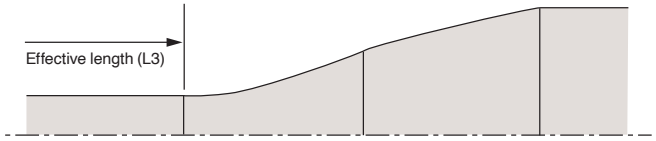
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESLNS20 | 2 FLUTES LONG NECK SQUARE ENDMILL





※ The marked effective neck length is the default value to prevent interference with the workpiece.
Proper control of the processing environment is required

EDP No	SIZES (mm)							Effective length by inclination angle				
	D	L1	L3	D3	L2	D2	θ	0.5°	1°	1.5°	2°	3°
ESLNS2005-3	0.5	0.75	3	0.47	50	4	8.9	3.9	4.3	4.6	4.9	5.4
ESLNS2005-4	0.5	0.75	4	0.47	50	4	8.1	5	5.4	5.8	6.1	6.6
ESLNS2005-5	0.5	0.75	5	0.47	50	4	7.5	6.1	6.6	6.9	7.3	7.8
ESLNS2005-6	0.5	0.75	6	0.47	50	4	7	7.2	7.7	8.1	8.4	9
ESLNS2005-8	0.5	0.75	8	0.47	50	4	6.2	9.3	9.9	10.3	10.7	11.4
ESLNS2006-2	0.6	0.9	2	0.57	50	4	9.6	2.8	3.1	3.4	3.6	4.1
ESLNS2006-4	0.6	0.9	4	0.57	50	4	6.9	7.2	7.7	8.1	8.4	9
ESLNS2006-6	0.6	0.9	6	0.57	50	4	6.1	9.3	9.9	10.3	10.7	11.4
ESLNS2006-8	0.6	0.9	8	0.57	50	4	5.4	11.5	12.1	12.6	13	13.7
ESLNS2006-10	0.6	0.9	10	0.57	50	4	9.6	2.8	3.1	3.4	3.6	4.1
ESLNS2007-2	0.7	1.05	2	0.67	50	4	8	5	5.4	5.8	6.1	6.6
ESLNS2007-4	0.7	1.05	4	0.67	50	4	6.9	7.2	7.7	8.1	8.4	9
ESLNS2007-6	0.7	1.05	6	0.67	50	4	6	9.3	9.9	10.3	10.7	11.4
ESLNS2007-8	0.7	1.05	8	0.67	50	4	5.3	11.5	12.1	12.6	13	13.7
ESLNS2007-10	0.7	1.2	10	0.77	50	4	7.9	5	5.4	5.8	6.1	6.6
ESLNS2008-4	0.8	1.2	4	0.77	50	4	6.8	7.2	7.7	8.1	8.4	9
ESLNS2008-6	0.8	1.2	6	0.77	50	4	5.9	9.3	9.9	10.3	10.7	11.4
ESLNS2008-8	0.8	1.2	8	0.77	50	4	5.2	11.5	12.1	12.6	13	13.7
ESLNS2008-10	0.8	1.2	10	0.77	55	4	4.7	13.6	14.2	14.8	15.2	16
ESLNS2008-12	0.8	1.2	12	0.77	55	4	6.7	7.2	7.7	8.1	8.4	9.1
ESLNS2009-6	0.9	1.35	6	0.86	50	4	5.8	9.4	9.9	10.4	10.7	11.4
ESLNS2009-8	0.9	1.35	8	0.86	50	4	5.1	11.5	12.1	12.6	13	13.7
ESLNS2009-10	0.9	1.35	10	0.86	55	4	4.6	13.6	14.3	14.8	15.2	16
ESLNS2009-12	0.9	1.35	12	0.86	55	4	9.4	2.9	3.2	3.4	3.7	4.1

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESLNS20 | 2 FLUTES LONG NECK SQUARE ENDMILL

EDP No	SIZES (mm)							Effective length by inclination angle				
	D	L1	L3	D3	L2	D2	θ	0.5°	1°	1.5°	2°	3°
ESLNS2010-2	1	1.5	2	0.96	50	4	7.7	5.1	5.5	5.8	6.1	6.6
ESLNS2010-4	1	1.5	4	0.96	50	4	6.6	7.2	7.7	8.1	8.4	9.1
ESLNS2010-6	1	1.5	6	0.96	50	4	5.7	9.4	9.9	10.4	10.7	11.4
ESLNS2010-8	1	1.5	8	0.96	50	4	5	11.5	12.1	12.6	13	13.7
ESLNS2010-10	1	1.5	10	0.96	55	4	4.5	13.6	14.3	14.8	15.2	16
ESLNS2010-12	1	1.5	12	0.96	55	4	4.1	15.7	16.4	17	17.4	18.7
ESLNS2010-14	1	1.5	14	0.96	60	4	3.8	17.8	18.6	19.1	19.6	21.3
ESLNS2010-16	1	1.5	16	0.96	60	4	3.2	22	22.8	23.5	24	26.6
ESLNS2010-20	1	1.5	20	0.96	60	4	6.3	7.3	7.7	8.1	8.5	9.1
ESLNS2012-6	1.2	1.8	6	1.15	50	4	5.5	9.4	9.9	10.4	10.8	11.4
ESLNS2012-8	1.2	1.8	8	1.15	50	4	4.8	11.5	12.1	12.6	13	13.7
ESLNS2012-10	1.2	1.8	10	1.15	50	4	11.5	12.1	12.6	13	13.7	16
ESLNS2012-12	1.2	1.8	12	1.15	55	4	4.3	13.6	14.3	14.8	15.2	16
ESLNS2012-16	1.2	1.8	16	1.15	55	4	3.6	17.8	18.6	19.2	19.7	21.3
ESLNS2014-6	1.4	2.1	6	1.34	50	4	6.1	7.3	7.8	8.1	8.5	9.1
ESLNS2014-8	1.4	2.1	8	1.34	50	4	5.3	9.4	10	10.4	10.8	11.5
ESLNS2014-10	1.4	2.1	10	1.34	50	4	4.6	11.6	12.1	12.6	13	13.8
ESLNS2014-12	1.4	2.1	12	1.34	55	4	4.1	13.7	14.3	14.8	15.3	16.1
ESLNS2014-14	1.4	2.1	14	1.34	55	4	3.7	15.8	16.5	17	17.5	18.7
ESLNS2014-16	1.4	2.1	16	1.34	55	4	3.4	17.9	18.6	19.2	19.7	21.4
ESLNS2015-4	1.5	2.25	4	1.44	50	4	7.2	5.2	5.5	5.9	6.2	6.7
ESLNS2015-6	1.5	2.25	6	1.44	50	4	6	7.3	7.8	8.1	8.5	9.1
ESLNS2015-8	1.5	2.25	8	1.44	50	4	5.1	9.4	10	10.4	10.8	11.5
ESLNS2015-10	1.5	2.25	10	1.44	50	4	4.5	11.6	12.1	12.6	13	13.8
ESLNS2015-12	1.5	2.25	12	1.44	55	4	4	13.7	14.3	14.8	15.3	16.1
ESLNS2015-14	1.5	2.25	14	1.44	55	4	3.6	15.8	16.5	17	17.5	18.7
ESLNS2015-16	1.5	2.25	16	1.44	55	4	3.3	17.9	18.6	19.2	19.7	-
ESLNS2015-18	1.5	2.25	18	1.44	60	4	3	20	20.7	21.3	21.9	-
ESLNS2015-20	1.5	2.25	20	1.44	60	4	2.8	22	22.9	23.5	24.1	-
ESLNS2015-25	1.5	2.25	25	1.44	65	4	2.4	27.3	28.1	28.8	30	-
ESLNS2016-6	1.6	2.4	6	1.54	50	4	5.9	7.3	7.8	8.1	8.5	9.1
ESLNS2016-8	1.6	2.4	8	1.54	50	4	5	9.4	10	10.4	10.8	11.5
ESLNS2016-10	1.6	2.4	10	1.54	50	4	4.4	11.6	12.1	12.6	13	13.8
ESLNS2016-12	1.6	2.4	12	1.54	55	4	3.9	13.7	14.3	14.8	15.3	16.1
ESLNS2016-14	1.6	2.4	14	1.54	55	4	3.5	15.8	16.5	17	17.5	18.7
ESLNS2016-16	1.6	2.4	16	1.54	55	4	3.2	17.9	18.6	19.2	19.7	21.4
ESLNS2016-18	1.6	2.4	18	1.54	60	4	2.9	20	20.7	21.3	21.9	-
ESLNS2016-20	1.6	2.4	20	1.54	60	4	2.7	22	22.9	23.5	24.1	-
ESLNS2018-6	1.8	2.7	6	1.73	50	4	5.6	7.4	7.8	8.2	8.5	9.1
ESLNS2018-8	1.8	2.7	8	1.73	50	4	4.8	9.5	10	10.4	10.8	11.5
ESLNS2018-10	1.8	2.7	10	1.73	50	4	4.2	11.6	12.2	12.6	13	13.8

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESLNS20 | 2 FLUTES LONG NECK SQUARE ENDMILL

EDP No	SIZES (mm)							Effective length by inclination angle				
	D	L1	L3	D3	L2	D2	θ	0.5°	1°	1.5°	2°	3°
ESLNS2018-12	1.8	2.7	12	1.73	55	4	3.7	13.7	14.3	14.8	15.3	16.1
ESLNS2018-14	1.8	2.7	14	1.73	55	4	3.3	15.8	16.5	17	17.5	18.8
ESLNS2018-16	1.8	2.7	16	1.73	55	4	3	17.9	18.6	19.2	19.7	-
ESLNS2018-18	1.8	2.7	18	1.73	60	4	2.7	20	20.7	21.3	21.9	-
ESLNS2018-20	1.8	2.7	20	1.73	60	4	2.5	22.1	22.9	23.5	24.1	-
ESLNS2020-4	2	3	4	1.92	50	4	6.5	5.3	5.6	5.9	6.2	6.7
ESLNS2020-6	2	3	6	1.92	50	4	5.3	7.4	7.8	8.2	8.5	9.1
ESLNS2020-8	2	3	8	1.92	50	4	4.5	9.5	10	10.4	10.8	11.5
ESLNS2020-10	2	3	10	1.92	50	4	3.9	11.6	12.2	12.7	13.1	13.8
ESLNS2020-12	2	3	12	1.92	55	4	3.4	13.7	14.3	14.9	15.3	16.1
ESLNS2020-14	2	3	14	1.92	55	4	3.1	15.8	16.5	17	17.5	18.8
ESLNS2020-16	2	3	16	1.92	55	4	2.8	17.9	18.6	19.2	19.7	-
ESLNS2020-18	2	3	18	1.92	60	4	2.6	20	20.8	21.4	21.9	-
ESLNS2020-20	2	3	20	1.92	60	4	2.4	22.1	22.9	23.5	24.1	-
ESLNS2020-25	2	3	25	1.92	65	4	2	27.3	28.2	28.9	-	-
ESLNS2020-30	2	3	30	1.92	70	4	1.7	32.5	33.4	34.4	-	-
ESLNS2025-8	2.5	3.75	8	2.4	50	4	3.7	9.6	10.1	10.5	10.9	11.5
ESLNS2025-10	2.5	3.75	10	2.4	50	4	3.1	11.7	12.2	12.7	13.1	13.8
ESLNS2025-12	2.5	3.75	12	2.4	55	4	2.7	13.8	14.4	14.9	15.3	-
ESLNS2025-14	2.5	3.75	14	2.4	55	4	2.4	15.9	16.5	17.1	17.5	-
ESLNS2025-16	2.5	3.75	16	2.4	55	4	2.2	18	18.7	19.2	19.7	-
ESLNS2025-18	2.5	3.75	18	2.4	55	4	2	20.1	20.8	21.4	-	-
ESLNS2025-20	2.5	3.75	20	2.4	60	4	1.8	22.1	22.9	23.5	-	-
ESLNS2025-25	2.5	3.75	25	2.4	60	4	1.5	27.3	28.2	-	-	-
ESLNS2025-30	2.5	3.75	30	2.4	70	4	1.3	32.6	33.5	-	-	-
ESLNS2030-8	3	4.5	8	2.88	55	6	5.6	9.6	10.1	10.5	10.9	11.5
ESLNS2030-10	3	4.5	10	2.88	55	6	5	11.7	12.3	12.7	13.1	13.8
ESLNS2030-12	3	4.5	12	2.88	60	6	4.5	13.8	14.4	14.9	15.4	16.3
ESLNS2030-14	3	4.5	14	2.88	60	6	4.1	15.9	16.6	17.1	17.6	18.9
ESLNS2030-16	3	4.5	16	2.88	60	6	3.7	18	18.7	19.3	19.8	21.6
ESLNS2030-18	3	4.5	18	2.88	60	6	3.4	20.1	20.8	21.4	21.9	24.2
ESLNS2030-20	3	4.5	20	2.88	65	6	3.2	22.2	23	23.6	24.2	26.9
ESLNS2030-25	3	4.5	25	2.88	70	6	2.7	27.4	28.2	28.9	30.2	-
ESLNS2030-30	3	4.5	30	2.88	75	6	2.4	32.6	33.5	34.5	36.2	-
ESLNS2030-35	3	4.5	35	2.88	80	6	2.1	37.7	38.7	40.2	42.2	-
ESLNS2030-40	3	4.5	40	2.88	90	6	1.9	42.9	43.9	45.9	-	-
ESLNS2040-12	4	6	12	3.85	60	6	3.4	13.9	14.5	15	15.4	16.3
ESLNS2040-16	4	6	16	3.85	60	6	2.8	18.1	18.8	19.3	19.8	-
ESLNS2040-20	4	6	20	3.85	70	6	2.3	22.3	23	23.6	24.3	-
ESLNS2040-25	4	6	25	3.85	70	6	2	27.4	28.3	28.9	-	-
ESLNS2040-30	4	6	30	3.85	80	6	1.7	32.6	33.5	34.6	-	-

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESLNS20 | 2 FLUTES LONG NECK SQUARE ENDMILL

EDP No	SIZES (mm)							Effective length by inclination angle				
	D	L1	L3	D3	L2	D2	θ	0.5°	1°	1.5°	2°	3°
ESLNS2040-35	4	6	35	3.85	80	6	1.5	37.8	38.8	-	-	-
ESLNS2040-40	4	6	40	3.85	90	6	1.3	42.9	44	-	-	-
ESLNS2040-45	4	6	45	3.85	90	6	1.2	48.1	49.4	-	-	-
ESLNS2040-50	4	6	50	3.85	100	6	1.1	53.2	54.8	-	-	-
ESLNS2050-16	5	7.5	16	4.85	60	6	1.5	18.1	18.8	-	-	-
ESLNS2050-20	5	7.5	20	4.85	60	6	1.3	22.3	23	-	-	-
ESLNS2050-25	5	7.5	25	4.85	70	6	1.1	27.4	28.3	-	-	-
ESLNS2050-30	5	7.5	30	4.85	70	6	0.9	32.6	-	-	-	-
ESLNS2050-35	5	7.5	35	4.85	80	6	0.8	37.8	-	-	-	-
ESLNS2050-40	5	7.5	40	4.85	90	6	0.7	42.9	-	-	-	-
ESLNS2050-50	5	7.5	50	4.85	100	6	0.6	53.2	-	-	-	-

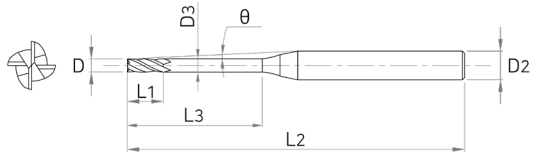
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESLNS40 | 4 FLUTES LONG NECK SQUARE ENDMILL





■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.012	h5

CARBIDE | AlTiN | 4 | 30° HELIX | DATA P.590

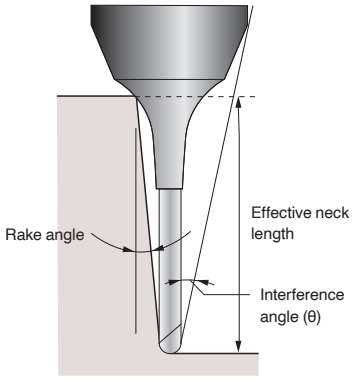
EDP No	SIZES (mm)							Effective length by inclination angle				
	D	L1	L3	D3	L2	D2	θ	0.5°	1°	1.5°	2°	3°
ESLNS4010-4	1	1.5	4	0.96	50	4	7.7	5.1	5.5	5.8	6.1	6.6
ESLNS4010-6	1	1.5	6	0.96	50	4	6.6	7.2	7.7	8.1	8.4	9.1
ESLNS4010-8	1	1.5	8	0.96	50	4	5.7	9.4	9.9	10.4	10.7	11.4
ESLNS4010-10	1	1.5	10	0.96	50	4	5	11.5	12.1	12.6	13	13.7
ESLNS4015-4	1.5	2.25	4	1.44	50	4	7.2	5.2	5.5	5.9	6.2	6.7
ESLNS4015-6	1.5	2.25	6	1.44	50	4	6	7.3	7.8	8.1	8.5	9.1
ESLNS4015-8	1.5	2.25	8	1.44	50	4	5.1	9.4	10	10.4	10.8	11.5
ESLNS4015-10	1.5	2.25	10	1.44	50	4	4.5	11.6	12.1	12.6	13	13.8
ESLNS4015-12	1.5	2.25	12	1.44	55	4	4	13.7	14.3	14.8	15.3	16.1
ESLNS4015-14	1.5	2.25	14	1.44	55	4	3.6	15.8	16.5	17	17.5	18.7
ESLNS4015-16	1.5	2.25	16	1.44	55	4	3.3	17.9	18.6	19.2	19.7	-
ESLNS4015-18	1.5	2.25	18	1.44	60	4	3	20	20.7	21.3	21.9	-
ESLNS4015-20	1.5	2.25	20	1.44	60	4	2.8	22	22.9	23.5	24.1	-
ESLNS4015-25	1.5	2.25	25	1.44	65	4	2.4	27.3	28.1	28.8	30	-
ESLNS4020-4	2	3	4	1.92	50	4	6.5	5.3	5.6	5.9	6.2	6.7
ESLNS4020-6	2	3	6	1.92	50	4	5.3	7.4	7.8	8.2	8.5	9.1
ESLNS4020-8	2	3	8	1.92	50	4	4.5	9.5	10	10.4	10.8	11.5
ESLNS4020-10	2	3	10	1.92	50	4	3.9	11.6	12.2	12.7	13.1	13.8
ESLNS4020-12	2	3	12	1.92	55	4	3.4	13.7	14.3	14.9	15.3	16.1
ESLNS4020-14	2	3	14	1.92	55	4	3.1	15.8	16.5	17	17.5	18.8
ESLNS4020-16	2	3	16	1.92	55	4	2.8	17.9	18.6	19.2	19.7	-
ESLNS4020-18	2	3	18	1.92	60	4	2.6	20	20.8	21.4	21.9	-
ESLNS4020-20	2	3	20	1.92	60	4	2.4	22.1	22.9	23.5	24.1	-
ESLNS4020-25	2	3	25	1.92	65	4	2	27.3	28.2	28.9	-	-

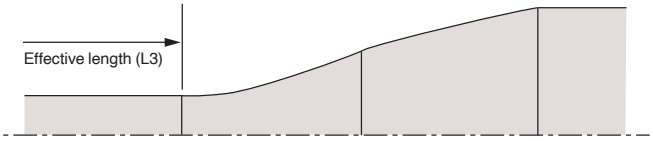
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESLNS40 | 4 FLUTES LONG NECK SQUARE ENDMILL





※ The marked effective neck length is the default value to prevent interference with the workpiece.
Proper control of the processing environment is required

EDP No	SIZES (mm)							Effective length by inclination angle				
	D	L1	L3	D3	L2	D2	θ	0.5°	1°	1.5°	2°	3°
ESLNS4020-30	2	3	30	1.92	70	4	1.7	32.5	33.4	34.4	-	-
ESLNS4025-8	2.5	3.75	8	2.4	50	4	3.7	9.6	10.1	10.5	10.9	11.5
ESLNS4025-10	2.5	3.75	10	2.4	50	4	3.1	11.7	12.2	12.7	13.1	13.8
ESLNS4025-12	2.5	3.75	12	2.4	55	4	2.7	13.8	14.4	14.9	15.3	-
ESLNS4025-14	2.5	3.75	14	2.4	55	4	2.4	15.9	16.5	17.1	17.5	-
ESLNS4025-16	2.5	3.75	16	2.4	55	4	2.2	18	18.7	19.2	19.7	-
ESLNS4025-18	2.5	3.75	18	2.4	60	4	2	20.1	20.8	21.4	-	-
ESLNS4025-20	2.5	3.75	20	2.4	60	4	1.8	22.1	22.9	23.5	-	-
ESLNS4025-25	2.5	3.75	25	2.4	65	4	1.5	27.3	28.2	-	-	-
ESLNS4025-30	2.5	3.75	30	2.4	70	4	1.3	32.6	33.5	-	-	-
ESLNS4030-8	3	4.5	8	2.88	55	6	5.6	9.6	10.1	10.5	10.9	11.5
ESLNS4030-10	3	4.5	10	2.88	55	6	5	11.7	12.3	12.7	13.1	13.8
ESLNS4030-12	3	4.5	12	2.88	60	6	4.5	13.8	14.4	14.9	15.4	16.3
ESLNS4030-14	3	4.5	14	2.88	60	6	4.1	15.9	16.6	17.1	17.6	18.9
ESLNS4030-16	3	4.5	16	2.88	60	6	3.7	18	18.7	19.3	19.8	21.6
ESLNS4030-18	3	4.5	18	2.88	60	6	3.4	20.1	20.8	21.4	21.9	24.2
ESLNS4030-20	3	4.5	20	2.88	65	6	3.2	22.2	23	23.6	24.2	26.9
ESLNS4030-25	3	4.5	25	2.88	70	6	2.7	27.4	28.2	28.9	30.2	-
ESLNS4030-30	3	4.5	30	2.88	75	6	2.4	32.6	33.5	34.5	36.2	-
ESLNS4030-35	3	4.5	35	2.88	80	6	2.1	37.7	38.7	40.2	42.2	-
ESLNS4030-40	3	4.5	40	2.88	90	6	1.9	42.9	43.9	45.9	-	-
ESLNS4040-12	4	6	12	3.85	60	6	3.4	13.9	14.5	15	15.4	16.3
ESLNS4040-16	4	6	16	3.85	60	6	2.8	18.1	18.8	19.3	19.8	-
ESLNS4040-20	4	6	20	3.85	70	6	2.3	22.3	23	23.6	24.3	-

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESLNS40 | 4 FLUTES LONG NECK SQUARE ENDMILL

EDP No	SIZES (mm)							Effective length by inclination angle				
	D	L1	L3	D3	L2	D2	θ	0.5°	1°	1.5°	2°	3°
ESLNS4040-25	4	6	25	3.85	70	6	2	27.4	28.3	28.9	-	-
ESLNS4040-30	4	6	30	3.85	80	6	1.7	32.6	33.5	34.6	-	-
ESLNS4040-35	4	6	35	3.85	80	6	1.5	37.8	38.8	-	-	-
ESLNS4040-40	4	6	40	3.85	90	6	1.3	42.9	44	-	-	-
ESLNS4040-45	4	6	45	3.85	90	6	1.2	48.1	49.4	-	-	-
ESLNS4040-50	4	6	50	3.85	100	6	1.1	53.2	54.8	-	-	-
ESLNS4050-16	5	7.5	16	4.85	60	6	1.5	18.1	18.8	-	-	-
ESLNS4050-20	5	7.5	20	4.85	60	6	1.3	22.3	23	-	-	-
ESLNS4050-25	5	7.5	25	4.85	70	6	1.1	27.4	28.3	-	-	-
ESLNS4050-30	5	7.5	30	4.85	70	6	0.9	32.6	-	-	-	-
ESLNS4050-35	5	7.5	35	4.85	80	6	0.8	37.8	-	-	-	-
ESLNS4050-40	5	7.5	40	4.85	90	6	0.7	42.9	-	-	-	-
ESLNS4050-50	5	7.5	50	4.85	100	6	0.6	53.2	-	-	-	-

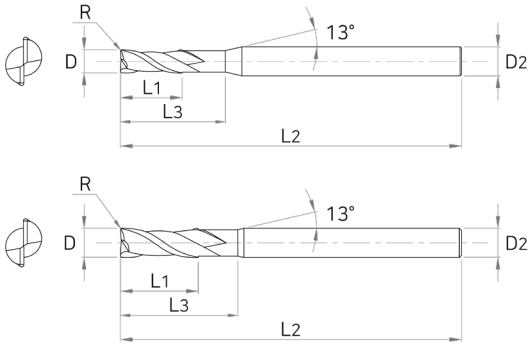
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESR702 | 2 FLUTES NECK RADIUS ENDMILL





■ Tolerance

D		Shank Dia
~D6	0~-0.012	h5
D8~12	0~-0.015	

CARBIDE | AlTiN | 2 | 30° HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.591

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESR702 01000503S4	1	0.05	1.5	3	50	4
ESR702 01000504S4	1	0.05	1.5	4	50	4
ESR702 01000506S4	1	0.05	1.5	6	50	4
ESR702 01000508S4	1	0.05	1.5	8	50	4
ESR702 01000510S4	1	0.05	1.5	10	50	4
ESR702 0100103S4	1	0.1	1.5	3	50	4
ESR702 0100104	1	0.1	1.5	4	50	6
ESR702 0100104S4	1	0.1	1.5	4	50	4
ESR702 0100106	1	0.1	1.5	6	50	6
ESR702 0100106S4	1	0.1	1.5	6	50	4
ESR702 0100108S4	1	0.1	1.5	8	50	4
ESR702 0100110S4	1	0.1	1.5	10	50	4
ESR702 0100203S4	1	0.2	1.5	3	50	4
ESR702 0100204	1	0.2	1.5	4	50	6
ESR702 0100204S4	1	0.2	1.5	4	50	4
ESR702 0100206	1	0.2	1.5	6	50	6
ESR702 0100206S4	1	0.2	1.5	6	50	4
ESR702 0100208S4	1	0.2	1.5	8	50	4
ESR702 0100210	1	0.2	1.5	10	50	6
ESR702 0100210S4	1	0.2	1.5	10	50	4
ESR702 0100212	1	0.2	1.5	12	50	6
ESR702 0100303S4	1	0.3	1.5	3	50	4
ESR702 0100304S4	1	0.3	1.5	4	50	4
ESR702 0100306S4	1	0.3	1.5	6	50	4

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESR702 0100308S4	1	0.3	1.5	8	50	4
ESR702 0100310S4	1	0.3	1.5	10	50	4
ESR702 0120208	1.2	0.2	2	8	50	6
ESR702 0120212	1.2	0.2	2	12	50	6
ESR702 01500504S4	1.5	0.05	2.5	4	50	4
ESR702 01500506S4	1.5	0.05	2.5	6	50	4
ESR702 01500508S4	1.5	0.05	2.5	8	50	4
ESR702 01500510S4	1.5	0.05	2.5	10	50	4
ESR702 01500512S4	1.5	0.05	2.5	12	50	4
ESR702 0150104S4	1.5	0.1	2.5	4	50	4
ESR702 0150106S4	1.5	0.1	2.5	6	50	4
ESR702 0150108S4	1.5	0.1	2.5	8	50	4
ESR702 0150110S4	1.5	0.1	2.5	10	50	4
ESR702 0150112S4	1.5	0.1	2.5	12	50	4
ESR702 0150204	1.5	0.2	2.5	4	50	6
ESR702 0150204S4	1.5	0.2	2.5	4	50	4
ESR702 0150206	1.5	0.2	2.5	6	50	6
ESR702 0150206S4	1.5	0.2	2.5	6	50	4
ESR702 0150208	1.5	0.2	2.5	8	50	6
ESR702 0150208S4	1.5	0.2	2.5	8	50	4
ESR702 0150210	1.5	0.2	2.5	10	50	6
ESR702 0150210S4	1.5	0.2	2.5	10	50	4
ESR702 0150212S4	1.5	0.2	2.5	12	50	4
ESR702 0150215	1.5	0.2	2.5	15	50	6

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESR702 | 2 FLUTES NECK RADIUS ENDMILL

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESR702 0150304S4	1.5	0.3	2.5	4	50	4
ESR702 0150306S4	1.5	0.3	2.5	6	50	4
ESR702 0150308S4	1.5	0.3	2.5	8	50	4
ESR702 0150310S4	1.5	0.3	2.5	10	50	4
ESR702 0150312S4	1.5	0.3	2.5	12	50	4
ESR702 0150504S4	1.5	0.5	2.5	4	50	4
ESR702 0150506S4	1.5	0.5	2.5	6	50	4
ESR702 0150508S4	1.5	0.5	2.5	8	50	4
ESR702 0150510S4	1.5	0.5	2.5	10	50	4
ESR702 0150512S4	1.5	0.5	2.5	12	50	4
ESR702 0200106S4	2	0.1	3	6	50	4
ESR702 0200108	2	0.1	3	8	50	6
ESR702 0200108S4	2	0.1	3	8	50	4
ESR702 0200110S4	2	0.1	3	10	50	4
ESR702 0200112	2	0.1	3	12	50	6
ESR702 0200112S4	2	0.1	3	12	50	4
ESR702 0200116S4	2	0.1	3	16	50	4
ESR702 0200120S4	2	0.1	3	20	50	4
ESR702 0200206	2	0.2	3	6	50	6
ESR702 0200206S4	2	0.2	3	6	50	4
ESR702 0200208S4	2	0.2	3	8	50	4
ESR702 0200209	2	0.2	3	9	50	6
ESR702 0200210S4	2	0.2	3	10	50	4
ESR702 0200212S4	2	0.2	3	12	50	4
ESR702 0200216	2	0.2	3	16	50	6
ESR702 0200216S4	2	0.2	3	16	50	4
ESR702 0200220S4	2	0.2	3	20	50	4
ESR702 0200306	2	0.3	3	6	50	6
ESR702 0200306S4	2	0.3	3	6	50	4
ESR702 0200308S4	2	0.3	3	8	50	4
ESR702 0200310S4	2	0.3	3	10	50	4
ESR702 0200312S4	2	0.3	3	12	50	4
ESR702 0200316S4	2	0.3	3	16	50	4
ESR702 0200320S4	2	0.3	3	20	50	4
ESR702 0200506	2	0.5	3	6	50	6
ESR702 0200506S4	2	0.5	3	6	50	4
ESR702 0200508S4	2	0.5	3	8	50	4
ESR702 0200509	2	0.5	3	9	50	6
ESR702 0200510S4	2	0.5	3	10	50	4
ESR702 0200512	2	0.5	3	12	50	6
ESR702 0200512S4	2	0.5	3	12	50	4

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESR702 0200516	2	0.5	3	16	50	6
ESR702 0200516S4	2	0.5	3	16	50	4
ESR702 0200520S4	2	0.5	3	20	50	4
ESR702 0250208S4	2.5	0.2	3.5	8	50	4
ESR702 0250210S4	2.5	0.2	3.5	10	50	4
ESR702 0250212S4	2.5	0.2	3.5	12	50	4
ESR702 0250216S4	2.5	0.2	3.5	16	50	4
ESR702 0250308S4	2.5	0.3	3.5	8	50	4
ESR702 0250310S4	2.5	0.3	3.5	10	50	4
ESR702 0250312S4	2.5	0.3	3.5	12	50	4
ESR702 0250316S4	2.5	0.3	3.5	16	50	4
ESR702 0250508S4	2.5	0.5	3.5	8	50	4
ESR702 0250510S4	2.5	0.5	3.5	10	50	4
ESR702 0250512S4	2.5	0.5	3.5	12	50	4
ESR702 0250516S4	2.5	0.5	3.5	16	50	4
ESR702 0300108	3	0.1	4.5	8	55	6
ESR702 0300110	3	0.1	4.5	10	55	6
ESR702 0300112	3	0.1	4.5	12	55	6
ESR702 0300116	3	0.1	4.5	16	55	6
ESR702 0300120	3	0.1	4.5	20	60	6
ESR702 0300208	3	0.2	4.5	8	55	6
ESR702 0300209	3	0.2	4.5	9	55	6
ESR702 0300210	3	0.2	4.5	10	55	6
ESR702 0300212	3	0.2	4.5	12	55	6
ESR702 0300216	3	0.2	4.5	16	55	6
ESR702 0300220	3	0.2	4.5	20	60	6
ESR702 0300308	3	0.3	4.5	8	55	6
ESR702 0300309	3	0.3	4.5	9	55	6
ESR702 0300310	3	0.3	4.5	10	55	6
ESR702 0300312	3	0.3	4.5	12	55	6
ESR702 0300314	3	0.3	4.5	14	55	6
ESR702 0300316	3	0.3	4.5	16	55	6
ESR702 0300320	3	0.3	4.5	20	60	6
ESR702 0300508	3	0.5	4.5	8	55	6
ESR702 0300509	3	0.5	4.5	9	55	6
ESR702 0300510	3	0.5	4.5	10	55	6
ESR702 0300512	3	0.5	4.5	12	55	6
ESR702 0300516	3	0.5	4.5	16	55	6
ESR702 0300520	3	0.5	4.5	20	60	6
ESR702 0301008	3	1	4.5	8	55	6
ESR702 0301010	3	1	4.5	10	55	6

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESR702 | 2 FLUTES NECK RADIUS ENDMILL

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESR702 0301012	3	1	4.5	12	55	6
ESR702 0301016	3	1	4.5	16	55	6
ESR702 0301020	3	1	4.5	20	60	6
ESR702 0301025	3	1	4.5	25	60	6
ESR702 0400110	4	0.1	6	10	55	6
ESR702 0400112	4	0.1	6	12	55	6
ESR702 0400116	4	0.1	6	16	55	6
ESR702 0400120	4	0.1	6	20	60	6
ESR702 0400125	4	0.1	6	25	60	6
ESR702 0400210	4	0.2	6	10	55	6
ESR702 0400212	4	0.2	6	12	55	6
ESR702 0400216	4	0.2	6	16	55	6
ESR702 0400220	4	0.2	6	20	60	6
ESR702 0400225	4	0.2	6	25	60	6
ESR702 0400310	4	0.3	6	10	55	6
ESR702 0400312	4	0.3	6	12	55	6
ESR702 0400316	4	0.3	6	16	55	6
ESR702 0400320	4	0.3	6	20	60	6
ESR702 0400325	4	0.3	6	25	60	6
ESR702 0400510	4	0.5	6	10	55	6
ESR702 0400512	4	0.5	6	12	55	6
ESR702 0400516	4	0.5	6	16	55	6
ESR702 0400520	4	0.5	6	20	60	6
ESR702 0400525	4	0.5	6	25	60	6
ESR702 0400530	4	0.5	6	30	70	6
ESR702 0401010	4	1	6	10	55	6
ESR702 0401012	4	1	6	12	55	6

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESR702 0401016	4	1	6	16	55	6
ESR702 0401020	4	1	6	20	60	6
ESR702 0401025	4	1	6	25	60	6
ESR702 0401030	4	1	6	30	70	6
ESR702 0500318	5	0.3	8	18	60	6
ESR702 0600220	6	0.2	9	20	60	6
ESR702 0600320	6	0.3	9	20	60	6
ESR702 0600520	6	0.5	9	20	60	6
ESR702 0601020	6	1	9	20	60	6
ESR702 0601520	6	1.5	9	20	60	6
ESR702 0602020	6	2	9	20	60	6
ESR702 0800225	8	0.2	12	25	60	8
ESR702 0800325	8	0.3	12	25	60	8
ESR702 0800525	8	0.5	12	25	60	8
ESR702 0801025	8	1	12	25	60	8
ESR702 0801525	8	1.5	12	25	60	8
ESR702 1000232	10	0.2	15	32	70	10
ESR702 1000332	10	0.3	15	32	70	10
ESR702 1000532	10	0.5	15	32	70	10
ESR702 1001032	10	1	15	32	70	10
ESR702 1001532	10	1.5	15	32	70	10
ESR702 1002032	10	2	15	32	70	10
ESR702 1200338	12	0.3	18	38	80	12
ESR702 1200538	12	0.5	18	38	80	12
ESR702 1201038	12	1	18	38	80	12
ESR702 1201538	12	1.5	18	38	80	12
ESR702 1202038	12	2	18	38	80	12

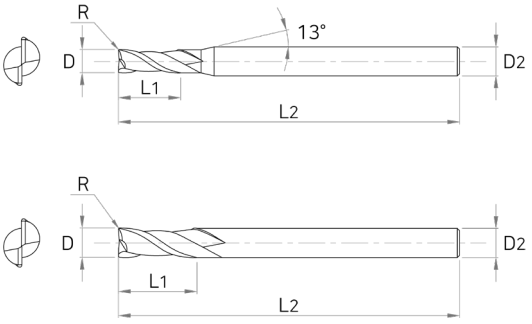
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESR732 | 2 FLUTES LONG SHANK RADIUS ENDMILL





■ Tolerance

D		Shank Dia
~D6	0 ~ -0.012	h5
D8 ~ 12	0 ~ -0.015	

CARBIDE | AlTiN | 2 | 30° HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.591

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
ESR732 01001	1	0.1	2	50	6
ESR732 01002	1	0.2	2	50	6
ESR732 01003	1	0.3	2	50	6
ESR732 01501	1.5	0.1	3	50	6
ESR732 01502	1.5	0.2	3	50	6
ESR732 01503	1.5	0.3	3	50	6
ESR732 01505	1.5	0.5	3	50	6
ESR732 02001	2	0.1	5	50	6
ESR732 02002	2	0.2	5	50	6
ESR732 02003	2	0.3	5	50	6
ESR732 02005	2	0.5	5	50	6
ESR732 02501	2.5	0.1	7	60	6
ESR732 02502	2.5	0.2	7	60	6
ESR732 02503	2.5	0.3	7	60	6
ESR732 02505	2.5	0.5	7	60	6
ESR732 03001	3	0.1	8	60	6
ESR732 03002	3	0.2	8	60	6
ESR732 03003	3	0.3	8	60	6
ESR732 03005	3	0.5	8	60	6
ESR732 04001	4	0.1	10	70	6
ESR732 04002	4	0.2	10	70	6
ESR732 04003	4	0.3	10	70	6
ESR732 04005	4	0.5	10	70	6
ESR732 04010	4	1	10	70	6
ESR732 05001	5	0.1	13	80	6

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
ESR732 05002	5	0.2	13	80	6
ESR732 05003	5	0.3	13	80	6
ESR732 05005	5	0.5	13	80	6
ESR732 05010	5	1	13	80	6
ESR732 06001	6	0.1	15	90	6
ESR732 06002	6	0.2	15	90	6
ESR732 06003	6	0.3	15	90	6
ESR732 06005	6	0.5	15	90	6
ESR732 06010	6	1	15	90	6
ESR732 08001	8	0.1	20	100	8
ESR732 08002	8	0.2	20	100	8
ESR732 08003	8	0.3	20	100	8
ESR732 08005	8	0.5	20	100	8
ESR732 08010	8	1	20	100	8
ESR732 08020	8	2	20	100	8
ESR732 10002	10	0.2	25	100	10
ESR732 10003	10	0.3	25	100	10
ESR732 10005	10	0.5	25	100	10
ESR732 10010	10	1	25	100	10
ESR732 10020	10	2	25	100	10
ESR732 12002	12	0.2	30	110	12
ESR732 12003	12	0.3	30	110	12
ESR732 12005	12	0.5	30	110	12
ESR732 12010	12	1	30	110	12
ESR732 12020	12	2	30	110	12

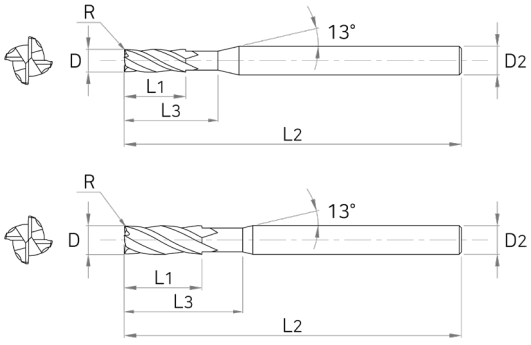
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESR704 | 4 FLUTES NECK RADIUS ENDMILL





■ Tolerance

D		Shank Dia
~D6	0~-0.012	h5
D8~12	0~-0.015	

CARBIDE | AlTiN | 4 | 30° HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.592

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESR704 0100103S4	1	0.1	2	3	50	4
ESR704 0100104S4	1	0.1	2	4	50	4
ESR704 0100106S4	1	0.1	2	6	50	4
ESR704 0100203S4	1	0.2	2	3	50	4
ESR704 0100204S4	1	0.2	2	4	50	4
ESR704 0100206S4	1	0.2	2	6	50	4
ESR704 0100303S4	1	0.3	2	3	50	4
ESR704 0100304S4	1	0.3	2	4	50	4
ESR704 0100306S4	1	0.3	2	6	50	4
ESR704 0150104S4	1.5	0.1	2.5	4	50	4
ESR704 0150106S4	1.5	0.1	2.5	6	50	4
ESR704 0150204S4	1.5	0.2	2.5	4	50	4
ESR704 0150206S4	1.5	0.2	2.5	6	50	4
ESR704 0150304S4	1.5	0.3	2.5	4	50	4
ESR704 0150306S4	1.5	0.3	2.5	6	50	4
ESR704 0200106S4	2	0.1	3	6	50	4
ESR704 0200108S4	2	0.1	3	8	50	4
ESR704 0200206S4	2	0.2	3	6	50	4
ESR704 0200208	2	0.2	3	8	50	6
ESR704 0200208S4	2	0.2	3	8	50	4
ESR704 0200210	2	0.2	3	10	50	6
ESR704 0200212	2	0.2	3	12	50	6
ESR704 0200306S4	2	0.3	3	6	50	4
ESR704 0200308S4	2	0.3	3	8	50	4

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESR704 0200506S4	2	0.5	3	6	50	4
ESR704 0200508S4	2	0.5	3	8	50	4
ESR704 0250106S4	2.5	0.1	3.5	6	50	4
ESR704 0300108	3	0.1	4	8	55	6
ESR704 0300110	3	0.1	4	10	55	6
ESR704 0300112	3	0.1	4	12	55	6
ESR704 0300116	3	0.1	4	16	55	6
ESR704 0300120	3	0.1	4	20	60	6
ESR704 0300208	3	0.2	4	8	55	6
ESR704 0300210	3	0.2	4	10	55	6
ESR704 0300212	3	0.2	4	12	55	6
ESR704 0300216	3	0.2	4	16	55	6
ESR704 0300220	3	0.2	4	20	60	6
ESR704 0300308	3	0.3	4	8	55	6
ESR704 0300309	3	0.3	4	9	55	6
ESR704 0300310	3	0.3	4	10	55	6
ESR704 0300312	3	0.3	4	12	55	6
ESR704 0300316	3	0.3	4	16	55	6
ESR704 0300320	3	0.3	4	20	60	6
ESR704 0300508	3	0.5	4	8	55	6
ESR704 0300509	3	0.5	4	9	55	6
ESR704 0300510	3	0.5	4	10	55	6
ESR704 0300512	3	0.5	4	12	55	6
ESR704 0300516	3	0.5	4	16	55	6

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESR704 | 4 FLUTES NECK RADIUS ENDMILL

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESR704 0300520	3	0.5	4	20	60	6
ESR704 0301008	3	1	4	8	55	6
ESR704 0301010	3	1	4	10	55	6
ESR704 0301012	3	1	4	12	55	6
ESR704 0301016	3	1	4	16	55	6
ESR704 0301020	3	1	4	20	60	6
ESR704 0400110	4	0.1	6	10	55	6
ESR704 0400112	4	0.1	6	12	55	6
ESR704 0400116	4	0.1	6	16	55	6
ESR704 0400120	4	0.1	6	20	60	6
ESR704 0400125	4	0.1	6	25	60	6
ESR704 0400210	4	0.2	6	10	55	6
ESR704 0400212	4	0.2	6	12	55	6
ESR704 0400216	4	0.2	6	16	55	6
ESR704 0400220	4	0.2	6	20	60	6
ESR704 0400225	4	0.2	6	25	60	6
ESR704 0400310	4	0.3	6	10	55	6
ESR704 0400312	4	0.3	6	12	55	6
ESR704 0400316	4	0.3	6	16	55	6
ESR704 0400320	4	0.3	6	20	60	6
ESR704 0400325	4	0.3	6	25	60	6
ESR704 0400510	4	0.5	6	10	55	6
ESR704 0400512	4	0.5	6	12	55	6
ESR704 0400516	4	0.5	6	16	55	6
ESR704 0400520	4	0.5	6	20	60	6
ESR704 0400525	4	0.5	6	25	60	6
ESR704 0401010	4	1	6	10	55	6

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESR704 0401012	4	1	6	12	55	6
ESR704 0401016	4	1	6	16	55	6
ESR704 0401020	4	1	6	20	60	6
ESR704 0401025	4	1	6	25	60	6
ESR704 0600220	6	0.2	9	20	60	6
ESR704 0600320	6	0.3	9	20	60	6
ESR704 0600520	6	0.5	9	20	60	6
ESR704 0601020	6	1	9	20	60	6
ESR704 0601520	6	1.5	9	20	60	6
ESR704 0602020	6	2	9	20	60	6
ESR704 0800225	8	0.2	12	25	60	8
ESR704 0800325	8	0.3	12	25	60	8
ESR704 0800525	8	0.5	12	25	60	8
ESR704 0801025	8	1	12	25	60	8
ESR704 0801525	8	1.5	12	25	60	8
ESR704 0802025	8	2	12	25	60	8
ESR704 1000232	10	0.2	15	32	70	10
ESR704 1000332	10	0.3	15	32	70	10
ESR704 1000532	10	0.5	15	32	70	10
ESR704 1001032	10	1	15	32	70	10
ESR704 1001532	10	1.5	15	32	70	10
ESR704 1002032	10	2	15	32	70	10
ESR704 1200338	12	0.3	18	38	80	12
ESR704 1200538	12	0.5	18	38	80	12
ESR704 1201038	12	1	18	38	80	12
ESR704 1201538	12	1.5	18	38	80	12
ESR704 1202038	12	2	18	38	80	12

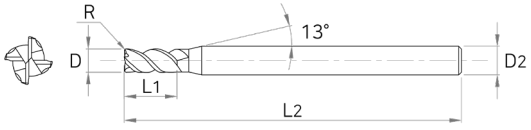
■ Applicable Working Material

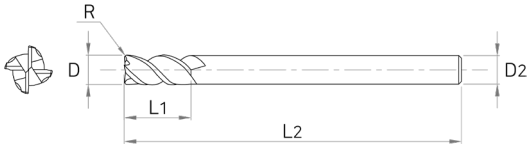
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESR714 | 4 FLUTES RADIUS ENDMILL







■ Tolerance

D		Shank Dia
~D6	0~-0.012	h5
D8~12	0~-0.015	

CARBIDE | AlTiN | 4 | 45° HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.592

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
ESR714 0303	3	0.3	8	50	6
ESR714 0305S4	3	0.5	8	50	4
ESR714 0305	3	0.5	8	50	6
ESR714 0403	4	0.3	11	50	6
ESR714 0405	4	0.5	11	50	6
ESR714 0405S4	4	0.5	11	50	4
ESR714 0410	4	1	11	50	6
ESR714 0603	6	0.3	15	60	6
ESR714 0605	6	0.5	15	60	6
ESR714 0610	6	1	15	60	6
ESR714 0803	8	0.3	20	60	8
ESR714 0805	8	0.5	20	60	8
ESR714 0810	8	1	20	60	8
ESR714 0815	8	1.5	20	60	8
ESR714 0820	8	2	20	60	8

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
ESR714 1003	10	0.3	25	70	10
ESR714 1005	10	0.5	25	70	10
ESR714 1010	10	1	25	70	10
ESR714 1015	10	1.5	25	70	10
ESR714 1020	10	2	25	70	10
ESR714 1025	10	2.5	25	70	10
ESR714 1030	10	3	25	70	10
ESR714 1203	12	0.3	30	80	12
ESR714 1205	12	0.5	30	80	12
ESR714 1210	12	1	30	80	12
ESR714 1215	12	1.5	30	80	12
ESR714 1220	12	2	30	80	12
ESR714 1225	12	2.5	30	80	12
ESR714 1230	12	3	30	80	12

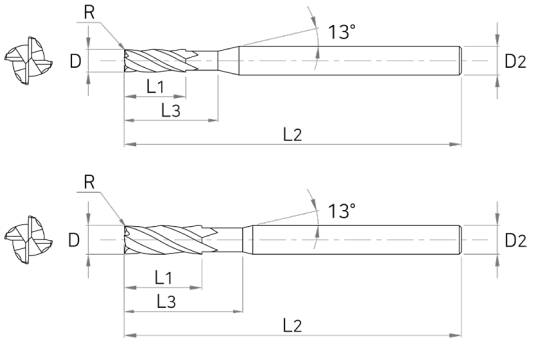
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESR724 | 4 FLUTES NECK RADIUS ENDMILL





■ Tolerance

D		Shank Dia
~D6	0 ~ -0.012	h5
D8 ~ 12	0 ~ -0.015	

CARBIDE | AlTiN | 4 | 30° HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.592

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESR724 0600520	6	0.5	9	20	90	6
ESR724 0601020	6	1	9	20	90	6
ESR724 0800525	8	0.5	12	25	100	8
ESR724 0801025	8	1	12	25	100	8
ESR724 1000532	10	0.5	15	32	100	10
ESR724 1001032	10	1	15	32	100	10
ESR724 1002032	10	2	15	32	100	10
ESR724 1200538	12	0.5	18	38	110	12
ESR724 1201038	12	1	18	38	110	12
ESR724 1202038	12	2	18	38	110	12

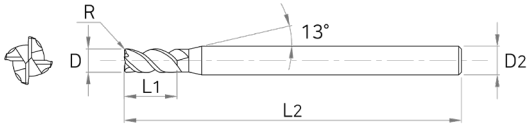
■ Applicable Working Material

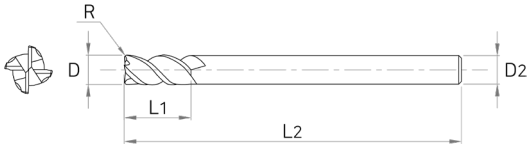
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESR734 | 4 FLUTES LONG SHANK RADIUS ENDMILL







■ Tolerance

D		Shank Dia
~D6	0~-0.012	h5
D8~12	0~-0.015	

CARBIDE | AlTiN | 4 | 30° HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.592

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
ESR734 01001	1	0.1	2	50	6
ESR734 01002	1	0.2	2	50	6
ESR734 01003	1	0.3	2	50	6
ESR734 01501	1.5	0.1	3	50	6
ESR734 01502	1.5	0.2	3	50	6
ESR734 01503	1.5	0.3	3	50	6
ESR734 01505	1.5	0.5	3	50	6
ESR734 02001	2	0.1	5	50	6
ESR734 02002	2	0.2	5	50	6
ESR734 02003	2	0.3	5	50	6
ESR734 02005	2	0.5	5	50	6
ESR734 02501	2.5	0.1	7	60	6
ESR734 02502	2.5	0.2	7	60	6
ESR734 02503	2.5	0.3	7	60	6
ESR734 02505	2.5	0.5	7	60	6
ESR734 03001	3	0.1	8	60	6
ESR734 03002	3	0.2	8	60	6
ESR734 03003	3	0.3	8	60	6
ESR734 03005	3	0.5	8	60	6
ESR734 04001	4	0.1	10	70	6
ESR734 04002	4	0.2	10	70	6
ESR734 04002S4	4	0.2	10	70	4
ESR734 04003	4	0.3	10	70	6
ESR734 04005	4	0.5	10	70	6

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
ESR734 04005S4	4	0.5	10	70	4
ESR734 04010	4	1	10	70	6
ESR734 05001	5	0.1	13	80	6
ESR734 05002	5	0.2	13	80	6
ESR734 05003	5	0.3	13	80	6
ESR734 05005	5	0.5	13	80	6
ESR734 05010	5	1	13	80	6
ESR734 06001	6	0.1	15	90	6
ESR734 06002	6	0.2	15	90	6
ESR734 06003	6	0.3	15	90	6
ESR734 06005	6	0.5	15	90	6
ESR734 06010	6	1	15	90	6
ESR734 08001	8	0.1	20	100	8
ESR734 08002	8	0.2	20	100	8
ESR734 08003	8	0.3	20	100	8
ESR734 08005	8	0.5	20	100	8
ESR734 08010	8	1	20	100	8
ESR734 08020	8	2	20	100	8
ESR734 10002	10	0.2	25	100	10
ESR734 10003	10	0.3	25	100	10
ESR734 10005	10	0.5	25	100	10
ESR734 10010	10	1	25	100	10
ESR734 10020	10	2	25	100	10
ESR734 12002	12	0.2	30	110	12

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESR734 | 4 FLUTES LONG SHANK RADIUS ENDMILL

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
ESR734 12003	12	0.3	30	110	12
ESR734 12005	12	0.5	30	110	12
ESR734 12010	12	1	30	110	12

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
ESR734 12010L	12	1	30	150	12
ESR734 12020	12	2	30	110	12

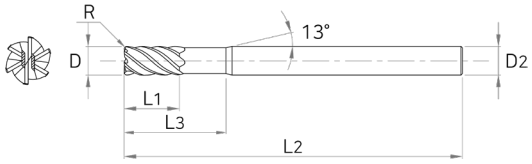
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESR706 | 6 FLUTES NECK RADIUS ENDMILL





■ Tolerance

D		Shank Dia
~D6	0~-0.012	h5
D8~12	0~-0.015	

CARBIDE | AlTiN | 6 | 45° HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.592

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESR706 0600314	6	0.3	6	14	50	6
ESR706 0600514	6	0.5	6	14	50	6
ESR706 0800524	8	0.5	8	24	60	8
ESR706 0801024	8	1	8	24	60	8
ESR706 1000530	10	0.5	10	30	70	10
ESR706 1001030	10	1	10	30	70	10
ESR706 1200530	12	0.5	12	30	75	12
ESR706 1201030	12	1	12	30	75	12

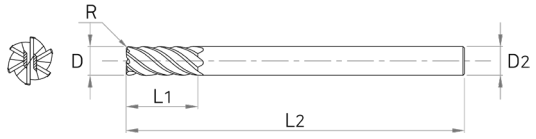
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESR736 | 6 FLUTES RADIUS ENDMILL





■ Tolerance

D		Shank Dia
~D6	0 ~ -0.012	h5
D8 ~ 12	0 ~ -0.015	

CARBIDE | AlTiN | 6 | 45° HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.580

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
ESR736 06005	6	0.5	15	90	6
ESR736 06010	6	1	15	90	6
ESR736 08005	8	0.5	20	100	8
ESR736 08010	8	1	20	100	8
ESR736 10005	10	0.5	25	100	10
ESR736 10010	10	1	25	100	10
ESR736 12005	12	0.5	30	110	12
ESR736 12010	12	1	30	110	12

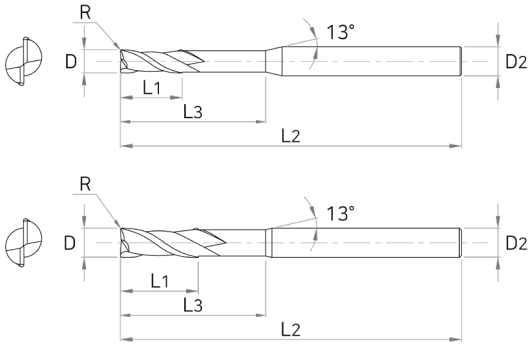
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESRR712 | 2 FLUTES RIB RADIUS ENDMILL





■ Tolerance

D		Shank Dia
~D6	0~-0.012	h5
D8~16	0~-0.015	

CARBIDE | AlTiN | 2 | 30° HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.593

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESRR712 002002005	0.2	0.02	0.2	0.5	40	4
ESRR712 00200201	0.2	0.02	0.2	1	40	4
ESRR712 002002015	0.2	0.02	0.2	1.5	40	4
ESRR712 002005005	0.2	0.05	0.2	0.5	40	4
ESRR712 00200501	0.2	0.05	0.2	1	40	4
ESRR712 002005015	0.2	0.05	0.2	1.5	40	4
ESRR712 00300201	0.3	0.02	0.3	1	40	4
ESRR712 00300202	0.3	0.02	0.3	2	40	4
ESRR712 00300203	0.3	0.02	0.3	3	40	4
ESRR712 00300501	0.3	0.05	0.3	1	40	4
ESRR712 00300502	0.3	0.05	0.3	2	40	4
ESRR712 00300503	0.3	0.05	0.3	3	40	4
ESRR712 00400201	0.4	0.02	0.4	1	40	4
ESRR712 00400202	0.4	0.02	0.4	2	40	4
ESRR712 00400203	0.4	0.02	0.4	3	40	4
ESRR712 00400204	0.4	0.02	0.4	4	40	4
ESRR712 00400501	0.4	0.05	0.4	1	40	4
ESRR712 00400502	0.4	0.05	0.4	2	40	4
ESRR712 00400503	0.4	0.05	0.4	3	40	4
ESRR712 00400504	0.4	0.05	0.4	4	40	4
ESRR712 00401001	0.4	0.1	0.4	1	40	4
ESRR712 004010015	0.4	0.1	0.4	1.5	40	4
ESRR712 00401002	0.4	0.1	0.4	2	40	4
ESRR712 00401003	0.4	0.1	0.4	3	40	4

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESRR712 00401004	0.4	0.1	0.4	4	40	4
ESRR712 00500201	0.5	0.02	0.5	1	45	4
ESRR712 005002015	0.5	0.02	0.5	1.5	45	4
ESRR712 00500202	0.5	0.02	0.5	2	45	4
ESRR712 005002025	0.5	0.02	0.5	2.5	45	4
ESRR712 00500203	0.5	0.02	0.5	3	45	4
ESRR712 00500204	0.5	0.02	0.5	4	45	4
ESRR712 00500205	0.5	0.02	0.5	5	45	4
ESRR712 00500206	0.5	0.02	0.5	6	45	4
ESRR712 00500208	0.5	0.02	0.5	8	45	4
ESRR712 00500210	0.5	0.02	0.5	10	45	4
ESRR712 00500501	0.5	0.05	0.5	1	45	4
ESRR712 005005015	0.5	0.05	0.5	1.5	45	4
ESRR712 00500502	0.5	0.05	0.5	2	45	4
ESRR712 005005025	0.5	0.05	0.5	2.5	45	4
ESRR712 00500503	0.5	0.05	0.5	3	45	4
ESRR712 00500504	0.5	0.05	0.5	4	45	4
ESRR712 00500505	0.5	0.05	0.5	5	45	4
ESRR712 00500506	0.5	0.05	0.5	6	45	4
ESRR712 00500508	0.5	0.05	0.5	8	45	4
ESRR712 00500510	0.5	0.05	0.5	10	45	4
ESRR712 00501001	0.5	0.1	0.5	1	45	4
ESRR712 005010015	0.5	0.1	0.5	1.5	45	4
ESRR712 00501002	0.5	0.1	0.5	2	45	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESRR712 | 2 FLUTES RIB RADIUS ENDMILL

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESRR712 005010025	0.5	0.1	0.5	2.5	45	4
ESRR712 00501003	0.5	0.1	0.5	3	45	4
ESRR712 00501004	0.5	0.1	0.5	4	45	4
ESRR712 00501005	0.5	0.1	0.5	5	45	4
ESRR712 00501006	0.5	0.1	0.5	6	45	4
ESRR712 00501008	0.5	0.1	0.5	8	45	4
ESRR712 00501010	0.5	0.1	0.5	10	45	4
ESRR712 00600202	0.6	0.02	0.6	2	45	4
ESRR712 00600203	0.6	0.02	0.6	3	45	4
ESRR712 00600204	0.6	0.02	0.6	4	45	4
ESRR712 00600206	0.6	0.02	0.6	6	45	4
ESRR712 00600208	0.6	0.02	0.6	8	45	4
ESRR712 00600210	0.6	0.02	0.6	10	45	4
ESRR712 00600212	0.6	0.02	0.6	12	50	4
ESRR712 00600502	0.6	0.05	0.6	2	45	4
ESRR712 00600503	0.6	0.05	0.6	3	45	4
ESRR712 00600504	0.6	0.05	0.6	4	45	4
ESRR712 00600506	0.6	0.05	0.6	6	45	4
ESRR712 00600508	0.6	0.05	0.6	8	45	4
ESRR712 00600510	0.6	0.05	0.6	10	45	4
ESRR712 00600512	0.6	0.05	0.6	12	50	4
ESRR712 00601002	0.6	0.1	0.6	2	45	4
ESRR712 00601003	0.6	0.1	0.6	3	45	4
ESRR712 00601004	0.6	0.1	0.6	4	45	4
ESRR712 00601006	0.6	0.1	0.6	6	45	4
ESRR712 00601008	0.6	0.1	0.6	8	45	4
ESRR712 00601010	0.6	0.1	0.6	10	45	4
ESRR712 00601012	0.6	0.1	0.6	12	50	4
ESRR712 00701002	0.7	0.1	0.7	2	45	4
ESRR712 00701004	0.7	0.1	0.7	4	45	4
ESRR712 00701006	0.7	0.1	0.7	6	45	4
ESRR712 00701008	0.7	0.1	0.7	8	45	4
ESRR712 00701010	0.7	0.1	0.7	10	45	4
ESRR712 00800202	0.8	0.02	0.8	2	45	4
ESRR712 00800204	0.8	0.02	0.8	4	45	4
ESRR712 00800206	0.8	0.02	0.8	6	45	4
ESRR712 00800208	0.8	0.02	0.8	8	45	4
ESRR712 00800210	0.8	0.02	0.8	10	45	4
ESRR712 00800212	0.8	0.02	0.8	12	50	4
ESRR712 00800502	0.8	0.05	0.8	2	45	4
ESRR712 00800504	0.8	0.05	0.8	4	45	4

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESRR712 00800506	0.8	0.05	0.8	6	45	4
ESRR712 00800508	0.8	0.05	0.8	8	45	4
ESRR712 00800510	0.8	0.05	0.8	10	45	4
ESRR712 00800512	0.8	0.05	0.8	12	50	4
ESRR712 00801002	0.8	0.1	0.8	2	45	4
ESRR712 00801004	0.8	0.1	0.8	4	45	4
ESRR712 00801006	0.8	0.1	0.8	6	45	4
ESRR712 00801008	0.8	0.1	0.8	8	45	4
ESRR712 00801010	0.8	0.1	0.8	10	45	4
ESRR712 00801012	0.8	0.1	0.8	12	50	4
ESRR712 00802002	0.8	0.2	0.8	2	45	4
ESRR712 00802004	0.8	0.2	0.8	4	45	4
ESRR712 00802006	0.8	0.2	0.8	6	45	4
ESRR712 00802008	0.8	0.2	0.8	8	45	4
ESRR712 00802010	0.8	0.2	0.8	10	45	4
ESRR712 00802012	0.8	0.2	0.8	12	50	4
ESRR712 01000204	1	0.02	1	4	45	4
ESRR712 01000206	1	0.02	1	6	45	4
ESRR712 01000208	1	0.02	1	8	45	4
ESRR712 01000210	1	0.02	1	10	50	4
ESRR712 01000212	1	0.02	1	12	50	4
ESRR712 01000214	1	0.02	1	14	50	4
ESRR712 01000216	1	0.02	1	16	50	4
ESRR712 01000220	1	0.02	1	20	50	4
ESRR712 01000504	1	0.05	1	4	45	4
ESRR712 01000506	1	0.05	1	6	45	4
ESRR712 01000508	1	0.05	1	8	45	4
ESRR712 01000510	1	0.05	1	10	50	4
ESRR712 01000512	1	0.05	1	12	50	4
ESRR712 01000514	1	0.05	1	14	50	4
ESRR712 01000516	1	0.05	1	16	50	4
ESRR712 01000520	1	0.05	1	20	50	4
ESRR712 01001004	1	0.1	1	4	45	4
ESRR712 01001006	1	0.1	1	6	45	4
ESRR712 01001008	1	0.1	1	8	45	4
ESRR712 01001010	1	0.1	1	10	50	4
ESRR712 01001012	1	0.1	1	12	50	4
ESRR712 01001014	1	0.1	1	14	50	4
ESRR712 01001016	1	0.1	1	16	50	4
ESRR712 01001020	1	0.1	1	20	50	4
ESRR712 01002004	1	0.2	1	4	45	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESRR712 | 2 FLUTES RIB RADIUS ENDMILL

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESRR712 01002006	1	0.2	1	6	45	4
ESRR712 01002008	1	0.2	1	8	45	4
ESRR712 01002010	1	0.2	1	10	50	4
ESRR712 01002012	1	0.2	1	12	50	4
ESRR712 01002014	1	0.2	1	14	50	4
ESRR712 01002016	1	0.2	1	16	50	4
ESRR712 01002020	1	0.2	1	20	50	4
ESRR712 01003004	1	0.3	1	4	45	4
ESRR712 01003006	1	0.3	1	6	45	4
ESRR712 01003008	1	0.3	1	8	45	4
ESRR712 01003010	1	0.3	1	10	50	4
ESRR712 01003012	1	0.3	1	12	50	4
ESRR712 01003014	1	0.3	1	14	50	4
ESRR712 01003016	1	0.3	1	16	50	4
ESRR712 01003020	1	0.3	1	20	50	4
ESRR712 01200204	1.2	0.02	1.2	4	45	4
ESRR712 01200206	1.2	0.02	1.2	6	45	4
ESRR712 01200208	1.2	0.02	1.2	8	45	4
ESRR712 01200210	1.2	0.02	1.2	10	50	4
ESRR712 01200212	1.2	0.02	1.2	12	50	4
ESRR712 01200214	1.2	0.02	1.2	14	50	4
ESRR712 01200216	1.2	0.02	1.2	16	50	4
ESRR712 01200220	1.2	0.02	1.2	20	50	4
ESRR712 01200504	1.2	0.05	1.2	4	45	4
ESRR712 01200506	1.2	0.05	1.2	6	45	4
ESRR712 01200508	1.2	0.05	1.2	8	45	4
ESRR712 01200510	1.2	0.05	1.2	10	50	4
ESRR712 01200512	1.2	0.05	1.2	12	50	4
ESRR712 01200514	1.2	0.05	1.2	14	50	4
ESRR712 01200516	1.2	0.05	1.2	16	50	4
ESRR712 01200520	1.2	0.05	1.2	20	50	4
ESRR712 01201004	1.2	0.1	1.2	4	45	4
ESRR712 01201006	1.2	0.1	1.2	6	45	4
ESRR712 01201008	1.2	0.1	1.2	8	45	4
ESRR712 01201010	1.2	0.1	1.2	10	50	4
ESRR712 01201012	1.2	0.1	1.2	12	50	4
ESRR712 01201014	1.2	0.1	1.2	14	50	4
ESRR712 01201016	1.2	0.1	1.2	16	50	4
ESRR712 01201020	1.2	0.1	1.2	20	50	4
ESRR712 01202004	1.2	0.2	1.2	4	45	4
ESRR712 01202006	1.2	0.2	1.2	6	45	4

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESRR712 01202008	1.2	0.2	1.2	8	45	4
ESRR712 01202010	1.2	0.2	1.2	10	50	4
ESRR712 01202012	1.2	0.2	1.2	12	50	4
ESRR712 01202014	1.2	0.2	1.2	14	50	4
ESRR712 01202016	1.2	0.2	1.2	16	50	4
ESRR712 01202020	1.2	0.2	1.2	20	50	4
ESRR712 01203004	1.2	0.3	1.2	4	45	4
ESRR712 01203006	1.2	0.3	1.2	6	45	4
ESRR712 01203008	1.2	0.3	1.2	8	45	4
ESRR712 01203010	1.2	0.3	1.2	10	50	4
ESRR712 01203012	1.2	0.3	1.2	12	50	4
ESRR712 01203014	1.2	0.3	1.2	14	50	4
ESRR712 01203016	1.2	0.3	1.2	16	50	4
ESRR712 01203020	1.2	0.3	1.2	20	50	4
ESRR712 01500204	1.5	0.02	1.5	4	45	4
ESRR712 01500206	1.5	0.02	1.5	6	45	4
ESRR712 01500208	1.5	0.02	1.5	8	45	4
ESRR712 01500210	1.5	0.02	1.5	10	50	4
ESRR712 01500212	1.5	0.02	1.5	12	50	4
ESRR712 01500214	1.5	0.02	1.5	14	50	4
ESRR712 01500216	1.5	0.02	1.5	16	50	4
ESRR712 01500220	1.5	0.02	1.5	20	50	4
ESRR712 01500504	1.5	0.05	1.5	4	45	4
ESRR712 01500506	1.5	0.05	1.5	6	45	4
ESRR712 01500508	1.5	0.05	1.5	8	45	4
ESRR712 01500510	1.5	0.05	1.5	10	50	4
ESRR712 01500512	1.5	0.05	1.5	12	50	4
ESRR712 01500514	1.5	0.05	1.5	14	50	4
ESRR712 01500516	1.5	0.05	1.5	16	50	4
ESRR712 01500520	1.5	0.05	1.5	20	50	4
ESRR712 01501004	1.5	0.1	1.5	4	45	4
ESRR712 01501006	1.5	0.1	1.5	6	45	4
ESRR712 01501008	1.5	0.1	1.5	8	45	4
ESRR712 01501010	1.5	0.1	1.5	10	50	4
ESRR712 01501012	1.5	0.1	1.5	12	50	4
ESRR712 01501014	1.5	0.1	1.5	14	50	4
ESRR712 01501016	1.5	0.1	1.5	16	50	4
ESRR712 01501020	1.5	0.1	1.5	20	50	4
ESRR712 01502004	1.5	0.2	1.5	4	45	4
ESRR712 01502006	1.5	0.2	1.5	6	45	4
ESRR712 01502008	1.5	0.2	1.5	8	45	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESRR712 | 2 FLUTES RIB RADIUS ENDMILL

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESRR712 01502010	1.5	0.2	1.5	10	50	4
ESRR712 01502012	1.5	0.2	1.5	12	50	4
ESRR712 01502014	1.5	0.2	1.5	14	50	4
ESRR712 01502016	1.5	0.2	1.5	16	50	4
ESRR712 01502020	1.5	0.2	1.5	20	50	4
ESRR712 01503004	1.5	0.3	1.5	4	45	4
ESRR712 01503006	1.5	0.3	1.5	6	45	4
ESRR712 01503008	1.5	0.3	1.5	8	45	4
ESRR712 01503010	1.5	0.3	1.5	10	50	4
ESRR712 01503012	1.5	0.3	1.5	12	50	4
ESRR712 01503014	1.5	0.3	1.5	14	50	4
ESRR712 01503016	1.5	0.3	1.5	16	50	4
ESRR712 01503020	1.5	0.3	1.5	20	50	4
ESRR712 01505004	1.5	0.5	1.5	4	45	4
ESRR712 01505006	1.5	0.5	1.5	6	45	4
ESRR712 01505008	1.5	0.5	1.5	8	45	4
ESRR712 01505010	1.5	0.5	1.5	10	50	4
ESRR712 01505012	1.5	0.5	1.5	12	50	4
ESRR712 01505014	1.5	0.5	1.5	14	50	4
ESRR712 01505016	1.5	0.5	1.5	16	50	4
ESRR712 01505020	1.5	0.5	1.5	20	50	4
ESRR712 02000206	2	0.02	2	6	45	4
ESRR712 02000208	2	0.02	2	8	45	4
ESRR712 02000210	2	0.02	2	10	50	4
ESRR712 02000212	2	0.02	2	12	50	4
ESRR712 02000214	2	0.02	2	14	50	4
ESRR712 02000216	2	0.02	2	16	50	4
ESRR712 02000220	2	0.02	2	20	50	4
ESRR712 02000225	2	0.02	2	25	60	4
ESRR712 02000506	2	0.05	2	6	45	4
ESRR712 02000508	2	0.05	2	8	45	4
ESRR712 02000510	2	0.05	2	10	50	4
ESRR712 02000512	2	0.05	2	12	50	4
ESRR712 02000514	2	0.05	2	14	50	4
ESRR712 02000516	2	0.05	2	16	50	4
ESRR712 02000520	2	0.05	2	20	50	4
ESRR712 02000525	2	0.05	2	25	60	4
ESRR712 02001006	2	0.1	2	6	45	4
ESRR712 02001008	2	0.1	2	8	45	4
ESRR712 02001010	2	0.1	2	10	50	4
ESRR712 02001012	2	0.1	2	12	50	4

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESRR712 02001014	2	0.1	2	14	50	4
ESRR712 02001016	2	0.1	2	16	50	4
ESRR712 02001020	2	0.1	2	20	50	4
ESRR712 02001025	2	0.1	2	25	60	4
ESRR712 02001030	2	0.1	2	30	70	4
ESRR712 02002006	2	0.2	2	6	45	4
ESRR712 02002008	2	0.2	2	8	45	4
ESRR712 02002010	2	0.2	2	10	50	4
ESRR712 02002012	2	0.2	2	12	50	4
ESRR712 02002014	2	0.2	2	14	50	4
ESRR712 02002016	2	0.2	2	16	50	4
ESRR712 02002020	2	0.2	2	20	50	4
ESRR712 02002025	2	0.2	2	25	60	4
ESRR712 02002030	2	0.2	2	30	70	4
ESRR712 02003006	2	0.3	2	6	45	4
ESRR712 02003008	2	0.3	2	8	45	4
ESRR712 02003010	2	0.3	2	10	50	4
ESRR712 02003012	2	0.3	2	12	50	4
ESRR712 02003014	2	0.3	2	14	50	4
ESRR712 02003016	2	0.3	2	16	50	4
ESRR712 02003020	2	0.3	2	20	50	4
ESRR712 02003025	2	0.3	2	25	60	4
ESRR712 02003030	2	0.3	2	30	70	4
ESRR712 02005006	2	0.5	2	6	45	4
ESRR712 02005008	2	0.5	2	8	45	4
ESRR712 02005010	2	0.5	2	10	50	4
ESRR712 02005012	2	0.5	2	12	50	4
ESRR712 02005014	2	0.5	2	14	50	4
ESRR712 02005016	2	0.5	2	16	50	4
ESRR712 02005020	2	0.5	2	20	50	4
ESRR712 02005025	2	0.5	2	25	60	4
ESRR712 02005030	2	0.5	2	30	70	4
ESRR712 02501010	2.5	0.1	2.5	10	50	4
ESRR712 02501016	2.5	0.1	2.5	16	50	4
ESRR712 02501020	2.5	0.1	2.5	20	50	4
ESRR712 02501025	2.5	0.1	2.5	25	60	4
ESRR712 02501030	2.5	0.1	2.5	30	70	4
ESRR712 02502010	2.5	0.2	2.5	10	50	4
ESRR712 02502016	2.5	0.2	2.5	16	50	4
ESRR712 02502020	2.5	0.2	2.5	20	50	4
ESRR712 02503010	2.5	0.3	2.5	10	50	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESRR712 | 2 FLUTES RIB RADIUS ENDMILL

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESRR712 02503016	2.5	0.3	2.5	16	50	4
ESRR712 02503020	2.5	0.3	2.5	20	50	4
ESRR712 02505010	2.5	0.5	2.5	10	50	4
ESRR712 02505016	2.5	0.5	2.5	16	50	4
ESRR712 02505020	2.5	0.5	2.5	20	50	4
ESRR712 03001010	3	0.1	3	10	50	6
ESRR712 03001012	3	0.1	3	12	50	6
ESRR712 03001016	3	0.1	3	16	55	6
ESRR712 03001020	3	0.1	3	20	60	6
ESRR712 03001025	3	0.1	3	25	65	6
ESRR712 03001030	3	0.1	3	30	70	6
ESRR712 03001035	3	0.1	3	35	75	6
ESRR712 03001040	3	0.1	3	40	80	6
ESRR712 03002010	3	0.2	3	10	50	6
ESRR712 03002012	3	0.2	3	12	50	6
ESRR712 03002016	3	0.2	3	16	55	6
ESRR712 03002020	3	0.2	3	20	60	6
ESRR712 03002025	3	0.2	3	25	65	6
ESRR712 03002030	3	0.2	3	30	70	6
ESRR712 03002035	3	0.2	3	35	75	6
ESRR712 03002040	3	0.2	3	40	80	6
ESRR712 03003010	3	0.3	3	10	50	6
ESRR712 03003012	3	0.3	3	12	50	6
ESRR712 03003016	3	0.3	3	16	55	6
ESRR712 03003020	3	0.3	3	20	60	6
ESRR712 03003025	3	0.3	3	25	65	6
ESRR712 03003030	3	0.3	3	30	70	6
ESRR712 03003035	3	0.3	3	35	75	6
ESRR712 03003040	3	0.3	3	40	80	6
ESRR712 03005010	3	0.5	3	10	50	6
ESRR712 03005012	3	0.5	3	12	50	6
ESRR712 03005016	3	0.5	3	16	55	6
ESRR712 03005020	3	0.5	3	20	60	6
ESRR712 03005025	3	0.5	3	25	65	6
ESRR712 03005030	3	0.5	3	30	70	6
ESRR712 03005035	3	0.5	3	35	75	6
ESRR712 03005040	3	0.5	3	40	80	6
ESRR712 03010010	3	1	3	10	50	6
ESRR712 03010012	3	1	3	12	50	6
ESRR712 03010016	3	1	3	16	55	6
ESRR712 03010020	3	1	3	20	60	6

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESRR712 03010025	3	1	3	25	65	6
ESRR712 03010030	3	1	3	30	70	6
ESRR712 03010035	3	1	3	35	75	6
ESRR712 03010040	3	1	3	40	80	6
ESRR712 04001012	4	0.1	4	12	50	6
ESRR712 04001016	4	0.1	4	16	55	6
ESRR712 04001020	4	0.1	4	20	60	6
ESRR712 04001025	4	0.1	4	25	65	6
ESRR712 04001030	4	0.1	4	30	70	6
ESRR712 04001035	4	0.1	4	35	75	6
ESRR712 04001040	4	0.1	4	40	80	6
ESRR712 04002012	4	0.2	4	12	50	6
ESRR712 04002016	4	0.2	4	16	55	6
ESRR712 04002020	4	0.2	4	20	60	6
ESRR712 04002025	4	0.2	4	25	65	6
ESRR712 04002030	4	0.2	4	30	70	6
ESRR712 04002035	4	0.2	4	35	75	6
ESRR712 04002040	4	0.2	4	40	80	6
ESRR712 04003012	4	0.3	4	12	50	6
ESRR712 04003016	4	0.3	4	16	55	6
ESRR712 04003020	4	0.3	4	20	60	6
ESRR712 04003025	4	0.3	4	25	65	6
ESRR712 04003030	4	0.3	4	30	70	6
ESRR712 04003035	4	0.3	4	35	75	6
ESRR712 04003040	4	0.3	4	40	80	6
ESRR712 04005012	4	0.5	4	12	50	6
ESRR712 04005016	4	0.5	4	16	55	6
ESRR712 04005020	4	0.5	4	20	60	6
ESRR712 04005025	4	0.5	4	25	65	6
ESRR712 04005030	4	0.5	4	30	70	6
ESRR712 04005035	4	0.5	4	35	75	6
ESRR712 04005040	4	0.5	4	40	80	6
ESRR712 04010012	4	1	4	12	50	6
ESRR712 04010016	4	1	4	16	55	6
ESRR712 04010020	4	1	4	20	60	6
ESRR712 04010025	4	1	4	25	65	6
ESRR712 04010030	4	1	4	30	70	6
ESRR712 04010035	4	1	4	35	75	6
ESRR712 04010040	4	1	4	40	80	6
ESRR712 05002015	5	0.2	6	15	60	6
ESRR712 05002025	5	0.2	6	25	70	6

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESRR712 | 2 FLUTES RIB RADIUS ENDMILL

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESRR712 05002030	5	0.2	6	30	70	6
ESRR712 05002040	5	0.2	6	40	80	6
ESRR712 05005015	5	0.5	6	15	60	6
ESRR712 05005025	5	0.5	6	25	70	6
ESRR712 05005030	5	0.5	6	30	70	6
ESRR712 05005040	5	0.5	6	40	80	6
ESRR712 05010015	5	1	6	15	60	6
ESRR712 05010025	5	1	6	25	70	6
ESRR712 05010030	5	1	6	30	70	6
ESRR712 05010040	5	1	6	40	80	6
ESRR712 06001020	6	0.1	7	20	60	6
ESRR712 06001040	6	0.1	7	40	80	6
ESRR712 06002020	6	0.2	7	20	60	6
ESRR712 06002040	6	0.2	7	40	80	6
ESRR712 06003020	6	0.3	7	20	60	6
ESRR712 06003040	6	0.3	7	40	80	6
ESRR712 06005020	6	0.5	7	20	60	6
ESRR712 06005040	6	0.5	7	40	80	6
ESRR712 06010020	6	1	7	20	60	6
ESRR712 06010040	6	1	7	40	80	6
ESRR712 06015020	6	1.5	7	20	60	6

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESRR712 06015040	6	1.5	7	40	80	6
ESRR712 08002022	8	0.2	9	22	65	8
ESRR712 08003022	8	0.3	9	22	65	8
ESRR712 08005022	8	0.5	9	22	65	8
ESRR712 08010022	8	1	9	22	65	8
ESRR712 08015022	8	1.5	9	22	65	8
ESRR712 10002024	10	0.2	11	24	70	10
ESRR712 10003024	10	0.3	11	24	70	10
ESRR712 10005024	10	0.5	11	24	70	10
ESRR712 10010024	10	1	11	24	70	10
ESRR712 10015024	10	1.5	11	24	70	10
ESRR712 10020024	10	2	11	24	70	10
ESRR712 12002026	12	0.2	13	26	80	12
ESRR712 12003026	12	0.3	13	26	80	12
ESRR712 12005026	12	0.5	13	26	80	12
ESRR712 12010026	12	1	13	26	80	12
ESRR712 12015026	12	1.5	13	26	80	12
ESRR712 12020026	12	2	13	26	80	12
ESRR712 12030026	12	3	13	26	80	12
ESRR712 16005035	16	0.5	20	35	110	16
ESRR712 16010035	16	1	20	35	110	16

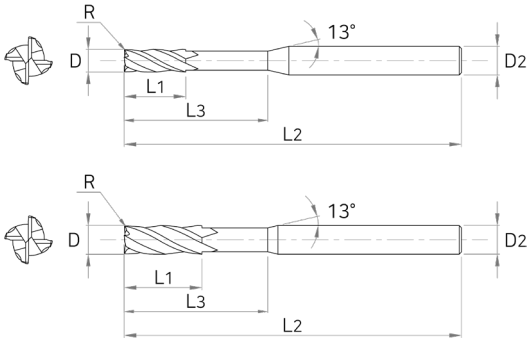
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESRR714 | 4 FLUTES RIB RADIUS ENDMILL





■ Tolerance

D		Shank Dia
~D6	0~-0.012	h5
D8~20	0~-0.015	

CARBIDE | AlTiN | 4 | 30° HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.603

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESRR714 00500502	0.5	0.05	0.5	2	45	4
ESRR714 00500504	0.5	0.05	0.5	4	45	4
ESRR714 00500506	0.5	0.05	0.5	6	45	4
ESRR714 00500508	0.5	0.05	0.5	8	45	4
ESRR714 00501002	0.5	0.1	0.5	2	45	4
ESRR714 00501004	0.5	0.1	0.5	4	45	4
ESRR714 00501006	0.5	0.1	0.5	6	45	4
ESRR714 00501008	0.5	0.1	0.5	8	45	4
ESRR714 00600502	0.6	0.05	0.6	2	45	4
ESRR714 00600504	0.6	0.05	0.6	4	45	4
ESRR714 00600506	0.6	0.05	0.6	6	45	4
ESRR714 00600508	0.6	0.05	0.6	8	45	4
ESRR714 00601002	0.6	0.1	0.6	2	45	4
ESRR714 00601004	0.6	0.1	0.6	4	45	4
ESRR714 00601006	0.6	0.1	0.6	6	45	4
ESRR714 00601008	0.6	0.1	0.6	8	45	4
ESRR714 00700502	0.7	0.05	0.7	2	45	4
ESRR714 00700504	0.7	0.05	0.7	4	45	4
ESRR714 00700506	0.7	0.05	0.7	6	45	4
ESRR714 00700508	0.7	0.05	0.7	8	45	4
ESRR714 00701002	0.7	0.1	0.7	2	45	4
ESRR714 00701004	0.7	0.1	0.7	4	45	4
ESRR714 00701006	0.7	0.1	0.7	6	45	4
ESRR714 00701008	0.7	0.1	0.7	8	45	4

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESRR714 00800202	0.8	0.02	0.8	2	45	4
ESRR714 00800204	0.8	0.02	0.8	4	45	4
ESRR714 00800206	0.8	0.02	0.8	6	45	4
ESRR714 00800208	0.8	0.02	0.8	8	45	4
ESRR714 00800210	0.8	0.02	0.8	10	45	4
ESRR714 00800212	0.8	0.02	0.8	12	50	4
ESRR714 00800502	0.8	0.05	0.8	2	45	4
ESRR714 00800504	0.8	0.05	0.8	4	45	4
ESRR714 00800506	0.8	0.05	0.8	6	45	4
ESRR714 00800508	0.8	0.05	0.8	8	45	4
ESRR714 00800510	0.8	0.05	0.8	10	45	4
ESRR714 00800512	0.8	0.05	0.8	12	50	4
ESRR714 00801002	0.8	0.1	0.8	2	45	4
ESRR714 00801004	0.8	0.1	0.8	4	45	4
ESRR714 00801006	0.8	0.1	0.8	6	45	4
ESRR714 00801008	0.8	0.1	0.8	8	45	4
ESRR714 00801010	0.8	0.1	0.8	10	45	4
ESRR714 00801012	0.8	0.1	0.8	12	50	4
ESRR714 01000204	1	0.02	1	4	45	4
ESRR714 01000206	1	0.02	1	6	45	4
ESRR714 01000208	1	0.02	1	8	45	4
ESRR714 01000210	1	0.02	1	10	50	4
ESRR714 01000212	1	0.02	1	12	50	4
ESRR714 01000214	1	0.02	1	14	50	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESRR714 | 4 FLUTES RIB RADIUS ENDMILL

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESRR714 01000216	1	0.02	1	16	50	4
ESRR714 01000220	1	0.02	1	20	50	4
ESRR714 01000503	1	0.05	1	3	45	4
ESRR714 01000504	1	0.05	1	4	45	4
ESRR714 01000506	1	0.05	1	6	45	4
ESRR714 01000508	1	0.05	1	8	45	4
ESRR714 01000510	1	0.05	1	10	50	4
ESRR714 01000512	1	0.05	1	12	50	4
ESRR714 01000514	1	0.05	1	14	50	4
ESRR714 01000516	1	0.05	1	16	50	4
ESRR714 01000520	1	0.05	1	20	50	4
ESRR714 01001003	1	0.1	1	3	45	4
ESRR714 01001004	1	0.1	1	4	45	4
ESRR714 01001006	1	0.1	1	6	45	4
ESRR714 01001008	1	0.1	1	8	45	4
ESRR714 01001010	1	0.1	1	10	50	4
ESRR714 01001012	1	0.1	1	12	50	4
ESRR714 01001014	1	0.1	1	14	50	4
ESRR714 01001016	1	0.1	1	16	50	4
ESRR714 01001020	1	0.1	1	20	50	4
ESRR714 01002003	1	0.2	1	3	45	4
ESRR714 01002004	1	0.2	1	4	45	4
ESRR714 01002006	1	0.2	1	6	45	4
ESRR714 01002008	1	0.2	1	8	45	4
ESRR714 01002010	1	0.2	1	10	50	4
ESRR714 01002012	1	0.2	1	12	50	4
ESRR714 01002014	1	0.2	1	14	50	4
ESRR714 01002016	1	0.2	1	16	50	4
ESRR714 01002020	1	0.2	1	20	50	4
ESRR714 01003003	1	0.3	1	3	45	4
ESRR714 01003004	1	0.3	1	4	45	4
ESRR714 01003006	1	0.3	1	6	45	4
ESRR714 01003008	1	0.3	1	8	45	4
ESRR714 01003010	1	0.3	1	10	50	4
ESRR714 01003012	1	0.3	1	12	50	4
ESRR714 01003014	1	0.3	1	14	50	4
ESRR714 01003016	1	0.3	1	16	50	4
ESRR714 01003020	1	0.3	1	20	50	4
ESRR714 01200204	1.2	0.02	1.2	4	45	4
ESRR714 01200206	1.2	0.02	1.2	6	45	4
ESRR714 01200208	1.2	0.02	1.2	8	45	4

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESRR714 01200210	1.2	0.02	1.2	10	50	4
ESRR714 01200212	1.2	0.02	1.2	12	50	4
ESRR714 01200214	1.2	0.02	1.2	14	50	4
ESRR714 01200216	1.2	0.02	1.2	16	50	4
ESRR714 01200220	1.2	0.02	1.2	20	50	4
ESRR714 01200503	1.2	0.05	1.2	3	45	4
ESRR714 01200504	1.2	0.05	1.2	4	45	4
ESRR714 01200506	1.2	0.05	1.2	6	45	4
ESRR714 01200508	1.2	0.05	1.2	8	45	4
ESRR714 01200510	1.2	0.05	1.2	10	50	4
ESRR714 01200512	1.2	0.05	1.2	12	50	4
ESRR714 01200514	1.2	0.05	1.2	14	50	4
ESRR714 01200516	1.2	0.05	1.2	16	50	4
ESRR714 01200520	1.2	0.05	1.2	20	50	4
ESRR714 01201003	1.2	0.1	1.2	3	45	4
ESRR714 01201004	1.2	0.1	1.2	4	45	4
ESRR714 01201006	1.2	0.1	1.2	6	45	4
ESRR714 01201008	1.2	0.1	1.2	8	45	4
ESRR714 01201010	1.2	0.1	1.2	10	50	4
ESRR714 01201012	1.2	0.1	1.2	12	50	4
ESRR714 01201014	1.2	0.1	1.2	14	50	4
ESRR714 01201016	1.2	0.1	1.2	16	50	4
ESRR714 01201020	1.2	0.1	1.2	20	50	4
ESRR714 01202003	1.2	0.2	1.2	3	45	4
ESRR714 01202004	1.2	0.2	1.2	4	45	4
ESRR714 01202006	1.2	0.2	1.2	6	45	4
ESRR714 01202008	1.2	0.2	1.2	8	45	4
ESRR714 01202010	1.2	0.2	1.2	10	50	4
ESRR714 01202012	1.2	0.2	1.2	12	50	4
ESRR714 01202014	1.2	0.2	1.2	14	50	4
ESRR714 01202016	1.2	0.2	1.2	16	50	4
ESRR714 01202020	1.2	0.2	1.2	20	50	4
ESRR714 01203003	1.2	0.3	1.2	3	45	4
ESRR714 01203004	1.2	0.3	1.2	4	45	4
ESRR714 01203006	1.2	0.3	1.2	6	45	4
ESRR714 01203008	1.2	0.3	1.2	8	45	4
ESRR714 01203010	1.2	0.3	1.2	10	50	4
ESRR714 01203012	1.2	0.3	1.2	12	50	4
ESRR714 01203016	1.2	0.3	1.2	16	50	4
ESRR714 01203020	1.2	0.3	1.2	20	50	4
ESRR714 01500206	1.5	0.02	1.5	6	45	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESRR714 | 4 FLUTES RIB RADIUS ENDMILL

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESRR714 01500208	1.5	0.02	1.5	8	45	4
ESRR714 01500210	1.5	0.02	1.5	10	50	4
ESRR714 01500212	1.5	0.02	1.5	12	50	4
ESRR714 01500214	1.5	0.02	1.5	14	50	4
ESRR714 01500216	1.5	0.02	1.5	16	50	4
ESRR714 01500220	1.5	0.02	1.5	20	50	4
ESRR714 01500222	1.5	0.02	1.5	22	60	4
ESRR714 01500504	1.5	0.05	1.5	4	45	4
ESRR714 01500506	1.5	0.05	1.5	6	45	4
ESRR714 01500508	1.5	0.05	1.5	8	45	4
ESRR714 01500510	1.5	0.05	1.5	10	50	4
ESRR714 01500512	1.5	0.05	1.5	12	50	4
ESRR714 01500514	1.5	0.05	1.5	14	50	4
ESRR714 01500516	1.5	0.05	1.5	16	50	4
ESRR714 01500520	1.5	0.05	1.5	20	50	4
ESRR714 01500522	1.5	0.05	1.5	22	60	4
ESRR714 01500526	1.5	0.05	1.5	26	60	4
ESRR714 01501004	1.5	0.1	1.5	4	45	4
ESRR714 01501006	1.5	0.1	1.5	6	45	4
ESRR714 01501008	1.5	0.1	1.5	8	45	4
ESRR714 01501010	1.5	0.1	1.5	10	50	4
ESRR714 01501012	1.5	0.1	1.5	12	50	4
ESRR714 01501014	1.5	0.1	1.5	14	50	4
ESRR714 01501016	1.5	0.1	1.5	16	50	4
ESRR714 01501020	1.5	0.1	1.5	20	50	4
ESRR714 01501022	1.5	0.1	1.5	22	60	4
ESRR714 01501026	1.5	0.1	1.5	26	60	4
ESRR714 01502004	1.5	0.2	1.5	4	45	4
ESRR714 01502006	1.5	0.2	1.5	6	45	4
ESRR714 01502008	1.5	0.2	1.5	8	45	4
ESRR714 01502010	1.5	0.2	1.5	10	50	4
ESRR714 01502012	1.5	0.2	1.5	12	50	4
ESRR714 01502014	1.5	0.2	1.5	14	50	4
ESRR714 01502016	1.5	0.2	1.5	16	50	4
ESRR714 01502020	1.5	0.2	1.5	20	50	4
ESRR714 01502022	1.5	0.2	1.5	22	60	4
ESRR714 01502025	1.5	0.2	1.5	25	60	4
ESRR714 01503004	1.5	0.3	1.5	4	45	4
ESRR714 01503006	1.5	0.3	1.5	6	45	4
ESRR714 01503008	1.5	0.3	1.5	8	45	4
ESRR714 01503010	1.5	0.3	1.5	10	50	4

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESRR714 01503012	1.5	0.3	1.5	12	50	4
ESRR714 01503014	1.5	0.3	1.5	14	50	4
ESRR714 01503016	1.5	0.3	1.5	16	50	4
ESRR714 01503020	1.5	0.3	1.5	20	50	4
ESRR714 01503022	1.5	0.3	1.5	22	60	4
ESRR714 01503025	1.5	0.3	1.5	25	60	4
ESRR714 01505004	1.5	0.5	1.5	4	45	4
ESRR714 01505006	1.5	0.5	1.5	6	45	4
ESRR714 01505008	1.5	0.5	1.5	8	45	4
ESRR714 01505010	1.5	0.5	1.5	10	50	4
ESRR714 01505012	1.5	0.5	1.5	12	50	4
ESRR714 01505014	1.5	0.5	1.5	14	50	4
ESRR714 01505016	1.5	0.5	1.5	16	50	4
ESRR714 01505020	1.5	0.5	1.5	20	50	4
ESRR714 01505022	1.5	0.5	1.5	22	60	4
ESRR714 01505025	1.5	0.5	1.5	25	60	4
ESRR714 02000206	2	0.02	2	6	45	4
ESRR714 02000208	2	0.02	2	8	45	4
ESRR714 02000210	2	0.02	2	10	50	4
ESRR714 02000212	2	0.02	2	12	50	4
ESRR714 02000214	2	0.02	2	14	50	4
ESRR714 02000216	2	0.02	2	16	50	4
ESRR714 02000220	2	0.02	2	20	50	4
ESRR714 02000225	2	0.02	2	25	60	4
ESRR714 02000230	2	0.02	2	30	70	4
ESRR714 02000506	2	0.05	2	6	45	4
ESRR714 02000508	2	0.05	2	8	45	4
ESRR714 02000510	2	0.05	2	10	50	4
ESRR714 02000512	2	0.05	2	12	50	4
ESRR714 02000514	2	0.05	2	14	50	4
ESRR714 02000516	2	0.05	2	16	50	4
ESRR714 02000520	2	0.05	2	20	50	4
ESRR714 02000525	2	0.05	2	25	60	4
ESRR714 02000530	2	0.05	2	30	70	4
ESRR714 02001006	2	0.1	2	6	45	4
ESRR714 02001008	2	0.1	2	8	45	4
ESRR714 02001010	2	0.1	2	10	50	4
ESRR714 02001012	2	0.1	2	12	50	4
ESRR714 02001014	2	0.1	2	14	50	4
ESRR714 02001016	2	0.1	2	16	50	4
ESRR714 02001020	2	0.1	2	20	50	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESRR714 | 4 FLUTES RIB RADIUS ENDMILL

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESRR714 02001022	2	0.1	2	22	60	4
ESRR714 02001025	2	0.1	2	25	60	4
ESRR714 02001030	2	0.1	2	30	70	4
ESRR714 02002006	2	0.2	2	6	45	4
ESRR714 02002008	2	0.2	2	8	45	4
ESRR714 02002010	2	0.2	2	10	50	4
ESRR714 02002012	2	0.2	2	12	50	4
ESRR714 02002014	2	0.2	2	14	50	4
ESRR714 02002016	2	0.2	2	16	50	4
ESRR714 02002020	2	0.2	2	20	50	4
ESRR714 02002022	2	0.2	2	22	60	4
ESRR714 02002025	2	0.2	2	25	60	4
ESRR714 02002030	2	0.2	2	30	70	4
ESRR714 02003006	2	0.3	2	6	45	4
ESRR714 02003008	2	0.3	2	8	45	4
ESRR714 02003010	2	0.3	2	10	50	4
ESRR714 02003012	2	0.3	2	12	50	4
ESRR714 02003014	2	0.3	2	14	50	4
ESRR714 02003016	2	0.3	2	16	50	4
ESRR714 02003020	2	0.3	2	20	50	4
ESRR714 02003022	2	0.3	2	22	60	4
ESRR714 02003025	2	0.3	2	25	60	4
ESRR714 02003030	2	0.3	2	30	70	4
ESRR714 02005006	2	0.5	3	6	45	4
ESRR714 02005008	2	0.5	2	8	45	4
ESRR714 02005010	2	0.5	2	10	50	4
ESRR714 02005012	2	0.5	2	12	50	4
ESRR714 02005014	2	0.5	2	14	50	4
ESRR714 02005016	2	0.5	2	16	50	4
ESRR714 02005020	2	0.5	2	20	50	4
ESRR714 02005022	2	0.5	2	22	60	4
ESRR714 02005025	2	0.5	2	25	60	4
ESRR714 02005030	2	0.5	2	30	70	4
ESRR714 02501008	2.5	0.1	2.5	8	45	4
ESRR714 02501010	2.5	0.1	2.5	10	50	4
ESRR714 02501012	2.5	0.1	2.5	12	50	4
ESRR714 02501014	2.5	0.1	2.5	14	50	4
ESRR714 02501016	2.5	0.1	2.5	16	50	4
ESRR714 02501020	2.5	0.1	2.5	20	50	4
ESRR714 02501025	2.5	0.1	2.5	25	60	4
ESRR714 02501030	2.5	0.1	2.5	30	70	4

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESRR714 02502008	2.5	0.2	2.5	8	45	4
ESRR714 02502010	2.5	0.2	2.5	10	50	4
ESRR714 02502012	2.5	0.2	2.5	12	50	4
ESRR714 02502014	2.5	0.2	2.5	14	50	4
ESRR714 02502016	2.5	0.2	2.5	16	50	4
ESRR714 02502020	2.5	0.2	2.5	20	50	4
ESRR714 02502025	2.5	0.2	2.5	25	60	4
ESRR714 02502030	2.5	0.2	2.5	30	70	4
ESRR714 02503008	2.5	0.3	2.5	8	45	4
ESRR714 02503010	2.5	0.3	2.5	10	50	4
ESRR714 02503012	2.5	0.3	2.5	12	50	4
ESRR714 02503014	2.5	0.3	2.5	14	50	4
ESRR714 02503016	2.5	0.3	2.5	16	50	4
ESRR714 02503020	2.5	0.3	2.5	20	50	4
ESRR714 02503025	2.5	0.3	2.5	25	60	4
ESRR714 02503030	2.5	0.3	2.5	30	70	4
ESRR714 02505008	2.5	0.5	2.5	8	45	4
ESRR714 02505010	2.5	0.5	2.5	10	50	4
ESRR714 02505012	2.5	0.5	2.5	12	50	4
ESRR714 02505014	2.5	0.5	2.5	14	50	4
ESRR714 02505016	2.5	0.5	2.5	16	50	4
ESRR714 02505020	2.5	0.5	2.5	20	50	4
ESRR714 02505025	2.5	0.5	2.5	25	60	4
ESRR714 02505030	2.5	0.5	2.5	30	70	4
ESRR714 03001008	3	0.1	3	8	45	6
ESRR714 03001010	3	0.1	3	10	50	6
ESRR714 03001012	3	0.1	3	12	50	6
ESRR714 03001014	3	0.1	3	14	50	6
ESRR714 03001016	3	0.1	3	16	55	6
ESRR714 03001020	3	0.1	3	20	60	6
ESRR714 03001025	3	0.1	3	25	65	6
ESRR714 03001030	3	0.1	3	30	70	6
ESRR714 03001035	3	0.1	3	35	75	6
ESRR714 03001040	3	0.1	3	40	80	6
ESRR714 03001045	3	0.1	3	45	90	6
ESRR714 03002008	3	0.2	3	8	45	6
ESRR714 03002010	3	0.2	3	10	50	6
ESRR714 03002012	3	0.2	3	12	50	6
ESRR714 03002014	3	0.2	3	14	50	6
ESRR714 03002016	3	0.2	3	16	55	6
ESRR714 03002020	3	0.2	3	20	60	6

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESRR714 | 4 FLUTES RIB RADIUS ENDMILL

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESRR714 03002025	3	0.2	3	25	65	6
ESRR714 03002030	3	0.2	3	30	70	6
ESRR714 03002035	3	0.2	3	35	75	6
ESRR714 03002040	3	0.2	3	40	80	6
ESRR714 03002045	3	0.2	3	45	90	6
ESRR714 03003008	3	0.3	3	8	45	6
ESRR714 03003010	3	0.3	3	10	50	6
ESRR714 03003012	3	0.3	3	12	50	6
ESRR714 03003014	3	0.3	3	14	50	6
ESRR714 03003016	3	0.3	3	16	55	6
ESRR714 03003020	3	0.3	3	20	60	6
ESRR714 03003025	3	0.3	3	25	65	6
ESRR714 03003030	3	0.3	3	30	70	6
ESRR714 03003035	3	0.3	3	35	75	6
ESRR714 03003040	3	0.3	3	40	80	6
ESRR714 03003045	3	0.3	3	45	90	6
ESRR714 03005008	3	0.5	3	8	45	6
ESRR714 03005010	3	0.5	3	10	50	6
ESRR714 03005012	3	0.5	3	12	50	6
ESRR714 03005014	3	0.5	3	14	50	6
ESRR714 03005016	3	0.5	3	16	55	6
ESRR714 03005020	3	0.5	3	20	60	6
ESRR714 03005025	3	0.5	3	25	65	6
ESRR714 03005030	3	0.5	3	30	70	6
ESRR714 03005035	3	0.5	3	35	75	6
ESRR714 03005040	3	0.5	3	40	80	6
ESRR714 03005045	3	0.5	3	45	90	6
ESRR714 03005050	3	0.5	3	50	100	6
ESRR714 03010008	3	1	3	8	45	6
ESRR714 03010010	3	1	3	10	50	6
ESRR714 03010012	3	1	3	12	50	6
ESRR714 03010014	3	1	3	14	50	6
ESRR714 03010016	3	1	3	16	55	6
ESRR714 03010020	3	1	3	20	60	6
ESRR714 03010025	3	1	3	25	65	6
ESRR714 03010030	3	1	3	30	70	6
ESRR714 03010035	3	1	3	35	75	6
ESRR714 03010040	3	1	3	40	80	6
ESRR714 03010045	3	1	3	45	90	6
ESRR714 03010050	3	1	3	50	100	6
ESRR714 04001010	4	0.1	4	10	50	6

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESRR714 04001012	4	0.1	4	12	50	6
ESRR714 04001013	4	0.1	4	13	55	6
ESRR714 04001016	4	0.1	4	16	55	6
ESRR714 04001020	4	0.1	4	20	60	6
ESRR714 04001025	4	0.1	4	25	65	6
ESRR714 04001030	4	0.1	4	30	70	6
ESRR714 04001035	4	0.1	4	35	75	6
ESRR714 04001040	4	0.1	4	40	80	6
ESRR714 04001045	4	0.1	4	45	90	6
ESRR714 04001050	4	0.1	4	50	100	6
ESRR714 04002010	4	0.2	4	10	50	6
ESRR714 04002012	4	0.2	4	12	50	6
ESRR714 04002013	4	0.2	4	13	55	6
ESRR714 04002016	4	0.2	4	16	55	6
ESRR714 04002020	4	0.2	4	20	60	6
ESRR714 04002025	4	0.2	4	25	65	6
ESRR714 04002030	4	0.2	4	30	70	6
ESRR714 04002035	4	0.2	4	35	75	6
ESRR714 04002040	4	0.2	4	40	80	6
ESRR714 04002045	4	0.2	4	45	90	6
ESRR714 04002050	4	0.2	4	50	100	6
ESRR714 04003010	4	0.3	4	10	50	6
ESRR714 04003012	4	0.3	4	12	50	6
ESRR714 04003013	4	0.3	4	13	55	6
ESRR714 04003016	4	0.3	4	16	55	6
ESRR714 04003020	4	0.3	4	20	60	6
ESRR714 04003025	4	0.3	4	25	65	6
ESRR714 04003030	4	0.3	4	30	70	6
ESRR714 04003035	4	0.3	4	35	75	6
ESRR714 04003040	4	0.3	4	40	80	6
ESRR714 04003045	4	0.3	4	45	90	6
ESRR714 04003050	4	0.3	4	50	100	6
ESRR714 04005010	4	0.5	4	10	50	6
ESRR714 04005012	4	0.5	4	12	50	6
ESRR714 04005013	4	0.5	4	13	55	6
ESRR714 04005016	4	0.5	4	16	55	6
ESRR714 04005020	4	0.5	4	20	60	6
ESRR714 04005025	4	0.5	4	25	65	6
ESRR714 04005030	4	0.5	4	30	70	6
ESRR714 04005035	4	0.5	4	35	75	6
ESRR714 04005040	4	0.5	4	40	80	6

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESRR714 | 4 FLUTES RIB RADIUS ENDMILL

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESRR714 04005045	4	0.5	4	45	90	6
ESRR714 04005050	4	0.5	4	50	100	6
ESRR714 04005055	4	0.5	4	55	100	6
ESRR714 04010010	4	1	4	10	50	6
ESRR714 04010012	4	1	4	12	50	6
ESRR714 04010013	4	1	4	13	55	6
ESRR714 04010016	4	1	4	16	55	6
ESRR714 04010020	4	1	4	20	60	6
ESRR714 04010025	4	1	4	25	65	6
ESRR714 04010030	4	1	4	30	70	6
ESRR714 04010035	4	1	4	35	75	6
ESRR714 04010040	4	1	4	40	80	6
ESRR714 04010045	4	1	4	45	90	6
ESRR714 04010050	4	1	4	50	100	6
ESRR714 04010055	4	1	4	55	100	6
ESRR714 05001016	5	0.1	5	16	60	6
ESRR714 05001030	5	0.1	5	30	70	6
ESRR714 05001040	5	0.1	5	40	80	6
ESRR714 05002016	5	0.2	5	16	60	6
ESRR714 05002030	5	0.2	5	30	70	6
ESRR714 05002040	5	0.2	5	40	80	6
ESRR714 05003016	5	0.3	5	16	60	6
ESRR714 05003030	5	0.3	5	30	70	6
ESRR714 05003040	5	0.3	5	40	80	6
ESRR714 05005016	5	0.5	5	16	60	6
ESRR714 05005030	5	0.5	5	30	70	6
ESRR714 05005040	5	0.5	5	40	80	6
ESRR714 05005050	5	0.5	5	50	100	6
ESRR714 05005060	5	0.5	5	60	110	6
ESRR714 05010016	5	1	5	16	60	6
ESRR714 05010030	5	1	5	30	70	6
ESRR714 05010040	5	1	5	40	80	6
ESRR714 05010050	5	1	5	50	100	6
ESRR714 05010060	5	1	5	60	110	6
ESRR714 05015015	5	1.5	5	15	60	6
ESRR714 05020015	5	2	5	15	60	6
ESRR714 06001020	6	0.1	7	20	60	6
ESRR714 06001040	6	0.1	7	40	80	6
ESRR714 06001050	6	0.1	7	50	100	6
ESRR714 06002020	6	0.2	7	20	60	6
ESRR714 06002040	6	0.2	7	40	80	6

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESRR714 06002050	6	0.2	7	50	100	6
ESRR714 06003020	6	0.3	7	20	60	6
ESRR714 06003030	6	0.3	7	30	70	6
ESRR714 06003040	6	0.3	7	40	80	6
ESRR714 06003050	6	0.3	7	50	100	6
ESRR714 06005020	6	0.5	7	20	60	6
ESRR714 06005030	6	0.5	7	30	70	6
ESRR714 06005040	6	0.5	7	40	80	6
ESRR714 06005050	6	0.5	7	50	100	6
ESRR714 06005060	6	0.5	7	60	110	6
ESRR714 06010020	6	1	7	20	60	6
ESRR714 06010030	6	1	7	30	70	6
ESRR714 06010040	6	1	7	40	80	6
ESRR714 06010050	6	1	7	50	100	6
ESRR714 06010060	6	1	7	60	110	6
ESRR714 06015020	6	1.5	7	20	60	6
ESRR714 06015040	6	1.5	7	40	80	6
ESRR714 06015050	6	1.5	7	50	100	6
ESRR714 06020020	6	2	7	20	60	6
ESRR714 06020030	6	2	7	30	70	6
ESRR714 06020040	6	2	7	40	80	6
ESRR714 06020050	6	2	7	50	100	6
ESRR714 08001025	8	0.1	9	25	70	8
ESRR714 08002022	8	0.2	9	22	65	8
ESRR714 08002040	8	0.2	9	40	100	8
ESRR714 08003022	8	0.3	9	22	65	8
ESRR714 08003040	8	0.3	9	40	100	8
ESRR714 08005022	8	0.5	9	22	65	8
ESRR714 08005035	8	0.5	9	35	100	8
ESRR714 08005040	8	0.5	9	40	100	8
ESRR714 08005050	8	0.5	9	50	120	8
ESRR714 08005060	8	0.5	9	60	120	8
ESRR714 08010022	8	1	9	22	65	8
ESRR714 08010035	8	1	9	35	100	8
ESRR714 08010040	8	1	9	40	100	8
ESRR714 08010050	8	1	9	50	120	8
ESRR714 08010060	8	1	9	60	120	8
ESRR714 08015022	8	1.5	9	22	65	8
ESRR714 08015040	8	1.5	9	40	100	8
ESRR714 08020022	8	2	9	22	65	8
ESRR714 08020040	8	2	9	40	100	8

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESRR714 | 4 FLUTES RIB RADIUS ENDMILL

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESRR714 08020050	8	2	9	50	120	8
ESRR714 10001030	10	0.1	11	30	75	10
ESRR714 10002024	10	0.2	11	24	70	10
ESRR714 10002040	10	0.2	11	40	100	10
ESRR714 10003024	10	0.3	11	24	70	10
ESRR714 10003040	10	0.3	11	40	100	10
ESRR714 10005024	10	0.5	11	24	70	10
ESRR714 10005040	10	0.5	11	40	100	10
ESRR714 10005050	10	0.5	11	50	120	10
ESRR714 10005060	10	0.5	11	60	120	10
ESRR714 10010024	10	1	11	24	70	10
ESRR714 10010040	10	1	11	40	100	10
ESRR714 10010050	10	1	11	50	120	10
ESRR714 10010060	10	1	11	60	120	10
ESRR714 10015024	10	1.5	11	24	70	10
ESRR714 10015040	10	1.5	11	40	100	10
ESRR714 10020024	10	2	11	24	70	10
ESRR714 10020040	10	2	11	40	100	10
ESRR714 10020050	10	2	11	50	120	10
ESRR714 10025024	10	2.5	11	24	70	10
ESRR714 12002032	12	0.2	13	32	80	12

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESRR714 12003026	12	0.3	13	26	80	12
ESRR714 12003045	12	0.3	13	45	110	12
ESRR714 12005026	12	0.5	13	26	80	12
ESRR714 12005040	12	0.5	13	40	110	12
ESRR714 12005060	12	0.5	13	60	130	12
ESRR714 12010026	12	1	13	26	80	12
ESRR714 12010040	12	1	13	40	110	12
ESRR714 12010060	12	1	13	60	130	12
ESRR714 12015026	12	1.5	13	26	80	12
ESRR714 12020026	12	2	13	26	80	12
ESRR714 12020040	12	2	13	40	110	12
ESRR714 12030026	12	3	13	26	80	12
ESRR714 16005035	16	0.5	20	35	100	16
ESRR714 16005050	16	0.5	35	50	150	16
ESRR714 16010035	16	1	20	35	100	16
ESRR714 16010050	16	1	35	50	150	16
ESRR714 20005040	20	0.5	25	40	100	20
ESRR714 20005055	20	0.5	40	55	150	20
ESRR714 20010040	20	1	25	40	100	20
ESRR714 20010055	20	1	40	55	150	20

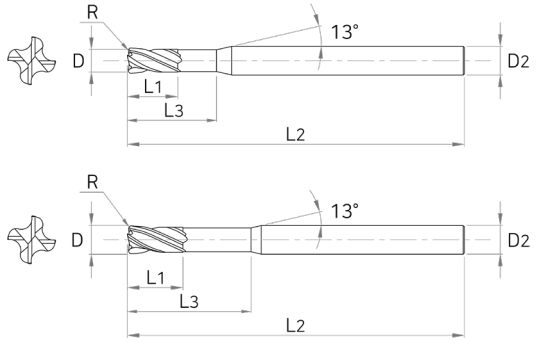
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESXR704 | 4 FLUTES NECK RADIUS ENDMILL





■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.02	h5

CARBIDE | AlTiN | 4 | M HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.590

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESXR704 01000504	1	0.05	1.5	4	45	4
ESXR704 02000506	2	0.05	3	6	45	4
ESXR704 02000507	2	0.05	2.5	7	50	4
ESXR704 0200107	2	0.1	2.5	7	50	4
ESXR704 0300107	3	0.1	4	7	45	6
ESXR704 0300109	3	0.1	4	9	55	6
ESXR704 0300209	3	0.2	4	9	55	6
ESXR704 0300309	3	0.3	4	9	55	6
ESXR704 0300312	3	0.3	4	12	55	6
ESXR704 0300316	3	0.3	4	16	55	6
ESXR704 0400109	4	0.1	5	9	45	6
ESXR704 0400212	4	0.2	5	12	55	6
ESXR704 0400212S4	4	0.2	5	12	55	4
ESXR704 0400312	4	0.3	5	12	55	6
ESXR704 0400316	4	0.3	5	16	55	6
ESXR704 0400320	4	0.3	5	20	55	6
ESXR704 0400512	4	0.5	5	12	55	6
ESXR704 0400516	4	0.5	5	16	55	6
ESXR704 0400516S4	4	0.5	5	16	55	4
ESXR704 0400520	4	0.5	5	20	55	6
ESXR704 0401012	4	1	5	12	55	6
ESXR704 0500116	5	0.1	6	16	60	6
ESXR704 0500216	5	0.2	6	16	60	6
ESXR704 0500316	5	0.3	6	16	60	6

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESXR704 0500516	5	0.5	6	16	60	6
ESXR704 0501016	5	1	6	16	60	6
ESXR704 0600120	6	0.1	7	20	60	6
ESXR704 0600214	6	0.2	7	14	50	6
ESXR704 0600220	6	0.2	7	20	60	6
ESXR704 0600320	6	0.3	7	20	60	6
ESXR704 0600520	6	0.5	7	20	60	6
ESXR704 0601020	6	1	7	20	60	6
ESXR704 0601520	6	1.5	7	20	60	6
ESXR704 0800125	8	0.1	9	25	60	8
ESXR704 0800218	8	0.2	9	18	60	8
ESXR704 0800225	8	0.2	9	25	60	8
ESXR704 0800325	8	0.3	9	25	60	8
ESXR704 0800525	8	0.5	9	25	60	8
ESXR704 0801025	8	1	9	25	60	8
ESXR704 0801525	8	1.5	9	25	60	8
ESXR704 0802025	8	2	9	25	60	8
ESXR704 1000225	10	0.2	12	25	75	10
ESXR704 1000232	10	0.2	11	32	75	10
ESXR704 1000332	10	0.3	11	32	75	10
ESXR704 1000532	10	0.5	11	32	75	10
ESXR704 1001032	10	1	11	32	75	10
ESXR704 1001532	10	1.5	11	32	75	10
ESXR704 1002032	10	2	11	32	75	10

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESXR704 | 4 FLUTES NECK RADIUS ENDMILL

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESXR704 1200238	12	0.2	12	38	75	12
ESXR704 1200330	12	0.3	15	30	75	12
ESXR704 1200338	12	0.3	12	38	75	12
ESXR704 1200538	12	0.5	12	38	75	12

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESXR704 1201038	12	1	12	38	75	12
ESXR704 1201538	12	1.5	12	38	75	12
ESXR704 1202038	12	2	12	38	75	12

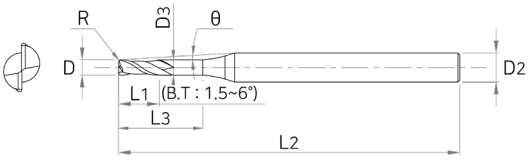
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESLNR20 | 2 FLUTES LONG NECK RADIUS ENDMILL





■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.012	h5

CARBIDE | AlTiN | 2 | 30° HELIX | R ±0.01 All Sizes | DATA P.616

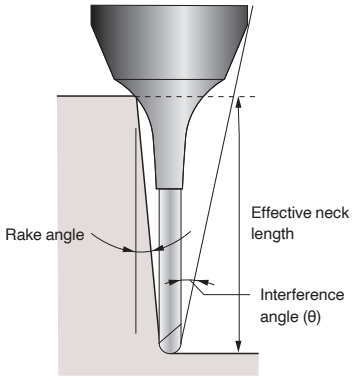
EDP No	SIZES (mm)								Effective length by inclination angle				
	D	R	L1	L3	D3	L2	D2	θ	0.5°	1°	1.5°	2°	3°
ESLNR2002-0.5-005	0.2	0.05	0.15	0.5	0.17	50	4	11.4	0.9	1	1	1.1	12
ESLNR2002-1-005	0.2	0.05	0.15	1	0.17	50	4	10.9	1.6	1.7	1.9	2	2.3
ESLNR2002-1.5-005	0.2	0.05	0.15	1.5	0.17	50	4	10.3	2.1	2.3	2.5	2.7	3
ESLNR2002-2-005	0.2	0.05	0.15	2	0.17	50	4	9.9	2.8	3.1	3.4	3.6	4.1
ESLNR2003-1-005	0.3	0.05	0.25	1	0.27	50	4	10.8	1.4	1.5	1.6	1.7	1.9
ESLNR2003-1.5-005	0.3	0.05	0.25	1.5	0.27	50	4	10.3	2.1	2.3	2.5	2.7	3
ESLNR2003-2.5-005	0.3	0.05	0.25	2.5	0.27	50	4	9.8	2.7	2.9	3.1	3.3	3.6
ESLNR2003-2-005	0.3	0.05	0.25	2	0.27	50	4	9.4	3.2	3.5	3.7	3.9	4.3
ESLNR2003-3-005	0.3	0.05	0.25	3	0.27	50	4	9	3.9	4.3	4.6	4.9	5.4
ESLNR2004-1-005	0.4	0.05	0.3	1	0.37	50	4	10.8	1.4	1.5	1.6	1.7	1.9
ESLNR2004-1.5-005	0.4	0.05	0.3	1.5	0.37	50	4	10.3	2	2.1	2.2	2.3	2.5
ESLNR2004-2-005	0.4	0.05	0.3	2	0.37	50	4	9.8	2.7	2.9	3.1	3.3	3.6
ESLNR2004-2.5-005	0.4	0.05	0.3	2.5	0.37	50	4	9.4	3.2	3.5	3.7	3.9	4.3
ESLNR2004-3-005	0.4	0.05	0.3	3	0.37	50	4	9	3.8	4	4.3	4.5	4.9
ESLNR2004-3.5-005	0.4	0.05	0.3	3.5	0.37	50	4	8.6	4.3	4.6	4.9	5.1	5.5
ESLNR2004-4-005	0.4	0.05	0.3	4	0.37	50	4	8.3	5	5.4	5.8	6.1	6.6
ESLNR2004-2-01	0.4	0.1	0.3	2	0.37	50	4	9.8	2.7	2.9	3.1	3.3	3.6
ESLNR2004-3-01	0.4	0.1	0.3	3	0.37	50	4	9	3.8	4	4.3	4.5	4.9
ESLNR2004-4-01	0.4	0.1	0.3	4	0.37	50	4	8.3	5	5.4	5.8	6.1	6.6
ESLNR2005-1-005	0.5	0.05	0.35	1	0.47	50	4	10.8	1.4	1.5	1.6	1.7	1.9
ESLNR2005-2-005	0.5	0.05	0.35	2	0.47	50	4	9.7	2.5	2.6	2.8	2.9	3.1
ESLNR2005-3-005	0.5	0.05	0.35	3	0.47	50	4	8.9	3.8	4	4.3	4.5	4.9
ESLNR2005-4-005	0.5	0.05	0.35	4	0.47	50	4	8.2	4.8	5.2	5.4	5.7	6.1
ESLNR2005-5-005	0.5	0.05	0.35	5	0.47	50	4	7.6	6.1	6.6	6.9	7.3	7.8

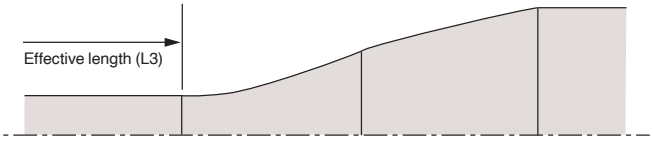
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESLNR20 | 2 FLUTES LONG NECK RADIUS ENDMILL





※ The marked effective neck length is the default value to prevent interference with the workpiece.
Proper control of the processing environment is required

EDP No	SIZES (mm)								Effective length by inclination angle				
	D	R	L1	L3	D3	L2	D2	θ	0.5°	1°	1.5°	2°	3°
ESLNR2005-6-005	0.5	0.05	0.35	6	0.47	50	4	7	7.2	7.7	8.1	8.4	9
ESLNR2005-1-01	0.5	0.1	0.35	1	0.47	50	4	10.8	1.4	1.5	1.6	1.7	1.9
ESLNR2005-2-01	0.5	0.1	0.35	2	0.47	50	4	9.8	2.5	2.6	2.8	2.9	3.1
ESLNR2005-3-01	0.5	0.1	0.35	3	0.47	50	4	8.9	3.8	4	4.3	4.5	4.9
ESLNR2005-4-01	0.5	0.1	0.35	4	0.47	50	4	8.2	4.8	5.2	5.4	5.7	6.1
ESLNR2005-5-01	0.5	0.1	0.35	5	0.47	50	4	7.6	6.1	6.5	6.9	7.2	7.8
ESLNR2005-6-01	0.5	0.1	0.35	6	0.47	50	4	7.1	7.2	7.7	8.1	8.4	9
ESLNR2006-2-01	0.6	0.1	0.4	2	0.57	50	4	9.7	2.5	2.6	2.8	2.9	3.1
ESLNR2006-4-01	0.6	0.1	0.4	4	0.57	50	4	8.1	4.8	5.2	5.4	5.7	6.1
ESLNR2006-6-01	0.6	0.1	0.4	6	0.57	50	4	7	7.2	7.7	8.1	8.4	9
ESLNR2006-8-01	0.6	0.1	0.4	8	0.57	50	4	6.1	9.3	9.9	10.3	10.7	11
ESLNR2006-10-01	0.6	0.1	0.4	10	0.57	50	4	5.5	11.5	12.1	12.5	13	13.7
ESLNR2008-4-01	0.8	0.1	0.5	4	0.77	50	4	8	4.8	5.2	5.4	5.7	6.1
ESLNR2008-6-01	0.8	0.1	0.5	6	0.77	50	4	6.8	7	7.4	7.7	7.9	8.4
ESLNR2008-8-01	0.8	0.1	0.5	8	0.77	50	4	5.9	9.3	9.9	10.3	10.7	11.4
ESLNR2008-12-01	0.8	0.1	0.5	12	0.77	50	4	4.7	13.6	14.2	14.7	15.2	16
ESLNR2008-4-02	0.8	0.2	0.5	4	0.77	50	4	8	4.8	5.1	5.4	5.6	6.1
ESLNR2008-6-02	0.8	0.2	0.5	6	0.77	50	4	6.9	7	7.3	7.7	7.9	8.4
ESLNR2010-4-01	1	0.1	0.8	4	0.94	50	4	7.7	4.7	4.9	5.1	5.2	5.5
ESLNR2010-6-01	1	0.1	0.8	6	0.94	50	4	6.6	7.1	7.4	7.7	8	8.5
ESLNR2010-8-01	1	0.1	0.8	8	0.94	50	4	5.7	9.2	9.6	9.9	10.2	10.8
ESLNR2010-10-01	1	0.1	0.8	10	0.94	50	4	5.1	11.6	12.1	12.6	13	13.7
ESLNR2010-12-01	1	0.1	0.8	12	0.94	55	4	4.5	13.7	14.3	14.8	15.3	16
ESLNR2010-16-01	1	0.1	0.8	16	0.94	60	4	3.8	17.9	18.6	19.2	19.7	21.3

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESLNR20 | 2 FLUTES LONG NECK RADIUS ENDMILL

EDP No	SIZES (mm)								Effective length by inclination angle				
	D	R	L1	L3	D3	L2	D2	θ	0.5°	1°	1.5°	2°	3°
ESLNR2010-20-01	1	0.1	0.8	20	0.94	60	4	3.2	22	22.8	23.5	24	26.7
ESLNR2010-4-02	1	0.2	0.8	4	0.94	50	4	7.8	4.7	4.9	5.1	5.2	5.5
ESLNR2010-6-02	1	0.2	0.8	6	0.94	50	4	6.6	7.1	7.4	7.7	8	8.5
ESLNR2010-8-02	1	0.2	0.8	8	0.94	50	4	5.8	9.2	9.6	9.9	10.2	10.8
ESLNR2010-10-02	1	0.2	0.8	10	0.94	50	4	5.1	11.6	12.1	12.6	13	13.7
ESLNR2010-12-02	1	0.2	0.8	12	0.94	55	4	4.6	13.7	14.3	14.8	15.2	16
ESLNR2010-16-02	1	0.2	0.8	16	0.94	60	4	3.8	17.9	18.6	19.2	19.7	21.3
ESLNR2010-20-02	1	0.2	0.8	20	0.94	60	4	3.2	22	22.8	23.5	24	26.6
ESLNR2010-6-03	1	0.3	0.8	6	0.94	50	4	6.7	7.1	7.4	7.7	8	8.4
ESLNR2010-10-03	1	0.3	0.8	10	0.94	50	4	5.1	11.5	12.1	12.6	13	13.7
ESLNR2010-16-03	1	0.3	0.8	16	0.94	60	4	3.8	17.9	18.6	19.1	19.6	21.3
ESLNR2010-20-03	1	0.3	0.8	20	0.94	60	4	3.2	22	22.8	23.5	24	26.6
ESLNR2015-4-01	1.5	0.1	1.35	4	1.42	50	4	7.2	4.8	4.9	5.1	5.3	5.5
ESLNR2015-8-01	1.5	0.1	1.35	8	1.42	50	4	5.2	9.2	9.6	10	10.3	10.8
ESLNR2015-12-01	1.5	0.1	1.35	12	1.42	55	4	4	13.4	13.9	14.3	14.7	16.1
ESLNR2015-15-01	1.5	0.1	1.35	15	1.42	55	4	3.5	16.9	17.6	18.1	18.6	20.1
ESLNR2015-20-01	1.5	0.1	1.35	20	1.42	60	4	2.8	22.1	22.9	23.5	24.1	-
ESLNR2015-4-02	1.5	0.2	1.35	4	1.42	50	4	7.3	4.7	4.9	5.1	5.3	5.5
ESLNR2015-8-02	1.5	0.2	1.35	8	1.42	50	4	5.2	9.2	9.6	10	10.3	10.8
ESLNR2015-12-02	1.5	0.2	1.35	12	1.42	55	4	4.1	13.4	13.9	14.3	14.7	16.1
ESLNR2015-15-02	1.5	0.2	1.35	15	1.42	55	4	3.5	16.9	17.5	18.1	18.6	20
ESLNR2015-20-02	1.5	0.2	1.35	20	1.42	60	4	2.8	22.1	22.9	23.5	24.1	-
ESLNR2015-8-03	1.5	0.3	1.35	8	1.42	50	4	5.2	9.2	9.6	10	10.3	10.8
ESLNR2015-15-03	1.5	0.3	1.35	15	1.42	55	4	3.5	16.9	17.5	18.1	18.6	20
ESLNR2015-20-03	1.5	0.3	1.35	20	1.42	60	4	2.8	22.1	22.9	23.5	24	-
ESLNR2020-6-02	2	0.2	1.7	6	1.92	50	4	5.4	6.8	7.1	7.3	7.5	8.1
ESLNR2020-8-02	2	0.2	1.7	8	1.92	50	4	4.6	8.9	9.2	9.4	9.7	10.8
ESLNR2020-12-02	2	0.2	1.7	12	1.92	55	4	3.5	13.4	13.9	14.3	14.7	16.1
ESLNR2020-16-02	2	0.2	1.7	16	1.92	55	4	2.8	17.6	18.1	18.6	19.3	-
ESLNR2020-20-02	2	0.2	1.7	20	1.92	60	4	2.4	22.1	22.9	23.5	24.1	-
ESLNR2020-25-02	2	0.2	1.7	25	1.92	65	4	2	27.3	28.2	28.8	-	-
ESLNR2020-30-02	2	0.2	1.7	30	1.92	70	4	1.7	32.5	33.4	34.4	-	-
ESLNR2020-8-03	2	0.3	1.7	8	1.92	50	4	4.6	8.9	9.2	9.4	9.7	10.7
ESLNR2020-16-03	2	0.3	1.7	16	1.92	55	4	2.8	17.6	18.1	18.6	19.3	-
ESLNR2020-20-03	2	0.3	1.7	20	1.92	60	4	2.4	22.1	22.9	23.5	24	-
ESLNR2020-6-05	2	0.5	1.7	6	1.92	50	4	5.5	6.8	7.1	7.3	7.4	8
ESLNR2020-8-05	2	0.5	1.7	8	1.92	50	4	4.7	8.9	9.2	9.4	9.6	10.7
ESLNR2020-12-05	2	0.5	1.7	12	1.92	55	4	3.5	13.4	13.9	14.3	14.6	16
ESLNR2020-16-05	2	0.5	1.7	16	1.92	55	4	2.9	17.6	18.1	18.6	19.2	-
ESLNR2020-20-05	2	0.5	1.7	20	1.92	60	4	2.4	22.1	22.9	23.5	24	-
ESLNR2020-25-05	2	0.5	1.7	25	1.92	65	4	2	27.3	28.1	28.8	-	-

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESLNR20 | 2 FLUTES LONG NECK RADIUS ENDMILL

EDP No	SIZES (mm)								Effective length by inclination angle				
	D	R	L1	L3	D3	L2	D2	θ	0.5°	1°	1.5°	2°	3°
ESLNR2020-30-05	2	0.5	1.7	30	1.92	70	4	1.7	32.5	33.4	34.3	-	-
ESLNR2020-8-08	2	0.8	1.7	8	1.92	50	4	4.8	8.9	9.2	9.4	9.6	10.6
ESLNR2020-16-08	2	0.8	1.7	16	1.92	55	4	2.9	17.6	18.1	18.6	19.2	-
ESLNR2020-20-08	2	0.8	1.7	20	1.92	60	4	2.4	22.1	22.8	23.5	24	-
ESLNR2030-8-02	3	0.2	2.5	8	2.86	55	6	5.7	9	9.3	9.5	9.9	10.9
ESLNR2030-12-02	3	0.2	2.5	12	2.86	60	6	4.5	13.1	13.5	14	14.7	16.2
ESLNR2030-16-02	3	0.2	2.5	16	2.86	60	6	3.8	17.7	18.2	18.7	19.5	21.6
ESLNR2030-20-02	3	0.2	2.5	20	2.86	65	6	3.2	21.8	22.4	23.1	24.2	26.9
ESLNR2030-30-02	3	0.2	2.5	30	2.86	75	6	2.4	32.6	33.5	34.5	36.2	-
ESLNR2030-35-02	3	0.2	2.5	35	2.86	80	6	2.1	37.7	38.7	40.2	42.2	-
ESLNR2030-8-03	3	0.3	2.5	8	2.86	55	6	5.7	9	9.3	9.5	9.9	10.9
ESLNR2030-16-03	3	0.3	2.5	16	2.86	60	6	3.8	17.7	18.2	18.7	19.4	21.5
ESLNR2030-20-03	3	0.3	2.5	20	2.86	65	6	3.2	21.8	22.4	23.1	24.2	26.8
ESLNR2030-30-03	3	0.3	2.5	30	2.86	75	6	2.4	32.6	33.5	34.5	36.2	-
ESLNR2030-8-05	3	0.5	2.5	8	2.86	55	6	5.8	9	9.3	9.5	9.8	10.8
ESLNR2030-12-05	3	0.5	2.5	12	2.86	60	6	4.6	13.1	13.5	13.9	14.6	16.2
ESLNR2030-16-05	3	0.5	2.5	16	2.86	60	6	3.8	17.7	18.2	18.7	19.4	21.5
ESLNR2030-20-05	3	0.5	2.5	20	2.86	65	6	3.2	21.8	22.4	23.1	24.2	26.8
ESLNR2030-30-05	3	0.5	2.5	30	2.86	75	6	2.4	32.6	33.5	34.5	36.1	-
ESLNR2030-35-05	3	0.5	2.5	35	2.86	80	6	2.1	37.7	38.7	40.2	42.1	-

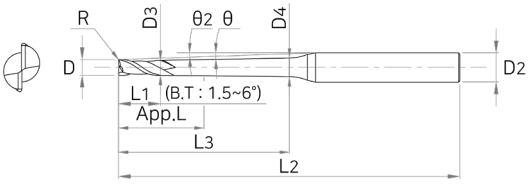
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESTNR20 | 2 FLUTES TAPERED NECK RADIUS ENDMILL





■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.012	h5

CARBIDE | AlTiN | 2 | 30° HELIX | R ±0.01 All Sizes | DATA P.619

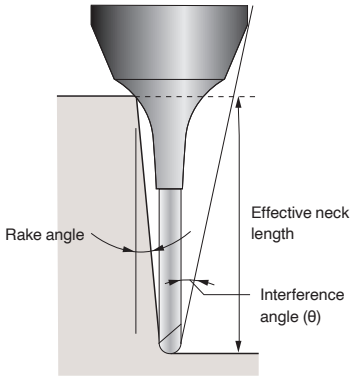
EDP No	SIZES (mm)											Effective length by inclination angle				
	D	R	L1	L3	θ2	D3	D4	L2	D2	App.L	θ	0.5°	1°	1.5°	2°	3°
ESTNR2002-2-09005	0.2	0.05	0.15	2	0.9	0.17	0.23	50	4	1.1	10	-	2.8	3.1	3.4	3.9
ESTNR2004-4-09005	0.4	0.05	0.3	4	0.9	0.37	0.49	50	4	1.25	8.4	-	4.9	5.3	5.7	6.3
ESTNR2004-5-09005	0.4	0.05	0.3	5	0.9	0.37	0.52	50	4	1.25	7.8	-	5.9	6.4	6.8	7.5
ESTNR2004-4-0901	0.4	0.1	0.3	4	0.9	0.37	0.49	50	4	1.25	8.5	-	4.9	5.3	5.7	6.3
ESTNR2004-5-0901	0.4	0.1	0.3	5	0.9	0.37	0.52	50	4	1.25	7.9	-	5.9	6.4	6.8	7.5
ESTNR2005-5-0901	0.5	0.1	0.35	5	0.9	0.47	0.62	50	4	1.3	7.8	-	5.9	6.4	6.8	7.5
ESTNR2005-8-0901	0.5	0.1	0.35	8	0.9	0.47	0.71	50	4	1.3	6.4	-	9	9.7	10.2	11
ESTNR2005-10-0901	0.5	0.1	0.35	10	0.9	0.47	0.77	55	4	1.3	5.8	-	11	11.8	12.4	13.2
ESTNR2006-12-0901	0.6	0.1	0.4	12	0.9	0.57	0.93	55	4	1.35	5.1	-	13	13.9	14.5	15.5
ESTNR2006-15-0901	0.6	0.1	0.4	15	0.9	0.57	13	55	4	1.35	4.5	-	16.1	17.1	17.8	18.8
ESTNR2008-6-0402	0.8	0.2	0.5	6	0.4	0.77	0.85	50	4	2.64	7	6.6	7.1	7.5	7.8	8.3
ESTNR2008-12-0902	0.8	0.2	0.5	12	0.9	0.77	1.13	55	4	1.45	5	-	13	13.9	14.5	15.5
ESTNR2010-8-0402	1	0.2	0.8	8	0.4	0.94	14	55	6	5.09	7.4	8.8	9.3	9.7	10.1	10.6
ESTNR2010-10-0902	1	0.2	0.8	10	0.9	0.94	1.23	55	6	5.09	6.8	-	11.2	11.9	12.4	13.3
ESTNR2010-15-0902	1	0.2	0.8	15	0.9	0.94	1.39	60	6	2.7	5.6	-	16.3	17.2	17.8	18.8
ESTNR2010-20-0902	1	0.2	0.8	20	0.9	0.94	1.54	65	6	2.7	4.8	-	21.3	22.4	23.2	24.7
ESTNR2010-25-0902	1	0.2	0.8	25	0.9	0.94	1.7	70	6	2.7	4.1	-	26.4	27.6	28.5	30.9
ESTNR2010-30-0902	1	0.2	0.8	30	0.9	0.94	1.86	75	6	2.7	3.7	-	31.5	32.8	33.7	37
ESTNR2010-35-0902	1	0.2	0.8	35	0.9	0.94	22	80	6	2.7	3.3	-	36.5	38	39	43.2
ESTNR2010-8-0403	1	0.3	0.8	8	0.4	0.94	14	55	6	2.7	7.4	8.8	9.3	9.7	10	10.6
ESTNR2010-15-0903	1	0.3	0.8	15	0.9	0.94	1.39	60	6	2.7	5.6	-	16.3	17.2	17.8	18.8
ESTNR2010-25-0903	1	0.3	0.8	25	0.9	0.94	1.7	70	6	2.7	4.2	-	26.4	27.6	28.5	30.8
ESTNR2010-30-0903	1	0.3	0.8	30	0.9	0.94	1.86	75	6	2.7	3.7	-	31.5	32.8	33.7	37
ESTNR2015-10-0402	1.5	0.2	1.35	10	0.4	1.42	1.54	55	6	7.07	6.4	11	11.5	11.9	12.3	13

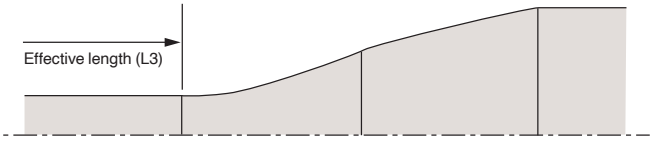
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESTNR20 | 2 FLUTES TAPERED NECK RADIUS ENDMILL





※ The marked effective neck length is the default value to prevent interference with the workpiece.
Proper control of the processing environment is required

EDP No	SIZES (mm)											Effective length by inclination angle				
	D	R	L1	L3	θ2	D3	D4	L2	D2	App.L	θ	0.5°	1°	1.5°	2°	3°
ESTNR2015-15-0902	1.5	0.2	1.35	15	0.9	1.42	1.85	60	6	7.07	5.3	-	16.4	17.3	17.9	18.9
ESTNR2015-20-0902	1.5	0.2	1.35	20	0.9	1.42	21	65	6	3.89	4.5	-	21.5	22.5	23.2	24.9
ESTNR2015-25-0902	1.5	0.2	1.35	25	0.9	1.42	2.16	70	6	3.89	3.9	-	26.6	27.7	28.5	31
ESTNR2015-30-0902	1.5	0.2	1.35	30	0.9	1.42	2.32	75	6	3.89	3.4	-	31.6	32.9	33.8	37.1
ESTNR2015-10-0403	1.5	0.3	1.35	10	0.4	1.42	1.54	55	6	3.89	6.4	11	11.5	11.9	12.3	13
ESTNR2015-20-0903	1.5	0.3	1.35	20	0.9	1.42	21	65	6	3.89	4.5	-	21.5	22.5	23.2	24.8
ESTNR2015-25-0903	1.5	0.3	1.35	25	0.9	1.42	2.16	70	6	3.89	3.9	-	26.5	27.7	28.5	31
ESTNR2015-30-0903	1.5	0.3	1.35	30	0.9	1.42	2.32	75	6	3.89	3.4	-	31.6	32.9	33.8	37.1
ESTNR2020-30-0902	2	0.2	1.7	30	0.9	1.92	2.81	70	6	7.42	3.1	-	31.6	32.9	33.8	37.2
ESTNR2020-40-0902	2	0.2	1.7	40	0.9	1.92	3.12	80	6	7.42	2.5	-	41.8	43.3	44.6	-
ESTNR2020-50-0902	2	0.2	1.7	50	0.9	1.92	3.44	90	6	7.42	2.1	-	51.9	53.6	55.7	-
ESTNR2020-12-0403	2	0.3	1.7	12	0.4	1.92	2.06	55	6	7.42	5.5	13	13.6	14.1	14.5	15.6
ESTNR2020-20-0903	2	0.3	1.7	20	0.9	1.92	2.5	65	6	4.24	4.1	-	21.5	22.5	23.2	24.9
ESTNR2020-30-0903	2	0.3	1.7	30	0.9	1.92	2.81	70	6	4.24	3.1	-	31.6	32.9	33.8	37.1
ESTNR2020-40-0903	2	0.3	1.7	40	0.9	1.92	3.12	80	6	4.24	2.5	-	41.7	43.3	44.6	-
ESTNR2020-50-0903	2	0.3	1.7	50	0.9	1.92	3.44	90	6	4.24	2.1	-	51.8	53.6	55.7	-
ESTNR2020-8-0405	2	0.5	1.7	8	0.4	1.92	2.01	50	6	4.24	6.8	8.7	9	9.3	9.5	10.4
ESTNR2020-12-0405	2	0.5	1.7	12	0.4	1.92	2.06	55	6	4.24	5.6	13	13.6	14.1	14.4	15.5
ESTNR2020-16-0405	2	0.5	1.7	16	0.4	1.92	2.12	60	6	4.24	4.7	17	17.8	18.3	18.7	20.7
ESTNR2020-20-0905	2	0.5	1.7	20	0.9	1.92	2.5	65	6	4.24	4.2	-	21.5	22.5	23.2	24.8
ESTNR2020-25-0905	2	0.5	1.7	25	0.9	1.92	2.65	65	6	4.24	3.6	-	26.6	27.7	28.5	30.9
ESTNR2020-30-0905	2	0.5	1.7	30	0.9	1.92	2.81	70	6	4.24	3.1	-	31.6	32.9	33.8	37.1
ESTNR2020-40-0905	2	0.5	1.7	40	0.9	1.92	3.12	80	6	4.24	2.5	-	41.7	43.2	44.6	-
ESTNR2020-50-0905	2	0.5	1.7	50	0.9	1.92	3.44	90	6	4.24	2.1	-	51.8	53.6	55.6	-

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESTNR20 | 2 FLUTES TAPERED NECK RADIUS ENDMILL

EDP No	SIZES (mm)											Effective length by inclination angle				
	D	R	L1	L3	θ2	D3	D4	L2	D2	App.L	θ	0.5°	1°	1.5°	2°	3°
ESTNR2030-40-0902	3	0.2	2.5	40	0.9	2.86	4.04	80	6	6.95	2	-	42	43.4	-	-
ESTNR2030-50-0902	3	0.2	2.5	50	0.9	2.86	4.35	90	6	6.95	1.6	-	52.1	53.7	-	-
ESTNR2030-60-0902	3	0.2	2.5	60	0.9	2.86	4.67	100	6	6.95	1.4	-	62.2	-	-	-
ESTNR2030-40-0903	3	0.3	2.5	40	0.9	2.86	4.04	80	6	6.95	2	-	42	43.4	-	-
ESTNR2030-50-0903	3	0.3	2.5	50	0.9	2.86	4.35	90	6	6.95	1.7	-	52.1	53.7	-	-
ESTNR2030-60-0903	3	0.3	2.5	60	0.9	2.86	4.67	100	6	6.95	1.4	-	62.2	-	-	-
ESTNR2030-40-0905	3	0.5	2.5	40	0.9	2.86	4.04	80	6	6.95	2	-	42	43.4	-	-
ESTNR2030-50-0905	3	0.5	2.5	50	0.9	2.86	4.35	90	6	6.95	1.7	-	52.1	53.7	-	-
ESTNR2030-60-0905	3	0.5	2.5	60	0.9	2.86	4.67	100	6	6.95	1.4	-	62.1	-	-	-

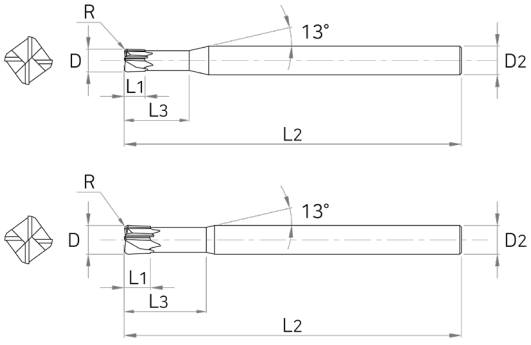
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESPM4 | 4 FLUTES NECK RADIUS ENDMILL





■ Tolerance

D		Shank Dia
~D6	0~-0.012	h5
D8~20	0~-0.015	

CARBIDE | AlTiN | 4 | 0° HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.621

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESPM4 030-05	3	0.5	1.2	8	50	6
ESPM4 040-05	4	0.5	1.5	10	50	6
ESPM4 060-05	6	0.5	2.5	12	60	6
ESPM4 060-10	6	1	2.5	12	60	6
ESPM4 060-15	6	1.5	2.5	12	60	6
ESPM4 060-15L	6	1.5	2.5	12	90	6
ESPM4 080-10	8	1	3.5	16	60	8
ESPM4 080-20	8	2	3.5	16	60	8
ESPM4 080-20L	8	2	3.5	16	100	8
ESPM4 100-10	10	1	4	20	70	10
ESPM4 100-20	10	2	4	20	70	10
ESPM4 100-20L	10	2	4	20	100	10
ESPM4 120-20	12	2	5	25	80	12
ESPM4 120-30	12	3	5	25	80	12
ESPM4 120-30L	12	3	5	25	110	12

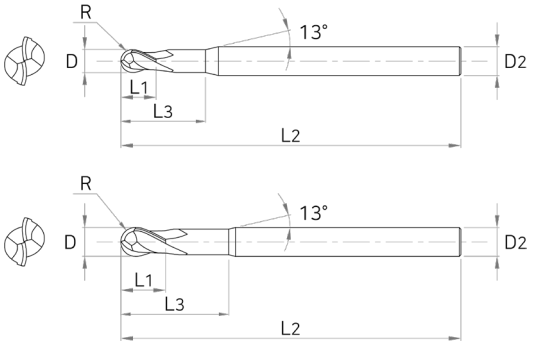
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESB702 | 2 FLUTES NECK BALL ENDMILL





■ Tolerance

D		Shank Dia
~D6	0 ~ -0.012	h5
D8 ~ 12	0 ~ -0.015	

CARBIDE | AlTiN | 2 | 30° HELIX | R ±0.005 R3 OR UNDER | R ±0.008 ABOVE R3 | DATA P.622

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESB702 001	0.1	0.05	0.15	-	40	4
ESB702 002	0.2	0.1	0.3	-	40	4
ESB702 003	0.3	0.15	0.5	-	40	4
ESB702 004	0.4	0.2	0.6	-	40	4
ESB702 005	0.5	0.25	0.7	-	40	4
ESB702 006	0.6	0.3	0.9	-	40	4
ESB702 007	0.7	0.35	1.1	-	40	4
ESB702 008	0.8	0.4	1.2	-	40	4
ESB702 009	0.9	0.45	1.4	-	40	4
ESB702 010	1	0.5	1.5	3	50	6
ESB702 010S4	1	0.5	1.5	-	45	4
ESB702 015	1.5	0.75	2	4	50	6
ESB702 015S4	1.5	0.75	2	-	45	4
ESB702 020	2	1	2.5	5	50	6
ESB702 020S4	2	1	2.5	-	45	4
ESB702 025	2.5	1.25	3	7	50	6
ESB702 030	3	1.5	4	10	60	6

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESB702 030S	3	1.5	4	10	50	6
ESB702 030S4	3	1.5	4	-	45	4
ESB702 031	3	1.5	4	10	70	6
ESB702 040	4	2	5	10	60	6
ESB702 040S	4	2	5	10	50	6
ESB702 040S4	4	2	5	-	45	4
ESB702 041	4	2	5	10	70	6
ESB702 050	5	2.5	6	12	60	6
ESB702 060	6	3	7	12	60	6
ESB702 061	6	3	7	12	90	6
ESB702 080	8	4	9	15	70	8
ESB702 081	8	4	9	15	100	8
ESB702 100	10	5	11	25	75	10
ESB702 101	10	5	11	25	100	10
ESB702 120	12	6	12	25	80	12
ESB702 121	12	6	12	25	110	12

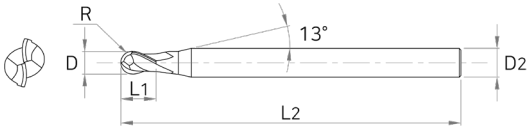
■ Applicable Working Material

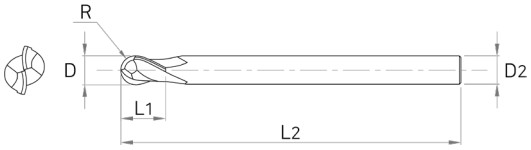
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESB712 | 2 FLUTES BALL ENDMILL







■ Tolerance

D		Shank Dia
~D6	0~-0.012	h5
D8~12	0~-0.015	

CARBIDE | AlTiN | 2 | 30° HELIX | R ±0.005 R3 OR UNDER | R ±0.008 ABOVE R3 | DATA P.622

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
ESB712 010	1	0.5	2.5	50	6
ESB712 010S	1	0.5	1.5	40	6
ESB712 010S4	1	0.5	2.5	50	4
ESB712 012	1.2	0.6	3	50	6
ESB712 015	1.5	0.75	4	50	6
ESB712 015S	1.5	0.75	2.5	40	6
ESB712 015S4	1.5	0.75	4	50	4
ESB712 020	2	1	5	50	6
ESB712 020S	2	1	3	40	6
ESB712 020S4	2	1	5	50	4
ESB712 025	2.5	1.25	7	60	6
ESB712 030	3	1.5	8	60	6
ESB712 030S	3	1.5	4.5	50	6

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
ESB712 030S4	3	1.5	8	60	4
ESB712 040	4	2	8	70	6
ESB712 040S	4	2	6	50	6
ESB712 050	5	2.5	10	80	6
ESB712 050S	5	2.5	7.5	50	6
ESB712 060	6	3	12	90	6
ESB712 060S	6	3	9	50	6
ESB712 080S	8	4	12	50	8
ESB712 081	8	4	14	100	8
ESB712 100	10	5	18	100	10
ESB712 100S	10	5	15	60	10
ESB712 120	12	6	22	110	12
ESB712 120S	12	6	18	60	12

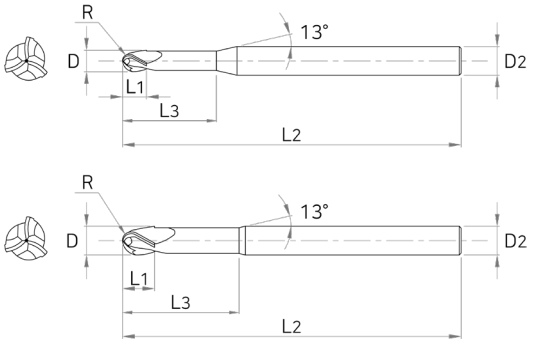
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESB703 | 3 FLUTES NECK BALL ENDMILL





■ Tolerance

D		Shank Dia
~D6	0 ~ -0.012	h5
D8 ~ 12	0 ~ -0.015	

CARBIDE | AlTiN | 3 | 30° HELIX | R ±0.005 R3 OR UNDER | R ±0.008 ABOVE R3 | DATA P.623

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESB703 020	2	1	2.5	5	50	6
ESB703 025	2.5	1.25	3	7	50	6
ESB703 030	3	1.5	4	10	60	6
ESB703 030S	3	1.5	4	10	50	6
ESB703 031	3	1.5	4	10	70	6
ESB703 040	4	2	5	10	60	6
ESB703 040S	4	2	5	10	50	6
ESB703 041	4	2	5	10	70	6
ESB703 050	5	2.5	6	12	60	6
ESB703 060	6	3	7	12	60	6
ESB703 061	6	3	7	12	90	6
ESB703 080	8	4	9	15	70	8
ESB703 081	8	4	9	15	100	8
ESB703 100	10	5	11	25	75	10
ESB703 101	10	5	11	25	100	10
ESB703 120	12	6	12	25	80	12
ESB703 121	12	6	12	25	110	12

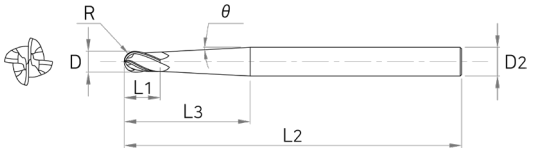
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESB734 | 3 FLUTES NECK BALL ENDMILL





■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.012	h5

CARBIDE | AlTiN | 4 | 15° HELIX | R ±0.005 R3 OR UNDER | R ±0.008 ABOVE R3 | DATA P.623

EDP No	SIZES (mm)						
	D	R	θ	L1	L3	L2	D2
ESB734 020-2.5	2	1	2.5	2	25	60	4
ESB734 020-3.5	2	1	3.5	2	18	60	4
ESB734 025-2.5	2.5	1.25	2.5	3	20	60	4
ESB734 025-3.0	2.5	1.25	3	3	17	60	4
ESB734 030-2.0	3	1.5	2	3	46	70	6
ESB734 030-2.5	3	1.5	2.5	3	37	70	6
ESB734 040-2.0	4	2	2	4	33	70	6
ESB734 040-2.5	4	2	2.5	4	27	70	6
ESB734 050-2.5	5	2.5	2.5	5	16	70	6
ESB734 060-1.5	6	3	1.5	6	44	100	8
ESB734 060-2.5	6	3	2.5	6	29	100	8
ESB734 080-1.5	8	4	1.5	8	46	100	10
ESB734 080-2.5	8	4	2.5	8	31	100	10
ESB734 100-1.5	10	5	1.5	10	48	110	12
ESB734 100-2.5	10	5	2.5	10	33	110	12

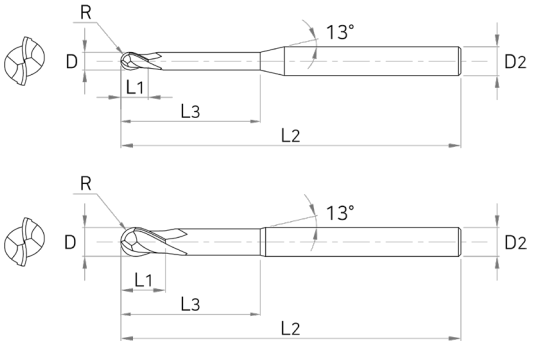
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESRB712 | 2 FLUTES RIB BALL ENDMILL





■ Tolerance

D		Shank Dia
~D6	0 ~ -0.012	h5
D8 ~ 12	0 ~ -0.015	

CARBIDE | AlTiN | 2 | 30° HELIX | R ±0.005 R3 OR UNDER | R ±0.008 ABOVE R3 | DATA P.624

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESRB712 001002	0.1	0.05	0.1	0.2	40	4
ESRB712 001003	0.1	0.05	0.1	0.3	40	4
ESRB712 001005	0.1	0.05	0.1	0.5	40	4
ESRB712 00101	0.1	0.05	0.1	1	40	4
ESRB712 002005	0.2	0.1	0.2	0.5	40	4
ESRB712 002015	0.2	0.1	0.2	1.5	40	4
ESRB712 00201	0.2	0.1	0.2	1	40	4
ESRB712 00202	0.2	0.1	0.2	2	40	4
ESRB712 00203	0.2	0.1	0.2	3	40	4
ESRB712 003015	0.3	0.15	0.3	1.5	40	4
ESRB712 00301	0.3	0.15	0.3	1	40	4
ESRB712 003025	0.3	0.15	0.3	2.5	40	4
ESRB712 00302	0.3	0.15	0.3	2	40	4
ESRB712 00303	0.3	0.15	0.3	3	40	4
ESRB712 00304	0.3	0.15	0.3	4	40	4
ESRB712 00305	0.3	0.15	0.3	5	40	4
ESRB712 004015	0.4	0.2	0.4	1.5	40	4
ESRB712 00401	0.4	0.2	0.4	1	40	4
ESRB712 004025	0.4	0.2	0.4	2.5	40	4
ESRB712 00402	0.4	0.2	0.4	2	40	4
ESRB712 00403	0.4	0.2	0.4	3	40	4
ESRB712 00404	0.4	0.2	0.4	4	40	4
ESRB712 00405	0.4	0.2	0.4	5	40	4
ESRB712 00406	0.4	0.2	0.4	6	40	4

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESRB712 00408	0.4	0.2	0.4	8	40	4
ESRB712 00410	0.4	0.2	0.4	10	40	4
ESRB712 005015	0.5	0.25	0.5	1.5	45	4
ESRB712 00501	0.5	0.25	0.5	1	45	4
ESRB712 00501S6	0.5	0.25	0.5	1	45	6
ESRB712 005025	0.5	0.25	0.5	2.5	45	4
ESRB712 00502	0.5	0.25	0.5	2	45	4
ESRB712 00502S6	0.5	0.25	0.5	2	45	6
ESRB712 00503	0.5	0.25	0.5	3	45	4
ESRB712 00504	0.5	0.25	0.5	4	45	4
ESRB712 00504S6	0.5	0.25	0.5	4	45	6
ESRB712 00505	0.5	0.25	0.5	5	45	4
ESRB712 00506	0.5	0.25	0.5	6	45	4
ESRB712 00508	0.5	0.25	0.5	8	45	4
ESRB712 00510	0.5	0.25	0.5	10	45	4
ESRB712 00512	0.5	0.25	0.5	12	45	4
ESRB712 00514	0.5	0.25	0.5	14	45	4
ESRB712 00516	0.5	0.25	0.5	16	45	4
ESRB712 00601	0.6	0.3	0.6	1	45	4
ESRB712 00601S6	0.6	0.3	0.6	1	45	6
ESRB712 00602	0.6	0.3	0.6	2	45	4
ESRB712 00602S6	0.6	0.3	0.6	2	45	6
ESRB712 00603	0.6	0.3	0.6	3	45	4
ESRB712 00603S6	0.6	0.3	0.6	3	45	6

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESRB712 | 2 FLUTES RIB BALL ENDMILL

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESRB712 00604	0.6	0.3	0.6	4	45	4
ESRB712 00604S6	0.6	0.3	0.6	4	45	6
ESRB712 00605	0.6	0.3	0.6	5	45	4
ESRB712 00605S6	0.6	0.3	0.6	5	45	6
ESRB712 00606	0.6	0.3	0.6	6	45	4
ESRB712 00606S6	0.6	0.3	0.6	6	45	6
ESRB712 00608	0.6	0.3	0.6	8	45	4
ESRB712 00608S6	0.6	0.3	0.6	8	45	6
ESRB712 00610	0.6	0.3	0.6	10	45	4
ESRB712 00610S6	0.6	0.3	0.6	10	45	6
ESRB712 00612	0.6	0.3	0.6	12	45	4
ESRB712 00612S6	0.6	0.3	0.6	12	45	6
ESRB712 00614	0.6	0.3	0.6	14	45	4
ESRB712 00614S6	0.6	0.3	0.6	14	45	6
ESRB712 00616	0.6	0.3	0.6	16	45	4
ESRB712 00616S6	0.6	0.3	0.6	16	50	6
ESRB712 00702	0.7	0.35	0.7	2	45	4
ESRB712 00704	0.7	0.35	0.7	4	45	4
ESRB712 00706	0.7	0.35	0.7	6	45	4
ESRB712 00708	0.7	0.35	0.7	8	45	4
ESRB712 00710	0.7	0.35	0.7	10	45	4
ESRB712 00712	0.7	0.35	0.7	12	45	4
ESRB712 00801	0.8	0.4	0.8	1	45	4
ESRB712 00801S6	0.8	0.4	0.8	1	45	6
ESRB712 00802	0.8	0.4	0.8	2	45	4
ESRB712 00802S6	0.8	0.4	0.8	2	45	6
ESRB712 00803	0.8	0.4	0.8	3	45	4
ESRB712 00803S6	0.8	0.4	0.8	3	45	6
ESRB712 00804	0.8	0.4	0.8	4	45	4
ESRB712 00804S6	0.8	0.4	0.8	4	45	6
ESRB712 00805	0.8	0.4	0.8	5	45	4
ESRB712 00805S6	0.8	0.4	0.8	5	45	6
ESRB712 00806	0.8	0.4	0.8	6	45	4
ESRB712 00806S6	0.8	0.4	0.8	6	45	6
ESRB712 00808	0.8	0.4	0.8	8	45	4
ESRB712 00808S6	0.8	0.4	0.8	8	45	6
ESRB712 00810	0.8	0.4	0.8	10	45	4
ESRB712 00810S6	0.8	0.4	0.8	10	45	6
ESRB712 00812	0.8	0.4	0.8	12	45	4
ESRB712 00812S6	0.8	0.4	0.8	12	45	6
ESRB712 00814	0.8	0.4	0.8	14	45	4

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESRB712 00814S6	0.8	0.4	0.8	14	45	6
ESRB712 00816	0.8	0.4	0.8	16	45	4
ESRB712 00816S6	0.8	0.4	0.8	16	50	6
ESRB712 00820	0.8	0.4	0.8	20	50	4
ESRB712 00820S6	0.8	0.4	0.8	20	55	6
ESRB712 00904	0.9	0.45	0.9	4	45	4
ESRB712 00906	0.9	0.45	0.9	6	45	4
ESRB712 00908	0.9	0.45	0.9	8	45	4
ESRB712 00910	0.9	0.45	0.9	10	45	4
ESRB712 01002	1	0.5	1	2	50	4
ESRB712 01002S6	1	0.5	1	2	50	6
ESRB712 01003	1	0.5	1	3	50	4
ESRB712 01003S6	1	0.5	1	3	50	6
ESRB712 01004	1	0.5	1	4	50	4
ESRB712 01004S6	1	0.5	1	4	50	6
ESRB712 01005	1	0.5	1	5	50	4
ESRB712 01005S6	1	0.5	1	5	50	6
ESRB712 01006	1	0.5	1	6	50	4
ESRB712 01006S6	1	0.5	1	6	50	6
ESRB712 01007	1	0.5	1	7	50	4
ESRB712 01007S6	1	0.5	1	7	50	6
ESRB712 01008	1	0.5	1	8	50	4
ESRB712 01008S6	1	0.5	1	8	50	6
ESRB712 01009	1	0.5	1	9	50	4
ESRB712 01009S6	1	0.5	1	9	50	6
ESRB712 01010	1	0.5	1	10	50	4
ESRB712 01010S6	1	0.5	1	10	50	6
ESRB712 01012	1	0.5	1	12	50	4
ESRB712 01012S6	1	0.5	1	12	50	6
ESRB712 01014	1	0.5	1	14	50	4
ESRB712 01014S6	1	0.5	1	14	50	6
ESRB712 01016	1	0.5	1	16	50	4
ESRB712 01016S6	1	0.5	1	16	50	6
ESRB712 01018	1	0.5	1	18	50	4
ESRB712 01018S6	1	0.5	1	18	50	6
ESRB712 01020	1	0.5	1	20	55	4
ESRB712 01020S6	1	0.5	1	20	55	6
ESRB712 01022	1	0.5	1	22	60	4
ESRB712 01022S6	1	0.5	1	22	60	6
ESRB712 01026	1	0.5	1	26	60	4
ESRB712 01026S6	1	0.5	1	26	60	6

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESRB712 | 2 FLUTES RIB BALL ENDMILL

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESRB712 01030	1	0.5	1	30	70	4
ESRB712 01030S6	1	0.5	1	30	70	6
ESRB712 01040	1	0.5	1	40	80	4
ESRB712 01050	1	0.5	1	50	100	4
ESRB712 01204	1.2	0.6	1.2	4	50	4
ESRB712 01206	1.2	0.6	1.2	6	50	4
ESRB712 01208	1.2	0.6	1.2	8	50	4
ESRB712 01210	1.2	0.6	1.2	10	50	4
ESRB712 01212	1.2	0.6	1.2	12	50	4
ESRB712 01216	1.2	0.6	1.2	16	50	4
ESRB712 01220	1.2	0.6	1.2	20	50	4
ESRB712 01226	1.2	0.6	1.2	26	60	4
ESRB712 01406	1.4	0.7	1.4	6	50	4
ESRB712 01408	1.4	0.7	1.4	8	50	4
ESRB712 01410	1.4	0.7	1.4	10	50	4
ESRB712 01412	1.4	0.7	1.4	12	50	4
ESRB712 01416	1.4	0.7	1.4	16	50	4
ESRB712 01503	1.5	0.75	1.5	3	50	4
ESRB712 01503S6	1.5	0.75	1.5	3	50	6
ESRB712 01504	1.5	0.75	1.5	4	50	4
ESRB712 01504S6	1.5	0.75	1.5	4	50	6
ESRB712 01505	1.5	0.75	1.5	5	50	4
ESRB712 01506	1.5	0.75	1.5	6	50	4
ESRB712 01506S6	1.5	0.75	1.5	6	50	6
ESRB712 01507	1.5	0.75	1.5	7	50	4
ESRB712 01508	1.5	0.75	1.5	8	50	4
ESRB712 01508S6	1.5	0.75	1.5	8	50	6
ESRB712 01510	1.5	0.75	1.5	10	50	4
ESRB712 01510S6	1.5	0.75	1.5	10	50	6
ESRB712 01512	1.5	0.75	1.5	12	50	4
ESRB712 01512S6	1.5	0.75	1.5	12	50	6
ESRB712 01514	1.5	0.75	1.5	14	50	4
ESRB712 01514S6	1.5	0.75	1.5	14	50	6
ESRB712 01516	1.5	0.75	1.5	16	50	4
ESRB712 01516S6	1.5	0.75	1.5	16	50	6
ESRB712 01518	1.5	0.75	1.5	18	50	4
ESRB712 01518S6	1.5	0.75	1.5	18	50	6
ESRB712 01520	1.5	0.75	1.5	20	55	4
ESRB712 01520S6	1.5	0.75	1.5	20	55	6
ESRB712 01522	1.5	0.75	1.5	22	60	4
ESRB712 01522S6	1.5	0.75	1.5	22	60	6

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESRB712 01526	1.5	0.75	1.5	26	60	4
ESRB712 01526S6	1.5	0.75	1.5	26	60	6
ESRB712 01530	1.5	0.75	1.5	30	70	4
ESRB712 01530S6	1.5	0.75	1.5	30	70	6
ESRB712 01535	1.5	0.75	1.5	35	70	4
ESRB712 01535S6	1.5	0.75	1.5	35	70	6
ESRB712 01540	1.5	0.75	1.5	40	80	4
ESRB712 01540S6	1.5	0.75	1.5	40	80	6
ESRB712 01604	1.6	0.8	1.6	4	50	4
ESRB712 01606	1.6	0.8	1.6	6	50	4
ESRB712 01608	1.6	0.8	1.6	8	50	4
ESRB712 01610	1.6	0.8	1.6	10	50	4
ESRB712 01612	1.6	0.8	1.6	12	50	4
ESRB712 01616	1.6	0.8	1.6	16	50	4
ESRB712 01620	1.6	0.8	1.6	20	50	4
ESRB712 01804	1.8	0.9	1.8	4	50	4
ESRB712 01806	1.8	0.9	1.8	6	50	4
ESRB712 01808	1.8	0.9	1.8	8	50	4
ESRB712 01810	1.8	0.9	1.8	10	50	4
ESRB712 01812	1.8	0.9	1.8	12	50	4
ESRB712 01816	1.8	0.9	1.8	16	50	4
ESRB712 01820	1.8	0.9	1.8	20	50	4
ESRB712 02004	2	1	2	4	50	4
ESRB712 02004S6	2	1	2	4	50	6
ESRB712 02006	2	1	2	6	50	4
ESRB712 02006S6	2	1	2	6	50	6
ESRB712 02008	2	1	2	8	50	4
ESRB712 02008S6	2	1	2	8	50	6
ESRB712 02010	2	1	2	10	50	4
ESRB712 02010S6	2	1	2	10	50	6
ESRB712 02012	2	1	2	12	50	4
ESRB712 02012S6	2	1	2	12	50	6
ESRB712 02014	2	1	2	14	50	4
ESRB712 02014S6	2	1	2	14	50	6
ESRB712 02016	2	1	2	16	50	4
ESRB712 02016S6	2	1	2	16	50	6
ESRB712 02018	2	1	2	18	55	4
ESRB712 02018S6	2	1	2	18	55	6
ESRB712 02020	2	1	2	20	55	4
ESRB712 02020S6	2	1	2	20	55	6
ESRB712 02022	2	1	2	22	60	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESRB712 | 2 FLUTES RIB BALL ENDMILL

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESRB712 02022S6	2	1	2	22	60	6
ESRB712 02026	2	1	2	26	60	4
ESRB712 02026S6	2	1	2	26	60	6
ESRB712 02030	2	1	2	30	70	4
ESRB712 02030S6	2	1	2	30	70	6
ESRB712 02035	2	1	2	35	70	4
ESRB712 02035S6	2	1	2	35	70	6
ESRB712 02040	2	1	2	40	80	4
ESRB712 02040S6	2	1	2	40	80	6
ESRB712 02045	2	1	2	45	90	4
ESRB712 02045S6	2	1	2	45	90	6
ESRB712 02050	2	1	2	50	100	4
ESRB712 02050S6	2	1	2	50	100	6
ESRB712 02060	2	1	2	60	110	4
ESRB712 02508	2.5	1.25	2.5	8	50	4
ESRB712 02510	2.5	1.25	2.5	10	50	4
ESRB712 02512	2.5	1.25	2.5	12	50	4
ESRB712 02516	2.5	1.25	2.5	16	50	4
ESRB712 02520	2.5	1.25	2.5	20	50	4
ESRB712 02522	2.5	1.25	2.5	22	60	4
ESRB712 02526	2.5	1.25	2.5	26	60	4
ESRB712 02530	2.5	1.25	2.5	30	70	4
ESRB712 02535	2.5	1.25	2.5	35	70	4
ESRB712 02540	2.5	1.25	2.5	40	80	4
ESRB712 02545	2.5	1.25	2.5	45	90	4
ESRB712 02550	2.5	1.25	2.5	50	100	4
ESRB712 03006	3	1.5	3	6	50	6
ESRB712 03008	3	1.5	3	8	50	6
ESRB712 03010	3	1.5	3	10	50	6
ESRB712 03012	3	1.5	3	12	50	6
ESRB712 03014	3	1.5	3	14	60	6
ESRB712 03016	3	1.5	3	16	60	6
ESRB712 03018	3	1.5	3	18	60	6
ESRB712 03020	3	1.5	3	20	60	6
ESRB712 03022	3	1.5	3	22	65	6
ESRB712 03026	3	1.5	3	26	65	6
ESRB712 03030	3	1.5	3	30	70	6
ESRB712 03035	3	1.5	3	35	70	6
ESRB712 03040	3	1.5	3	40	80	6
ESRB712 03045	3	1.5	3	45	90	6
ESRB712 03050	3	1.5	3	50	100	6

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESRB712 03060	3	1.5	3	60	100	6
ESRB712 03510	3.5	1.75	3	10	50	6
ESRB712 03516	3.5	1.75	3	16	60	6
ESRB712 03520	3.5	1.75	3	20	60	6
ESRB712 03526	3.5	1.75	3	26	65	6
ESRB712 03530	3.5	1.75	3	30	70	6
ESRB712 04008	4	2	4	8	50	6
ESRB712 04010	4	2	4	10	50	6
ESRB712 04012	4	2	4	12	50	6
ESRB712 04014	4	2	4	14	60	6
ESRB712 04016	4	2	4	16	60	6
ESRB712 04018	4	2	4	18	60	6
ESRB712 04020	4	2	4	20	60	6
ESRB712 04022	4	2	4	22	65	6
ESRB712 04026	4	2	4	26	65	6
ESRB712 04030	4	2	4	30	70	6
ESRB712 04035	4	2	4	35	70	6
ESRB712 04040	4	2	4	40	80	6
ESRB712 04045	4	2	4	45	90	6
ESRB712 04050	4	2	4	50	100	6
ESRB712 04055	4	2	4	55	100	6
ESRB712 04060	4	2	4	60	100	6
ESRB712 05015	5	2.5	6	15	60	6
ESRB712 05020	5	2.5	6	20	60	6
ESRB712 05026	5	2.5	6	26	65	6
ESRB712 05030	5	2.5	6	30	70	6
ESRB712 05035	5	2.5	6	35	70	6
ESRB712 05040	5	2.5	6	40	80	6
ESRB712 05045	5	2.5	6	45	90	6
ESRB712 05050	5	2.5	6	50	100	6
ESRB712 05055	5	2.5	6	55	100	6
ESRB712 05060	5	2.5	6	60	100	6
ESRB712 0602090	6	3	12	20	90	6
ESRB712 06020	6	3	8	20	60	6
ESRB712 0603090	6	3	12	30	90	6
ESRB712 06030	6	3	8	30	60	6
ESRB712 08025100	8	4	14	25	100	8
ESRB712 08025	8	4	10	25	70	8
ESRB712 08035100	8	4	14	35	100	8
ESRB712 08035	8	4	10	35	70	8
ESRB712 10030100	10	5	18	30	100	10

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESRB712 | 2 FLUTES RIB BALL ENDMILL

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESRB712 10030	10	5	12	30	75	10
ESRB712 10040100	10	5	18	40	100	10
ESRB712 10040	10	5	12	40	75	10
ESRB712 12032110	12	6	22	32	110	12

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ESRB712 12032	12	6	14	32	80	12
ESRB712 12045110	12	6	22	45	110	12
ESRB712 12045	12	6	14	45	80	12

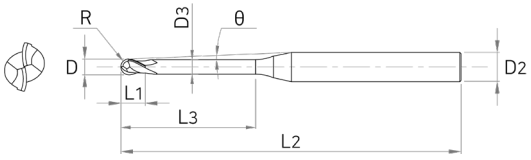
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESLNB20 | 2 FLUTES LONG NECK BALL ENDMILL





■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.012	h5

CARBIDE | AlTiN | 2 | 30° HELIX | R ±0.005 All Sizes | DATA P.629

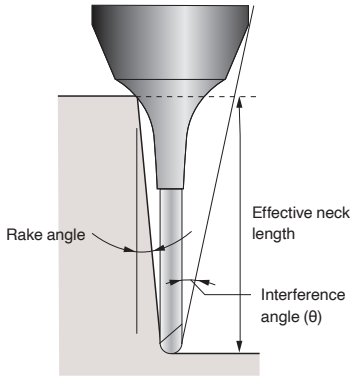
EDP No	SIZES (mm)								Effective length by inclination angle				
	D	R	L1	L3	D3	L2	D2	θ	0.5°	1°	1.5°	2°	3°
ESLNB2001-0.2	0.1	0.05	0.08	0.2	0.08	45	4	11.8	0.3	0.3	0.3	0.4	0.4
ESLNB2001-0.3	0.1	0.05	0.08	0.3	0.08	45	4	11.7	0.4	0.4	0.5	0.5	0.5
ESLNB2001-0.5	0.1	0.05	0.08	0.5	0.08	45	4	11.4	0.6	0.7	0.7	0.7	0.8
ESLNB2002-0.5	0.2	0.1	0.15	0.5	0.17	50	4	11.5	1.2	1.3	1.5	1.6	2
ESLNB2002-1	0.2	0.1	0.15	1	0.17	50	4	10.9	1.7	1.9	2.1	2.3	2.7
ESLNB2002-1.5	0.2	0.1	0.15	1.5	0.17	50	4	10.4	2.3	2.5	2.8	3	3.4
ESLNB2002-2	0.2	0.1	0.15	2	0.17	50	4	9.9	2.8	3.1	3.4	3.6	4.1
ESLNB2002-2.5	0.2	0.1	0.15	2.5	0.17	50	4	9.5	3.4	3.7	4	4.2	4.7
ESLNB2002-3.0	0.2	0.1	0.15	3	0.17	50	4	9.1	3.9	4.3	4.6	4.9	5.4
ESLNB2003-1	0.3	0.15	0.25	1	0.27	50	4	10.9	1.7	1.9	2.1	2.3	2.7
ESLNB2003-1.5	0.3	0.15	0.25	1.5	0.27	50	4	10.4	2.3	2.5	2.7	3	3.4
ESLNB2003-2	0.3	0.15	0.25	2	0.27	50	4	9.9	2.8	3.1	3.4	3.6	4
ESLNB2003-2.5	0.3	0.15	0.25	2.5	0.27	50	4	9.5	3.4	3.7	4	4.2	4.7
ESLNB2003-3	0.3	0.15	0.25	3	0.27	50	4	9.1	3.9	4.3	4.6	4.8	5.3
ESLNB2004-1	0.4	0.2	0.3	1	0.37	50	4	11	1.7	1.9	2.1	2.3	2.7
ESLNB2004-1.5	0.4	0.2	0.3	1.5	0.37	50	4	10.4	2.3	2.5	2.7	2.9	3.4
ESLNB2004-2	0.4	0.2	0.3	2	0.37	50	4	9.9	2.8	3.1	3.4	3.6	4
ESLNB2004-2.5	0.4	0.2	0.3	2.5	0.37	50	4	9.5	3.4	3.7	4	4.2	4.7
ESLNB2004-3	0.4	0.2	0.3	3	0.37	50	4	9.1	3.9	4.3	4.6	4.8	5.3
ESLNB2004-3.5	0.4	0.2	0.3	3.5	0.37	50	4	8.7	4.5	4.8	5.2	5.4	6
ESLNB2004-4	0.4	0.2	0.3	4	0.37	50	4	8.3	5	5.4	5.7	6	6.6
ESLNB2004-4.5	0.4	0.2	0.3	4.5	0.37	50	4	8	5.6	6	6.3	6.6	7.2
ESLNB2005-1	0.5	0.25	0.35	1	0.47	50	4	11	1.7	1.9	2.1	2.3	2.6
ESLNB2005-2	0.5	0.25	0.35	2	0.47	50	4	9.9	2.8	3.1	3.3	3.6	4

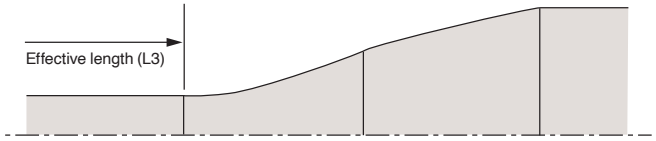
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESLNB20 | 2 FLUTES LONG NECK BALL ENDMILL





※ The marked effective neck length is the default value to prevent interference with the workpiece.
Proper control of the processing environment is required

EDP No	SIZES (mm)								Effective length by inclination angle				
	D	R	L1	L3	D3	L2	D2	θ	0.5°	1°	1.5°	2°	3°
ESLNB2005-3	0.5	0.25	0.35	3	0.47	50	4	9	3.9	4.3	4.6	4.8	5.3
ESLNB2005-4	0.5	0.25	0.35	4	0.47	50	4	8.3	5	5.4	5.7	6	6.6
ESLNB2005-5	0.5	0.25	0.35	5	0.47	50	4	7.7	6.1	6.5	6.9	7.2	7.8
ESLNB2005-6	0.5	0.25	0.35	6	0.47	50	4	7.1	7.2	7.6	8	8.4	9
ESLNB2005-8	0.5	0.25	0.35	8	0.47	50	4	6.3	9.3	9.9	10.3	10.7	11.4
ESLNB2006-1	0.6	0.3	0.4	1	0.57	50	4	11	1.7	1.9	2.1	2.3	2.6
ESLNB2006-2	0.6	0.3	0.4	2	0.57	50	4	9.9	2.8	3.1	3.3	3.6	4
ESLNB2006-3	0.6	0.3	0.4	3	0.57	50	4	9	3.9	4.3	4.5	4.8	5.3
ESLNB2006-4	0.6	0.3	0.4	4	0.57	50	4	8.3	5	5.4	5.7	6	6.6
ESLNB2006-5	0.6	0.3	0.4	5	0.57	50	4	7.6	6.1	6.5	6.9	7.2	7.8
ESLNB2006-6	0.6	0.3	0.4	6	0.57	50	4	7.1	7.2	7.6	8	8.4	9
ESLNB2006-7	0.6	0.3	0.4	7	0.57	50	4	6.6	8.3	8.8	9.2	9.5	10.2
ESLNB2006-8	0.6	0.3	0.4	8	0.57	50	4	6.2	9.3	9.9	10.3	10.7	11.4
ESLNB2006-9	0.6	0.3	0.4	9	0.57	50	4	5.8	10.4	10.9	11.4	11.8	12.5
ESLNB2006-10	0.6	0.3	0.4	10	0.57	50	4	5.5	11.4	12	12.5	12.9	13.7
ESLNB2006-12	0.6	0.3	0.4	12	0.57	50	4	5	13.6	14.2	14.7	15.2	16
ESLNB2008-2	0.8	0.4	0.5	2	0.77	50	4	9.9	2.8	3.1	3.3	3.5	4
ESLNB2008-4	0.8	0.4	0.5	4	0.77	50	4	8.2	5	5.4	5.7	6	6.5
ESLNB2008-5	0.8	0.4	0.5	5	0.77	50	4	7.5	6.1	6.5	6.9	7.2	7.8
ESLNB2008-6	0.8	0.4	0.5	6	0.77	50	4	7	7.2	7.6	8	8.4	9
ESLNB2008-8	0.8	0.4	0.5	8	0.77	50	4	6.1	9.3	9.8	10.3	10.7	11.3
ESLNB2008-10	0.8	0.4	0.5	10	0.77	50	4	5.4	11.4	12	12.5	12.9	13.7
ESLNB2010-2	1	0.5	0.8	2	0.96	50	4	9.9	2.9	3.1	3.3	3.5	4
ESLNB2010-3	1	0.5	0.8	3	0.96	50	4	8.9	4	4.3	4.5	4.8	5.3

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESLNB20 | 2 FLUTES LONG NECK BALL ENDMILL

EDP No	SIZES (mm)								Effective length by inclination angle				
	D	R	L1	L3	D3	L2	D2	θ	0.5°	1°	1.5°	2°	3°
ESLNB2010-4	1	0.5	0.8	4	0.96	50	4	8.1	5	5.4	5.7	6	6.5
ESLNB2010-5	1	0.5	0.8	5	0.96	50	4	7.4	6.1	6.5	6.9	7.2	7.8
ESLNB2010-6	1	0.5	0.8	6	0.96	50	4	6.8	7.2	7.7	8	8.4	9
ESLNB2010-7	1	0.5	0.8	7	0.96	50	4	6.3	8.3	8.8	9.2	9.5	10.2
ESLNB2010-8	1	0.5	0.8	8	0.96	50	4	5.9	9.3	9.9	10.3	10.7	11.3
ESLNB2010-9	1	0.5	0.8	9	0.96	50	4	5.5	10.4	11	11.4	11.8	12.5
ESLNB2010-10	1	0.5	0.8	10	0.96	50	4	5.2	11.5	12	12.5	12.9	13.7
ESLNB2010-12	1	0.5	0.8	12	0.96	55	4	4.6	13.6	14.2	14.7	15.2	15.9
ESLNB2010-14	1	0.5	0.8	14	0.96	55	4	4.2	15.7	16.4	16.9	17.4	18.5
ESLNB2010-16	1	0.5	0.8	16	0.96	55	4	3.8	17.8	18.5	19.1	19.6	21.2
ESLNB2010-18	1	0.5	0.8	18	0.96	60	4	3.5	19.9	20.7	21.3	21.8	23.8
ESLNB2010-20	1	0.5	0.8	20	0.96	60	4	3.3	22	22.8	23.4	24	26.5
ESLNB2012-4	1.2	0.6	1.1	4	1.15	50	4	7.9	5.1	5.4	5.7	6	6.5
ESLNB2012-6	1.2	0.6	1.1	6	1.15	50	4	6.6	7.2	7.7	8	8.4	9
ESLNB2012-8	1.2	0.6	1.1	8	1.15	50	4	5.7	9.4	9.9	10.3	10.7	11.3
ESLNB2012-10	1.2	0.6	1.1	10	1.15	50	4	5	11.5	12.1	12.5	12.9	13.7
ESLNB2012-12	1.2	0.6	1.1	12	1.15	55	4	4.5	13.6	14.2	14.7	15.2	15.9
ESLNB2014-8	1.4	0.7	1.3	8	1.34	50	4	5.5	9.4	9.9	10.3	10.7	11.3
ESLNB2014-12	1.4	0.7	1.3	12	1.34	55	4	4.3	13.6	14.2	14.7	15.2	15.9
ESLNB2014-16	1.4	0.7	1.3	16	1.34	55	4	3.5	17.8	18.5	19.1	19.6	21.2
ESLNB2015-4	1.5	0.75	1.35	4	1.44	50	4	7.7	5.1	5.4	5.7	6	6.5
ESLNB2015-6	1.5	0.75	1.35	6	1.44	50	4	6.4	7.3	7.7	8	8.4	9
ESLNB2015-8	1.5	0.75	1.35	8	1.44	50	4	5.4	9.4	9.9	10.3	10.7	11.3
ESLNB2015-10	1.5	0.75	1.35	10	1.44	50	4	4.7	11.5	12.1	12.5	12.9	13.7
ESLNB2015-12	1.5	0.75	1.35	12	1.44	55	4	4.2	13.6	14.2	14.7	15.2	15.9
ESLNB2015-14	1.5	0.75	1.35	14	1.44	55	4	3.8	15.7	16.4	16.9	17.4	18.5
ESLNB2015-16	1.5	0.75	1.35	16	1.44	55	4	3.4	17.8	18.5	19.1	19.6	21.1
ESLNB2015-20	1.5	0.75	1.35	20	1.44	60	4	2.9	22	22.8	23.4	24	-
ESLNB2016-8	1.6	0.8	1.4	8	1.54	50	4	5.3	9.4	9.9	10.3	10.7	11.3
ESLNB2016-10	1.6	0.8	1.4	10	1.54	55	4	4.6	11.5	12.1	12.5	12.9	13.7
ESLNB2016-12	1.6	0.8	1.4	12	1.54	55	4	4.1	13.6	14.2	14.7	15.2	15.9
ESLNB2016-16	1.6	0.8	1.4	16	1.54	55	4	3.3	17.8	18.5	19.1	19.6	21.1
ESLNB2016-20	1.6	0.8	1.4	20	1.54	60	4	2.8	22	22.8	23.4	24	-
ESLNB2018-8	1.8	0.9	1.6	8	1.73	50	4	5.1	9.4	9.9	10.3	10.7	11.3
ESLNB2018-12	1.8	0.9	1.6	12	1.73	55	4	3.9	13.7	14.3	14.7	15.2	15.9
ESLNB2018-16	1.8	0.9	1.6	16	1.73	55	4	3.1	17.9	18.6	19.1	19.6	21.1
ESLNB2018-20	1.8	0.9	1.6	20	1.73	60	4	2.6	22	22.8	23.4	24	-
ESLNB2020-3	2	1	1.7	3	1.92	50	4	8.3	4.1	4.4	4.6	4.8	5.2
ESLNB2020-4	2	1	3	4	1.92	50	4	7.3	5.2	5.5	5.8	6	6.5
ESLNB2020-6	2	1	3	6	1.92	50	4	5.8	7.3	7.7	8.1	8.4	9
ESLNB2020-8	2	1	3	8	1.92	50	4	4.9	9.5	9.9	10.3	10.7	11.3

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESLNB20 | 2 FLUTES LONG NECK BALL ENDMILL

EDP No	SIZES (mm)								Effective length by inclination angle				
	D	R	L1	L3	D3	L2	D2	θ	0.5°	1°	1.5°	2°	3°
ESLNB2020-10	2	1	3	10	1.92	50	4	4.2	11.6	12.1	12.6	12.9	13.6
ESLNB2020-12	2	1	3	12	1.92	55	4	3.7	13.7	14.3	14.8	15.2	15.9
ESLNB2020-14	2	1	3	14	1.92	55	4	3.2	15.8	16.4	16.9	17.4	18.5
ESLNB2020-16	2	1	3	16	1.92	55	4	2.9	17.9	18.6	19.1	19.6	-
ESLNB2020-18	2	1	3	18	1.92	60	4	2.7	20	20.7	21.3	21.8	-
ESLNB2020-20	2	1	3	20	1.92	60	4	2.4	22.1	22.8	23.4	24	-
ESLNB2020-22	2	1	3	22	1.92	60	4	2.3	24.1	24.9	25.6	26.3	-
ESLNB2020-25	2	1	3	25	1.92	65	4	2	27.3	28.1	28.8	-	-
ESLNB2020-30	2	1	3	30	1.92	70	4	1.7	32.4	33.4	34.2	-	-
ESLNB2020-35	2	1	3	35	1.92	75	4	1.5	37.6	38.6	-	-	-
ESLNB2020-40	2	1	3	40	1.92	80	4	1.4	42.8	43.8	-	-	-
ESLNB2025-10	2.5	1.25	4	10	2.4	50	4	3.4	11.6	12.1	12.6	13	13.6
ESLNB2025-16	2.5	1.25	4	16	2.4	55	4	2.3	17.9	18.6	19.1	19.6	-
ESLNB2025-20	2.5	1.25	4	20	2.4	60	4	1.9	22.1	22.8	23.5	-	-
ESLNB2030-8	3	1.5	4	8	2.88	55	6	6.2	9.6	10	10.4	10.7	11.3
ESLNB2030-10	3	1.5	4	10	2.88	55	6	5.5	11.7	12.2	12.6	13	13.6
ESLNB2030-13	3	1.5	4	13	2.88	60	6	4.6	14.8	15.4	15.9	16.3	17.1
ESLNB2030-16	3	1.5	4	16	2.88	60	6	4	18	18.6	19.1	19.6	21.1
ESLNB2030-18	3	1.5	4	18	2.88	60	6	3.6	20	20.7	21.3	21.8	23.7
ESLNB2030-20	3	1.5	4	20	2.88	65	6	3.4	22.1	22.9	23.5	24	26.4
ESLNB2030-25	3	1.5	4	25	2.88	70	6	2.8	27.3	28.2	28.8	29.9	-
ESLNB2030-30	3	1.5	4	30	2.88	75	6	2.2	37.7	38.7	40	41.9	-
ESLNB2030-35	3	1.5	4	35	2.88	80	6	4.5	11.6	12.1	12.5	12.9	13.5
ESLNB2040-10	4	2	5	10	3.9	55	6	3.6	14.7	15.3	15.8	16.2	17
ESLNB2040-13	4	2	5	13	3.9	60	6	3.1	17.9	18.5	19.1	19.5	20.9
ESLNB2040-16	4	2	5	16	3.9	60	6	2.5	22.1	22.8	23.4	23.9	-
ESLNB2040-20	4	2	5	20	3.9	65	6	2.1	27.3	28.1	28.8	29.8	-
ESLNB2040-25	4	2	5	25	3.9	70	6	1.8	32.4	33.4	34.2	-	-
ESLNB2040-30	4	2	5	30	3.9	75	6	1.6	37.6	38.6	39.9	-	-
ESLNB2040-35	4	2	5	35	3.9	80	6	1.4	42.8	43.8	-	-	-
ESLNB2040-40	4	2	5	40	3.9	80	6	1.2	47.9	49.1	-	-	-
ESLNB2040-45	4	2	5	45	3.9	90	6	1.1	53.1	54.5	-	-	-
ESLNB2040-50	4	2	5	50	3.9	100	6	1.4	22	22.8	-	-	-
ESLNB2050-20	5	2.5	6	20	4.9	65	6	1.2	27.2	28.1	-	-	-
ESLNB2050-25	5	2.5	6	25	4.9	70	6	1	32.4	-	-	-	-
ESLNB2050-30	5	2.5	6	30	4.9	75	6	0.8	42.8	-	-	-	-
ESLNB2050-35	5	2.5	6	35	4.9	80	6	0.7	42.8	-	-	-	-
ESLNB2050-40	5	2.5	6	40	4.9	90	6	-	-	-	-	-	-

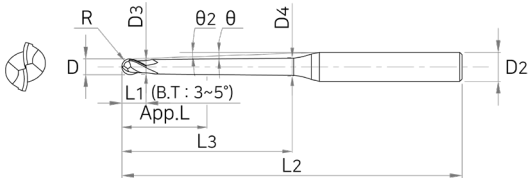
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESTNB20 | 2 FLUTES TAPERED NECK BALL ENDMILL





■ Tolerance

D		Shank Dia
~D6	0~-0.012	h5
D8~12	0~-0.015	

CARBIDE | AlTiN | 2 | 30° HELIX | R ±0.01 R3 OR UNDER | R ±0.015 ABOVE R3 | DATA P.630

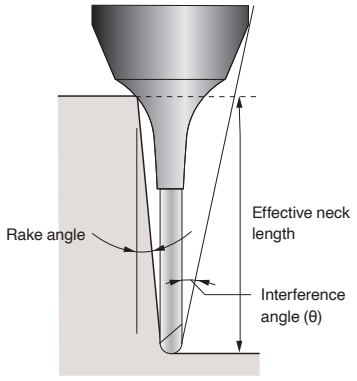
EDP No	SIZES (mm)											Effective length by inclination angle				
	D	R	L1	L3	θ2	D3	D4	L2	D2	App.L	θ	0.5°	1°	1.5°	2°	3°
ESTNB2002-1-04	0.2	0.1	0.15	1	0.4	0.17	0.18	50	4	1.35	10.9	1.5	1.7	1.8	2	2.3
ESTNB2002-1.5-04	0.2	0.1	0.15	1.5	0.4	0.17	0.19	50	4	1.77	10.4	2	2.2	2.4	2.6	2.9
ESTNB2002-2-09	0.2	0.1	0.15	2	0.9	0.17	0.23	50	4	1.1	10.1	-	2.8	3.1	3.4	3.9
ESTNB2002-2.5-09	0.2	0.1	0.15	2.5	0.9	0.17	0.24	50	4	1.1	9.6	-	3.3	3.7	4	4.5
ESTNB2003-2-04	0.3	0.15	0.25	2	0.4	0.28	0.29	50	4	2.19	10	2.5	2.8	3	3.2	3.5
ESTNB2003-3-09	0.3	0.15	0.25	3	0.9	0.28	0.36	50	4	1.2	9.3	-	3.8	4.2	4.5	5.1
ESTNB2003-4-09	0.3	0.15	0.25	4	0.9	0.28	0.39	50	4	1.2	8.6	-	4.8	5.3	5.7	6.3
ESTNB2004-2-04	0.4	0.2	0.3	2	0.4	0.37	0.39	50	4	2.2	10	2.5	2.8	3	3.2	3.5
ESTNB2004-3-04	0.4	0.2	0.3	3	0.4	0.37	0.41	50	4	2.44	9.1	3.6	3.9	4.1	4.4	4.8
ESTNB2004-4-04	0.4	0.2	0.3	4	0.4	0.37	0.42	50	4	2.44	8.4	4.7	5.2	5.6	5.9	6.5
ESTNB2004-4-09	0.4	0.2	0.3	4	0.9	0.37	0.49	50	4	1.25	8.5	-	4.8	5.3	5.7	6.3
ESTNB2004-5-04	0.4	0.2	0.3	5	0.4	0.37	0.44	50	4	2.44	7.8	5.7	6.3	6.7	7.1	7.7
ESTNB2004-5-09	0.4	0.2	0.3	5	0.9	0.37	0.52	50	4	1.25	7.9	-	5.9	6.4	6.8	7.5
ESTNB2005-4-04	0.5	0.25	0.35	4	0.4	0.47	0.52	50	4	2.49	8.4	4.6	5	5.3	5.5	5.9
ESTNB2005-8-09	0.5	0.25	0.35	8	0.9	0.47	0.71	50	4	1.3	6.5	-	8.9	9.6	10.1	10.9
ESTNB2005-12-09	0.5	0.25	0.35	12	0.9	0.47	0.84	50	4	1.3	5.3	-	13	13.9	14.5	15.4
ESTNB20054-2-04	0.54	0.27	0.37	2	0.4	0.52	0.54	50	4	1.8	10	2.3	2.5	2.7	2.8	3
ESTNB20054-4-04	0.54	0.27	0.37	4	0.4	0.52	0.57	50	4	1.8	8.4	4.5	4.9	5.2	5.5	5.9
ESTNB20054-5-04	0.54	0.27	0.37	5	0.4	0.52	0.59	50	4	1.8	7.8	5.5	6	6.3	6.6	7.1
ESTNB20054-6-04	0.54	0.27	0.37	6	0.4	0.52	0.6	50	4	1.8	7.2	6.7	7.3	7.8	8.2	8.8
ESTNB20054-6.5-04	0.54	0.27	0.37	6.5	0.4	0.52	0.61	50	4	1.8	7	7.2	7.9	8.3	8.7	9.4
ESTNB20054-7-04	0.54	0.27	0.37	7	0.4	0.52	0.61	50	4	1.8	6.8	7.7	8.4	8.9	9.3	10
ESTNB2006-2-04	0.6	0.3	0.4	2	0.4	0.57	0.59	50	4	2.17	10	2.4	2.5	2.7	2.8	3
ESTNB2006-4-04	0.6	0.3	0.4	4	0.4	0.57	0.62	50	4	2.54	8.4	4.6	5	5.2	5.5	5.9

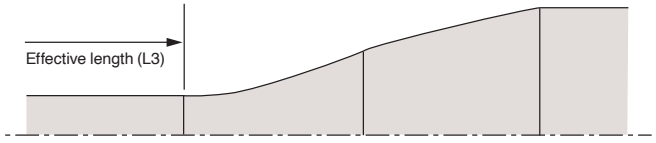
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESTNB20 | 2 FLUTES TAPERED NECK BALL ENDMILL





※ The marked effective neck length is the default value to prevent interference with the workpiece.
Proper control of the processing environment is required

EDP No	SIZES (mm)											Effective length by inclination angle				
	D	R	L1	L3	θ2	D3	D4	L2	D2	App.L	θ	0.5°	1°	1.5°	2°	3°
ESTNB2006-6-04	0.6	0.3	0.4	6	0.4	0.57	0.65	50	4	2.54	7.2	6.8	7.4	7.8	8.2	8.8
ESTNB2006-6-09	0.6	0.3	0.4	6	0.9	0.57	0.75	50	4	1.35	7.3	-	6.9	7.5	7.9	8.6
ESTNB2006-8-09	0.6	0.3	0.4	8	0.9	0.57	0.81	50	4	1.35	6.4	-	8.9	9.6	10.1	10.9
ESTNB2006-10-04	0.6	0.3	0.4	10	0.4	0.57	0.7	50	4	2.54	5.6	10.8	11.7	12.2	12.7	13.5
ESTNB2006-10-09	0.6	0.3	0.4	10	0.9	0.57	0.87	50	4	1.35	5.7	-	11	11.8	12.3	13.2
ESTNB2006-12-09	0.6	0.3	0.4	12	0.9	0.57	0.93	55	4	1.35	5.2	-	13	13.9	14.5	15.4
ESTNB2006-15-04	0.6	0.3	0.4	15	0.4	0.57	0.77	55	4	2.54	4.4	15.9	17	17.6	18.2	19.2
ESTNB2006-15-09	0.6	0.3	0.4	15	0.9	0.57	1.03	55	4	1.35	4.5	-	16.1	17.1	17.7	18.8
ESTNB2008-4-04	0.8	0.4	0.5	4	0.4	0.77	0.82	50	4	2.64	8.3	4.6	4.9	5.2	5.5	5.9
ESTNB2008-6-04	0.8	0.4	0.5	6	0.4	0.77	0.85	50	4	2.64	7.1	6.6	7.1	7.5	7.7	8.3
ESTNB2008-8-09	0.8	0.4	0.5	8	0.9	0.77	1.01	50	4	1.45	6.3	-	8.9	9.6	10.1	10.9
ESTNB2008-12-09	0.8	0.4	0.5	12	0.9	0.77	1.13	55	4	1.45	5	-	13	13.9	14.5	15.4
ESTNB2008-16-09	0.8	0.4	0.5	16	0.9	0.77	1.26	55	4	1.45	4.2	-	17.1	18.1	18.8	19.9
ESTNB2009-4-04	0.9	0.45	0.6	4	0.4	0.86	0.91	50	4	3.46	8.2	4.5	4.7	4.9	5.1	5.4
ESTNB2009-8-04	0.9	0.45	0.6	8	0.4	0.86	0.96	55	4	3.46	6.1	8.7	9.3	9.7	10	10.6
ESTNB2009-12-04	0.9	0.45	0.6	12	0.4	0.86	1.02	55	4	3.46	4.8	12.9	13.8	14.4	14.9	15.7
ESTNB2009-16-04	0.9	0.45	0.6	16	0.4	0.86	1.08	60	4	3.46	4	17	18	18.7	19.3	20.5
ESTNB2009-18-04	0.9	0.45	0.6	18	0.4	0.86	1.1	65	4	3.46	3.7	19.1	20.1	20.9	21.5	23.1
ESTNB2009-20-04	0.9	0.45	0.6	20	0.4	0.86	1.13	65	4	3.46	3.4	21.1	22.2	23	23.6	25.6
ESTNB2009-22-04	0.9	0.45	0.6	22	0.4	0.86	1.16	65	4	3.46	3.2	23.1	24.3	25.1	25.8	28.2
ESTNB2009-24-04	0.9	0.45	0.6	24	0.4	0.86	1.19	70	4	3.46	3	25.2	26.4	27.2	27.9	-
ESTNB2010-6-04	1	0.5	0.8	6	0.4	0.94	1.01	50	6	5.09	8.3	6.8	7.2	7.5	7.8	8.3
ESTNB2010-8-04	1	0.5	0.8	8	0.4	0.94	1.04	55	6	5.09	7.5	8.8	9.3	9.7	10	10.6
ESTNB2010-10-04	1	0.5	0.8	10	0.4	0.94	1.07	55	6	5.09	6.8	11	11.7	12.3	12.7	13.5

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESTNB20 | 2 FLUTES TAPERED NECK BALL ENDMILL

EDP No	SIZES (mm)											Effective length by inclination angle				
	D	R	L1	L3	θ2	D3	D4	L2	D2	App.L	θ	0.5°	1°	1.5°	2°	3°
ESTNB2010-10-09	1	0.5	0.8	10	0.9	0.94	1.23	55	6	2.7	6.9	-	11.2	11.9	12.4	13.2
ESTNB2010-15-09	1	0.5	0.8	15	0.9	0.94	1.39	60	6	2.7	5.7	-	16.2	17.1	17.8	18.8
ESTNB2010-20-04	1	0.5	0.8	20	0.4	0.94	1.21	65	6	5.09	4.7	21.2	22.3	23	23.6	25.7
ESTNB2010-20-09	1	0.5	0.8	20	0.4	0.94	1.54	65	6	2.7	4.8	-	21.3	22.4	23.1	24.6
ESTNB2010-25-09	1	0.5	0.8	25	0.4	0.94	1.7	70	6	2.7	4.2	-	26.4	27.6	28.4	30.8
ESTNB2010-30-04	1	0.5	0.8	30	0.4	0.94	1.35	75	6	5.09	3.6	31.3	32.7	33.6	34.8	38.5
ESTNB2010-30-09	1	0.5	0.8	30	0.9	0.94	1.86	75	6	2.7	3.7	-	31.4	32.8	33.7	36.9
ESTNB2010-35-09	1	0.5	0.8	35	0.9	0.94	2.02	80	6	2.7	3.3	-	36.5	38	39	43.1
ESTNB2010-40-09	1	0.5	0.8	40	0.9	0.94	2.17	85	6	2.7	3	-	41.6	43.2	44.4	-
ESTNB2010-50-09	1	0.5	0.8	50	0.9	0.94	2.49	95	6	2.7	2.5	-	51.7	53.5	55.5	-
ESTNB2010-60-09	1	0.5	0.8	60	0.9	0.94	2.8	105	6	2.7	2.2	-	61.8	63.8	66.6	-
ESTNB2010-70-09	1	0.5	0.8	70	0.9	0.94	3.11	115	6	2.7	1.9	-	71.9	74	-	-
ESTNB2015-8-04	1.5	0.75	1.35	8	0.4	1.42	1.51	55	6	7.07	7.3	8.9	9.4	9.7	10	10.6
ESTNB2015-10-04	1.5	0.75	1.35	10	0.4	1.42	1.54	55	6	7.07	6.6	10.9	11.5	11.9	12.2	12.9
ESTNB2015-12-04	1.5	0.75	1.35	12	0.4	1.42	1.57	55	6	7.07	6	13	13.6	14	14.4	15.4
ESTNB2015-15-09	1.5	0.75	1.35	15	0.9	1.42	1.85	60	6	3.89	5.4	-	16.4	17.2	17.8	18.8
ESTNB2015-20-09	1.5	0.75	1.35	20	0.9	1.42	2.01	65	6	3.89	4.5	-	21.4	22.4	23.2	24.7
ESTNB2015-30-09	1.5	0.75	1.35	30	0.9	1.42	2.32	75	6	3.89	3.4	-	31.5	32.9	33.7	37
ESTNB2018-4-04	1.8	0.9	1.6	4	0.4	1.73	1.76	50	6	4.38	9.2	4.6	4.8	4.9	5.1	5.4
ESTNB2018-8-04	1.8	0.9	1.6	8	0.4	1.73	1.82	50	6	6.61	7.1	8.6	9	9.2	9.4	10.2
ESTNB2018-12-04	1.8	0.9	1.6	12	0.4	1.73	1.88	55	6	6.61	5.8	12.9	13.5	14	14.4	15.4
ESTNB2018-16-04	1.8	0.9	1.6	16	0.4	1.73	1.93	60	6	6.61	4.9	17	17.7	18.3	18.7	20.5
ESTNB2018-20-04	1.8	0.9	1.6	20	0.4	1.73	1.99	65	6	6.61	4.3	21.2	22.3	23	23.6	25.6
ESTNB2018-24-04	1.8	0.9	1.6	24	0.4	1.73	2.04	65	6	6.61	3.8	25.3	26.5	27.3	27.9	30.8
ESTNB2018-28-04	1.8	0.9	1.6	28	0.4	1.73	2.1	70	6	6.61	3.4	29.4	30.6	31.5	32.4	35.9
ESTNB2018-32-04	1.8	0.9	1.6	32	0.4	1.73	2.15	70	6	6.61	3	33.4	34.8	35.7	37.1	-
ESTNB2018-36-04	1.8	0.9	1.6	36	0.4	1.73	2.21	75	6	6.61	2.8	37.5	38.9	39.9	41.7	-
ESTNB2018-38-04	1.8	0.9	1.6	38	0.4	1.73	2.24	80	6	6.61	2.7	39.5	41	42	44	-
ESTNB2018-40-04	1.8	0.9	1.6	40	0.4	1.73	2.27	80	6	6.61	2.6	41.5	43.1	44.2	46.3	-
ESTNB2020-8-04	2	1	1.7	8	0.4	1.92	2.01	50	6	7.42	7	8.7	9	9.2	9.5	10.2
ESTNB2020-12-04	2	1	1.7	12	0.4	1.92	2.06	55	6	7.42	5.7	13	13.6	14	14.4	15.4
ESTNB2020-16-04	2	1	1.7	16	0.4	1.92	2.12	60	6	7.42	4.8	17	17.7	18.3	18.7	20.5
ESTNB2020-20-04	2	1	1.7	20	0.4	1.92	2.18	65	6	7.42	4.1	21.3	22.3	23	23.6	25.6
ESTNB2020-20-09	2	1	1.7	20	0.9	1.92	2.5	65	6	4.24	4.2	-	21.4	22.4	23.2	24.6
ESTNB2020-25-09	2	1	1.7	25	0.9	1.92	2.65	65	6	4.24	3.6	-	26.5	27.7	28.5	30.8
ESTNB2020-30-04	2	1	1.7	30	0.4	1.92	2.32	70	6	7.42	3.1	31.4	32.7	33.6	34.8	38.5
ESTNB2020-30-09	2	1	1.7	30	0.9	1.92	2.81	70	6	4.24	3.2	-	31.6	32.9	33.7	36.9
ESTNB2020-35-09	2	1	1.7	35	0.9	1.92	2.97	75	6	4.24	2.8	-	36.6	38	39	-
ESTNB2020-40-04	2	1	1.7	40	0.4	1.92	2.46	80	6	7.42	2.5	41.5	43.1	44.2	46.3	-
ESTNB2020-40-09	2	1	1.7	40	0.9	1.92	3.12	80	6	4.24	2.6	-	41.7	43.2	44.5	-
ESTNB2020-50-09	2	1	1.7	50	0.9	1.92	3.44	90	6	4.24	2.1	-	51.5	53.5	55.5	-

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESTNB20 | 2 FLUTES TAPERED NECK BALL ENDMILL

EDP No	SIZES (mm)											Effective length by inclination angle				
	D	R	L1	L3	θ2	D3	D4	L2	D2	App.L	θ	0.5°	1°	1.5°	2°	3°
ESTNB2020-60-09	2	1	1.7	60	0.9	1.92	3.75	100	6	4.24	1.8	-	61.9	63.8	-	-
ESTNB2020-70-09	2	1	1.7	70	0.9	1.92	4.07	110	6	4.24	1.8	-	72	74.1	-	-
ESTNB2030-8-04	3	1.5	2.5	8	0.4	2.86	2.94	50	6	8.5	6.3	8.8	9.1	9.3	9.5	10.3
ESTNB2030-16-04	3	1.5	2.5	16	0.4	2.86	3.05	55	6	12.52	4.1	17.2	17.8	18.3	18.7	20.6
ESTNB2030-20-04	3	1.5	2.5	20	0.4	2.86	3.1	60	6	12.52	3.4	21.2	22	22.6	23.3	25.7
ESTNB2030-30-04	3	1.5	2.5	30	0.4	2.86	3.24	70	6	12.52	2.5	31.6	32.8	33.7	34.9	-
ESTNB2030-30-09	3	1.5	2.5	30	0.9	2.86	3.72	70	6	6.95	2.6	-	31.8	33	33.8	-
ESTNB2030-40-04	3	1.5	2.5	40	0.4	2.86	3.38	80	6	12.52	2	41.7	43.2	44.3	-	-
ESTNB2030-40-09	3	1.5	2.5	40	0.9	2.86	4.04	80	6	6.95	2	-	41.9	43.3	-	-
ESTNB2030-50-09	3	1.5	2.5	50	0.9	2.86	4.35	90	6	6.95	1.7	-	52	53.6	-	-
ESTNB2030-60-09	3	1.5	2.5	60	0.9	2.86	4.67	100	6	6.95	1.4	-	62.1	-	-	-
ESTNB2030-70-09	3	1.5	2.5	70	0.9	2.86	4.98	110	6	6.95	1.2	-	72.1	-	-	-
ESTNB2040-20-10	4	2	8	20	1	3.86	4.28	70	8	12.01	5	20.5	21.6	22.3	22.8	23.5
ESTNB2040-30-10	4	2	8	30	1	3.86	4.63	80	8	12.01	3.51	22	31.6	32.5	33.2	34.16
ESTNB2040-40-10	4	2	8	40	1	3.86	4.98	90	8	12.01	2.7	22	42	43.4	44.3	-
ESTNB2040-50-10	4	2	8	50	1	3.86	5.33	100	8	12.01	2.2	22	52	53.6	54.7	-
ESTNB2040-60-10	4	2	8	60	1	3.86	5.68	110	8	12.01	1.9	22	62	63.8	-	-
ESTNB2050-30-10	5	2.5	10	30	1	4.86	5.56	80	8	14.01	2.8	25.5	31.7	32.6	33.2	-
ESTNB2050-40-10	5	2.5	10	40	1	4.86	5.91	90	8	14.01	2.1	25.5	41.7	42.8	43.5	-
ESTNB2050-60-10	5	2.5	10	60	1	4.86	6.61	110	8	14.01	1.5	25.5	62.1	-	-	-
ESTNB2060-30-10	6	3	12	30	1	5.86	6.49	80	8	16.01	1.9	29	31.8	32.6	-	-
ESTNB2060-40-10	6	3	12	40	1	5.86	6.84	90	8	16.01	1.5	29	41.8	-	-	-
ESTNB2060-50-10	6	3	12	50	1	5.86	7.19	100	8	16.01	1.2	29	51.8	-	-	-
ESTNB2060-60-10	6	3	12	60	1	5.86	7.54	110	10	16.01	1.9	29	62.2	63.9	-	-
ESTNB2060-70-10	6	3	12	70	1	5.86	7.89	120	10	16.01	1.7	29	72.2	74.1	-	-
ESTNB2060-80-10	6	3	12	80	1	5.86	8.23	130	10	16.01	1.5	29	82.2	-	-	-
ESTNB2080-50-10	8	4	14	50	1	7.86	9.12	110	10	18.01	1.2	32	51.9	-	-	-
ESTNB2080-60-10	8	4	14	60	1	7.86	9.47	120	10	18.01	1	32	-	-	-	-
ESTNB2080-70-10	8	4	14	70	1	7.86	9.82	130	10	18.01	0.9	32	-	-	-	-
ESTNB2080-80-10	8	4	14	80	1	7.86	10.16	140	12	18.01	1.5	32	82.3	-	-	-
ESTNB2100-60-10	10	5	18	60	1	9.86	11.33	130	12	22.01	1.1	39	62.1	-	-	-
ESTNB2100-75-10	10	5	18	75	1	9.86	11.85	140	12	22.01	0.9	39	-	-	-	-

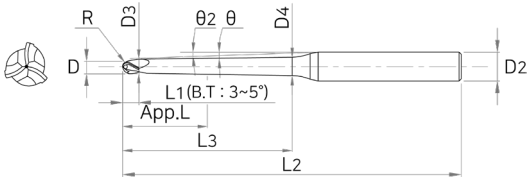
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESTNB30 | 3 FLUTES TAPERED NECK BALL ENDMILL





■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.015	h5

CARBIDE | AlTiN | 3 | 30° HELIX | R ±0.005 All Sizes | DATA P.633

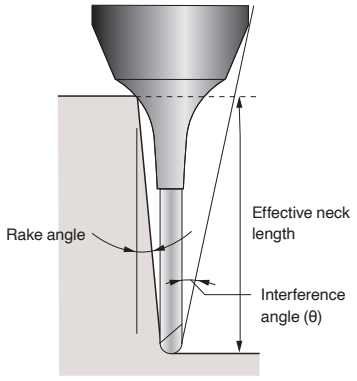
EDP No	SIZES (mm)											Effective length by inclination angle				
	D	R	L1	L3	θ2	D3	D4	L2	D2	App.L	θ	0.5°	1°	1.5°	2°	3°
ESTNB3020-8-04	2	1	1.7	8	0.4	1.92	2.01	50	6	7.42	7	8.7	9	9.2	9.5	10.2
ESTNB3020-12-04	2	1	1.7	12	0.4	1.92	2.06	55	6	7.42	5.7	13	13.6	14	14.4	15.4
ESTNB3020-16-04	2	1	1.7	16	0.4	1.92	2.12	60	6	7.42	4.8	17	17.7	18.3	18.7	20.5
ESTNB3020-20-04	2	1	1.7	20	0.4	1.92	2.18	65	6	7.42	4.1	21.3	22.3	23	23.6	25.6
ESTNB3020-20-09	2	1	1.7	20	0.9	1.92	2.5	65	6	4.24	4.2	-	21.4	22.4	23.2	24.6
ESTNB3020-25-09	2	1	1.7	25	0.9	1.92	2.65	65	6	4.24	3.6	-	26.5	27.7	28.5	30.8
ESTNB3020-30-04	2	1	1.7	30	0.4	1.92	2.32	70	6	7.42	3.1	31.4	32.7	33.6	34.8	38.5
ESTNB3020-30-09	2	1	1.7	30	0.9	1.92	2.81	70	6	4.24	3.2	-	31.6	32.9	33.7	36.9
ESTNB3020-35-09	2	1	1.7	35	0.9	1.92	2.97	75	6	4.24	2.8	-	36.6	38	39	-
ESTNB3020-40-04	2	1	1.7	40	0.4	1.92	2.46	80	6	7.42	2.5	41.5	43.1	44.2	46.3	-
ESTNB3020-40-09	2	1	1.7	40	0.9	1.92	3.12	80	6	4.24	2.6	-	41.7	43.2	44.5	-
ESTNB3020-50-09	2	1	1.7	50	0.9	1.92	3.44	90	6	4.24	2.1	-	51.8	53.5	55.5	-
ESTNB3020-60-09	2	1	1.7	60	0.9	1.92	3.75	100	6	4.24	1.8	-	61.9	63.8	-	-
ESTNB3020-70-09	2	1	1.7	70	0.9	1.92	4.07	110	6	4.24	1.6	-	72	74.1	-	-
ESTNB3030-8-04	3	1.5	2.5	8	0.4	2.86	2.94	50	6	8.5	6.3	8.8	9.1	9.3	9.5	10.3
ESTNB3030-16-04	3	1.5	2.5	16	0.4	2.86	3.05	55	6	12.52	4.1	17.2	17.8	18.3	18.7	20.6
ESTNB3030-20-04	3	1.5	2.5	20	0.4	2.86	3.1	60	6	12.52	3.4	21.2	22	22.6	23.3	25.7
ESTNB3030-30-04	3	1.5	2.5	30	0.4	2.86	3.24	70	6	12.52	2.5	31.6	32.8	33.7	34.9	-
ESTNB3030-30-09	3	1.5	2.5	30	0.9	2.86	3.72	70	6	6.95	2.6	-	31.8	33	33.8	-
ESTNB3030-40-04	3	1.5	2.5	40	0.4	2.86	3.38	80	6	12.52	2	41.7	43.2	44.3	-	-
ESTNB3030-40-09	3	1.5	2.5	40	0.9	2.86	4.04	80	6	6.95	2	-	41.9	43.3	-	-
ESTNB3030-50-09	3	1.5	2.5	50	0.9	2.86	4.35	90	6	6.95	1.7	-	52	53.6	-	-
ESTNB3030-60-09	3	1.5	2.5	60	0.9	2.86	4.67	100	6	6.95	1.4	-	62.1	-	-	-
ESTNB3030-70-09	3	1.5	2.5	70	0.9	2.86	4.98	110	6	6.95	1.2	-	72.1	-	-	-

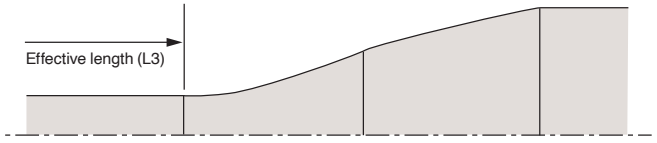
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

ESTNB30 | 3 FLUTES TAPERED NECK BALL ENDMILL





※ The marked effective neck length is the default value to prevent interference with the workpiece.
Proper control of the processing environment is required

EDP No	SIZES (mm)											Effective length by inclination angle				
	D	R	L1	L3	θ2	D3	D4	L2	D2	App.L	θ	0.5°	1°	1.5°	2°	3°
ESTNB3040-20-10	4	2	8	20	1	3.86	4.28	70	8	12.01	5	20.5	21.6	22.3	22.8	23.5
ESTNB3040-30-10	4	2	8	30	1	3.86	4.63	80	8	12.01	3.6	22	31.6	32.5	33.2	34.1
ESTNB3040-40-10	4	2	8	40	1	3.86	4.98	90	8	12.01	2.7	22	42	43.4	44.3	-
ESTNB3040-50-10	4	2	8	50	1	3.86	5.33	100	8	12.01	2.2	22	52	53.6	54.7	-
ESTNB3040-60-10	4	2	8	60	1	3.86	5.68	110	8	12.01	1.9	22	62	63.8	-	-
ESTNB3050-30-10	5	2.5	10	30	1	4.86	5.56	80	8	14.01	2.8	25.5	31.7	32.6	33.2	-
ESTNB3050-40-10	5	2.5	10	40	1	4.86	5.91	90	8	14.01	2.1	25.5	41.7	42.8	43.5	-
ESTNB3050-60-10	5	2.5	10	60	1	4.86	6.61	110	8	12.52	1.5	25.5	62.1	-	-	-

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
	○	◎	◎	○					

○ : GOOD ◎ : EXCELLENT

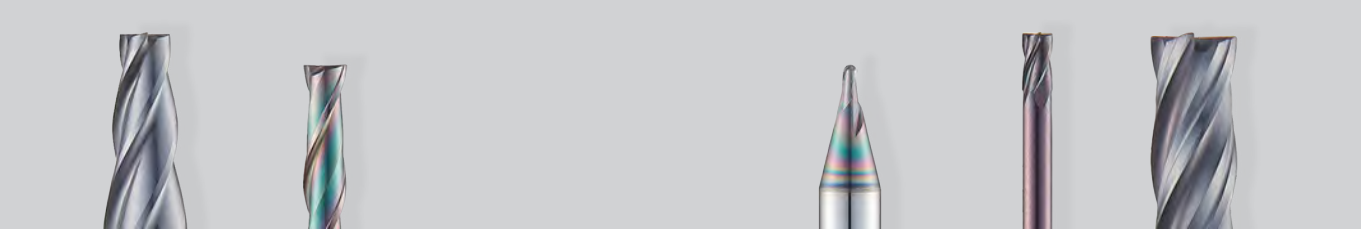
U-WING ENDMILL

Mid Hardness HRc 30 ~ 50



Contents

Section		EDP No	Geometry	Type	Diameter(mm)		Page
Type	Flutes				Min	Max	
SQUARE	2F	UE502		2 FLUTES SQUARE ENDMILL	D0.1	D25	160
	2F	UE512		2 FLUTES LONG NECK SQUARE ENDMILL	D0.1	D12	162
	2F	UE522		2 FLUTES SQUARE ENDMILL	D1	D25	165
	2F	UXE502		2 FLUTES SQUARE ENDMILL FOR HEAVY CUTS	D0.1	D20	168
	4F	UE504H		4 FLUTES 45° HELIX SQUARE ENDMILL	D1	D20	170
	4F	UE514		4 FLUTES LONG NECK SQUARE ENDMILL	D1	D12	171
	4F	UE524		4 FLUTES SQUARE ENDMILL	D1	D25	173
	4F	ULE504		4 FLUTES AUTOMATIC CNC SQUARE ENDMILL	D3	D16	176
	4F	UE504		4 FLUTES SQUARE ENDMILL	D0.8	D25	177
	4F	UXE504		4 FLUTES SQUARE ENDMILL FOR HEAVY CUTS	D1	D20	178
	6F	UE506		6 FLUTES SQUARE ENDMILL	D6	D20	180
	2F	UTE502		2 FLUTES TAPERED SQUARE ENDMILL	D0.3	D10	181
	4F	UTE504		4 FLUTES TAPERED SQUARE ENDMILL	D0.8	D10	183
RADIUS	2F	UR502		2 FLUTES RADIUS ENDMILL	D0.2	D20	186
	2F	UR512		2 FLUTES NECK TYPE RADIUS ENDMILL	D0.2	D20	190
	2F	UR542		2 FLUTES TAPERED NECK RADIUS ENDMILL	D0.2	D4	196
	4F	UR504		4 FLUTES RADIUS ENDMILL	D3	D20	207
	4F	UR544		4 FLUTES TAPERED NECK RADIUS ENDMILL	D1	D4	209
	4F	UXR504		4 FLUTES MULTI HELIX RADIUS ENDMILL	D1	D20	216
	4F	UXR514		4 FLUTES MULTI HELIX NECK RADIUS ENDMILL	D1	D20	219
	6F	UR506		6 FLUTES RADIUS ENDMILL	D6	D20	224
	3F	UDR503		3 FLUTES DOUBLE RADIUS ENDMILL	D6	D20	225
	4F	USPM4		4 FLUTES RADIUS ENDMILL FOR HIGH SPEED MACHINING	D1	D20	226
	4F	UTR504		4 FLUTES TAPERED RADIUS ENDMILL	D0.8	D2.5	228
BALL	2F	UB502		2 FLUTES BALL ENDMILL	R0.1	R25	233
	2F	UB502-P		2 FLUTES HIGH PRECISION BALL ENDMILL	R0.1	R12	236
	2F	UB512		2 FLUTES LONG NECK BALL ENDMILL	R0.1	R12	237
	2F	UB512 S6		2 FLUTES LONG NECK BALL ENDMILL (SHANK 6)	R0.5	R2	241
	2F	UB532		2 FLUTES LOLLIPOP STYLE BALL ENDMILL	R3	R12	243



Contents

Section		EDP No	Geometry	Type	Diameter		Page
Type	Flutes				Min	Max	
BALL	2F	UB542		2 FLUTES TAPERED NECK BALL ENDMILL	R0.1	R12	244
	2F	USB502		2 FLUTES STRAIGHT BALL ENDMILL	R3	R20	256
	3F	UB503		3 FLUTES BALL ENDMILL	R1	R12	257
	4F	UB504		4 FLUTES BALL ENDMILL	R1	R12	258
	2F	UTB502		2 FLUTES TAPERED BALL ENDMILL	R0.3	R2	259
ROUGHING	3~5F	UF50		3~5 FLUTES CHAMFER PITCH ROUGHING ENDMILL	D3	D25	261
	3~5F	UF51		3~5 FLUTES FINE PITCH ROUGHING ENDMILL	D3	D25	262
	3~5F	UF51-H		3~5 FLUTES 45° HELIX FINE PITCH ROUGHING ENDMILL	D3	D25	263

EDP No. System

*If expressed as an integer, the decimal point is omitted.

U R 5 0 2 030 10 25 - S3

Section	Geometry	Grade	Length, Shank Type	Flutes	Cutting Dia	Corner R	Neck Length	OAL	Detailed characteristics
U : U-Wing	B : Ball	5 : Grade	0 : Straight	2 : 2 Flute	0.1	0.05	0.2	35	P : Precision Tolerance
	SB : Straight Ball		1 : Neck	3 : 3 Flute	~	~			S3 ~S6 : Shank Dia
	E : Square		2 : Long Shank	4 : 4 Flute	25	5	100	300	H : High Helix
	R : Radius		3 : Lollipop	5 : 5 Flute					
	SPM : Speed Power Mill		4 : Tapered Neck	6 : 6 Flute					
	XE : Heavy Cut Square								
	XR : Multi Helix Radius								
	TE : Tapered Square								
	TR : Tapered Radius								
	TB : Tapered Ball								
	DR : Double Radius								
	F : Roughing								
	LE : Square (Lath								

Ex) 2 Flute / Cutting Dia Ø3 / Corner R 1.0 / Neck Length 6mm / Shank Dia 4 / 50 Grade / Corner Radius Neck Type U-Wing Endmill

U-WING ENDMILL

Mid Hardness HRc 30 ~ 50



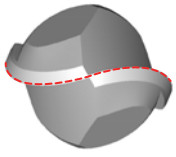
Characteristics

· Suitable for processing mold steel, mid hardness steel HRc 30~50
· New coatings excellent for wear resistance and lubrication
· Excellent for complex mold processing by securing various specifications and rib types

Features

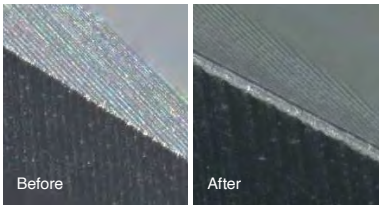
· Suitable for mid hardness steel, mold steel processing from HRc30-50
· Improvement of wear resistance and increased lubricity through AlCrN-based Coating
· Strengthened cutting edge of ball end mills with ultra-fine material
· Enhanced chipping resistance of flat end mill through application of high toughness material
· Range of shapes and specifications suitable for complex mold processing
· Suitable for precision processing by applying high precision tolerances on h5 shank, cutting diameter and radius

S curved gash shape

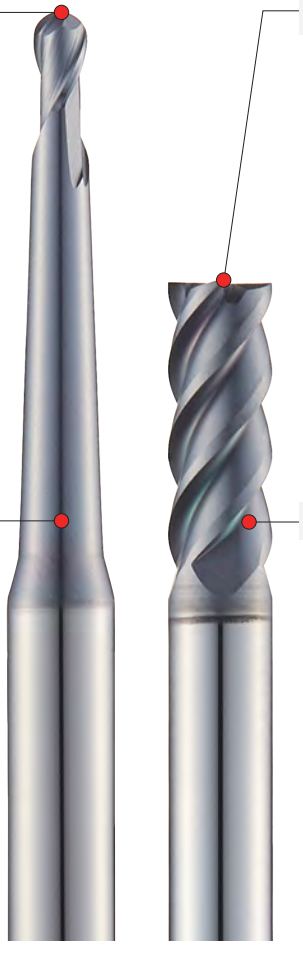


1) Improved cutting and wear resistance by dispersing processing loads

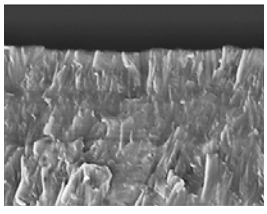
Cutting edge



1) Improved chipping resistance
2) New cutting edge to cope with a variety of mold processing and improved performance and tool life



AlCrN based new coating

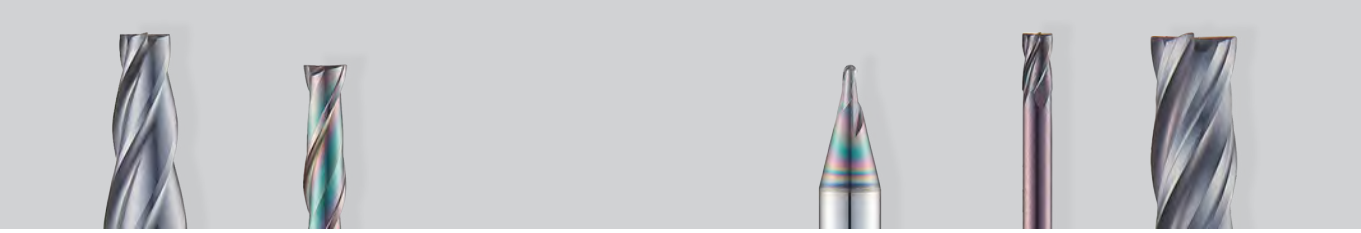


1) Improved the wear-resistance & oxidation resistance
2) Reinforced the lubrication by containing the Cr
3) Improved heat resistance

Adopted new raw material



1) Separated raw material by geometry to maximize tool characteristics and to increase versatility

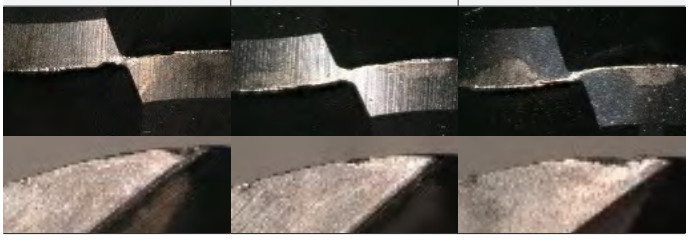


Case Study

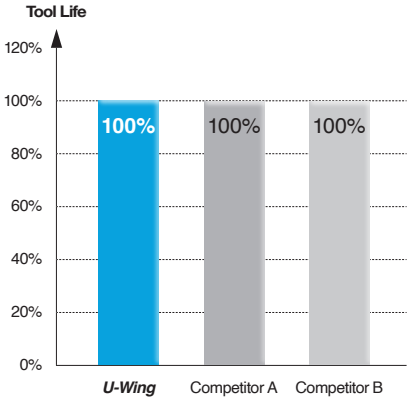
2F R3.0 BALL ENDMILL

STAVAX

U-Wing	Competitor A	Competitor B

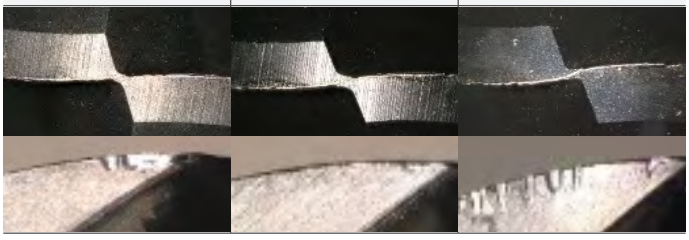


· Cutting Condition
· Profiling, rpm : 8,340, feed : 2,830, ap : 0.18, ae : 0.3, Note : Wet Machining

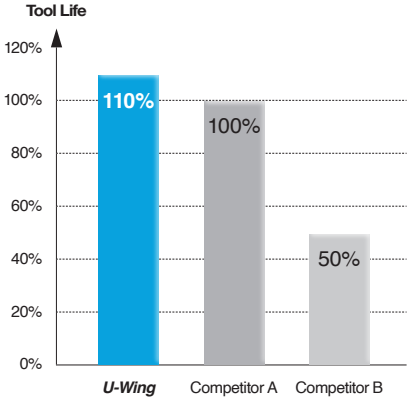


KP4M

U-Wing	Competitor A	Competitor B

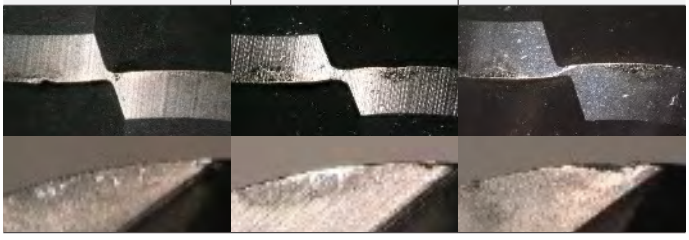


· Cutting Condition
· Profiling, rpm : 8,040, feed : 2,410, ap : 0.18, ae : 0.3, Note : Wet Machining

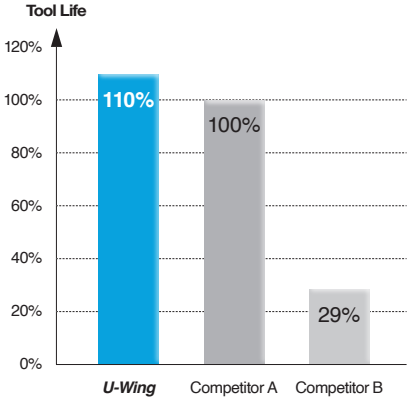


NAK80

U-Wing	Competitor A	Competitor B



· Cutting Condition
· Profiling, rpm : 7,128, feed : 2,420, ap : 0.18, ae : 0.3, Note : Wet Machining



U-WING ENDMILL

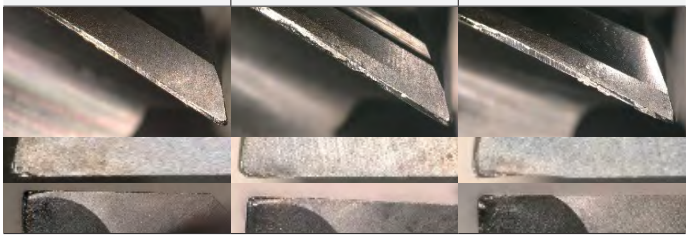
Mid Hardness HRc 30 ~ 50



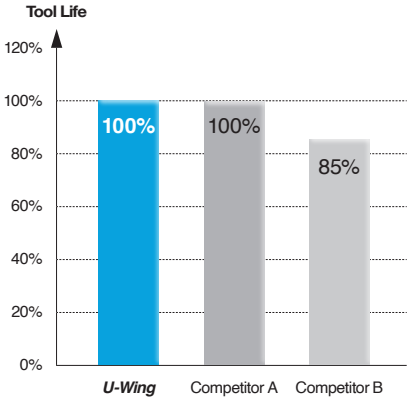
Case Study

4F D6.0 SQUARE ENDMILL

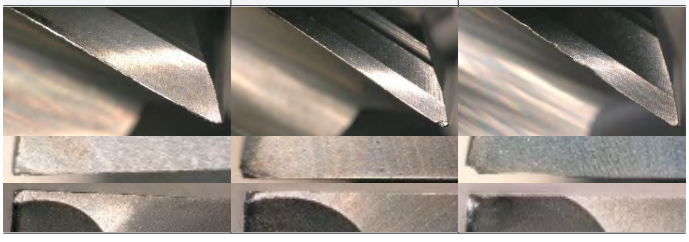
STAVAX

U-Wing	Competitor A	Competitor B
		

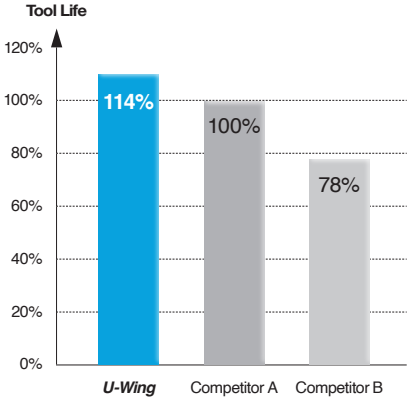
· Cutting Condition
· Shouldering, rpm : 2,840, feed : 340, ap : 6, ae : 0.3, Note : Wet Machining



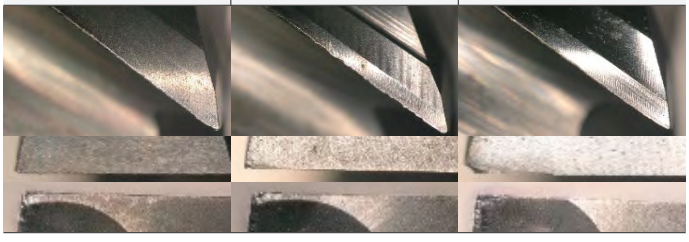
KP4M

U-Wing	Competitor A	Competitor B
		

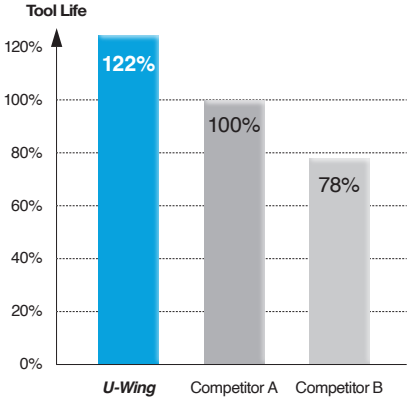
· Cutting Condition
· Shouldering, rpm : 5,560, feed : 660, ap : 6, ae : 0.3, Note : Wet Machining

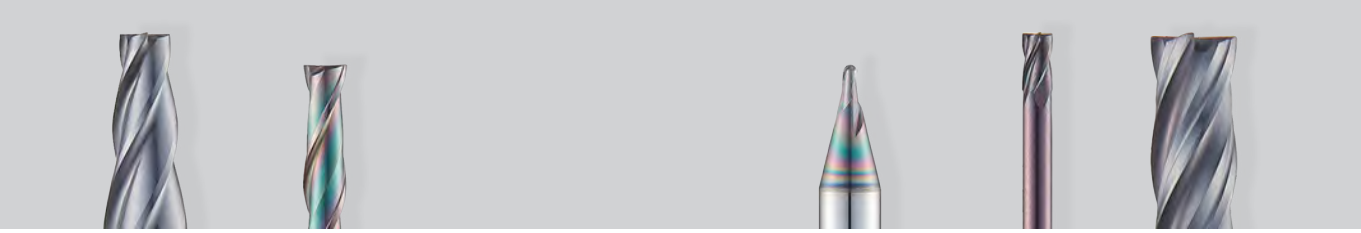


NAK80

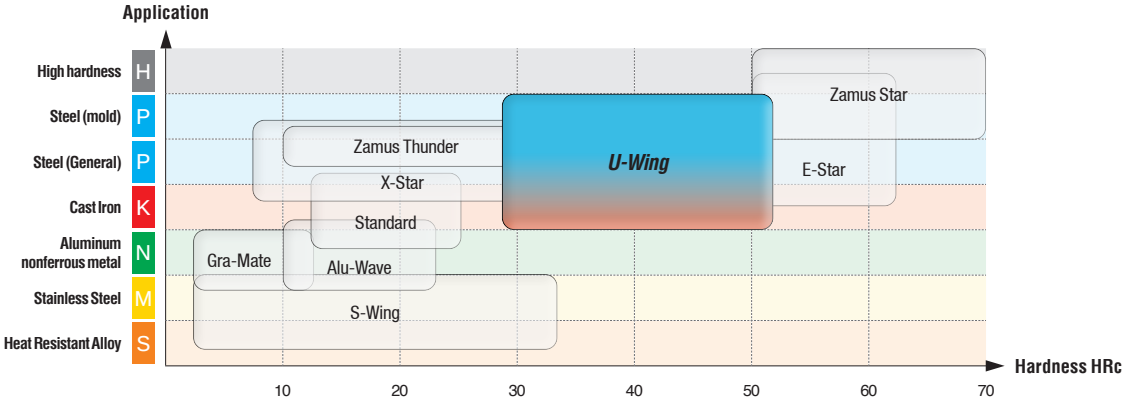
U-Wing	Competitor A	Competitor B
		

· Cutting Condition
· Shouldering, rpm : 3,360, feed : 400, ap : 6, ae : 0.3, Note : Wet Machining



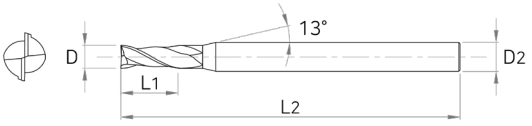


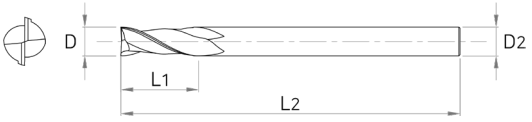
Applications



UE502 | 2 FLUTES SQUARE ENDMILL







■ Tolerance

D		Shank Dia
D0.1 ~ 6	0 ~ -0.012	h5
D6.5 ~ 25	0 ~ -0.015	

CARBIDE | AlCrN | 2 | 30° HELIX | DATA P.636

EDP No	SIZES (mm)			
	D	L1	L2	D2
UE502 001S3	0.1	0.2	40	3
UE502 001	0.1	0.2	40	4
UE502 0015	0.15	0.3	40	4
UE502 002S3	0.2	0.4	40	3
UE502 002	0.2	0.4	40	4
UE502 0025	0.25	0.5	40	4
UE502 003S3	0.3	0.6	40	3
UE502 003	0.3	0.6	40	4
UE502 0035	0.35	0.7	40	4
UE502 004S3	0.4	0.8	40	3
UE502 004	0.4	0.8	40	4
UE502 0045	0.45	0.9	40	4
UE502 005S3	0.5	1	40	3
UE502 005	0.5	1	40	4
UE502 0055	0.55	1.1	40	4
UE502 006S3	0.6	1.2	40	3
UE502 006	0.6	1.2	40	4
UE502 0065	0.65	1.3	40	4
UE502 007S3	0.7	1.4	40	3
UE502 007	0.7	1.4	40	4
UE502 0075	0.75	1.5	40	4
UE502 008S3	0.8	1.6	40	3
UE502 008	0.8	1.6	40	4
UE502 0085	0.85	1.7	40	4

EDP No	SIZES (mm)			
	D	L1	L2	D2
UE502 009S3	0.9	1.8	40	3
UE502 009	0.9	1.8	40	4
UE502 0095	0.95	2	40	4
UE502 010S3	1	2.5	50	3
UE502 010S4	1	2.5	50	4
UE502 010	1	2.5	50	6
UE502 011S4	1.1	3	50	4
UE502 012S3	1.2	3	50	3
UE502 012S4	1.2	3	50	4
UE502 012	1.2	3	50	6
UE502 013S4	1.3	3	50	4
UE502 014S4	1.4	4	50	4
UE502 015S3	1.5	4	50	3
UE502 015S4	1.5	4	50	4
UE502 015	1.5	4	50	6
UE502 016S4	1.6	4	50	4
UE502 017S4	1.7	4	50	4
UE502 018S4	1.8	5	50	4
UE502 019S4	1.9	5	50	4
UE502 020S3	2	6	50	3
UE502 020S4	2	6	50	4
UE502 020	2	6	50	6
UE502 021S4	2.1	6	50	4
UE502 022S4	2.2	6	50	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UE502 | 2 FLUTES SQUARE ENDMILL

EDP No	SIZES (mm)			
	D	L1	L2	D2
UE502 023S4	2.3	6	50	4
UE502 024S4	2.4	6	50	4
UE502 025S3	2.5	7	50	3
UE502 025	2.5	7	50	6
UE502 025S4	2.5	8	50	4
UE502 026S4	2.6	8	50	4
UE502 027S4	2.7	8	50	4
UE502 028S4	2.8	8	50	4
UE502 029S4	2.9	8	50	4
UE502 030S3	3	8	50	3
UE502 030S4	3	8	50	4
UE502 030	3	8	50	6
UE502 035S4	3.5	10	50	4
UE502 035	3.5	10	50	6
UE502 040080S4	4	10	80	4
UE502 040S4	4	10	50	4
UE502 040	4	10	50	6
UE502 045	4.5	14	50	6
UE502 050	5	15	60	6
UE502 055	5.5	15	60	6
UE502 060	6	15	60	6
UE502 065	6.5	18	60	8
UE502 070	7	20	60	8
UE502 075	7.5	20	60	8
UE502 080	8	20	70	8

EDP No	SIZES (mm)			
	D	L1	L2	D2
UE502 085	8.5	22	70	10
UE502 090	9	22	70	10
UE502 095	9.5	24	70	10
UE502 100	10	25	75	10
UE502 105	10.5	26	75	12
UE502 110	11	30	75	12
UE502 115	11.5	30	80	12
UE502 120	12	30	80	12
UE502 130	13	35	100	12
UE502 140S16	14	35	100	16
UE502 140	14	35	100	14
UE502 140S12	14	35	100	12
UE502 150	15	38	100	16
UE502 160	16	40	100	16
UE502 170	17	42	100	16
UE502 180	18	45	100	18
UE502 180S16	18	45	100	16
UE502 190	19	45	100	20
UE502 200	20	45	100	20
UE502 210	21	45	100	20
UE502 220	22	45	100	20
UE502 230	23	50	120	25
UE502 240	24	50	120	25
UE502 250	25	50	120	25

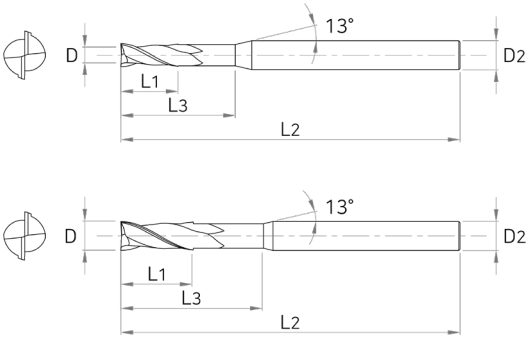
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UE512 | 2 FLUTES LONG NECK SQUARE ENDMILL





■ Tolerance

D		Shank Dia
D0.1 ~ 6	0 ~ -0.012	h5
D8 ~ 12	0 ~ -0.015	

CARBIDE | AlCrN | 2 | 30° HELIX | DATA P.637

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
UE512 001003	0.1	0.15	0.3	40	4
UE512 001005	0.1	0.15	0.5	40	4
UE512 00101	0.1	0.15	1	40	4
UE512 002005	0.2	0.3	0.5	40	4
UE512 00201	0.2	0.3	1	40	4
UE512 002015	0.2	0.3	1.5	40	4
UE512 00202	0.2	0.3	2	40	4
UE512 00301	0.3	0.5	1	40	4
UE512 003015	0.3	0.5	1.5	40	4
UE512 00302	0.3	0.5	2	40	4
UE512 003025	0.3	0.5	2.5	40	4
UE512 00303	0.3	0.5	3	40	4
UE512 00304	0.3	0.5	4	40	4
UE512 00305	0.3	0.5	5	40	4
UE512 00401	0.4	0.6	1	40	4
UE512 004015	0.4	0.6	1.5	40	4
UE512 00402	0.4	0.6	2	40	4
UE512 004025	0.4	0.6	2.5	40	4
UE512 00403	0.4	0.6	3	40	4
UE512 00404	0.4	0.6	4	40	4
UE512 00405	0.4	0.6	5	40	4
UE512 00406	0.4	0.6	6	40	4
UE512 00408	0.4	0.6	8	40	4
UE512 00410	0.4	0.6	10	40	4

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
UE512 00501	0.5	0.7	1	45	4
UE512 005015	0.5	0.7	1.5	45	4
UE512 00502	0.5	0.7	2	45	4
UE512 005025	0.5	0.7	2.5	45	4
UE512 00503	0.5	0.7	3	45	4
UE512 00504	0.5	0.7	4	45	4
UE512 00505	0.5	0.7	5	45	4
UE512 00506	0.5	0.7	6	45	4
UE512 00508	0.5	0.7	8	45	4
UE512 00510	0.5	0.7	10	45	4
UE512 00512	0.5	0.7	12	45	4
UE512 00514	0.5	0.7	14	45	4
UE512 00516	0.5	0.7	16	45	4
UE512 00602	0.6	0.9	2	45	4
UE512 00603	0.6	0.9	3	45	4
UE512 00604	0.6	0.9	4	45	4
UE512 00605	0.6	0.9	5	45	4
UE512 00606	0.6	0.9	6	45	4
UE512 00608	0.6	0.9	8	45	4
UE512 00610	0.6	0.9	10	45	4
UE512 00612	0.6	0.9	12	45	4
UE512 00614	0.6	0.9	14	45	4
UE512 00616	0.6	0.9	16	45	4
UE512 00702	0.7	1.2	2	45	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UE512 | 2 FLUTES LONG NECK SQUARE ENDMILL

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
UE512 00704	0.7	1.2	4	45	4
UE512 00706	0.7	1.2	6	45	4
UE512 00708	0.7	1.2	8	45	4
UE512 00710	0.7	1.2	10	45	4
UE512 00712	0.7	1.2	12	45	4
UE512 00802	0.8	1.2	2	45	4
UE512 00803	0.8	1.2	3	45	4
UE512 00804	0.8	1.2	4	45	4
UE512 00805	0.8	1.2	5	45	4
UE512 00806	0.8	1.2	6	45	4
UE512 00808	0.8	1.2	8	45	4
UE512 00810	0.8	1.2	10	45	4
UE512 00812	0.8	1.2	12	45	4
UE512 00814	0.8	1.2	14	45	4
UE512 00816	0.8	1.2	16	45	4
UE512 00820	0.8	1.2	20	45	4
UE512 00906	0.9	1.3	6	45	4
UE512 00908	0.9	1.3	8	45	4
UE512 00910	0.9	1.3	10	45	4
UE512 01002	1	1.5	2	50	4
UE512 01003	1	1.5	3	50	4
UE512 01004	1	1.5	4	50	4
UE512 01005	1	1.5	5	50	4
UE512 01006	1	1.5	6	50	4
UE512 01007	1	1.5	7	50	4
UE512 01008	1	1.5	8	50	4
UE512 01010	1	1.5	10	50	4
UE512 01012	1	1.5	12	50	4
UE512 01014	1	1.5	14	50	4
UE512 01016	1	1.5	16	50	4
UE512 01018	1	1.5	18	50	4
UE512 01020	1	1.5	20	50	4
UE512 01022	1	1.5	22	60	4
UE512 01026	1	1.5	26	60	4
UE512 01030	1	1.5	30	70	4
UE512 01040	1	1.5	40	80	4
UE512 01050	1	1.5	50	100	4
UE512 01204	1.2	1.8	4	50	4
UE512 01206	1.2	1.8	6	50	4
UE512 01208	1.2	1.8	8	50	4
UE512 01210	1.2	1.8	10	50	4

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
UE512 01212	1.2	1.8	12	50	4
UE512 01214	1.2	1.8	14	50	4
UE512 01216	1.2	1.8	16	50	4
UE512 01220	1.2	1.8	20	50	4
UE512 01226	1.2	1.8	26	60	4
UE512 01230	1.2	1.8	30	70	4
UE512 01406	1.4	2.1	6	50	4
UE512 01408	1.4	2.1	8	50	4
UE512 01410	1.4	2.1	10	50	4
UE512 01414	1.4	2.1	14	50	4
UE512 01416	1.4	2.1	16	50	4
UE512 01420	1.4	2.1	20	50	4
UE512 01504	1.5	2.3	4	50	4
UE512 01505	1.5	2.3	5	50	4
UE512 01506	1.5	2.3	6	50	4
UE512 01507	1.5	2.3	7	50	4
UE512 01508	1.5	2.3	8	50	4
UE512 01510	1.5	2.3	10	50	4
UE512 01512	1.5	2.3	12	50	4
UE512 01514	1.5	2.3	14	50	4
UE512 01516	1.5	2.3	16	50	4
UE512 01518	1.5	2.3	18	50	4
UE512 01520	1.5	2.3	20	50	4
UE512 01522	1.5	2.3	22	60	4
UE512 01526	1.5	2.3	26	60	4
UE512 01530	1.5	2.3	30	70	4
UE512 01608	1.6	2.3	8	50	4
UE512 01610	1.6	2.3	10	50	4
UE512 01612	1.6	2.3	12	50	4
UE512 01616	1.6	2.3	16	50	4
UE512 01620	1.6	2.3	20	50	4
UE512 01808	1.8	2.7	8	50	4
UE512 01810	1.8	2.7	10	50	4
UE512 01812	1.8	2.7	12	50	4
UE512 01816	1.8	2.7	16	50	4
UE512 01820	1.8	2.7	20	50	4
UE512 02006	2	3	6	50	4
UE512 02008	2	3	8	50	4
UE512 02010	2	3	10	50	4
UE512 02012	2	3	12	50	4
UE512 02014	2	3	14	50	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UE512 | 2 FLUTES LONG NECK SQUARE ENDMILL

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
UE512 02016	2	3	16	50	4
UE512 02018	2	3	18	50	4
UE512 02020	2	3	20	50	4
UE512 02022	2	3	22	60	4
UE512 02026	2	3	26	60	4
UE512 02030	2	3	30	70	4
UE512 02035	2	3	35	70	4
UE512 02040	2	3	40	80	4
UE512 02045	2	3	45	90	4
UE512 02050	2	3	50	100	4
UE512 02060	2	3	60	110	4
UE512 02508	2.5	4	8	50	4
UE512 02510	2.5	4	10	50	4
UE512 02512	2.5	4	12	50	4
UE512 02514	2.5	4	14	50	4
UE512 02516	2.5	4	16	50	4
UE512 02518	2.5	4	18	50	4
UE512 02520	2.5	4	20	50	4
UE512 02522	2.5	4	22	60	4
UE512 02526	2.5	4	26	60	4
UE512 02530	2.5	4	30	70	4
UE512 02535	2.5	4	35	70	4
UE512 02540	2.5	4	40	80	4
UE512 02545	2.5	4	45	90	4
UE512 02550	2.5	4	50	100	4
UE512 03006	3	4.5	6	50	6
UE512 03008	3	4.5	8	50	6
UE512 03010	3	4.5	10	50	6
UE512 03012	3	4.5	12	50	6
UE512 03014	3	4.5	14	60	6
UE512 03016	3	4.5	16	60	6
UE512 03018	3	4.5	18	60	6
UE512 03020	3	4.5	20	60	6
UE512 03022	3	4.5	22	65	6
UE512 03026	3	4.5	26	65	6
UE512 03030	3	4.5	30	70	6
UE512 03035	3	4.5	35	70	6
UE512 03040	3	4.5	40	80	6
UE512 03045	3	4.5	45	90	6

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
UE512 03050	3	4.5	50	100	6
UE512 03060	3	4.5	60	100	6
UE512 04008	4	6	8	50	6
UE512 04010	4	6	10	50	6
UE512 04012	4	6	12	50	6
UE512 04014	4	6	14	60	6
UE512 04016	4	6	16	60	6
UE512 04018	4	6	18	60	6
UE512 04020	4	6	20	60	6
UE512 04022	4	6	22	65	6
UE512 04026	4	6	26	65	6
UE512 04030	4	6	30	70	6
UE512 04035	4	6	35	70	6
UE512 04040	4	6	40	80	6
UE512 04045	4	6	45	90	6
UE512 04050	4	6	50	100	6
UE512 04060	4	6	60	100	6
UE512 05016	5	8	16	60	6
UE512 05020	5	8	20	60	6
UE512 05026	5	8	26	65	6
UE512 05030	5	8	30	70	6
UE512 05035	5	8	35	75	6
UE512 05040	5	8	40	80	6
UE512 05050	5	8	50	90	6
UE512 05060	5	8	60	100	6
UE512 06015	6	9	15	60	6
UE512 06020	6	9	20	60	6
UE512 06030	6	9	30	70	6
UE512 06032	6	9	32	90	6
UE512 08025	8	12	25	70	8
UE512 08030	8	12	30	80	8
UE512 08042	8	12	42	100	8
UE512 10030	10	15	30	75	10
UE512 10035	10	15	35	80	10
UE512 10045	10	15	45	100	10
UE512 12035	12	20	35	80	12
UE512 12040	12	20	40	90	12
UE512 12050	12	20	50	110	12

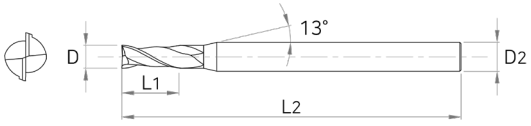
■ Applicable Working Material

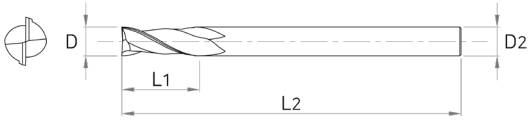
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UE522 | 2 FLUTES SQUARE ENDMILL







■ Tolerance

D		Shank Dia
D0.1 ~ 6	0 ~ -0.012	h5
D6.5 ~ 25	0 ~ -0.015	

CARBIDE | AlCrN | 2 | 30° HELIX | DATA P.642

EDP No	SIZES (mm)			
	D	L1	L2	D2
UE522 01003	1	3	60	6
UE522 01004	1	4	60	6
UE522 01005	1	5	60	6
UE522 01006	1	6	60	6
UE522 01007	1	7	60	6
UE522 01008	1	8	60	6
UE522 01010	1	10	60	6
UE522 01012	1	12	60	6
UE522 01204	1.2	4	60	6
UE522 01206	1.2	6	60	6
UE522 01208	1.2	8	60	6
UE522 01210	1.2	10	60	6
UE522 01212	1.2	12	60	6
UE522 01506	1.5	6	60	6
UE522 01508	1.5	8	60	6
UE522 01510	1.5	10	60	6
UE522 01512	1.5	12	60	6
UE522 01514	1.5	14	60	6
UE522 01516	1.5	16	60	6
UE522 02008	2	8	60	6
UE522 02010	2	10	60	6
UE522 02012	2	12	60	6
UE522 02014	2	14	60	6
UE522 02016	2	16	60	6

EDP No	SIZES (mm)			
	D	L1	L2	D2
UE522 02510	2.5	10	60	6
UE522 02512	2.5	12	60	6
UE522 02516	2.5	16	60	6
UE522 02520	2.5	20	60	6
UE522 02526	2.5	26	60	6
UE522 03010	3	10	70	6
UE522 03012	3	12	70	6
UE522 03014	3	14	70	6
UE522 03016	3	16	70	6
UE522 03016S3	3	16	100	3
UE522 03020	3	20	70	6
UE522 03026	3	26	70	6
UE522 03030	3	30	70	6
UE522 04012	4	12	70	6
UE522 04016	4	16	70	6
UE522 04020	4	20	70	6
UE522 04020S4	4	20	100	4
UE522 04026	4	26	70	6
UE522 04030	4	30	70	6
UE522 05015	5	15	70	6
UE522 05020	5	20	70	6
UE522 05025100	5	25	100	6
UE522 05025	5	25	70	6
UE522 05030	5	30	80	6

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UE522 | 2 FLUTES SQUARE ENDMILL

EDP No	SIZES (mm)			
	D	L1	L2	D2
UE522 05035	5	35	90	6
UE522 05040	5	40	100	6
UE522 06015080	6	15	80	6
UE522 06015	6	15	60	6
UE522 06020090	6	20	90	6
UE522 06020	6	20	70	6
UE522 06025	6	25	75	6
UE522 06030150	6	30	150	6
UE522 06030100	6	30	100	6
UE522 06030	6	30	80	6
UE522 06035	6	35	90	6
UE522 06040120	6	40	120	6
UE522 06040	6	40	90	6
UE522 06045	6	45	150	6
UE522 07035	7	35	85	8
UE522 08020	8	20	100	8
UE522 08025	8	25	80	8
UE522 08030100	8	30	100	8
UE522 08030	8	30	80	8
UE522 08035	8	35	90	8
UE522 08040150	8	40	150	8
UE522 08040120	8	40	120	8
UE522 08040	8	40	90	8
UE522 08045	8	45	100	8
UE522 08050150	8	50	150	8
UE522 08050	8	50	100	8
UE522 09045	9	45	100	10
UE522 10025	10	25	100	10
UE522 10030100	10	30	100	10
UE522 10030	10	30	80	10
UE522 10035	10	35	90	10
UE522 10040120	10	40	120	10
UE522 10040	10	40	90	10
UE522 10045	10	45	100	10
UE522 10050200	10	50	200	10
UE522 10050150	10	50	150	10
UE522 10050	10	50	100	10
UE522 10055	10	55	150	10
UE522 10060200	10	60	200	10
UE522 10060155	10	60	155	10
UE522 10060	10	60	110	10

EDP No	SIZES (mm)			
	D	L1	L2	D2
UE522 11050	11	50	110	12
UE522 12035	12	35	90	12
UE522 12040120	12	40	120	12
UE522 12040	12	40	100	12
UE522 12045	12	45	130	12
UE522 12050150	12	50	150	12
UE522 12050	12	50	100	12
UE522 12055	12	55	110	12
UE522 12060200	12	60	200	12
UE522 12060150	12	60	150	12
UE522 12060	12	60	110	12
UE522 12065	12	65	150	12
UE522 12070200	12	70	200	12
UE522 12070	12	70	120	12
UE522 14040	14	40	110	16
UE522 14050	14	50	110	16
UE522 14060150	14	60	150	16
UE522 14060	14	60	120	16
UE522 16040150	16	40	150	16
UE522 16040	16	40	120	16
UE522 16050150	16	50	150	16
UE522 16050	16	50	110	16
UE522 16060	16	60	120	16
UE522 16070200	16	70	200	16
UE522 16070150	16	70	150	16
UE522 16070	16	70	130	16
UE522 16080	16	80	150	16
UE522 16090	16	90	150	16
UE522 160110	16	110	200	16
UE522 160120	16	120	250	16
UE522 18050	18	50	120	20
UE522 18060	18	60	120	18
UE522 18070	18	70	130	20
UE522 180100	18	100	200	20
UE522 20050150	20	50	150	20
UE522 20050	20	50	110	20
UE522 20060	20	60	130	20
UE522 20070	20	70	130	20
UE522 20080	20	80	150	20
UE522 20090200	20	90	200	20
UE522 20090	20	90	150	20

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UE522 | 2 FLUTES SQUARE ENDMILL

EDP No	SIZES (mm)			
	D	L1	L2	D2
UE522 200110	20	110	200	20
UE522 200120	20	120	250	20
UE522 22075	22	75	150	20
UE522 220110	22	110	200	20

EDP No	SIZES (mm)			
	D	L1	L2	D2
UE522 25070	25	70	150	25
UE522 25090	25	90	150	25
UE522 250110	25	110	200	25
UE522 250120	25	120	250	25

■ Applicable Working Material

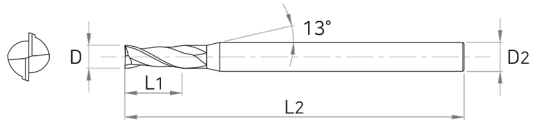
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

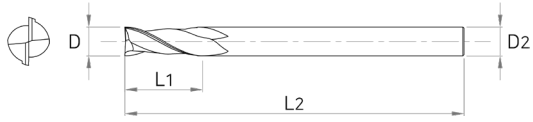
○ : GOOD ◎ : EXCELLENT

UXE502

2 FLUTES SQUARE ENDMILL FOR HEAVY CUTS







■ Tolerance

D		Shank Dia
D0.1 ~ 7	0 ~ -0.012	h5
D8 ~ 20	0 ~ -0.015	

CARBIDE | AlCrN | 2 | 30° HELIX | DATA P.636

EDP No	SIZES (mm)			
	D	L1	L2	D2
UXE502 001001	0.1	0.1	40	4
UXE502 001	0.1	0.2	40	4
UXE502 001003	0.1	0.3	40	4
UXE502 002002	0.2	0.2	40	4
UXE502 002	0.2	0.4	40	4
UXE502 002006	0.2	0.6	40	4
UXE502 003003	0.3	0.3	40	4
UXE502 003	0.3	0.6	40	4
UXE502 003009	0.3	0.9	40	4
UXE502 004004	0.4	0.4	40	4
UXE502 004	0.4	0.8	40	4
UXE502 004012	0.4	1.2	40	4
UXE502 005005	0.5	0.5	40	4
UXE502 005	0.5	1	40	4
UXE502 005015	0.5	1.5	40	4
UXE502 006006	0.6	0.6	40	4
UXE502 006	0.6	1.2	40	4
UXE502 006018	0.6	1.8	40	4
UXE502 007007	0.7	0.7	40	4
UXE502 007	0.7	1.4	40	4
UXE502 007021	0.7	2.1	40	4
UXE502 008008	0.8	0.8	40	4
UXE502 008	0.8	1.6	40	4
UXE502 008024	0.8	2.4	40	4

EDP No	SIZES (mm)			
	D	L1	L2	D2
UXE502 009009	0.9	0.9	40	4
UXE502 009	0.9	1.8	40	4
UXE502 009027	0.9	2.7	40	4
UXE502 01001	1	1	40	6
UXE502 01002	1	2	40	6
UXE502 010	1	2.5	50	6
UXE502 01003	1	3	50	6
UXE502 01004	1	4	50	6
UXE502 01006	1	6	50	6
UXE502 01202	1.2	2	40	6
UXE502 012	1.2	3	50	6
UXE502 01204	1.2	4	50	6
UXE502 01206	1.2	6	50	6
UXE502 015015	1.5	1.5	40	6
UXE502 01503	1.5	3	40	6
UXE502 015	1.5	4	50	6
UXE502 01506	1.5	6	50	6
UXE502 01508	1.5	8	50	6
UXE502 01510	1.5	10	50	6
UXE502 02002	2	2	40	6
UXE502 02004	2	4	40	6
UXE502 020	2	6	50	6
UXE502 02008	2	8	50	6
UXE502 02010	2	10	50	6

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UXE502 | 2 FLUTES SQUARE ENDMILL FOR HEAVY CUTS

EDP No	SIZES (mm)			
	D	L1	L2	D2
UXE502 02012	2	12	50	6
UXE502 025025	2.5	2.5	40	6
UXE502 02505	2.5	5	40	6
UXE502 025	2.5	7	50	6
UXE502 02510	2.5	10	50	6
UXE502 02512	2.5	12	50	6
UXE502 03003	3	3	40	6
UXE502 03006	3	6	40	6
UXE502 030	3	8	50	6
UXE502 03010	3	10	50	6
UXE502 03012	3	12	50	6
UXE502 03014	3	14	50	6
UXE502 03510	3.5	10	50	6
UXE502 04004	4	4	40	6
UXE502 04008	4	8	40	6
UXE502 040	4	10	50	6
UXE502 04012	4	12	50	6
UXE502 04014	4	14	50	6
UXE502 04016	4	16	50	6
UXE502 04511	4.5	11	50	6
UXE502 05005	5	5	50	6
UXE502 05010	5	10	50	6
UXE502 050	5	15	60	6
UXE502 05020	5	20	60	6
UXE502 05025	5	25	60	6

EDP No	SIZES (mm)			
	D	L1	L2	D2
UXE502 05513	5.5	13	50	6
UXE502 06006	6	6	50	6
UXE502 06012	6	12	50	6
UXE502 060	6	15	60	6
UXE502 06020	6	20	60	6
UXE502 06025	6	25	60	6
UXE502 06513	6.5	13	60	8
UXE502 07018	7	18	60	8
UXE502 08016	8	16	60	8
UXE502 080	8	20	70	8
UXE502 08025	8	25	70	8
UXE502 08030	8	30	70	8
UXE502 10022	10	22	65	10
UXE502 100	10	25	75	10
UXE502 10030	10	30	75	10
UXE502 10035	10	35	75	10
UXE502 12026	12	26	70	12
UXE502 120	12	30	80	12
UXE502 12035	12	35	80	12
UXE502 12040	12	40	80	12
UXE502 140	14	35	100	16
UXE502 160	16	32	100	16
UXE502 16040	16	40	100	16
UXE502 180	18	45	100	20
UXE502 200	20	45	100	20

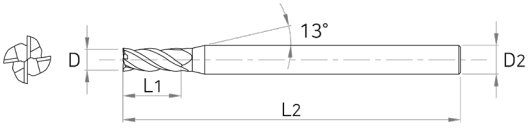
■ Applicable Working Material

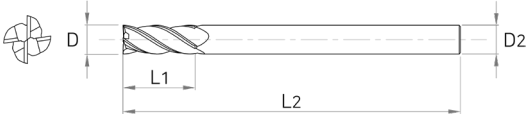
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UE504H | 4 FLUTES 45° HELIX SQUARE ENDMILL







■ Tolerance

D		Shank Dia
D1 ~ 20	0 ~ -0.03	h5

CARBIDE | AlCrN | 4 | 45° HELIX | DATA P.643

EDP No	SIZES (mm)			
	D	L1	L2	D2
UE504H 010	1	2.5	50	6
UE504H 01004	1	4	60	6
UE504H 01006	1	6	60	6
UE504H 015	1.5	4	50	6
UE504H 01506	1.5	6	60	6
UE504H 01508	1.5	8	60	6
UE504H 020	2	6	50	6
UE504H 02008	2	8	60	6
UE504H 02010	2	10	60	6
UE504H 030	3	8	50	6
UE504H 03010	3	10	70	6
UE504H 03012	3	12	70	6
UE504H 03016	3	16	70	6
UE504H 040	4	10	50	6
UE504H 04012	4	12	70	6
UE504H 04016	4	16	70	6
UE504H 04020	4	20	70	6
UE504H 050	5	15	50	6
UE504H 05030	5	30	80	6
UE504H 060	6	15	60	6
UE504H 06020	6	20	70	6

EDP No	SIZES (mm)			
	D	L1	L2	D2
UE504H 06030	6	30	80	6
UE504H 080	8	20	70	8
UE504H 08030	8	30	80	8
UE504H 08035	8	35	90	8
UE504H 08040	8	40	90	8
UE504H 100	10	25	75	10
UE504H 10030	10	30	80	10
UE504H 10040	10	40	90	10
UE504H 10050	10	50	100	10
UE504H 120	12	30	80	12
UE504H 12040	12	40	90	12
UE504H 12050	12	50	100	12
UE504H 12060	12	60	110	12
UE504H 160	16	40	100	16
UE504H 16050	16	50	110	16
UE504H 16060	16	60	120	16
UE504H 160110	16	110	200	16
UE504H 200	20	45	100	20
UE504H 20060	20	60	120	20
UE504H 20070	20	70	130	20
UE504H 200110	20	110	200	20

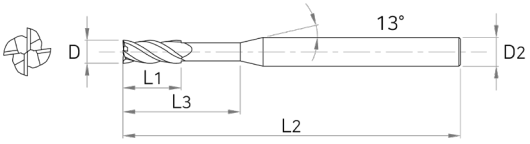
■ Applicable Working Material

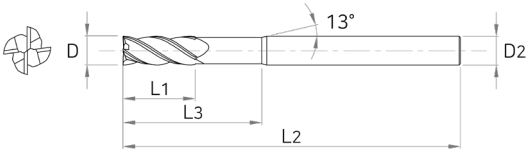
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UE514 | 4 FLUTES LONG NECK SQUARE ENDMILL







■ Tolerance

D		Shank Dia
D1 ~ 25	0 ~ -0.03	h5

CARBIDE | AlCrN | 4 | 35° HELIX | DATA P.644

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
UE514 01002	1	1.5	2	50	4
UE514 01003	1	1.5	3	50	4
UE514 01004	1	1.5	4	50	4
UE514 01005	1	1.5	5	50	4
UE514 01006	1	1.5	6	50	4
UE514 01007	1	1.5	7	50	4
UE514 01008	1	1.5	8	50	4
UE514 01010	1	1.5	10	50	4
UE514 01012	1	1.5	12	50	4
UE514 01014	1	1.5	14	50	4
UE514 01016	1	1.5	16	50	4
UE514 01018	1	1.5	18	50	4
UE514 01020	1	1.5	20	50	4
UE514 01022	1	1.5	22	60	4
UE514 01026	1	1.5	26	60	4
UE514 01030	1	1.5	30	70	4
UE514 01040	1	1.5	40	80	4
UE514 01050	1	1.5	50	100	4
UE514 01204	1.2	1.8	4	50	4
UE514 01206	1.2	1.8	6	50	4
UE514 01208	1.2	1.8	8	50	4
UE514 01210	1.2	1.8	10	50	4
UE514 01212	1.2	1.8	12	50	4
UE514 01214	1.2	1.8	14	50	4

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
UE514 01216	1.2	1.8	16	50	4
UE514 01220	1.2	1.8	20	50	4
UE514 01226	1.2	1.8	26	60	4
UE514 01230	1.2	1.8	30	70	4
UE514 01504	1.5	2.3	4	50	4
UE514 01505	1.5	2.3	5	50	4
UE514 01506	1.5	2.3	6	50	4
UE514 01507	1.5	2.3	7	50	4
UE514 01508	1.5	2.3	8	50	4
UE514 01510	1.5	2.3	10	50	4
UE514 01512	1.5	2.3	12	50	4
UE514 01514	1.5	2.3	14	50	4
UE514 01516	1.5	2.3	16	50	4
UE514 01518	1.5	2.3	18	50	4
UE514 01520	1.5	2.3	20	50	4
UE514 01522	1.5	2.3	22	60	4
UE514 01526	1.5	2.3	26	60	4
UE514 01530	1.5	2.3	30	70	4
UE514 02006	2	3	6	50	4
UE514 02008	2	3	8	50	4
UE514 02010	2	3	10	50	4
UE514 02012	2	3	12	50	4
UE514 02014	2	3	14	50	4
UE514 02016	2	3	16	50	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UE514 | 4 FLUTES LONG NECK SQUARE ENDMILL

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
UE514 02018	2	3	18	50	4
UE514 02020	2	3	20	50	4
UE514 02022	2	3	22	60	4
UE514 02026	2	3	26	60	4
UE514 02030	2	3	30	70	4
UE514 02035	2	3	35	70	4
UE514 02040	2	3	40	80	4
UE514 02045	2	3	45	90	4
UE514 02050	2	3	50	100	4
UE514 02060	2	3	60	110	4
UE514 02508	2.5	4	8	50	4
UE514 02510	2.5	4	10	50	4
UE514 02512	2.5	4	12	50	4
UE514 02514	2.5	4	14	50	4
UE514 02516	2.5	4	16	50	4
UE514 02518	2.5	4	18	50	4
UE514 02520	2.5	4	20	50	4
UE514 02522	2.5	4	22	60	4
UE514 02526	2.5	4	26	60	4
UE514 02530	2.5	4	30	70	4
UE514 02535	2.5	4	35	70	4
UE514 02540	2.5	4	40	80	4
UE514 02545	2.5	4	45	90	4
UE514 02550	2.5	4	50	100	4
UE514 03006	3	4.5	6	50	6
UE514 03008	3	4.5	8	50	6
UE514 03010	3	4.5	10	50	6
UE514 03012	3	4.5	12	50	6
UE514 03014	3	4.5	14	60	6
UE514 03016	3	4.5	16	60	6
UE514 03018	3	4.5	18	60	6
UE514 03020	3	4.5	20	60	6
UE514 03022	3	4.5	22	65	6
UE514 03026	3	4.5	26	65	6
UE514 03030	3	4.5	30	70	6
UE514 03035	3	4.5	35	70	6
UE514 03040	3	4.5	40	80	6
UE514 03045	3	4.5	45	90	6

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
UE514 03050	3	4.5	50	100	6
UE514 03060	3	4.5	60	100	6
UE514 04008	4	4.5	8	50	6
UE514 04010	4	4.5	10	50	6
UE514 04012	4	4.5	12	50	6
UE514 04014	4	4.5	14	60	6
UE514 04016	4	4.5	16	60	6
UE514 04018	4	4.5	18	60	6
UE514 04020	4	4.5	20	60	6
UE514 04022	4	4.5	22	65	6
UE514 04026	4	4.5	26	65	6
UE514 04030	4	4.5	30	70	6
UE514 04035	4	4.5	35	70	6
UE514 04040	4	4.5	40	80	6
UE514 04045	4	4.5	45	90	6
UE514 04050	4	4.5	50	100	6
UE514 04060	4	4.5	60	100	6
UE514 05016	5	8	16	60	6
UE514 05020	5	8	20	60	6
UE514 05026	5	8	26	65	6
UE514 05030	5	8	30	70	6
UE514 05035	5	8	35	75	6
UE514 05040	5	8	40	80	6
UE514 05050	5	8	50	90	6
UE514 05060	5	8	60	100	6
UE514 06015	6	9	15	60	6
UE514 06020	6	9	20	60	6
UE514 06030	6	9	30	70	6
UE514 06032	6	9	32	90	6
UE514 08025	8	12	25	70	8
UE514 08030	8	12	30	80	8
UE514 08042	8	12	42	100	8
UE514 10030	10	15	30	75	10
UE514 10035	10	15	35	80	10
UE514 10045	10	15	45	100	10
UE514 12035	12	20	35	80	12
UE514 12040	12	20	40	90	12
UE514 12050	12	20	50	110	12

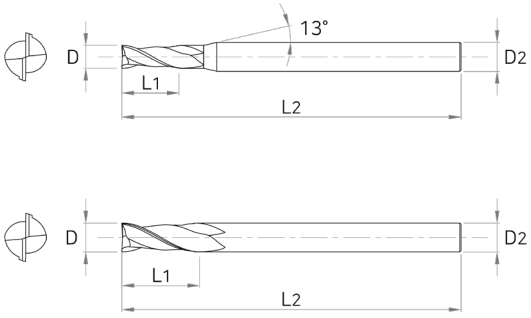
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UE524 | 4 FLUTES SQUARE ENDMILL





■ Tolerance

D		Shank Dia
D1 ~ 25	0 ~ -0.03	h5

CARBIDE | AlCrN | 4 | 35° HELIX | DATA P.645

EDP No	SIZES (mm)			
	D	L1	L2	D2
UE524 01003	1	3	60	6
UE524 01004	1	4	60	6
UE524 01005	1	5	60	6
UE524 01006	1	6	60	6
UE524 01007	1	7	60	6
UE524 01008	1	8	60	6
UE524 01010	1	10	60	6
UE524 01012	1	12	60	6
UE524 01204	1.2	4	60	6
UE524 01206	1.2	6	60	6
UE524 01208	1.2	8	60	6
UE524 01210	1.2	10	60	6
UE524 01212	1.2	12	60	6
UE524 01506	1.5	6	60	6
UE524 01508	1.5	8	60	6
UE524 01510	1.5	10	60	6
UE524 01512	1.5	12	60	6
UE524 01514	1.5	14	60	6
UE524 01516	1.5	16	60	6
UE524 01520	1.5	20	60	6
UE524 01526	1.5	26	60	6
UE524 02008	2	8	60	6
UE524 02008S4	2	8	40	4
UE524 02010	2	10	60	6

EDP No	SIZES (mm)			
	D	L1	L2	D2
UE524 02012	2	12	60	6
UE524 02014	2	14	60	6
UE524 02016	2	16	60	6
UE524 02510	2.5	10	60	6
UE524 02512	2.5	12	60	6
UE524 02516	2.5	16	60	6
UE524 02520	2.5	20	60	6
UE524 02526	2.5	26	60	6
UE524 03010	3	10	70	6
UE524 03012	3	12	70	6
UE524 03014	3	14	70	6
UE524 03016	3	16	70	6
UE524 03016S3	3	16	100	3
UE524 03020	3	20	70	6
UE524 03026	3	26	70	6
UE524 03030	3	30	70	6
UE524 03035	3	35	90	6
UE524 04012	4	12	70	6
UE524 04016	4	16	70	6
UE524 04020	4	20	70	6
UE524 04020S4	4	20	100	4
UE524 04026	4	26	70	6
UE524 04030	4	30	70	6
UE524 05015	5	15	70	6

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UE524 | 4 FLUTES SQUARE ENDMILL

EDP No	SIZES (mm)			
	D	L1	L2	D2
UE524 05020	5	20	70	6
UE524 05025100	5	25	100	6
UE524 05025	5	25	70	6
UE524 05030	5	30	80	6
UE524 05035	5	35	90	6
UE524 05040	5	40	100	6
UE524 06015080	6	15	80	6
UE524 06015	6	15	60	6
UE524 06020090	6	20	90	6
UE524 06020	6	20	70	6
UE524 06025	6	25	75	6
UE524 06030150	6	30	150	6
UE524 06030100	6	30	100	6
UE524 06030	6	30	80	6
UE524 06035	6	35	90	6
UE524 06040120	6	40	120	6
UE524 06040	6	40	90	6
UE524 06045	6	45	150	6
UE524 07035	7	35	85	8
UE524 08020	8	20	100	8
UE524 08025	8	25	80	8
UE524 08030100	8	30	100	8
UE524 08030	8	30	80	8
UE524 08035	8	35	90	8
UE524 08040150	8	40	150	8
UE524 08040120	8	40	120	8
UE524 08040	8	40	90	8
UE524 08045	8	45	100	8
UE524 08050150	8	50	150	8
UE524 08050	8	50	100	8
UE524 08060	8	60	155	8
UE524 08080	8	80	200	8
UE524 09045	9	45	100	10
UE524 10025	10	25	100	10
UE524 100100	10	30	100	10
UE524 10030	10	30	80	10
UE524 10035	10	35	90	10
UE524 10040120	10	40	120	10
UE524 10040	10	40	90	10
UE524 10045	10	45	100	10
UE524 10050200	10	50	200	10

EDP No	SIZES (mm)			
	D	L1	L2	D2
UE524 10050150	10	50	150	10
UE524 10050	10	50	100	10
UE524 10055	10	55	150	10
UE524 10060200	10	60	200	10
UE524 10060155	10	60	155	10
UE524 10060	10	60	110	10
UE524 10080200	10	80	200	10
UE524 11050	11	50	110	12
UE524 12030	12	30	110	12
UE524 12035	12	35	90	12
UE524 12040120	12	40	120	12
UE524 12040	12	40	100	12
UE524 12045	12	45	130	12
UE524 12050150	12	50	150	12
UE524 12050	12	50	100	12
UE524 12055	12	55	110	12
UE524 12060200	12	60	200	12
UE524 12060150	12	60	150	12
UE524 12060	12	60	110	12
UE524 12065	12	65	150	12
UE524 12070200	12	70	200	12
UE524 12070	12	70	120	12
UE524 12080	12	80	200	12
UE524 14040	14	40	110	16
UE524 14050	14	50	110	16
UE524 14060	14	60	150	16
UE524 16040	16	40	150	16
UE524 16050150	16	50	150	16
UE524 16050	16	50	110	16
UE524 16060	16	60	120	16
UE524 16070200	16	70	200	16
UE524 16070150	16	70	150	16
UE524 16070	16	70	130	16
UE524 16080	16	80	150	16
UE524 16090	16	90	150	16
UE524 160100	16	100	200	16
UE524 160110	16	110	200	16
UE524 160120	16	120	250	16
UE524 18050	18	50	120	20
UE524 18070	18	70	130	20
UE524 180100	18	100	200	20

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UE524 | 4 FLUTES SQUARE ENDMILL

EDP No	SIZES (mm)			
	D	L1	L2	D2
UE524 20050150	20	50	150	20
UE524 20050	20	50	110	20
UE524 20060	20	60	130	20
UE524 20070	20	70	130	20
UE524 20080	20	80	150	20
UE524 20090200	20	90	200	20
UE524 20090	20	90	150	20
UE524 200100	20	100	200	20
UE524 200110	20	110	200	20
UE524 200120	20	120	250	20

EDP No	SIZES (mm)			
	D	L1	L2	D2
UE524 200130	20	130	250	20
UE524 22075	22	75	150	20
UE524 220110	22	110	200	20
UE524 25070	25	70	150	25
UE524 25090	25	90	150	25
UE524 250100	25	100	200	25
UE524 250110	25	110	200	25
UE524 250120	25	120	250	25
UE524 250150	25	150	250	25

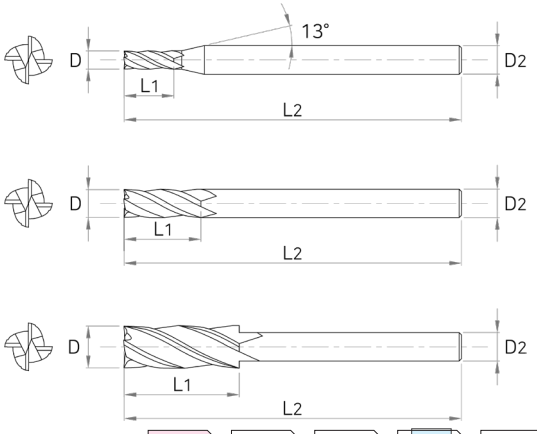
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

ULE504 | 4 FLUTES AUTOMATIC CNC SQUARE ENDMILL





CARBIDE | AlCrN | 4 | 30° HELIX | DATA P.646

■ Tolerance

D		Shank Dia
D3 ~ 16	0 ~ -0.02	h5

EDP No	SIZES (mm)			
	D	L1	L2	D2
ULE504 030S04	3	3	35	4
ULE504 040S04	4	4	35	4
ULE504 060S06	6	6	35	6
ULE504 070S07	7	20	45	7
ULE504 080S08	8	8	45	8
ULE504 080S06	8	8	35	6
ULE504 080S07	8	15	45	7
ULE504 090S07	9	15	45	7
ULE504 100S06	10	10	35	6
ULE504 100S10	10	15	45	10
ULE504 100S07	10	15	45	7
ULE504 110S07	11	15	45	7
ULE504 120S10	12	12	45	10
ULE504 120S06	12	12	35	6
ULE504 120S07	12	15	45	7
ULE504 120-25S10	12	25	55	10
ULE504 130S10	13	25	55	10
ULE504 140S10	14	25	55	10
ULE504 140S07	14	25	55	7
ULE504 160S10	16	25	60	10

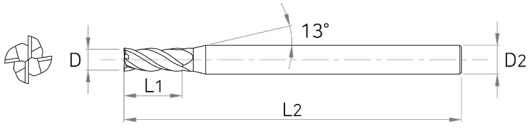
■ Applicable Working Material

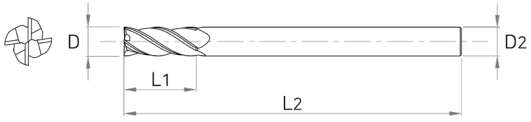
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UE504 | 4 FLUTES SQUARE ENDMILL







■ Tolerance

D		Shank Dia
D0.8 ~ 25	0 ~ -0.03	h5

CARBIDE | AlCrN | 4 | 34° HELIX | 36° HELIX | DATA P.647

EDP No	SIZES (mm)			
	D	L1	L2	D2
UE504 008	0.8	1.6	40	4
UE504 009	0.9	1.8	40	4
UE504 010	1	2.5	50	6
UE504 012	1.2	3	50	6
UE504 015	1.5	4	50	6
UE504 020	2	6	50	6
UE504 025	2.5	7	50	6
UE504 030	3	8	50	6
UE504 035	3.5	10	50	6
UE504 040	4	10	50	6
UE504 045	4.5	14	50	6
UE504 050	5	15	60	6
UE504 055	5.5	15	60	6
UE504 060	6	15	60	6
UE504 065	6.5	18	60	8
UE504 070	7	20	60	8
UE504 075	7.5	20	60	8
UE504 080	8	20	70	8
UE504 085	8.5	22	70	10
UE504 090	9	22	70	10
UE504 095	9.5	24	70	10
UE504 100	10	25	75	10

EDP No	SIZES (mm)			
	D	L1	L2	D2
UE504 105	10.5	26	75	12
UE504 110	11	30	75	12
UE504 115	11.5	30	80	12
UE504 120	12	30	80	12
UE504 125	12.5	30	80	12
UE504 130	13	35	100	12
UE504 140	14	35	100	16
UE504 140S14	14	35	100	14
UE504 140S12	14	35	100	12
UE504 150	15	38	100	16
UE504 160	16	40	100	16
UE504 170	17	42	100	16
UE504 180	18	45	100	18
UE504 180S16	18	45	100	16
UE504 190	19	45	100	20
UE504 200	20	45	100	20
UE504 210	21	45	100	20
UE504 220	22	45	100	20
UE504 230	23	50	120	25
UE504 240	24	50	120	25
UE504 250	25	50	120	25

■ Applicable Working Material

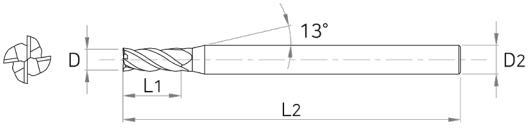
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

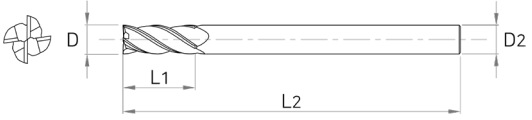
○ : GOOD ◎ : EXCELLENT

UXE504

4 FLUTES SQUARE ENDMILL FOR HEAVY CUTS







■ Tolerance

D		Shank Dia
D1 ~ 25	0 ~ -0.03	h5

CARBIDE | AlCrN | 4 | 34° HELIX | 35° HELIX | DATA P.647

EDP No	SIZES (mm)			
	D	L1	L2	D2
UXE504 01001	1	1	40	6
UXE504 01002	1	2	40	6
UXE504 010	1	2.5	50	6
UXE504 01003	1	3	50	6
UXE504 01004	1	4	50	6
UXE504 01006	1	6	50	6
UXE504 01202	1.2	2	40	6
UXE504 012	1.2	3	50	6
UXE504 01204	1.2	4	50	6
UXE504 01206	1.2	6	50	6
UXE504 015015	1.5	1.5	40	6
UXE504 01503	1.5	3	40	6
UXE504 015	1.5	4	50	6
UXE504 01506	1.5	6	50	6
UXE504 01508	1.5	8	50	6
UXE504 01510	1.5	10	50	6
UXE504 02002	2	2	40	6
UXE504 02004	2	4	40	6
UXE504 020	2	6	50	6
UXE504 02008	2	8	50	6
UXE504 02010	2	10	50	6
UXE504 02012	2	12	50	6
UXE504 025025	2.5	2.5	40	6
UXE504 02505	2.5	5	40	6

EDP No	SIZES (mm)			
	D	L1	L2	D2
UXE504 025	2.5	7	50	6
UXE504 02510	2.5	10	50	6
UXE504 02512	2.5	12	50	6
UXE504 03003	3	3	40	6
UXE504 03006	3	6	40	6
UXE504 030	3	8	50	6
UXE504 03010	3	10	50	6
UXE504 03012	3	12	50	6
UXE504 03014	3	14	50	6
UXE504 04004	4	4	40	6
UXE504 04008	4	8	40	6
UXE504 040	4	10	50	6
UXE504 04012	4	12	50	6
UXE504 04014	4	14	50	6
UXE504 04016	4	16	50	6
UXE504 05005	5	5	50	6
UXE504 05010	5	10	50	6
UXE504 050	5	15	60	6
UXE504 05020	5	20	60	6
UXE504 05025	5	25	60	6
UXE504 06006	6	6	50	6
UXE504 06012	6	12	50	6
UXE504 060	6	15	60	6
UXE504 06020	6	20	60	6

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UXE504 | 4 FLUTES SQUARE ENDMILL FOR HEAVY CUTS

EDP No	SIZES (mm)			
	D	L1	L2	D2
UXE504 06025	6	25	60	6
UXE504 08016	8	16	60	8
UXE504 080	8	20	70	8
UXE504 08025	8	25	70	8
UXE504 08030	8	30	70	8
UXE504 10022	10	22	65	10
UXE504 100	10	25	75	10
UXE504 10030	10	30	75	10
UXE504 10035	10	35	75	10

EDP No	SIZES (mm)			
	D	L1	L2	D2
UXE504 12026	12	26	70	12
UXE504 120	12	30	80	12
UXE504 12035	12	35	80	12
UXE504 12040	12	40	80	12
UXE504 140	14	35	100	16
UXE504 16032	16	32	100	16
UXE504 160	16	40	100	16
UXE504 180	18	45	100	20
UXE504 200	20	45	100	20

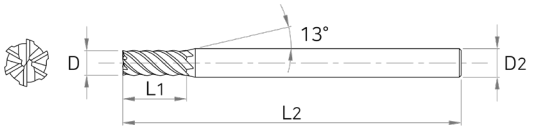
■ Applicable Working Material

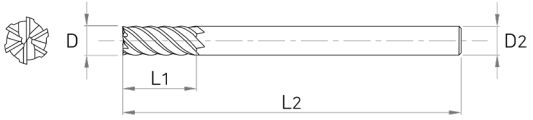
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UE506 | 6 FLUTES SQUARE ENDMILL







■ Tolerance

D		Shank Dia
D6 ~ 25	0 ~ -0.03	h5

CARBIDE | AlCrN | 6 | 45° HELIX | DATA P.647

EDP No	SIZES (mm)			
	D	L1	L2	D2
UE506 060	6	15	60	6
UE506 06020	6	20	70	6
UE506 06030110	6	30	110	6
UE506 06030	6	30	80	6
UE506 070	7	18	60	8
UE506 080	8	20	70	8
UE506 08030	8	30	80	8
UE506 08035	8	35	90	8
UE506 08040130	8	40	130	8
UE506 08040	8	40	90	8
UE506 090	9	22	70	10
UE506 100	10	25	75	10
UE506 10030	10	30	80	10
UE506 10040	10	40	90	10
UE506 10050150	10	50	150	10
UE506 10050	10	50	100	10
UE506 110	11	26	75	12
UE506 120	12	30	80	12
UE506 12040	12	40	90	12
UE506 12050	12	50	100	12

EDP No	SIZES (mm)			
	D	L1	L2	D2
UE506 12060150	12	60	150	12
UE506 12060	12	60	110	12
UE506 130	13	32	85	14
UE506 140	14	32	85	14
UE506 160	16	40	100	16
UE506 16050	16	50	110	16
UE506 16060	16	60	120	16
UE506 16090	16	90	150	16
UE506 160110250	16	110	250	16
UE506 160110	16	110	200	16
UE506 180	18	44	100	18
UE506 200	20	45	100	20
UE506 20060	20	60	120	20
UE506 20070	20	70	130	20
UE506 200110300	20	110	300	20
UE506 200110250	20	110	250	20
UE506 200110	20	110	200	20
UE506 250	25	50	120	25
UE506 251	25	92	180	25

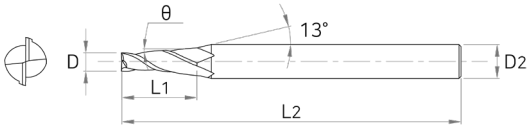
■ Applicable Working Material

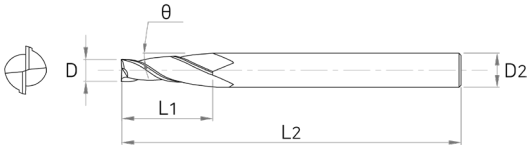
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UTE502 | 2 FLUTES TAPERED SQUARE ENDMILL







■ Tolerance

D		Shank Dia
D1 ~ 12	0 ~ -0.03	h5

CARBIDE | AlCrN | 2 | 30° HELIX | DATA P.648

EDP No	SIZES (mm)				
	D	θ	L1	L2	D2
UTE502 00302	0.3	2	1.2	40	4
UTE502 003015	0.3	1.5	1.2	40	4
UTE502 00301	0.3	1	1.2	40	4
UTE502 003005	0.3	0.5	1.2	40	4
UTE502 00310	0.3	10	1.5	40	4
UTE502 00307	0.3	7	1.5	40	4
UTE502 00305	0.3	5	1.5	40	4
UTE502 00303	0.3	3	1.5	40	4
UTE502 00403	0.4	3	1.6	40	4
UTE502 00402	0.4	2	1.6	40	4
UTE502 004015	0.4	1.5	1.6	40	4
UTE502 00401	0.4	1	1.6	40	4
UTE502 004005	0.4	0.5	1.6	40	4
UTE502 00410	0.4	10	2	40	4
UTE502 00407	0.4	7	2	40	4
UTE502 00405	0.4	5	2	40	4
UTE502 00503	0.5	3	2	45	4
UTE502 00502	0.5	2	2	45	4
UTE502 005015	0.5	1.5	2	45	4
UTE502 00501	0.5	1	2	45	4
UTE502 005005	0.5	0.5	2	45	4
UTE502 00510	0.5	10	2.5	45	4
UTE502 00507	0.5	7	2.5	45	4
UTE502 00505	0.5	5	2.5	45	4

EDP No	SIZES (mm)				
	D	θ	L1	L2	D2
UTE502 00603	0.6	3	2.4	45	4
UTE502 00602	0.6	2	2.4	45	4
UTE502 006015	0.6	1.5	2.4	45	4
UTE502 00601	0.6	1	2.4	45	4
UTE502 006005	0.6	0.5	2.4	45	4
UTE502 00610	0.6	10	3	45	4
UTE502 00607	0.6	7	3	45	4
UTE502 00605	0.6	5	3	45	4
UTE502 00703	0.7	3	2.8	45	4
UTE502 00702	0.7	2	2.8	45	4
UTE502 007015	0.7	1.5	2.8	45	4
UTE502 00701	0.7	1	2.8	45	4
UTE502 007005	0.7	0.5	2.8	45	4
UTE502 00710	0.7	10	3.5	45	4
UTE502 00707	0.7	7	3.5	45	4
UTE502 00705	0.7	5	3.5	45	4
UTE502 00803	0.8	3	3.2	45	4
UTE502 00802	0.8	2	3.2	45	4
UTE502 008015	0.8	1.5	3.2	45	4
UTE502 00801	0.8	1	3.2	45	4
UTE502 008005	0.8	0.5	3.2	45	4
UTE502 00810	0.8	10	4	45	4
UTE502 00807	0.8	7	4	45	4
UTE502 00805	0.8	5	4	45	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UTE502 | 2 FLUTES TAPERED SQUARE ENDMILL

EDP No	SIZES (mm)				
	D	θ	L1	L2	D2
UTE502 010015	1	1.5	4	50	4
UTE502 01001	1	1	4	50	4
UTE502 010005	1	0.5	4	50	4
UTE502 01003	1	3	6	50	4
UTE502 01002	1	2	6	50	4
UTE502 01010	1	10	8	50	4
UTE502 01007	1	7	8	50	4
UTE502 01005	1	5	8	50	4
UTE502 015015	1.5	1.5	6	50	4
UTE502 01501	1.5	1	6	50	4
UTE502 015005	1.5	0.5	6	50	4
UTE502 01503	1.5	3	8	50	4
UTE502 01502	1.5	2	8	50	4
UTE502 01510	1.5	10	10	50	6
UTE502 01507	1.5	7	10	50	4
UTE502 01505	1.5	5	10	50	4
UTE502 020015	2	1.5	8	50	4
UTE502 02001	2	1	8	50	4
UTE502 020005	2	0.5	8	50	4
UTE502 02003	2	3	10	50	4
UTE502 02002	2	2	10	50	4
UTE502 02010	2	10	12	50	8
UTE502 02007	2	7	12	50	6
UTE502 02005	2	5	12	50	6
UTE502 025015	2.5	1.5	10	50	6
UTE502 02501	2.5	1	10	50	6
UTE502 025005	2.5	0.5	10	50	6
UTE502 02503	2.5	3	12	50	6
UTE502 02502	2.5	2	12	50	6
UTE502 02510	2.5	10	14	50	8
UTE502 02507	2.5	7	14	50	6
UTE502 02505	2.5	5	14	50	6
UTE502 030015	3	1.5	12	50	6
UTE502 03001	3	1	12	50	6
UTE502 030005	3	0.5	12	50	6
UTE502 03003	3	3	14	50	6
UTE502 03002	3	2	14	50	6
UTE502 03010	3	10	16	50	10
UTE502 03007	3	7	16	50	8
UTE502 03005	3	5	16	50	6

EDP No	SIZES (mm)				
	D	θ	L1	L2	D2
UTE502 04007	4	7	16	65	8
UTE502 04002	4	2	16	60	6
UTE502 040015	4	1.5	16	60	6
UTE502 04001	4	1	16	60	6
UTE502 040005	4	0.5	16	60	6
UTE502 04010	4	10	17	65	10
UTE502 04003	4	3	19	60	6
UTE502 04005	4	5	22	65	8
UTE502 06010	6	10	17	75	12
UTE502 06003	6	3	19	65	8
UTE502 06002	6	2	20	65	8
UTE502 060015	6	1.5	20	65	8
UTE502 06001	6	1	20	65	8
UTE502 060005	6	0.5	20	65	8
UTE502 06005	6	5	22	75	10
UTE502 06007	6	7	24	75	12
UTE502 07005	7	5	28	80	12
UTE502 07003	7	3	28	80	10
UTE502 07002	7	2	28	80	10
UTE502 070015	7	1.5	28	70	10
UTE502 07001	7	1	28	70	8
UTE502 070005	7	0.5	28	70	8
UTE502 08002	8	2	28	90	10
UTE502 08007	8	7	32	90	16
UTE502 08010	8	10	34	100	20
UTE502 080015	8	1.5	35	90	10
UTE502 08001	8	1	35	90	10
UTE502 080005	8	0.5	35	90	10
UTE502 08003	8	3	38	90	12
UTE502 08005	8	5	45	100	16
UTE502 08010S25	8	10	48	150	25
UTE502 10005	10	5	34	100	16
UTE502 100015	10	1.5	38	90	12
UTE502 10007	10	7	40	90	20
UTE502 10003	10	3	40	100	16
UTE502 10002	10	2	40	75	16
UTE502 10001	10	1	40	90	12
UTE502 100005	10	0.5	40	90	12
UTE502 10010	10	10	42	100	25

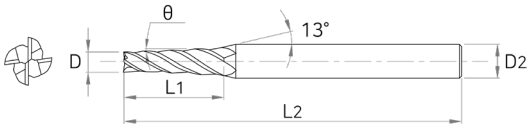
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UTE504 | 4 FLUTES TAPERED SQUARE ENDMILL





■ Tolerance

D		Shank Dia
D0.8 ~ 10	0 ~ -0.03	h5

CARBIDE | AlCrN | 4 | 30° HELIX | DATA P..649

EDP No	SIZES (mm)				
	D	θ	L1	L2	D2
UTE504 00802004	0.8	2	4	45	4
UTE504 00801504	0.8	1.5	4	45	4
UTE504 00801004	0.8	1	4	45	4
UTE504 00800504	0.8	0.5	4	45	4
UTE504 00802006	0.8	2	6	45	4
UTE504 00801506	0.8	1.5	6	45	4
UTE504 00801006	0.8	1	6	45	4
UTE504 00800506	0.8	0.5	6	45	4
UTE504 00802008	0.8	2	8	45	4
UTE504 00801508	0.8	1.5	8	45	4
UTE504 00801008	0.8	1	8	45	4
UTE504 00800508	0.8	0.5	8	45	4
UTE504 00802010	0.8	2	10	45	4
UTE504 00801510	0.8	1.5	10	45	4
UTE504 00801010	0.8	1	10	45	4
UTE504 00800510	0.8	0.5	10	45	4
UTE504 00802012	0.8	2	12	45	4
UTE504 00801512	0.8	1.5	12	45	4
UTE504 00801012	0.8	1	12	45	4
UTE504 00800512	0.8	0.5	12	45	4
UTE504 01003004	1	3	4	50	4
UTE504 01002004	1	2	4	50	4
UTE504 01001504	1	1.5	4	50	4
UTE504 01001004	1	1	4	50	4

EDP No	SIZES (mm)				
	D	θ	L1	L2	D2
UTE504 01000504	1	0.5	4	50	4
UTE504 01003006	1	3	6	50	4
UTE504 01002006	1	2	6	50	4
UTE504 01001506	1	1.5	6	50	4
UTE504 01001006	1	1	6	50	4
UTE504 01000506	1	0.5	6	50	4
UTE504 01003008	1	3	8	50	4
UTE504 01002008	1	2	8	50	4
UTE504 01001508	1	1.5	8	50	4
UTE504 01001008	1	1	8	50	4
UTE504 01000508	1	0.5	8	50	4
UTE504 01003010	1	3	10	50	4
UTE504 01002010	1	2	10	50	4
UTE504 01001510	1	1.5	10	50	4
UTE504 01001010	1	1	10	50	4
UTE504 01000510	1	0.5	10	50	4
UTE504 01003012	1	3	12	50	4
UTE504 01002012	1	2	12	50	4
UTE504 01001512	1	1.5	12	50	4
UTE504 01001012	1	1	12	50	4
UTE504 01000512	1	0.5	12	50	4
UTE504 01003016	1	3	16	50	4
UTE504 01002016	1	2	16	50	4
UTE504 01001516	1	1.5	16	50	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UTE504 | 4 FLUTES TAPERED SQUARE ENDMILL

EDP No	SIZES (mm)				
	D	θ	L1	L2	D2
UTE504 01001016	1	1	16	50	4
UTE504 01000516	1	0.5	16	50	4
UTE504 01203006	1.2	3	6	50	4
UTE504 01202006	1.2	2	6	50	4
UTE504 01201506	1.2	1.5	6	50	4
UTE504 01201006	1.2	1	6	50	4
UTE504 01200506	1.2	0.5	6	50	4
UTE504 01203008	1.2	3	8	50	4
UTE504 01202008	1.2	2	8	50	4
UTE504 01201508	1.2	1.5	8	50	4
UTE504 01201008	1.2	1	8	50	4
UTE504 01200508	1.2	0.5	8	50	4
UTE504 01203010	1.2	3	10	50	4
UTE504 01202010	1.2	2	10	50	4
UTE504 01201510	1.2	1.5	10	50	4
UTE504 01201010	1.2	1	10	50	4
UTE504 01200510	1.2	0.5	10	50	4
UTE504 01203012	1.2	3	12	50	4
UTE504 01202012	1.2	2	12	50	4
UTE504 01201512	1.2	1.5	12	50	4
UTE504 01201012	1.2	1	12	50	4
UTE504 01200512	1.2	0.5	12	50	4
UTE504 01203016	1.2	3	16	50	4
UTE504 01202016	1.2	2	16	50	4
UTE504 01201516	1.2	1.5	16	50	4
UTE504 01201016	1.2	1	16	50	4
UTE504 01200516	1.2	0.5	16	50	4
UTE504 01503006	1.5	3	6	50	4
UTE504 01502006	1.5	2	6	50	4
UTE504 01501506	1.5	1.5	6	50	4
UTE504 01501006	1.5	1	6	50	4
UTE504 01500506	1.5	0.5	6	50	4
UTE504 01503008	1.5	3	8	50	4
UTE504 01502008	1.5	2	8	50	4
UTE504 01501508	1.5	1.5	8	50	4
UTE504 01501008	1.5	1	8	50	4
UTE504 01500508	1.5	0.5	8	50	4
UTE504 01503010	1.5	3	10	50	4
UTE504 01502010	1.5	2	10	50	4
UTE504 01501510	1.5	1.5	10	50	4
UTE504 01501010	1.5	1	10	50	4

EDP No	SIZES (mm)				
	D	θ	L1	L2	D2
UTE504 01500510	1.5	0.5	10	50	4
UTE504 01503012	1.5	3	12	50	4
UTE504 01502012	1.5	2	12	50	4
UTE504 01501512	1.5	1.5	12	50	4
UTE504 01501012	1.5	1	12	50	4
UTE504 01500512	1.5	0.5	12	50	4
UTE504 01503016	1.5	3	16	50	4
UTE504 01502016	1.5	2	16	50	4
UTE504 01501516	1.5	1.5	16	50	4
UTE504 01501016	1.5	1	16	50	4
UTE504 01500516	1.5	0.5	16	50	4
UTE504 01503020	1.5	3	20	60	4
UTE504 01502020	1.5	2	20	60	4
UTE504 01501520	1.5	1.5	20	60	4
UTE504 01501020	1.5	1	20	60	4
UTE504 01500520	1.5	0.5	20	60	4
UTE504 02003008	2	3	8	50	4
UTE504 02002008	2	2	8	50	4
UTE504 02001508	2	1.5	8	50	4
UTE504 02001008	2	1	8	50	4
UTE504 02000508	2	0.5	8	50	4
UTE504 02003010	2	3	10	50	4
UTE504 02002010	2	2	10	50	4
UTE504 02001510	2	1.5	10	50	4
UTE504 02001010	2	1	10	50	4
UTE504 02000510	2	0.5	10	50	4
UTE504 02003012	2	3	12	50	4
UTE504 02002012	2	2	12	50	4
UTE504 02001512	2	1.5	12	50	4
UTE504 02001012	2	1	12	50	4
UTE504 02000512	2	0.5	12	50	4
UTE504 02003016	2	3	16	50	4
UTE504 02002016	2	2	16	50	4
UTE504 02001516	2	1.5	16	50	4
UTE504 02001016	2	1	16	50	4
UTE504 02000516	2	0.5	16	50	4
UTE504 02003020	2	3	20	60	6
UTE504 02002020	2	2	20	60	4
UTE504 02001520	2	1.5	20	60	4
UTE504 02001020	2	1	20	60	4
UTE504 02000520	2	0.5	20	60	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UTE504 | 4 FLUTES TAPERED SQUARE ENDMILL

EDP No	SIZES (mm)				
	D	θ	L1	L2	D2
UTE504 02003025	2	3	25	60	6
UTE504 02002025	2	2	25	60	4
UTE504 02001525	2	1.5	25	60	4
UTE504 02001025	2	1	25	60	4
UTE504 02000525	2	0.5	25	60	4
UTE504 02503010	2.5	3	10	50	4
UTE504 02502010	2.5	2	10	50	4
UTE504 02501510	2.5	1.5	10	50	4
UTE504 02501010	2.5	1	10	50	4
UTE504 02500510	2.5	0.5	10	50	4
UTE504 02503012	2.5	3	12	50	4
UTE504 02502012	2.5	2	12	50	4
UTE504 02501512	2.5	1.5	12	50	4
UTE504 02501012	2.5	1	12	50	4
UTE504 02500512	2.5	0.5	12	50	4
UTE504 02503016	2.5	3	16	50	6
UTE504 02502016	2.5	2	16	50	4
UTE504 02501516	2.5	1.5	16	50	4
UTE504 02501016	2.5	1	16	50	4
UTE504 02500516	2.5	0.5	16	50	4
UTE504 02503020	2.5	3	20	60	6
UTE504 02502020	2.5	2	20	60	4
UTE504 02501520	2.5	1.5	20	60	4
UTE504 02501020	2.5	1	20	60	4
UTE504 02500520	2.5	0.5	20	60	4
UTE504 02503025	2.5	3	25	60	6
UTE504 02502025	2.5	2	25	60	6
UTE504 02501525	2.5	1.5	25	60	4
UTE504 02501025	2.5	1	25	60	4
UTE504 02500525	2.5	0.5	25	60	4
UTE504 02503030	2.5	3	30	60	6
UTE504 02502030	2.5	2	30	60	6
UTE504 02501530	2.5	1.5	30	60	6
UTE504 02501030	2.5	1	30	60	4
UTE504 02500530	2.5	0.5	30	60	4
UTE504 030015	3	1.5	12	50	6
UTE504 03001	3	1	12	50	6
UTE504 030005	3	0.5	12	50	6
UTE504 03003	3	3	14	50	6
UTE504 03002	3	2	14	50	6
UTE504 03010	3	10	16	50	10

EDP No	SIZES (mm)				
	D	θ	L1	L2	D2
UTE504 03007	3	7	16	50	8
UTE504 03005	3	5	16	50	6
UTE504 04007	4	7	16	65	8
UTE504 04002	4	2	16	60	6
UTE504 040015	4	1.5	16	60	6
UTE504 04001	4	1	16	60	6
UTE504 040005	4	0.5	16	60	6
UTE504 04010	4	10	17	65	10
UTE504 04003	4	3	19	60	6
UTE504 04005	4	5	22	65	8
UTE504 06010	6	10	17	75	12
UTE504 06003	6	3	19	65	8
UTE504 06002	6	2	20	65	8
UTE504 060015	6	1.5	20	65	8
UTE504 06001	6	1	20	65	8
UTE504 060005	6	0.5	20	65	8
UTE504 06005	6	5	22	75	10
UTE504 06007	6	7	24	75	12
UTE504 07005	7	5	28	80	12
UTE504 07003	7	3	28	80	10
UTE504 07002	7	2	28	80	10
UTE504 070015	7	1.5	28	70	10
UTE504 07001	7	1	28	70	8
UTE504 070005	7	0.5	28	70	8
UTE504 08002	8	2	28	90	10
UTE504 08007	8	7	32	90	16
UTE504 08010	8	10	34	100	20
UTE504 080015	8	1.5	35	90	10
UTE504 08001	8	1	35	90	10
UTE504 080005	8	0.5	35	90	10
UTE504 08003	8	3	38	90	12
UTE504 08005	8	5	45	100	16
UTE504 10005	10	5	34	100	16
UTE504 100015	10	1.5	38	90	12
UTE504 10007	10	7	40	90	20
UTE504 10003	10	3	40	100	16
UTE504 10002	10	2	40	90	16
UTE504 10001	10	1	40	90	12
UTE504 100005	10	0.5	40	90	12
UTE504 10010	10	10	42	100	25

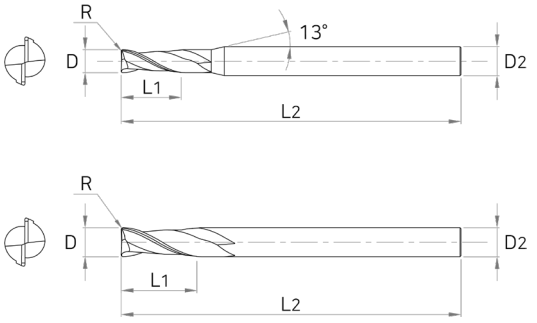
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UR502 | 2 FLUTES RADIUS ENDMILL





■ Tolerance

D		Shank Dia
D0.2 ~ 6	0 ~ -0.012	h5
D7 ~ 20	0 ~ -0.015	

CARBIDE | AlCrN | 2 | 30° HELIX | R ±0.01 R6 OR UNDER | R ±0.015 ABOVE R6 | DATA P.650

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
UR502 002002	0.2	0.02	0.4	40	4
UR502 002005	0.2	0.05	0.4	40	4
UR502 003002	0.3	0.02	0.6	40	4
UR502 003005	0.3	0.05	0.6	40	4
UR502 004005	0.4	0.05	0.8	40	4
UR502 00401	0.4	0.1	0.8	40	4
UR502 005005	0.5	0.05	1	40	4
UR502 00501	0.5	0.1	1	40	4
UR502 006005	0.6	0.05	1.2	40	4
UR502 00601	0.6	0.1	1.2	40	4
UR502 00602	0.6	0.2	1.2	40	4
UR502 007005	0.7	0.05	1.4	40	4
UR502 00701	0.7	0.1	1.4	40	4
UR502 00702	0.7	0.2	1.4	40	4
UR502 008005	0.8	0.05	1.6	40	4
UR502 00801	0.8	0.1	1.6	40	4
UR502 00802	0.8	0.2	1.6	40	4
UR502 009005	0.9	0.05	1.8	40	4
UR502 00901	0.9	0.1	1.8	40	4
UR502 010005	1	0.05	2.5	50	6
UR502 01001	1	0.1	2.5	50	6
UR502 01002	1	0.2	2.5	50	6
UR502 01003	1	0.3	2.5	50	6
UR502 012005	1.2	0.05	3	50	6

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
UR502 01201	1.2	0.1	3	50	6
UR502 01202	1.2	0.2	3	50	6
UR502 01203	1.2	0.3	3	50	6
UR502 015005	1.5	0.05	4	50	6
UR502 01501	1.5	0.1	4	50	6
UR502 01502	1.5	0.2	4	50	6
UR502 01503	1.5	0.3	4	50	6
UR502 01505	1.5	0.5	4	50	6
UR502 02001	2	0.1	6	50	6
UR502 02002	2	0.2	6	50	6
UR502 02003	2	0.3	6	50	6
UR502 02005	2	0.5	6	50	6
UR502 02501	2.5	0.1	7	60	6
UR502 02502	2.5	0.2	7	60	6
UR502 02503	2.5	0.3	7	60	6
UR502 02505	2.5	0.5	7	60	6
UR502 03001	3	0.1	8	60	6
UR502 03002	3	0.2	8	60	6
UR502 03003	3	0.3	8	60	6
UR502 03005	3	0.5	8	60	6
UR502 03010	3	1	8	60	6
UR502 03501	3.5	0.1	10	70	6
UR502 03502	3.5	0.2	10	70	6
UR502 03503	3.5	0.3	10	70	6

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UR502 | 2 FLUTES RADIUS ENDMILL

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
UR502 03505	3.5	0.5	10	70	6
UR502 04001	4	0.1	10	70	6
UR502 04001100S4	4	0.1	10	100	4
UR502 04001S4	4	0.1	10	70	4
UR502 04002	4	0.2	10	70	6
UR502 04002100S4	4	0.2	10	100	4
UR502 04002S4	4	0.2	10	70	4
UR502 04003	4	0.3	10	70	6
UR502 04003100S4	4	0.3	10	100	4
UR502 04003S4	4	0.3	10	70	4
UR502 04005	4	0.5	10	70	6
UR502 04005100S4	4	0.5	10	100	4
UR502 04005S4	4	0.5	10	70	4
UR502 04010	4	1	10	70	6
UR502 04010100S4	4	1	10	100	4
UR502 04010S4	4	1	10	70	4
UR502 04501	4.5	0.1	11	80	6
UR502 04502	4.5	0.2	11	80	6
UR502 04503	4.5	0.3	11	80	6
UR502 04505	4.5	0.5	11	80	6
UR502 05001	5	0.1	13	90	6
UR502 05002	5	0.2	13	90	6
UR502 05003	5	0.3	13	90	6
UR502 05005	5	0.5	13	90	6
UR502 05010	5	1	13	90	6
UR502 05501	5.5	0.1	13	90	6
UR502 05502	5.5	0.2	13	90	6
UR502 05503	5.5	0.3	13	90	6
UR502 05505	5.5	0.5	13	90	6
UR502 05510	5.5	1	13	90	6
UR502 06001	6	0.1	15	90	6
UR502 06002	6	0.2	15	90	6
UR502 06003	6	0.3	15	90	6
UR502 0600360	6	0.3	15	60	6
UR502 06005	6	0.5	15	90	6
UR502 06005110	6	0.5	15	110	6
UR502 06005130	6	0.5	15	130	6
UR502 0600560	6	0.5	15	60	6
UR502 06010	6	1	15	90	6
UR502 06010110	6	1	15	110	6
UR502 06010130	6	1	15	130	6

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
UR502 0601060	6	1	15	60	6
UR502 06015	6	1.5	15	90	6
UR502 06020	6	2	15	90	6
UR502 07001	7	0.1	16	90	8
UR502 07002	7	0.2	16	90	8
UR502 07003	7	0.3	16	90	8
UR502 07005	7	0.5	16	90	8
UR502 07010	7	1	16	90	8
UR502 07020	7	2	16	90	8
UR502 08001	8	0.1	20	100	8
UR502 08002	8	0.2	20	100	8
UR502 08003	8	0.3	20	100	8
UR502 0800370	8	0.3	20	70	8
UR502 08005	8	0.5	20	100	8
UR502 08005120	8	0.5	20	120	8
UR502 08005150	8	0.5	20	150	8
UR502 0800570	8	0.5	20	70	8
UR502 08010	8	1	20	100	8
UR502 08010120	8	1	20	120	8
UR502 08010150	8	1	20	150	8
UR502 0801070	8	1	20	70	8
UR502 08015	8	1.5	20	100	8
UR502 08020	8	2	20	100	8
UR502 08025	8	2.5	20	100	8
UR502 08030	8	3	20	100	8
UR502 10001	10	0.1	25	100	10
UR502 10002	10	0.2	25	100	10
UR502 10003	10	0.3	25	100	10
UR502 1000375	10	0.3	25	75	10
UR502 10005	10	0.5	25	100	10
UR502 10005130	10	0.5	25	130	10
UR502 10005150	10	0.5	25	150	10
UR502 1000575	10	0.5	25	75	10
UR502 10010	10	1	25	100	10
UR502 10010130	10	1	25	130	10
UR502 10010150	10	1	25	150	10
UR502 1001075	10	1	25	75	10
UR502 10015	10	1.5	25	100	10
UR502 10020	10	2	25	100	10
UR502 10025	10	2.5	25	100	10
UR502 10030	10	3	25	100	10

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UR502 | 2 FLUTES RADIUS ENDMILL

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
UR502 03505	3.5	0.5	10	70	6
UR502 04001	4	0.1	10	70	6
UR502 04001100S4	4	0.1	10	100	4
UR502 04001S4	4	0.1	10	70	4
UR502 04002	4	0.2	10	70	6
UR502 04002100S4	4	0.2	10	100	4
UR502 04002S4	4	0.2	10	70	4
UR502 04003	4	0.3	10	70	6
UR502 04003100S4	4	0.3	10	100	4
UR502 04003S4	4	0.3	10	70	4
UR502 04005	4	0.5	10	70	6
UR502 04005100S4	4	0.5	10	100	4
UR502 04005S4	4	0.5	10	70	4
UR502 04010	4	1	10	70	6
UR502 04010100S4	4	1	10	100	4
UR502 04010S4	4	1	10	70	4
UR502 04501	4.5	0.1	11	80	6
UR502 04502	4.5	0.2	11	80	6
UR502 04503	4.5	0.3	11	80	6
UR502 04505	4.5	0.5	11	80	6
UR502 05001	5	0.1	13	90	6
UR502 05002	5	0.2	13	90	6
UR502 05003	5	0.3	13	90	6
UR502 05005	5	0.5	13	90	6
UR502 05010	5	1	13	90	6
UR502 05501	5.5	0.1	13	90	6
UR502 05502	5.5	0.2	13	90	6
UR502 05503	5.5	0.3	13	90	6
UR502 05505	5.5	0.5	13	90	6
UR502 05510	5.5	1	13	90	6
UR502 06001	6	0.1	15	90	6
UR502 06002	6	0.2	15	90	6
UR502 06003	6	0.3	15	90	6
UR502 0600360	6	0.3	15	60	6
UR502 06005	6	0.5	15	90	6
UR502 06005110	6	0.5	15	110	6
UR502 06005130	6	0.5	15	130	6
UR502 0600560	6	0.5	15	60	6
UR502 06010	6	1	15	90	6
UR502 06010110	6	1	15	110	6
UR502 06010130	6	1	15	130	6

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
UR502 0601060	6	1	15	60	6
UR502 06015	6	1.5	15	90	6
UR502 06020	6	2	15	90	6
UR502 07001	7	0.1	16	90	8
UR502 07002	7	0.2	16	90	8
UR502 07003	7	0.3	16	90	8
UR502 07005	7	0.5	16	90	8
UR502 07010	7	1	16	90	8
UR502 07020	7	2	16	90	8
UR502 08001	8	0.1	20	100	8
UR502 08002	8	0.2	20	100	8
UR502 08003	8	0.3	20	100	8
UR502 0800370	8	0.3	20	70	8
UR502 08005	8	0.5	20	100	8
UR502 08005120	8	0.5	20	120	8
UR502 08005150	8	0.5	20	150	8
UR502 0800570	8	0.5	20	70	8
UR502 08010	8	1	20	100	8
UR502 08010120	8	1	20	120	8
UR502 08010150	8	1	20	150	8
UR502 0801070	8	1	20	70	8
UR502 08015	8	1.5	20	100	8
UR502 08020	8	2	20	100	8
UR502 08025	8	2.5	20	100	8
UR502 08030	8	3	20	100	8
UR502 10001	10	0.1	25	100	10
UR502 10002	10	0.2	25	100	10
UR502 10003	10	0.3	25	100	10
UR502 1000375	10	0.3	25	75	10
UR502 10005	10	0.5	25	100	10
UR502 10005130	10	0.5	25	130	10
UR502 10005150	10	0.5	25	150	10
UR502 1000575	10	0.5	25	75	10
UR502 10010	10	1	25	100	10
UR502 10010130	10	1	25	130	10
UR502 10010150	10	1	25	150	10
UR502 1001075	10	1	25	75	10
UR502 10015	10	1.5	25	100	10
UR502 10020	10	2	25	100	10
UR502 10025	10	2.5	25	100	10
UR502 10030	10	3	25	100	10

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UR502 | 2 FLUTES RADIUS ENDMILL

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
UR502 10040	10	4	25	100	10
UR502 11002	11	0.2	25	110	12
UR502 11003	11	0.3	25	110	12
UR502 11005	11	0.5	25	110	12
UR502 11010	11	1	25	110	12
UR502 11020	11	2	25	110	12
UR502 12001	12	0.1	30	110	12
UR502 12002	12	0.2	30	110	12
UR502 12003	12	0.3	30	110	12
UR502 1200380	12	0.3	30	80	12
UR502 12005	12	0.5	30	110	12
UR502 12005130	12	0.5	30	130	12
UR502 12005150	12	0.5	30	150	12
UR502 1200580	12	0.5	30	80	12
UR502 12010	12	1	30	110	12
UR502 12010130	12	1	30	130	12
UR502 12010150	12	1	30	150	12
UR502 1201080	12	1	30	80	12
UR502 12015	12	1.5	30	110	12

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
UR502 12020	12	2	30	110	12
UR502 12025	12	2.5	30	110	12
UR502 12030	12	3	30	110	12
UR502 12040	12	4	30	110	12
UR502 12050	12	5	30	110	12
UR502 14005	14	0.5	30	150	16
UR502 14010	14	1	30	150	16
UR502 14020	14	2	30	150	16
UR502 16005	16	0.5	32	150	16
UR502 16010	16	1	32	150	16
UR502 16015	16	1.5	32	150	16
UR502 16020	16	2	32	150	16
UR502 16030	16	3	32	150	16
UR502 20005	20	0.5	38	150	20
UR502 20010	20	1	38	150	20
UR502 20015	20	1.5	38	150	20
UR502 20020	20	2	38	150	20
UR502 20030	20	3	38	150	20

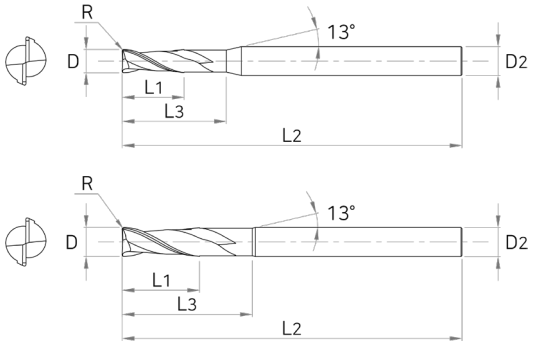
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UR512 | 2 FLUTES NECK RADIUS ENDMILL





■ Tolerance

D		Shank Dia
D0.2 ~ 6	0 ~ -0.012	h5
D8 ~ 20	0 ~ -0.015	

CARBIDE | AlCrN | 2 | 30° HELIX | R ±0.01 R6 OR UNDER | R ±0.015 ABOVE R6 | DATA P.651

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
UR512 002002005	0.2	0.02	0.3	0.5	40	4
UR512 00200201	0.2	0.02	0.3	1	40	4
UR512 002002015	0.2	0.02	0.3	1.5	40	4
UR512 00200202	0.2	0.02	0.3	2	40	4
UR512 002005005	0.2	0.05	0.3	0.5	40	4
UR512 00200501	0.2	0.05	0.3	1	40	4
UR512 002005015	0.2	0.05	0.3	1.5	40	4
UR512 00200502	0.2	0.05	0.3	2	40	4
UR512 00300201	0.3	0.02	0.5	1	40	4
UR512 00300202	0.3	0.02	0.5	2	40	4
UR512 00300203	0.3	0.02	0.5	3	40	4
UR512 00300501	0.3	0.05	0.5	1	40	4
UR512 00300502	0.3	0.05	0.5	2	40	4
UR512 00300503	0.3	0.05	0.5	3	40	4
UR512 00400501	0.4	0.05	0.6	1	40	4
UR512 004005015	0.4	0.05	0.6	1.5	40	4
UR512 00400502	0.4	0.05	0.6	2	40	4
UR512 004005025	0.4	0.05	0.6	2.5	40	4
UR512 00400503	0.4	0.05	0.6	3	40	4
UR512 00400504	0.4	0.05	0.6	4	40	4
UR512 0040101	0.4	0.1	0.6	1	40	4
UR512 00401015	0.4	0.1	0.6	1.5	40	4
UR512 0040102	0.4	0.1	0.6	2	40	4
UR512 00401025	0.4	0.1	0.6	2.5	40	4

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
UR512 0040103	0.4	0.1	0.6	3	40	4
UR512 0040104	0.4	0.1	0.6	4	40	4
UR512 00500501	0.5	0.05	0.7	1	45	4
UR512 005005015	0.5	0.05	0.7	1.5	45	4
UR512 00500502	0.5	0.05	0.7	2	45	4
UR512 005005025	0.5	0.05	0.7	2.5	45	4
UR512 00500503	0.5	0.05	0.7	3	45	4
UR512 00500504	0.5	0.05	0.7	4	45	4
UR512 00500505	0.5	0.05	0.7	5	45	4
UR512 00500506	0.5	0.05	0.7	6	45	4
UR512 0050101	0.5	0.1	0.7	1	45	4
UR512 00501015	0.5	0.1	0.7	1.5	45	4
UR512 0050102	0.5	0.1	0.7	2	45	4
UR512 00501025	0.5	0.1	0.7	2.5	45	4
UR512 0050103	0.5	0.1	0.7	3	45	4
UR512 0050104	0.5	0.1	0.7	4	45	4
UR512 0050105	0.5	0.1	0.7	5	45	4
UR512 0050106	0.5	0.1	0.7	6	45	4
UR512 00600502	0.6	0.05	0.9	2	45	4
UR512 00600503	0.6	0.05	0.9	3	45	4
UR512 00600504	0.6	0.05	0.9	4	45	4
UR512 00600506	0.6	0.05	0.9	6	45	4
UR512 00600508	0.6	0.05	0.9	8	45	4
UR512 00600510	0.6	0.05	0.9	10	45	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UR512 | 2 FLUTES NECK RADIUS ENDMILL

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
UR512 0060102	0.6	0.1	0.9	2	45	4
UR512 0060103	0.6	0.1	0.9	3	45	4
UR512 0060104	0.6	0.1	0.9	4	45	4
UR512 0060106	0.6	0.1	0.9	6	45	4
UR512 0060108	0.6	0.1	0.9	8	45	4
UR512 0060110	0.6	0.1	0.9	10	45	4
UR512 0060202	0.6	0.2	0.9	2	45	4
UR512 0060203	0.6	0.2	0.9	3	45	4
UR512 0060204	0.6	0.2	0.9	4	45	4
UR512 0060206	0.6	0.2	0.9	6	45	4
UR512 0060208	0.6	0.2	0.9	8	45	4
UR512 0060210	0.6	0.2	0.9	10	45	4
UR512 00700502	0.7	0.05	1.2	2	45	4
UR512 00700504	0.7	0.05	1.2	4	45	4
UR512 00700506	0.7	0.05	1.2	6	45	4
UR512 00700508	0.7	0.05	1.2	8	45	4
UR512 00700510	0.7	0.05	1.2	10	45	4
UR512 0070102	0.7	0.1	1.2	2	45	4
UR512 0070104	0.7	0.1	1.2	4	45	4
UR512 0070106	0.7	0.1	1.2	6	45	4
UR512 0070108	0.7	0.1	1.2	8	45	4
UR512 0070110	0.7	0.1	1.2	10	45	4
UR512 0070202	0.7	0.2	1.2	2	45	4
UR512 0070204	0.7	0.2	1.2	4	45	4
UR512 0070206	0.7	0.2	1.2	6	45	4
UR512 0070208	0.7	0.2	1.2	8	45	4
UR512 0070210	0.7	0.2	1.2	10	45	4
UR512 00800502	0.8	0.05	1.2	2	45	4
UR512 00800503	0.8	0.05	1.2	3	45	4
UR512 00800504	0.8	0.05	1.2	4	45	4
UR512 00800506	0.8	0.05	1.2	6	45	4
UR512 00800508	0.8	0.05	1.2	8	45	4
UR512 00800510	0.8	0.05	1.2	10	45	4
UR512 0080102	0.8	0.1	1.2	2	45	4
UR512 0080103	0.8	0.1	1.2	3	45	4
UR512 0080104	0.8	0.1	1.2	4	45	4
UR512 0080106	0.8	0.1	1.2	6	45	4
UR512 0080108	0.8	0.1	1.2	8	45	4
UR512 0080110	0.8	0.1	1.2	10	45	4
UR512 0080202	0.8	0.2	1.2	2	45	4
UR512 0080203	0.8	0.2	1.2	3	45	4

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
UR512 0080204	0.8	0.2	1.2	4	45	4
UR512 0080206	0.8	0.2	1.2	6	45	4
UR512 0080208	0.8	0.2	1.2	8	45	4
UR512 0080210	0.8	0.2	1.2	10	45	4
UR512 01000503	1	0.05	1.5	3	50	4
UR512 01000504	1	0.05	1.5	4	50	4
UR512 01000506	1	0.05	1.5	6	50	4
UR512 01000508	1	0.05	1.5	8	50	4
UR512 01000510	1	0.05	1.5	10	50	4
UR512 01000512	1	0.05	1.5	12	50	4
UR512 01000514	1	0.05	1.5	14	50	4
UR512 01000516	1	0.05	1.5	16	50	4
UR512 01000520	1	0.05	1.5	20	50	4
UR512 0100103	1	0.1	1.5	3	50	4
UR512 0100104	1	0.1	1.5	4	50	4
UR512 0100106	1	0.1	1.5	6	50	4
UR512 0100108	1	0.1	1.5	8	50	4
UR512 0100110	1	0.1	1.5	10	50	4
UR512 0100112	1	0.1	1.5	12	50	4
UR512 0100114	1	0.1	1.5	14	50	4
UR512 0100116	1	0.1	1.5	16	50	4
UR512 0100120	1	0.1	1.5	20	50	4
UR512 0100203	1	0.2	1.5	3	50	4
UR512 0100204	1	0.2	1.5	4	50	4
UR512 0100206	1	0.2	1.5	6	50	4
UR512 0100208	1	0.2	1.5	8	50	4
UR512 0100210	1	0.2	1.5	10	50	4
UR512 0100212	1	0.2	1.5	12	50	4
UR512 0100214	1	0.2	1.5	14	50	4
UR512 0100216	1	0.2	1.5	16	50	4
UR512 0100220	1	0.2	1.5	20	50	4
UR512 0100303	1	0.3	1.5	3	50	4
UR512 0100304	1	0.3	1.5	4	50	4
UR512 0100306	1	0.3	1.5	6	50	4
UR512 0100308	1	0.3	1.5	8	50	4
UR512 0100310	1	0.3	1.5	10	50	4
UR512 0100312	1	0.3	1.5	12	50	4
UR512 0100314	1	0.3	1.5	14	50	4
UR512 0100316	1	0.3	1.5	16	50	4
UR512 0100320	1	0.3	1.5	20	50	4
UR512 01200503	1.2	0.05	1.8	3	50	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UR512 | 2 FLUTES NECK RADIUS ENDMILL

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
UR512 01200504	1.2	0.05	1.8	4	50	4
UR512 01200506	1.2	0.05	1.8	6	50	4
UR512 01200508	1.2	0.05	1.8	8	50	4
UR512 01200510	1.2	0.05	1.8	10	50	4
UR512 01200512	1.2	0.05	1.8	12	50	4
UR512 01200516	1.2	0.05	1.8	16	50	4
UR512 01200520	1.2	0.05	1.8	20	50	4
UR512 0120103	1.2	0.1	1.8	3	50	4
UR512 0120104	1.2	0.1	1.8	4	50	4
UR512 0120106	1.2	0.1	1.8	6	50	4
UR512 0120108	1.2	0.1	1.8	8	50	4
UR512 0120110	1.2	0.1	1.8	10	50	4
UR512 0120112	1.2	0.1	1.8	12	50	4
UR512 0120116	1.2	0.1	1.8	16	50	4
UR512 0120120	1.2	0.1	1.8	20	50	4
UR512 0120203	1.2	0.2	1.8	3	50	4
UR512 0120204	1.2	0.2	1.8	4	50	4
UR512 0120206	1.2	0.2	1.8	6	50	4
UR512 0120208	1.2	0.2	1.8	8	50	4
UR512 0120210	1.2	0.2	1.8	10	50	4
UR512 0120212	1.2	0.2	1.8	12	50	4
UR512 0120216	1.2	0.2	1.8	16	50	4
UR512 0120220	1.2	0.2	1.8	20	50	4
UR512 0120303	1.2	0.3	1.8	3	50	4
UR512 0120304	1.2	0.3	1.8	4	50	4
UR512 0120306	1.2	0.3	1.8	6	50	4
UR512 0120308	1.2	0.3	1.8	8	50	4
UR512 0120310	1.2	0.3	1.8	10	50	4
UR512 0120312	1.2	0.3	1.8	12	50	4
UR512 0120316	1.2	0.3	1.8	16	50	4
UR512 0120320	1.2	0.3	1.8	20	50	4
UR512 01500504	1.5	0.05	2.3	4	50	4
UR512 01500506	1.5	0.05	2.3	6	50	4
UR512 01500508	1.5	0.05	2.3	8	50	4
UR512 01500510	1.5	0.05	2.3	10	50	4
UR512 01500512	1.5	0.05	2.3	12	50	4
UR512 01500514	1.5	0.05	2.3	14	50	4
UR512 01500516	1.5	0.05	2.3	16	50	4
UR512 01500520	1.5	0.05	2.3	20	50	4
UR512 01500522	1.5	0.05	2.3	22	60	4
UR512 01500526	1.5	0.05	2.3	26	60	4

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
UR512 0150104	1.5	0.1	2.3	4	50	4
UR512 0150106	1.5	0.1	2.3	6	50	4
UR512 0150108	1.5	0.1	2.3	8	50	4
UR512 0150110	1.5	0.1	2.3	10	50	4
UR512 0150112	1.5	0.1	2.3	12	50	4
UR512 0150114	1.5	0.1	2.3	14	50	4
UR512 0150116	1.5	0.1	2.3	16	50	4
UR512 0150120	1.5	0.1	2.3	20	50	4
UR512 0150122	1.5	0.1	2.3	22	60	4
UR512 0150126	1.5	0.1	2.3	26	60	4
UR512 0150204	1.5	0.2	2.3	4	50	4
UR512 0150206	1.5	0.2	2.3	6	50	4
UR512 0150208	1.5	0.2	2.3	8	50	4
UR512 0150210	1.5	0.2	2.3	10	50	4
UR512 0150212	1.5	0.2	2.3	12	50	4
UR512 0150214	1.5	0.2	2.3	14	50	4
UR512 0150216	1.5	0.2	2.3	16	50	4
UR512 0150220	1.5	0.2	2.3	20	50	4
UR512 0150222	1.5	0.2	2.3	22	60	4
UR512 0150226	1.5	0.2	2.3	26	60	4
UR512 0150304	1.5	0.3	2.3	4	50	4
UR512 0150306	1.5	0.3	2.3	6	50	4
UR512 0150308	1.5	0.3	2.3	8	50	4
UR512 0150310	1.5	0.3	2.3	10	50	4
UR512 0150312	1.5	0.3	2.3	12	50	4
UR512 0150314	1.5	0.3	2.3	14	50	4
UR512 0150316	1.5	0.3	2.3	16	50	4
UR512 0150320	1.5	0.3	2.3	20	50	4
UR512 0150322	1.5	0.3	2.3	22	60	4
UR512 0150326	1.5	0.3	2.3	26	60	4
UR512 0150504	1.5	0.5	2.3	4	50	4
UR512 0150506	1.5	0.5	2.3	6	50	4
UR512 0150508	1.5	0.5	2.3	8	50	4
UR512 0150510	1.5	0.5	2.3	10	50	4
UR512 0150512	1.5	0.5	2.3	12	50	4
UR512 0150514	1.5	0.5	2.3	14	50	4
UR512 0150516	1.5	0.5	2.3	16	50	4
UR512 0150520	1.5	0.5	2.3	20	50	4
UR512 0150522	1.5	0.5	2.3	22	60	4
UR512 0150526	1.5	0.5	2.3	26	60	4
UR512 0200106	2	0.1	3	6	50	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UR512 | 2 FLUTES NECK RADIUS ENDMILL

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
UR512 0200108	2	0.1	3	8	50	4
UR512 0200110	2	0.1	3	10	50	4
UR512 0200112	2	0.1	3	12	50	4
UR512 0200114	2	0.1	3	14	50	4
UR512 0200116	2	0.1	3	16	50	4
UR512 0200120	2	0.1	3	20	50	4
UR512 0200122	2	0.1	3	22	60	4
UR512 0200126	2	0.1	3	26	60	4
UR512 0200130	2	0.1	3	30	70	4
UR512 0200206	2	0.2	3	6	50	4
UR512 0200208	2	0.2	3	8	50	4
UR512 0200210	2	0.2	3	10	50	4
UR512 0200212	2	0.2	3	12	50	4
UR512 0200214	2	0.2	3	14	50	4
UR512 0200216	2	0.2	3	16	50	4
UR512 0200220	2	0.2	3	20	50	4
UR512 0200222	2	0.2	3	22	60	4
UR512 0200226	2	0.2	3	26	60	4
UR512 0200230	2	0.2	3	30	70	4
UR512 0200306	2	0.3	3	6	50	4
UR512 0200308	2	0.3	3	8	50	4
UR512 0200310	2	0.3	3	10	50	4
UR512 0200312	2	0.3	3	12	50	4
UR512 0200314	2	0.3	3	14	50	4
UR512 0200316	2	0.3	3	16	50	4
UR512 0200320	2	0.3	3	20	50	4
UR512 0200322	2	0.3	3	22	60	4
UR512 0200326	2	0.3	3	26	60	4
UR512 0200330	2	0.3	3	30	70	4
UR512 0200506	2	0.5	3	6	50	4
UR512 0200508	2	0.5	3	8	50	4
UR512 0200510	2	0.5	3	10	50	4
UR512 0200512	2	0.5	3	12	50	4
UR512 0200514	2	0.5	3	14	50	4
UR512 0200516	2	0.5	3	16	50	4
UR512 0200520	2	0.5	3	20	50	4
UR512 0200522	2	0.5	3	22	60	4
UR512 0200526	2	0.5	3	26	60	4
UR512 0200530	2	0.5	3	30	70	4
UR512 0250108	2.5	0.1	4	8	50	4
UR512 0250110	2.5	0.1	4	10	50	4

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
UR512 0250112	2.5	0.1	4	12	50	4
UR512 0250114	2.5	0.1	4	14	50	4
UR512 0250116	2.5	0.1	4	16	50	4
UR512 0250120	2.5	0.1	4	20	50	4
UR512 0250126	2.5	0.1	4	26	60	4
UR512 0250130	2.5	0.1	4	30	70	4
UR512 0250208	2.5	0.2	4	8	50	4
UR512 0250210	2.5	0.2	4	10	50	4
UR512 0250212	2.5	0.2	4	12	50	4
UR512 0250214	2.5	0.2	4	14	50	4
UR512 0250216	2.5	0.2	4	16	50	4
UR512 0250220	2.5	0.2	4	20	50	4
UR512 0250226	2.5	0.2	4	26	60	4
UR512 0250230	2.5	0.2	4	30	70	4
UR512 0250308	2.5	0.3	4	8	50	4
UR512 0250310	2.5	0.3	4	10	50	4
UR512 0250312	2.5	0.3	4	12	50	4
UR512 0250314	2.5	0.3	4	14	50	4
UR512 0250316	2.5	0.3	4	16	50	4
UR512 0250320	2.5	0.3	4	20	50	4
UR512 0250326	2.5	0.3	4	26	60	4
UR512 0250330	2.5	0.3	4	30	70	4
UR512 0250508	2.5	0.5	4	8	50	4
UR512 0250510	2.5	0.5	4	10	50	4
UR512 0250512	2.5	0.5	4	12	50	4
UR512 0250514	2.5	0.5	4	14	50	4
UR512 0250516	2.5	0.5	4	16	50	4
UR512 0250520	2.5	0.5	4	20	50	4
UR512 0250526	2.5	0.5	4	26	60	4
UR512 0250530	2.5	0.5	4	30	70	4
UR512 0300108	3	0.1	4.5	8	50	6
UR512 0300110	3	0.1	4.5	10	50	6
UR512 0300112	3	0.1	4.5	12	50	6
UR512 0300114	3	0.1	4.5	14	60	6
UR512 0300116	3	0.1	4.5	16	60	6
UR512 0300120	3	0.1	4.5	20	60	6
UR512 0300126	3	0.1	4.5	26	65	6
UR512 0300130	3	0.1	4.5	30	70	6
UR512 0300135	3	0.1	4.5	35	70	6
UR512 0300140	3	0.1	4.5	40	80	6
UR512 0300208	3	0.2	4.5	8	50	6

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UR512 | 2 FLUTES NECK RADIUS ENDMILL

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
UR512 0300210	3	0.2	4.5	10	50	6
UR512 0300212	3	0.2	4.5	12	50	6
UR512 0300214	3	0.2	4.5	14	60	6
UR512 0300216	3	0.2	4.5	16	60	6
UR512 0300220	3	0.2	4.5	20	60	6
UR512 0300226	3	0.2	4.5	26	65	6
UR512 0300230	3	0.2	4.5	30	70	6
UR512 0300235	3	0.2	4.5	35	70	6
UR512 0300240	3	0.2	4.5	40	80	6
UR512 0300308	3	0.3	4.5	8	50	6
UR512 0300310	3	0.3	4.5	10	50	6
UR512 0300312	3	0.3	4.5	12	50	6
UR512 0300314	3	0.3	4.5	14	60	6
UR512 0300316	3	0.3	4.5	16	60	6
UR512 0300320	3	0.3	4.5	20	60	6
UR512 0300326	3	0.3	4.5	26	65	6
UR512 0300330	3	0.3	4.5	30	70	6
UR512 0300335	3	0.3	4.5	35	70	6
UR512 0300340	3	0.3	4.5	40	80	6
UR512 0300508	3	0.5	4.5	8	50	6
UR512 0300510	3	0.5	4.5	10	50	6
UR512 0300512	3	0.5	4.5	12	50	6
UR512 0300514	3	0.5	4.5	14	60	6
UR512 0300516	3	0.5	4.5	16	60	6
UR512 0300520	3	0.5	4.5	20	60	6
UR512 0300526	3	0.5	4.5	26	65	6
UR512 0300530	3	0.5	4.5	30	70	6
UR512 0300535	3	0.5	4.5	35	70	6
UR512 0300540	3	0.5	4.5	40	80	6
UR512 0301008	3	1	4.5	8	50	6
UR512 0301010	3	1	4.5	10	50	6
UR512 0301012	3	1	4.5	12	50	6
UR512 0301014	3	1	4.5	14	60	6
UR512 0301016	3	1	4.5	16	60	6
UR512 0301020	3	1	4.5	20	60	6
UR512 0301026	3	1	4.5	26	65	6
UR512 0301030	3	1	4.5	30	70	6
UR512 0301035	3	1	4.5	35	70	6
UR512 0301040	3	1	4.5	40	80	6
UR512 0400110	4	0.1	6	10	50	6
UR512 0400112	4	0.1	6	12	50	6

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
UR512 0400114	4	0.1	6	14	60	6
UR512 0400116	4	0.1	6	16	60	6
UR512 0400120	4	0.1	6	20	60	6
UR512 0400126	4	0.1	6	26	65	6
UR512 0400130	4	0.1	6	30	65	6
UR512 0400135	4	0.1	6	35	70	6
UR512 0400140	4	0.1	6	40	80	6
UR512 0400145	4	0.1	6	45	90	6
UR512 0400150	4	0.1	6	50	100	6
UR512 0400210	4	0.2	6	10	50	6
UR512 0400212	4	0.2	6	12	50	6
UR512 0400214	4	0.2	6	14	60	6
UR512 0400216	4	0.2	6	16	60	6
UR512 0400220	4	0.2	6	20	60	6
UR512 0400226	4	0.2	6	26	65	6
UR512 0400230	4	0.2	6	30	65	6
UR512 0400235	4	0.2	6	35	70	6
UR512 0400240	4	0.2	6	40	80	6
UR512 0400245	4	0.2	6	45	90	6
UR512 0400250	4	0.2	6	50	100	6
UR512 0400310	4	0.3	6	10	50	6
UR512 0400312	4	0.3	6	12	50	6
UR512 0400314	4	0.3	6	14	60	6
UR512 0400316	4	0.3	6	16	60	6
UR512 0400320	4	0.3	6	20	60	6
UR512 0400326	4	0.3	6	26	65	6
UR512 0400330	4	0.3	6	30	65	6
UR512 0400335	4	0.3	6	35	70	6
UR512 0400340	4	0.3	6	40	80	6
UR512 0400345	4	0.3	6	45	90	6
UR512 0400350	4	0.3	6	50	100	6
UR512 0400510	4	0.5	6	10	50	6
UR512 0400512	4	0.5	6	12	50	6
UR512 0400514	4	0.5	6	14	60	6
UR512 0400516	4	0.5	6	16	60	6
UR512 0400520	4	0.5	6	20	60	6
UR512 0400526	4	0.5	6	26	65	6
UR512 0400530	4	0.5	6	30	65	6
UR512 0400535	4	0.5	6	35	70	6
UR512 0400540	4	0.5	6	40	80	6
UR512 0400545	4	0.5	6	45	90	6

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UR512 | 2 FLUTES NECK RADIUS ENDMILL

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
UR512 0400550	4	0.5	6	50	100	6
UR512 0401010	4	1	6	10	50	6
UR512 0401012	4	1	6	12	50	6
UR512 0401014	4	1	6	14	60	6
UR512 0401016	4	1	6	16	60	6
UR512 0401020	4	1	6	20	60	6
UR512 0401026	4	1	6	26	65	6
UR512 0401030	4	1	6	30	65	6
UR512 0401035	4	1	6	35	70	6
UR512 0401040	4	1	6	40	80	6
UR512 0401045	4	1	6	45	90	6
UR512 0401050	4	1	6	50	100	6
UR512 05001	5	0.1	8	15	60	6
UR512 05002	5	0.2	8	15	60	6
UR512 05003	5	0.3	8	15	60	6
UR512 05005	5	0.5	8	15	60	6
UR512 05010	5	1	8	15	60	6
UR512 05015	5	1.5	8	15	60	6
UR512 05020	5	2	8	15	60	6
UR512 06001	6	0.1	9	20	60	6
UR512 06002	6	0.2	9	20	60	6
UR512 06003	6	0.3	9	20	60	6
UR512 0600390	6	0.3	15	30	90	6
UR512 06005	6	0.5	9	20	60	6
UR512 0600590	6	0.5	15	30	90	6
UR512 06010	6	1	9	20	60	6
UR512 0601090	6	1	15	30	90	6
UR512 06015	6	1.5	9	20	60	6
UR512 06020	6	2	9	20	60	6
UR512 08001	8	0.1	12	25	70	8
UR512 08002	8	0.2	12	25	70	8
UR512 08003	8	0.3	12	25	70	8
UR512 08003100	8	0.3	20	35	100	8

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
UR512 08005	8	0.5	12	25	70	8
UR512 08005100	8	0.5	20	35	100	8
UR512 08010	8	1	12	25	70	8
UR512 08010100	8	1	20	35	100	8
UR512 08015	8	1.5	12	25	70	8
UR512 08020	8	2	12	25	70	8
UR512 10001	10	0.1	15	30	75	10
UR512 10002	10	0.2	15	30	75	10
UR512 10003	10	0.3	15	30	75	10
UR512 10003100	10	0.3	25	40	100	10
UR512 10005	10	0.5	15	30	75	10
UR512 10005100	10	0.5	25	40	100	10
UR512 10010	10	1	15	30	75	10
UR512 10010100	10	1	25	40	100	10
UR512 10015	10	1.5	15	30	75	10
UR512 10020	10	2	15	30	75	10
UR512 12002	12	0.2	18	32	80	12
UR512 12003	12	0.3	18	32	80	12
UR512 12003110	12	0.3	30	45	110	12
UR512 12005	12	0.5	18	32	80	12
UR512 12005110	12	0.5	30	45	110	12
UR512 12010	12	1	18	32	80	12
UR512 12010110	12	1	30	45	110	12
UR512 12015	12	1.5	18	32	80	12
UR512 12020	12	2	18	32	80	12
UR512 16005	16	0.5	20	35	100	16
UR512 16005150	16	0.5	35	50	150	16
UR512 16010	16	1	20	35	100	16
UR512 16010150	16	1	35	50	150	16
UR512 20005	20	0.5	25	40	100	20
UR512 20005150	20	0.5	40	55	150	20
UR512 20010	20	1	25	40	100	20
UR512 20010150	20	1	40	55	150	20

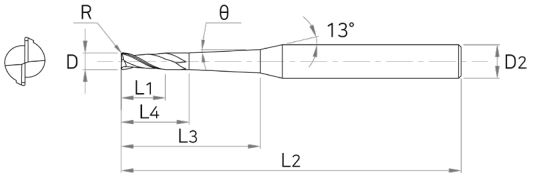
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UR542 | 2 FLUTES TAPERED NECK RADIUS ENDMILL





■ Tolerance

D		Shank Dia
D0.1 ~ 6	0 ~ -0.012	h5
D8 ~ 12	0 ~ -0.015	

CARBIDE | AlCrN | 2 | 30° HELIX | R ±0.01 | DATA P.652

EDP No	SIZES (mm)							
	D	R	θ	L1	L4	L3	L2	D2
UR542 0020050101	0.2	0.05	1	0.3	0.4	1	40	4
UR542 0020050102	0.2	0.05	1	0.3	0.4	2	40	4
UR542 0020050103	0.2	0.05	1	0.3	0.4	3	40	4
UR542 0020050201	0.2	0.05	2	0.3	0.4	1	40	4
UR542 0020050202	0.2	0.05	2	0.3	0.4	2	40	4
UR542 0020050203	0.2	0.05	2	0.3	0.4	3	40	4
UR542 0030050102	0.3	0.05	1	0.5	0.6	2	40	4
UR542 0030050103	0.3	0.05	1	0.5	0.6	3	40	4
UR542 0030050104	0.3	0.05	1	0.5	0.6	4	40	4
UR542 0030050105	0.3	0.05	1	0.5	0.6	5	40	4
UR542 0030050202	0.3	0.05	2	0.5	0.6	2	40	4
UR542 0030050203	0.3	0.05	2	0.5	0.6	3	40	4
UR542 0030050204	0.3	0.05	2	0.5	0.6	4	40	4
UR542 0030050205	0.3	0.05	2	0.5	0.6	5	40	4
UR542 0040050102	0.4	0.05	1	0.6	0.8	2	50	4
UR542 0040050103	0.4	0.05	1	0.6	0.8	3	50	4
UR542 0040050104	0.4	0.05	1	0.6	0.8	4	50	4
UR542 0040050105	0.4	0.05	1	0.6	0.8	5	50	4
UR542 0040050106	0.4	0.05	1	0.6	0.8	6	50	4
UR542 0040050202	0.4	0.05	2	0.6	0.8	2	50	4
UR542 0040050203	0.4	0.05	2	0.6	0.8	3	50	4
UR542 0040050204	0.4	0.05	2	0.6	0.8	4	50	4
UR542 0040050205	0.4	0.05	2	0.6	0.8	5	50	4
UR542 0040050206	0.4	0.05	2	0.6	0.8	6	50	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UR542 | 2 FLUTES TAPERED NECK RADIUS ENDMILL

EDP No	SIZES (mm)							
	D	R	θ	L1	L4	L3	L2	D2
UR542 004010102	0.4	0.1	1	0.6	0.8	2	50	4
UR542 004010103	0.4	0.1	1	0.6	0.8	3	50	4
UR542 004010104	0.4	0.1	1	0.6	0.8	4	50	4
UR542 004010105	0.4	0.1	1	0.6	0.8	5	50	4
UR542 004010106	0.4	0.1	1	0.6	0.8	6	50	4
UR542 004010202	0.4	0.1	2	0.6	0.8	2	50	4
UR542 004010203	0.4	0.1	2	0.6	0.8	3	50	4
UR542 0040050204	0.4	0.05	2	0.6	0.8	4	50	4
UR542 0040050205	0.4	0.05	2	0.6	0.8	5	50	4
UR542 0040050206	0.4	0.05	2	0.6	0.8	6	50	4
UR542 004010102	0.4	0.1	1	0.6	0.8	2	50	4
UR542 004010103	0.4	0.1	1	0.6	0.8	3	50	4
UR542 004010104	0.4	0.1	1	0.6	0.8	4	50	4
UR542 004010105	0.4	0.1	1	0.6	0.8	5	50	4
UR542 004010106	0.4	0.1	1	0.6	0.8	6	50	4
UR542 004010202	0.4	0.1	2	0.6	0.8	2	50	4
UR542 004010203	0.4	0.1	2	0.6	0.8	3	50	4
UR542 004010204	0.4	0.1	2	0.6	0.8	4	50	4
UR542 004010205	0.4	0.1	2	0.6	0.8	5	50	4
UR542 004010206	0.4	0.1	2	0.6	0.8	6	50	4
UR542 0050050104	0.5	0.05	1	0.7	1	4	50	4
UR542 0050050106	0.5	0.05	1	0.7	1	6	50	4
UR542 0050050108	0.5	0.05	1	0.7	1	8	50	4
UR542 0050050110	0.5	0.05	1	0.7	1	10	50	4
UR542 0050050204	0.5	0.05	2	0.7	1	4	50	4
UR542 0050050206	0.5	0.05	2	0.7	1	6	50	4
UR542 0050050208	0.5	0.05	2	0.7	1	8	50	4
UR542 0050050210	0.5	0.05	2	0.7	1	10	50	4
UR542 005010104	0.5	0.1	1	0.7	1	4	50	4
UR542 005010106	0.5	0.1	1	0.7	1	6	50	4
UR542 005010108	0.5	0.1	1	0.7	1	8	50	4
UR542 005010110	0.5	0.1	1	0.7	1	10	50	4
UR542 005010204	0.5	0.1	2	0.7	1	4	50	4
UR542 005010206	0.5	0.1	2	0.7	1	6	50	4
UR542 005010208	0.5	0.1	2	0.7	1	8	50	4
UR542 005010210	0.5	0.1	2	0.7	1	10	50	4
UR542 006010104	0.6	0.1	1	0.9	1.2	4	50	4
UR542 006010106	0.6	0.1	1	0.9	1.2	6	50	4
UR542 0020050101	0.2	0.05	1	0.3	0.4	1	40	4
UR542 0020050102	0.2	0.05	1	0.3	0.4	2	40	4
UR542 0020050103	0.2	0.05	1	0.3	0.4	3	40	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UR542 | 2 FLUTES TAPERED NECK RADIUS ENDMILL

EDP No	SIZES (mm)							
	D	R	θ	L1	L4	L3	L2	D2
UR542 006010106	0.6	0.1	1	0.9	1.2	6	50	4
UR542 0020050101	0.2	0.05	1	0.3	0.4	1	40	4
UR542 0020050102	0.2	0.05	1	0.3	0.4	2	40	4
UR542 0020050103	0.2	0.05	1	0.3	0.4	3	40	4
UR542 0020050201	0.2	0.05	2	0.3	0.4	1	40	4
UR542 0020050202	0.2	0.05	2	0.3	0.4	2	40	4
UR542 0020050203	0.2	0.05	2	0.3	0.4	3	40	4
UR542 0030050102	0.3	0.05	1	0.5	0.6	2	40	4
UR542 0030050103	0.3	0.05	1	0.5	0.6	3	40	4
UR542 0030050104	0.3	0.05	1	0.5	0.6	4	40	4
UR542 0030050105	0.3	0.05	1	0.5	0.6	5	40	4
UR542 0030050202	0.3	0.05	2	0.5	0.6	2	40	4
UR542 0030050203	0.3	0.05	2	0.5	0.6	3	40	4
UR542 0030050204	0.3	0.05	2	0.5	0.6	4	40	4
UR542 0030050205	0.3	0.05	2	0.5	0.6	5	40	4
UR542 0040050102	0.4	0.05	1	0.6	0.8	2	50	4
UR542 0040050103	0.4	0.05	1	0.6	0.8	3	50	4
UR542 0040050104	0.4	0.05	1	0.6	0.8	4	50	4
UR542 0040050105	0.4	0.05	1	0.6	0.8	5	50	4
UR542 0040050106	0.4	0.05	1	0.6	0.8	6	50	4
UR542 0040050202	0.4	0.05	2	0.6	0.8	2	50	4
UR542 0040050203	0.4	0.05	2	0.6	0.8	3	50	4
UR542 0040050204	0.4	0.05	2	0.6	0.8	4	50	4
UR542 0040050205	0.4	0.05	2	0.6	0.8	5	50	4
UR542 0040050206	0.4	0.05	2	0.6	0.8	6	50	4
UR542 004010102	0.4	0.1	1	0.6	0.8	2	50	4
UR542 004010103	0.4	0.1	1	0.6	0.8	3	50	4
UR542 004010104	0.4	0.1	1	0.6	0.8	4	50	4
UR542 004010105	0.4	0.1	1	0.6	0.8	5	50	4
UR542 004010106	0.4	0.1	1	0.6	0.8	6	50	4
UR542 004010202	0.4	0.1	2	0.6	0.8	2	50	4
UR542 004010203	0.4	0.1	2	0.6	0.8	3	50	4
UR542 004010204	0.4	0.1	2	0.6	0.8	4	50	4
UR542 004010205	0.4	0.1	2	0.6	0.8	5	50	4
UR542 004010206	0.4	0.1	2	0.6	0.8	6	50	4
UR542 0050050104	0.5	0.05	1	0.7	1	4	50	4
UR542 0050050106	0.5	0.05	1	0.7	1	6	50	4
UR542 0050050108	0.5	0.05	1	0.7	1	8	50	4
UR542 0050050110	0.5	0.05	1	0.7	1	10	50	4
UR542 0050050204	0.5	0.05	2	0.7	1	4	50	4
UR542 0050050206	0.5	0.05	2	0.7	1	6	50	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UR542 | 2 FLUTES TAPERED NECK RADIUS ENDMILL

EDP No	SIZES (mm)							
	D	R	θ	L1	L4	L3	L2	D2
UR542 0050050208	0.5	0.05	2	0.7	1	8	50	4
UR542 0050050210	0.5	0.05	2	0.7	1	10	50	4
UR542 005010104	0.5	0.1	1	0.7	1	4	50	4
UR542 005010106	0.5	0.1	1	0.7	1	6	50	4
UR542 005010108	0.5	0.1	1	0.7	1	8	50	4
UR542 005010110	0.5	0.1	1	0.7	1	10	50	4
UR542 005010204	0.5	0.1	2	0.7	1	4	50	4
UR542 005010206	0.5	0.1	2	0.7	1	6	50	4
UR542 005010208	0.5	0.1	2	0.7	1	8	50	4
UR542 005010210	0.5	0.1	2	0.7	1	10	50	4
UR542 006010104	0.6	0.1	1	0.9	1.2	4	50	4
UR542 006010106	0.6	0.1	1	0.9	1.2	6	50	4
UR542 006010108	0.6	0.1	1	0.9	1.2	8	50	4
UR542 006010110	0.6	0.1	1	0.9	1.2	10	50	4
UR542 006010112	0.6	0.1	1	0.9	1.2	12	50	4
UR542 006010204	0.6	0.1	2	0.9	1.2	4	50	4
UR542 006010206	0.6	0.1	2	0.9	1.2	6	50	4
UR542 006010208	0.6	0.1	2	0.9	1.2	8	50	4
UR542 006010210	0.6	0.1	2	0.9	1.2	10	50	4
UR542 006010212	0.6	0.1	2	0.9	1.2	12	50	4
UR542 006020104	0.6	0.2	1	0.9	1.2	4	50	4
UR542 006020106	0.6	0.2	1	0.9	1.2	6	50	4
UR542 006020108	0.6	0.2	1	0.9	1.2	8	50	4
UR542 006020110	0.6	0.2	1	0.9	1.2	10	50	4
UR542 006020112	0.6	0.2	1	0.9	1.2	12	50	4
UR542 006020204	0.6	0.2	2	0.9	1.2	4	50	4
UR542 006020206	0.6	0.2	2	0.9	1.2	6	50	4
UR542 006020208	0.6	0.2	2	0.9	1.2	8	50	4
UR542 006020210	0.6	0.2	2	0.9	1.2	10	50	4
UR542 006020212	0.6	0.2	2	0.9	1.2	12	50	4
UR542 008010104	0.8	0.1	1	1.2	1.6	4	50	4
UR542 008010106	0.8	0.1	1	1.2	1.6	6	50	4
UR542 008010108	0.8	0.1	1	1.2	1.6	8	50	4
UR542 008010110	0.8	0.1	1	1.2	1.6	10	50	4
UR542 008010112	0.8	0.1	1	1.2	1.6	12	50	4
UR542 008010116	0.8	0.1	1	1.2	1.6	16	50	4
UR542 008010204	0.8	0.1	2	1.2	1.6	4	50	4
UR542 008010206	0.8	0.1	2	1.2	1.6	6	50	4
UR542 008010208	0.8	0.1	2	1.2	1.6	8	50	4
UR542 008010210	0.8	0.1	2	1.2	1.6	10	50	4
UR542 008010212	0.8	0.1	2	1.2	1.6	12	50	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UR542 | 2 FLUTES TAPERED NECK RADIUS ENDMILL

EDP No	SIZES (mm)							
	D	R	θ	L1	L4	L3	L2	D2
UR542 008010216	0.8	0.1	2	1.2	1.6	16	50	4
UR542 008020104	0.8	0.2	1	1.2	1.6	4	50	4
UR542 008020106	0.8	0.2	1	1.2	1.6	6	50	4
UR542 008020108	0.8	0.2	1	1.2	1.6	8	50	4
UR542 008020110	0.8	0.2	1	1.2	1.6	10	50	4
UR542 008020112	0.8	0.2	1	1.2	1.6	12	50	4
UR542 008020116	0.8	0.2	1	1.2	1.6	16	50	4
UR542 008020204	0.8	0.2	2	1.2	1.6	4	50	4
UR542 008020206	0.8	0.2	2	1.2	1.6	6	50	4
UR542 008020208	0.8	0.2	2	1.2	1.6	8	50	4
UR542 008020210	0.8	0.2	2	1.2	1.6	10	50	4
UR542 008020212	0.8	0.2	2	1.2	1.6	12	50	4
UR542 008020216	0.8	0.2	2	1.2	1.6	16	50	4
UR542 010010106	1	0.1	1	1.5	2.5	6	50	4
UR542 010010108	1	0.1	1	1.5	2.5	8	50	4
UR542 010010110	1	0.1	1	1.5	2.5	10	50	4
UR542 010010112	1	0.1	1	1.5	2.5	12	50	4
UR542 010010116	1	0.1	1	1.5	2.5	16	50	4
UR542 010010120	1	0.1	1	1.5	2.5	20	50	4
UR542 010010125	1	0.1	1	1.5	2.5	25	60	4
UR542 010010130	1	0.1	1	1.5	2.5	30	70	4
UR542 010010140	1	0.1	1	1.5	2.5	40	80	4
UR542 010010150	1	0.1	1	1.5	2.5	50	90	6
UR542 010010206	1	0.1	2	1.5	2.5	6	50	4
UR542 010010208	1	0.1	2	1.5	2.5	8	50	4
UR542 010010210	1	0.1	2	1.5	2.5	10	50	4
UR542 010010212	1	0.1	2	1.5	2.5	12	50	4
UR542 010010216	1	0.1	2	1.5	2.5	16	50	4
UR542 010010220	1	0.1	2	1.5	2.5	20	50	4
UR542 010010225	1	0.1	2	1.5	2.5	25	60	4
UR542 010010230	1	0.1	2	1.5	2.5	30	70	4
UR542 010010240	1	0.1	2	1.5	2.5	40	80	4
UR542 010010250	1	0.1	2	1.5	2.5	50	90	6
UR542 010020106	1	0.2	1	1.5	2.5	6	50	4
UR542 010020108	1	0.2	1	1.5	2.5	8	50	4
UR542 010020110	1	0.2	1	1.5	2.5	10	50	4
UR542 010020112	1	0.2	1	1.5	2.5	12	50	4
UR542 010020116	1	0.2	1	1.5	2.5	16	50	4
UR542 010020120	1	0.2	1	1.5	2.5	20	50	4
UR542 010020125	1	0.2	1	1.5	2.5	25	60	4
UR542 010020130	1	0.2	1	1.5	2.5	30	70	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UR542 | 2 FLUTES TAPERED NECK RADIUS ENDMILL

EDP No	SIZES (mm)							
	D	R	θ	L1	L4	L3	L2	D2
UR542 010020140	1	0.2	1	1.5	2.5	40	80	4
UR542 010020150	1	0.2	1	1.5	2.5	50	90	6
UR542 010020206	1	0.2	2	1.5	2.5	6	50	4
UR542 010020208	1	0.2	2	1.5	2.5	8	50	4
UR542 010020210	1	0.2	2	1.5	2.5	10	50	4
UR542 010020212	1	0.2	2	1.5	2.5	12	50	4
UR542 010020216	1	0.2	2	1.5	2.5	16	50	4
UR542 010020220	1	0.2	2	1.5	2.5	20	50	4
UR542 010020225	1	0.2	2	1.5	2.5	25	60	4
UR542 010020230	1	0.2	2	1.5	2.5	30	70	4
UR542 010020240	1	0.2	2	1.5	2.5	40	80	4
UR542 010020250	1	0.2	2	1.5	2.5	50	90	6
UR542 012010108	1.2	0.1	1	1.8	3	8	50	4
UR542 012010112	1.2	0.1	1	1.8	3	12	50	4
UR542 012010116	1.2	0.1	1	1.8	3	16	50	4
UR542 012010120	1.2	0.1	1	1.8	3	20	50	4
UR542 012010125	1.2	0.1	1	1.8	3	25	60	4
UR542 012010130	1.2	0.1	1	1.8	3	30	70	4
UR542 012010208	1.2	0.1	2	1.8	3	8	50	4
UR542 012010212	1.2	0.1	2	1.8	3	12	50	4
UR542 012010216	1.2	0.1	2	1.8	3	16	50	4
UR542 012010220	1.2	0.1	2	1.8	3	20	50	4
UR542 012010225	1.2	0.1	2	1.8	3	25	60	4
UR542 012010230	1.2	0.1	2	1.8	3	30	70	4
UR542 012020108	1.2	0.2	1	1.8	3	8	50	4
UR542 012020112	1.2	0.2	1	1.8	3	12	50	4
UR542 012020116	1.2	0.2	1	1.8	3	16	50	4
UR542 012020120	1.2	0.2	1	1.8	3	20	50	4
UR542 012020125	1.2	0.2	1	1.8	3	25	60	4
UR542 012020130	1.2	0.2	1	1.8	3	30	70	4
UR542 012020208	1.2	0.2	2	1.8	3	8	50	4
UR542 012020212	1.2	0.2	2	1.8	3	12	50	4
UR542 012020216	1.2	0.2	2	1.8	3	16	50	4
UR542 012020220	1.2	0.2	2	1.8	3	20	50	4
UR542 012020225	1.2	0.2	2	1.8	3	25	60	4
UR542 012020230	1.2	0.2	2	1.8	3	30	70	4
UR542 015010108	1.5	0.1	1	2.3	3	8	50	4
UR542 015010110	1.5	0.1	1	2.3	3	10	50	4
UR542 015010112	1.5	0.1	1	2.3	3	12	50	4
UR542 015010116	1.5	0.1	1	2.3	3	16	50	4
UR542 015010120	1.5	0.1	1	2.3	3	20	50	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UR542 | 2 FLUTES TAPERED NECK RADIUS ENDMILL

EDP No	SIZES (mm)							
	D	R	θ	L1	L4	L3	L2	D2
UR542 015010125	1.5	0.1	1	2.3	3	25	60	4
UR542 015010130	1.5	0.1	1	2.3	3	30	70	4
UR542 015010140	1.5	0.1	1	2.3	3	40	80	4
UR542 015010150	1.5	0.1	1	2.3	3	50	90	4
UR542 015010208	1.5	0.1	2	2.3	3	8	50	4
UR542 015010210	1.5	0.1	2	2.3	3	10	50	4
UR542 015010212	1.5	0.1	2	2.3	3	12	50	4
UR542 015010216	1.5	0.1	2	2.3	3	16	50	4
UR542 015010220	1.5	0.1	2	2.3	3	20	50	4
UR542 015010225	1.5	0.1	2	2.3	3	25	60	4
UR542 015010230	1.5	0.1	2	2.3	3	30	70	4
UR542 015010240	1.5	0.1	2	2.3	3	40	80	6
UR542 015010250	1.5	0.1	2	2.3	3	50	90	6
UR542 015020108	1.5	0.2	1	2.3	3	8	50	4
UR542 015020110	1.5	0.2	1	2.3	3	10	50	4
UR542 015020112	1.5	0.2	1	2.3	3	12	50	4
UR542 015020116	1.5	0.2	1	2.3	3	16	50	4
UR542 015020120	1.5	0.2	1	2.3	3	20	50	4
UR542 015020125	1.5	0.2	1	2.3	3	25	60	4
UR542 015020130	1.5	0.2	1	2.3	3	30	70	4
UR542 015020140	1.5	0.2	1	2.3	3	40	80	4
UR542 015020150	1.5	0.2	1	2.3	3	50	90	4
UR542 015020208	1.5	0.2	2	2.3	3	8	50	4
UR542 015020210	1.5	0.2	2	2.3	3	10	50	4
UR542 015020212	1.5	0.2	2	2.3	3	12	50	4
UR542 015020216	1.5	0.2	2	2.3	3	16	50	4
UR542 015020220	1.5	0.2	2	2.3	3	20	50	4
UR542 015020225	1.5	0.2	2	2.3	3	25	60	4
UR542 015020230	1.5	0.2	2	2.3	3	30	70	4
UR542 015020240	1.5	0.2	2	2.3	3	40	80	6
UR542 015020250	1.5	0.2	2	2.3	3	50	90	6
UR542 015030108	1.5	0.3	1	2.3	3	8	50	4
UR542 015030110	1.5	0.3	1	2.3	3	10	50	4
UR542 015030112	1.5	0.3	1	2.3	3	12	50	4
UR542 015030116	1.5	0.3	1	2.3	3	16	50	4
UR542 015030120	1.5	0.3	1	2.3	3	20	50	4
UR542 015030125	1.5	0.3	1	2.3	3	25	60	4
UR542 015030130	1.5	0.3	1	2.3	3	30	70	4
UR542 015030140	1.5	0.3	1	2.3	3	40	80	4
UR542 015030150	1.5	0.3	1	2.3	3	50	90	4
UR542 015030208	1.5	0.3	2	2.3	3	8	50	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UR542 | 2 FLUTES TAPERED NECK RADIUS ENDMILL

EDP No	SIZES (mm)							
	D	R	θ	L1	L4	L3	L2	D2
UR542 015030210	1.5	0.3	2	2.3	3	10	50	4
UR542 015030212	1.5	0.3	2	2.3	3	12	50	4
UR542 015030216	1.5	0.3	2	2.3	3	16	50	4
UR542 015030220	1.5	0.3	2	2.3	3	20	50	4
UR542 015030225	1.5	0.3	2	2.3	3	25	60	4
UR542 015030230	1.5	0.3	2	2.3	3	30	70	4
UR542 015030240	1.5	0.3	2	2.3	3	40	80	6
UR542 015030250	1.5	0.3	2	2.3	3	50	90	6
UR542 020010110	2	0.1	1	2	5	10	50	4
UR542 020010112	2	0.1	1	2	5	12	50	4
UR542 020010116	2	0.1	1	2	5	16	50	4
UR542 020010120	2	0.1	1	2	5	20	50	4
UR542 020010125	2	0.1	1	2	5	25	60	4
UR542 020010130	2	0.1	1	2	5	30	70	4
UR542 020010140	2	0.1	1	2	5	40	80	6
UR542 020010150	2	0.1	1	2	5	50	100	6
UR542 020010160	2	0.1	1	2	5	60	100	6
UR542 020010180	2	0.1	1	2	5	80	140	6
UR542 020010210	2	0.1	2	2	5	10	50	4
UR542 020010212	2	0.1	2	2	5	12	50	4
UR542 020010216	2	0.1	2	2	5	16	50	4
UR542 020010220	2	0.1	2	2	5	20	50	4
UR542 020010225	2	0.1	2	2	5	25	60	4
UR542 020010230	2	0.1	2	2	5	30	70	4
UR542 020010240	2	0.1	2	2	5	40	80	6
UR542 020010250	2	0.1	2	2	5	50	100	6
UR542 020010260	2	0.1	2	2	5	60	100	6
UR542 020010280	2	0.1	2	2	5	80	140	8
UR542 020020110	2	0.2	1	2	5	10	50	4
UR542 020020112	2	0.2	1	2	5	12	50	4
UR542 020020116	2	0.2	1	2	5	16	50	4
UR542 020020120	2	0.2	1	2	5	20	50	4
UR542 020020125	2	0.2	1	2	5	25	60	4
UR542 020020130	2	0.2	1	2	5	30	70	4
UR542 020020140	2	0.2	1	2	5	40	80	6
UR542 020020150	2	0.2	1	2	5	50	100	6
UR542 020020160	2	0.2	1	2	5	60	100	6
UR542 020020180	2	0.2	1	2	5	80	140	6
UR542 020020210	2	0.2	2	2	5	10	50	4
UR542 020020212	2	0.2	2	2	5	12	50	4
UR542 020020216	2	0.2	2	2	5	16	50	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UR542 | 2 FLUTES TAPERED NECK RADIUS ENDMILL

EDP No	SIZES (mm)							
	D	R	θ	L1	L4	L3	L2	D2
UR542 020020220	2	0.2	2	2	5	20	50	4
UR542 020020225	2	0.2	2	2	5	25	60	4
UR542 020020230	2	0.2	2	2	5	30	70	4
UR542 020020240	2	0.2	2	2	5	40	80	6
UR542 020020250	2	0.2	2	2	5	50	100	6
UR542 020020260	2	0.2	2	2	5	60	100	6
UR542 020020280	2	0.2	2	2	5	80	140	8
UR542 020030110	2	0.3	1	2	5	10	50	4
UR542 020030112	2	0.3	1	2	5	12	50	4
UR542 020030116	2	0.3	1	2	5	16	50	4
UR542 020030120	2	0.3	1	2	5	20	50	4
UR542 020030125	2	0.3	1	2	5	25	60	4
UR542 020030130	2	0.3	1	2	5	30	70	4
UR542 020030140	2	0.3	1	2	5	40	80	6
UR542 020030150	2	0.3	1	2	5	50	100	6
UR542 020030160	2	0.3	1	2	5	60	100	6
UR542 020030180	2	0.3	1	2	5	80	140	6
UR542 020030210	2	0.3	2	2	5	10	50	4
UR542 020030212	2	0.3	2	2	5	12	50	4
UR542 020030216	2	0.3	2	2	5	16	50	4
UR542 020030220	2	0.3	2	2	5	20	50	4
UR542 020030225	2	0.3	2	2	5	25	60	4
UR542 020030230	2	0.3	2	2	5	30	70	4
UR542 020030240	2	0.3	2	2	5	40	80	6
UR542 020030250	2	0.3	2	2	5	50	100	6
UR542 020030260	2	0.3	2	2	5	60	100	6
UR542 020030280	2	0.3	2	2	5	80	140	8
UR542 020050110	2	0.5	1	2	5	10	50	4
UR542 020050112	2	0.5	1	2	5	12	50	4
UR542 020050116	2	0.5	1	2	5	16	50	4
UR542 020050120	2	0.5	1	2	5	20	50	4
UR542 020050125	2	0.5	1	2	5	25	60	4
UR542 020050130	2	0.5	1	2	5	30	70	4
UR542 020050140	2	0.5	1	2	5	40	80	6
UR542 020050150	2	0.5	1	2	5	50	100	6
UR542 020050160	2	0.5	1	2	5	60	100	6
UR542 020050180	2	0.5	1	2	5	80	140	6
UR542 020050210	2	0.5	2	2	5	10	50	4
UR542 020050212	2	0.5	2	2	5	12	50	4
UR542 020050216	2	0.5	2	2	5	16	50	4
UR542 020050220	2	0.5	2	2	5	20	50	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UR542 | 2 FLUTES TAPERED NECK RADIUS ENDMILL

EDP No	SIZES (mm)							
	D	R	θ	L1	L4	L3	L2	D2
UR542 020050225	2	0.5	2	2	5	25	60	4
UR542 020050230	2	0.5	2	2	5	30	70	4
UR542 020050240	2	0.5	2	2	5	40	80	6
UR542 020050250	2	0.5	2	2	5	50	100	6
UR542 020050260	2	0.5	2	2	5	60	100	6
UR542 020050280	2	0.5	2	2	5	80	140	8
UR542 030020116	3	0.2	1	4.5	6	16	60	6
UR542 030020120	3	0.2	1	4.5	6	20	65	6
UR542 030020130	3	0.2	1	4.5	6	30	70	6
UR542 030020140	3	0.2	1	4.5	6	40	80	6
UR542 030020150	3	0.2	1	4.5	6	50	90	6
UR542 030020160	3	0.2	1	4.5	6	60	100	6
UR542 030020216	3	0.2	2	4.5	6	16	60	6
UR542 030020220	3	0.2	2	4.5	6	20	65	6
UR542 030020230	3	0.2	2	4.5	6	30	70	6
UR542 030020240	3	0.2	2	4.5	6	40	80	6
UR542 030020250	3	0.2	2	4.5	6	50	90	8
UR542 030020260	3	0.2	2	4.5	6	60	100	8
UR542 030020270	3	0.2	2	4.5	6	70	120	8
UR542 030030116	3	0.3	1	4.5	6	16	60	6
UR542 030030120	3	0.3	1	4.5	6	20	65	6
UR542 030030130	3	0.3	1	4.5	6	30	70	6
UR542 030030140	3	0.3	1	4.5	6	40	80	6
UR542 030030150	3	0.3	1	4.5	6	50	90	6
UR542 030030160	3	0.3	1	4.5	6	60	100	6
UR542 030030216	3	0.3	2	4.5	6	16	60	6
UR542 030030220	3	0.3	2	4.5	6	20	65	6
UR542 030030230	3	0.3	2	4.5	6	30	70	6
UR542 030030240	3	0.3	2	4.5	6	40	80	6
UR542 030030250	3	0.3	2	4.5	6	50	90	8
UR542 030030260	3	0.3	2	4.5	6	60	100	8
UR542 030030270	3	0.3	2	4.5	6	70	120	8
UR542 030050116	3	0.5	1	4.5	6	16	60	6
UR542 030050120	3	0.5	1	4.5	6	20	65	6
UR542 030050130	3	0.5	1	4.5	6	30	70	6
UR542 030050140	3	0.5	1	4.5	6	40	80	6
UR542 030050150	3	0.5	1	4.5	6	50	90	6
UR542 030050160	3	0.5	1	4.5	6	60	100	6
UR542 030050216	3	0.5	2	4.5	6	16	60	6
UR542 030050220	3	0.5	2	4.5	6	20	65	6
UR542 030050230	3	0.5	2	4.5	6	30	70	6

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UR542 | 2 FLUTES TAPERED NECK RADIUS ENDMILL

EDP No	SIZES (mm)							
	D	R	θ	L1	L4	L3	L2	D2
UR542 030050240	3	0.5	2	4.5	6	40	80	6
UR542 030050250	3	0.5	2	4.5	6	50	90	8
UR542 030050260	3	0.5	2	4.5	6	60	100	8
UR542 030050270	3	0.5	2	4.5	6	70	120	8
UR542 040020140	4	0.2	1	6	8	40	90	6
UR542 040020150	4	0.2	1	6	8	50	100	6
UR542 040020160	4	0.2	1	6	8	60	110	6
UR542 040020170	4	0.2	1	6	8	70	120	8
UR542 030050240	3	0.5	2	4.5	6	40	80	6
UR542 030050250	3	0.5	2	4.5	6	50	90	8
UR542 030050260	3	0.5	2	4.5	6	60	100	8
UR542 030050270	3	0.5	2	4.5	6	70	120	8
UR542 040020140	4	0.2	1	6	8	40	90	6
UR542 040020150	4	0.2	1	6	8	50	100	6
UR542 040020160	4	0.2	1	6	8	60	110	6
UR542 040020170	4	0.2	1	6	8	70	120	8
UR542 040020240	4	0.2	2	6	8	40	90	8
UR542 040020250	4	0.2	2	6	8	50	100	8
UR542 040020260	4	0.2	2	6	8	60	110	8
UR542 040020270	4	0.2	2	6	8	70	120	10
UR542 040030140	4	0.3	1	6	8	40	90	6
UR542 040030150	4	0.3	1	6	8	50	100	6
UR542 040030160	4	0.3	1	6	8	60	110	6
UR542 040030170	4	0.3	1	6	8	70	120	8
UR542 040030240	4	0.3	2	6	8	40	90	8
UR542 040030250	4	0.3	2	6	8	50	100	8
UR542 040030260	4	0.3	2	6	8	60	110	8
UR542 040030270	4	0.3	2	6	8	70	120	10
UR542 040050140	4	0.5	1	6	8	40	90	6
UR542 040050150	4	0.5	1	6	8	50	100	6
UR542 040050160	4	0.5	1	6	8	60	110	6
UR542 040050170	4	0.5	1	6	8	70	120	8
UR542 040050240	4	0.5	2	6	8	40	90	8
UR542 040050250	4	0.5	2	6	8	50	100	8
UR542 040050260	4	0.5	2	6	8	60	110	8
UR542 040050270	4	0.5	2	6	8	70	120	10

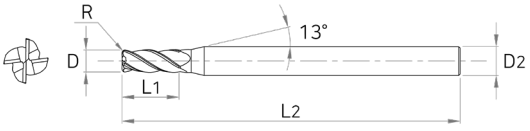
■ Applicable Working Material

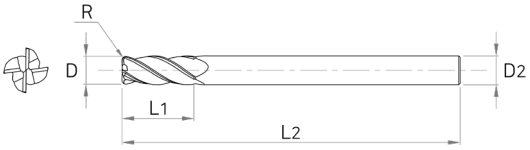
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UR504 | 4 FLUTES RADIUS ENDMILL







■ Tolerance

D		Shank Dia
D3 ~ 20	0 ~ -0.03	h5

CARBIDE | AlCrN | 4 | 40° HELIX | R ±0.01 | DATA P.651

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
UR504 03002	3	0.2	8	60	6
UR504 03002S4	3	0.2	8	60	4
UR504 03003	3	0.3	8	60	6
UR504 03005	3	0.5	8	60	6
UR504 03005S4	3	0.5	8	60	4
UR504 04002	4	0.2	10	70	6
UR504 04002S4	4	0.2	10	70	4
UR504 04003	4	0.3	10	70	6
UR504 04005	4	0.5	10	70	6
UR504 04005S4	4	0.5	10	70	4
UR504 04010	4	1	10	70	6
UR504 04010S4	4	1	10	70	4
UR504 05002	5	0.2	13	90	6
UR504 05003	5	0.3	13	90	6
UR504 05003060	5	0.3	13	60	6
UR504 05005	5	0.5	13	90	6
UR504 05005060	5	0.5	13	60	6
UR504 05010	5	1	13	90	6
UR504 06002	6	0.2	13	90	6
UR504 06003	6	0.3	15	90	6
UR504 06003060	6	0.3	15	60	6
UR504 06005	6	0.5	15	90	6
UR504 06005060	6	0.5	15	60	6
UR504 06010	6	1	15	90	6

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
UR504 06010060	6	1	15	60	6
UR504 08003	8	0.3	20	100	8
UR504 08003070	8	0.3	20	70	8
UR504 08005	8	0.5	20	100	8
UR504 08005070	8	0.5	20	70	8
UR504 08010	8	1	20	100	8
UR504 08010070	8	1	20	70	8
UR504 08015	8	1.5	20	100	8
UR504 08020	8	2	20	100	8
UR504 10003	10	0.3	25	100	10
UR504 10003075	10	0.3	25	75	10
UR504 10005	10	0.5	25	100	10
UR504 10005075	10	0.5	25	75	10
UR504 10010	10	1	25	100	10
UR504 10010075	10	1	25	75	10
UR504 10015	10	1.5	25	100	10
UR504 10020	10	2	25	100	10
UR504 10025	10	2.5	25	100	10
UR504 12003	12	0.3	30	110	12
UR504 12003080	12	0.3	30	80	12
UR504 12005	12	0.5	30	110	12
UR504 12005080	12	0.5	30	80	12
UR504 12010	12	1	30	110	12
UR504 12010080	12	1	30	80	12

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UR504 | 4 FLUTES RADIUS ENDMILL

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
UR504 12015	12	1.5	30	110	12
UR504 12020	12	2	30	110	12
UR504 12025	12	2.5	30	110	12
UR504 12030	12	3	30	110	12
UR504 16005	16	0.5	32	150	16
UR504 16005100	16	0.5	32	100	16
UR504 16010	16	1	32	150	16
UR504 16010100	16	1	32	100	16
UR504 16015	16	1.5	32	150	16
UR504 16015100	16	1.5	32	100	16
UR504 16020	16	2	32	150	16

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
UR504 16020	16	2	32	150	16
UR504 16020100	16	2	32	100	16
UR504 20005	20	0.5	38	150	20
UR504 20005100	20	0.5	38	100	20
UR504 20010	20	1	38	150	20
UR504 20010100	20	1	38	100	20
UR504 20015	20	1.5	38	150	20
UR504 20015100	20	1.5	38	100	20
UR504 20020	20	2	38	150	20
UR504 20020100	20	2	38	100	20

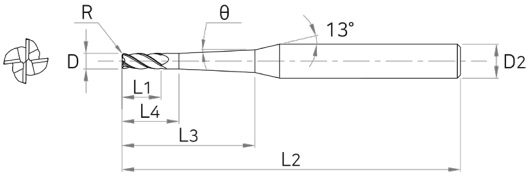
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UR544 | 4 FLUTES TAPERED NECK RADIUS ENDMILL





■ Tolerance

D		Shank Dia
D1 ~ 4	0 ~ -0.012	h5

CARBIDE | AlCrN | 4 | 30° HELIX | R ±0.01 | DATA P.653

EDP No	SIZES (mm)							
	D	R	θ	L1	L4	L3	L2	D2
UR544 010010106	1	0.1	1	1.5	2.5	6	50	4
UR544 010010108	1	0.1	1	1.5	2.5	8	50	4
UR544 010010110	1	0.1	1	1.5	2.5	10	50	4
UR544 010010112	1	0.1	1	1.5	2.5	12	50	4
UR544 010010116	1	0.1	1	1.5	2.5	16	50	4
UR544 010010120	1	0.1	1	1.5	2.5	20	50	4
UR544 010010125	1	0.1	1	1.5	2.5	25	60	4
UR544 010010130	1	0.1	1	1.5	2.5	30	70	4
UR544 010010140	1	0.1	1	1.5	2.5	40	80	4
UR544 010010150	1	0.1	1	1.5	2.5	50	90	4
UR544 010010206	1	0.1	2	1.5	2.5	6	50	4
UR544 010010208	1	0.1	2	1.5	2.5	8	50	4
UR544 010010210	1	0.1	2	1.5	2.5	10	50	4
UR544 010010212	1	0.1	2	1.5	2.5	12	50	4
UR544 010010216	1	0.1	2	1.5	2.5	16	50	4
UR544 010010220	1	0.1	2	1.5	2.5	20	50	4
UR544 010010225	1	0.1	2	1.5	2.5	25	60	4
UR544 010010230	1	0.1	2	1.5	2.5	30	70	4
UR544 010010240	1	0.1	2	1.5	2.5	40	80	4
UR544 010010250	1	0.1	2	1.5	2.5	50	90	6
UR544 010020106	1	0.2	1	1.5	2.5	6	50	4
UR544 010020108	1	0.2	1	1.5	2.5	8	50	4
UR544 010020110	1	0.2	1	1.5	2.5	10	50	4
UR544 010020112	1	0.2	1	1.5	2.5	12	50	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UR544 | 4 FLUTES TAPERED NECK RADIUS ENDMILL

EDP No	SIZES (mm)							
	D	R	θ	L1	L4	L3	L2	D2
UR544 010020116	1	0.2	1	1.5	2.5	16	50	4
UR544 010020120	1	0.2	1	1.5	2.5	20	50	4
UR544 010020125	1	0.2	1	1.5	2.5	25	60	4
UR544 010020130	1	0.2	1	1.5	2.5	30	70	4
UR544 010020140	1	0.2	1	1.5	2.5	40	80	4
UR544 010020150	1	0.2	1	1.5	2.5	50	90	4
UR544 010020206	1	0.2	2	1.5	2.5	6	50	4
UR544 010020208	1	0.2	2	1.5	2.5	8	50	4
UR544 010020210	1	0.2	2	1.5	2.5	10	50	4
UR544 010020212	1	0.2	2	1.5	2.5	12	50	4
UR544 010020216	1	0.2	2	1.5	2.5	16	50	4
UR544 010020220	1	0.2	2	1.5	2.5	20	50	4
UR544 010020225	1	0.2	2	1.5	2.5	25	60	4
UR544 010020230	1	0.2	2	1.5	2.5	30	70	4
UR544 010020240	1	0.2	2	1.5	2.5	40	80	4
UR544 010020250	1	0.2	2	1.5	2.5	50	90	6
UR544 012010108	1.2	0.1	1	1.8	3	8	50	4
UR544 012010112	1.2	0.1	1	1.8	3	12	50	4
UR544 012010116	1.2	0.1	1	1.8	3	16	50	4
UR544 012010120	1.2	0.1	1	1.8	3	20	50	4
UR544 012010125	1.2	0.1	1	1.8	3	25	60	4
UR544 012010130	1.2	0.1	1	1.8	3	30	70	4
UR544 012010208	1.2	0.1	2	1.8	3	8	50	4
UR544 012010212	1.2	0.1	2	1.8	3	12	50	4
UR544 012010216	1.2	0.1	2	1.8	3	16	50	4
UR544 012010220	1.2	0.1	2	1.8	3	20	50	4
UR544 012010225	1.2	0.1	2	1.8	3	25	60	4
UR544 012010230	1.2	0.1	2	1.8	3	30	70	4
UR544 012020108	1.2	0.2	1	1.8	3	8	50	4
UR544 012020112	1.2	0.2	1	1.8	3	12	50	4
UR544 012020116	1.2	0.2	1	1.8	3	16	50	4
UR544 012020120	1.2	0.2	1	1.8	3	20	50	4
UR544 012020125	1.2	0.2	1	1.8	3	25	60	4
UR544 012020130	1.2	0.2	1	1.8	3	30	70	4
UR544 012020208	1.2	0.2	2	1.8	3	8	50	4
UR544 012020212	1.2	0.2	2	1.8	3	12	50	4
UR544 012020216	1.2	0.2	2	1.8	3	16	50	4
UR544 012020220	1.2	0.2	2	1.8	3	20	50	4
UR544 012020225	1.2	0.2	2	1.8	3	25	60	4
UR544 012020230	1.2	0.2	2	1.8	3	30	70	4
UR544 015010108	1.5	0.1	1	2.3	3	8	50	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UR544 | 4 FLUTES TAPERED NECK RADIUS ENDMILL

EDP No	SIZES (mm)							
	D	R	θ	L1	L4	L3	L2	D2
UR544 015010110	1.5	0.1	1	2.3	3	10	50	4
UR544 015010112	1.5	0.1	1	2.3	3	12	50	4
UR544 015010116	1.5	0.1	1	2.3	3	16	50	4
UR544 015010120	1.5	0.1	1	2.3	3	20	50	4
UR544 015010125	1.5	0.1	1	2.3	3	25	60	4
UR544 015010130	1.5	0.1	1	2.3	3	30	70	4
UR544 015010140	1.5	0.1	1	2.3	3	40	80	4
UR544 015010150	1.5	0.1	1	2.3	3	50	90	4
UR544 015010208	1.5	0.1	2	2.3	3	8	50	4
UR544 015010210	1.5	0.1	2	2.3	3	10	50	4
UR544 015010212	1.5	0.1	2	2.3	3	12	50	4
UR544 015010216	1.5	0.1	2	2.3	3	16	50	4
UR544 015010220	1.5	0.1	2	2.3	3	20	50	4
UR544 015010225	1.5	0.1	2	2.3	3	25	60	4
UR544 015010230	1.5	0.1	2	2.3	3	30	70	4
UR544 015010240	1.5	0.1	2	2.3	3	40	80	6
UR544 015010250	1.5	0.1	2	2.3	3	50	90	6
UR544 015020108	1.5	0.2	1	2.3	3	8	50	4
UR544 015020110	1.5	0.2	1	2.3	3	10	50	4
UR544 015020112	1.5	0.2	1	2.3	3	12	50	4
UR544 015020116	1.5	0.2	1	2.3	3	16	50	4
UR544 015020120	1.5	0.2	1	2.3	3	20	50	4
UR544 015020125	1.5	0.2	1	2.3	3	25	60	4
UR544 015020130	1.5	0.2	1	2.3	3	30	70	4
UR544 015020140	1.5	0.2	1	2.3	3	40	80	4
UR544 015020150	1.5	0.2	1	2.3	3	50	90	4
UR544 015020208	1.5	0.2	2	2.3	3	8	50	4
UR544 015020210	1.5	0.2	2	2.3	3	10	50	4
UR544 015020212	1.5	0.2	2	2.3	3	12	50	4
UR544 015020216	1.5	0.2	2	2.3	3	16	50	4
UR544 015020220	1.5	0.2	2	2.3	3	20	50	4
UR544 015020225	1.5	0.2	2	2.3	3	25	60	4
UR544 015020230	1.5	0.2	2	2.3	3	30	70	4
UR544 015020240	1.5	0.2	2	2.3	3	40	80	6
UR544 015020250	1.5	0.2	2	2.3	3	50	90	6
UR544 015030108	1.5	0.3	1	2.3	3	8	50	4
UR544 015030110	1.5	0.3	1	2.3	3	10	50	4
UR544 015030112	1.5	0.3	1	2.3	3	12	50	4
UR544 015030116	1.5	0.3	1	2.3	3	16	50	4
UR544 015030120	1.5	0.3	1	2.3	3	20	50	4
UR544 015030125	1.5	0.3	1	2.3	3	25	60	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UR544 | 4 FLUTES TAPERED NECK RADIUS ENDMILL

EDP No	SIZES (mm)							
	D	R	θ	L1	L4	L3	L2	D2
UR544 015030130	1.5	0.3	1	2.3	3	30	70	4
UR544 015030140	1.5	0.3	1	2.3	3	40	80	4
UR544 015030150	1.5	0.3	1	2.3	3	50	90	4
UR544 015030208	1.5	0.3	2	2.3	3	8	50	4
UR544 015030210	1.5	0.3	2	2.3	3	10	50	4
UR544 015030212	1.5	0.3	2	2.3	3	12	50	4
UR544 015030216	1.5	0.3	2	2.3	3	16	50	4
UR544 015030220	1.5	0.3	2	2.3	3	20	50	4
UR544 015030225	1.5	0.3	2	2.3	3	25	60	4
UR544 015030230	1.5	0.3	2	2.3	3	30	70	4
UR544 015030240	1.5	0.3	2	2.3	3	40	80	6
UR544 015030250	1.5	0.3	2	2.3	3	50	90	6
UR544 020010110	2	0.1	1	2	5	10	50	4
UR544 020010112	2	0.1	1	2	5	12	50	4
UR544 020010116	2	0.1	1	2	5	16	50	4
UR544 020010120	2	0.1	1	2	5	20	50	4
UR544 020010125	2	0.1	1	2	5	25	60	4
UR544 020010130	2	0.1	1	2	5	30	70	4
UR544 020010140	2	0.1	1	2	5	40	80	6
UR544 020010150	2	0.1	1	2	5	50	100	6
UR544 020010160	2	0.1	1	2	5	60	100	6
UR544 020010180	2	0.1	1	2	5	80	140	6
UR544 020010210	2	0.1	2	2	5	10	50	4
UR544 020010212	2	0.1	2	2	5	12	50	4
UR544 020010216	2	0.1	2	2	5	16	50	4
UR544 020010220	2	0.1	2	2	5	20	50	4
UR544 020010225	2	0.1	2	2	5	25	60	4
UR544 020010230	2	0.1	2	2	5	30	70	4
UR544 020010240	2	0.1	2	2	5	40	80	6
UR544 020010250	2	0.1	2	2	5	50	100	6
UR544 020010260	2	0.1	2	2	5	60	100	6
UR544 020010280	2	0.1	2	2	5	80	140	8
UR544 020020110	2	0.2	1	2	5	10	50	4
UR544 020020112	2	0.2	1	2	5	12	50	4
UR544 020020116	2	0.2	1	2	5	16	50	4
UR544 020020120	2	0.2	1	2	5	20	50	4
UR544 020020125	2	0.2	1	2	5	25	60	4
UR544 020020130	2	0.2	1	2	5	30	70	4
UR544 020020140	2	0.2	1	2	5	40	80	6
UR544 020020150	2	0.2	1	2	5	50	100	6
UR544 020020160	2	0.2	1	2	5	60	100	6

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UR544 | 4 FLUTES TAPERED NECK RADIUS ENDMILL

EDP No	SIZES (mm)							
	D	R	θ	L1	L4	L3	L2	D2
UR544 020020180	2	0.2	1	2	5	80	140	6
UR544 020020210	2	0.2	2	2	5	10	50	4
UR544 020020212	2	0.2	2	2	5	12	50	4
UR544 020020216	2	0.2	2	2	5	16	50	4
UR544 020020220	2	0.2	2	2	5	20	50	4
UR544 020020225	2	0.2	2	2	5	25	60	4
UR544 020020230	2	0.2	2	2	5	30	70	4
UR544 020020240	2	0.2	2	2	5	40	80	6
UR544 020020250	2	0.2	2	2	5	50	100	6
UR544 020020260	2	0.2	2	2	5	60	100	6
UR544 020020280	2	0.2	2	2	5	80	140	8
UR544 020030110	2	0.3	1	2	5	10	50	4
UR544 020030112	2	0.3	1	2	5	12	50	4
UR544 020030116	2	0.3	1	2	5	16	50	4
UR544 020030120	2	0.3	1	2	5	20	50	4
UR544 020030125	2	0.3	1	2	5	25	60	4
UR544 020030130	2	0.3	1	2	5	30	70	4
UR544 020030140	2	0.3	1	2	5	40	80	6
UR544 020030150	2	0.3	1	2	5	50	100	6
UR544 020030160	2	0.3	1	2	5	60	100	6
UR544 020030180	2	0.3	1	2	5	80	140	6
UR544 020030210	2	0.3	2	2	5	10	50	4
UR544 020030212	2	0.3	2	2	5	12	50	4
UR544 020030216	2	0.3	2	2	5	16	50	4
UR544 020030220	2	0.3	2	2	5	20	50	4
UR544 020030225	2	0.3	2	2	5	25	60	4
UR544 020030230	2	0.3	2	2	5	30	70	4
UR544 020030240	2	0.3	2	2	5	40	80	6
UR544 020030250	2	0.3	2	2	5	50	100	6
UR544 020030260	2	0.3	2	2	5	60	100	6
UR544 020030280	2	0.3	2	2	5	80	140	8
UR544 020050110	2	0.5	1	2	5	10	50	4
UR544 020050112	2	0.5	1	2	5	12	50	4
UR544 020050116	2	0.5	1	2	5	16	50	4
UR544 020050120	2	0.5	1	2	5	20	50	4
UR544 020050125	2	0.5	1	2	5	25	60	4
UR544 020050130	2	0.5	1	2	5	30	70	4
UR544 020050140	2	0.5	1	2	5	40	80	6
UR544 020050150	2	0.5	1	2	5	50	100	6
UR544 020050160	2	0.5	1	2	5	60	100	6
UR544 020050180	2	0.5	1	2	5	80	140	6

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UR544 | 4 FLUTES TAPERED NECK RADIUS ENDMILL

EDP No	SIZES (mm)							
	D	R	θ	L1	L4	L3	L2	D2
UR544 020050210	2	0.5	2	2	5	10	50	4
UR544 020050212	2	0.5	2	2	5	12	50	4
UR544 020050216	2	0.5	2	2	5	16	50	4
UR544 020050220	2	0.5	2	2	5	20	50	4
UR544 020050225	2	0.5	2	2	5	25	60	4
UR544 020050230	2	0.5	2	2	5	30	70	4
UR544 020050240	2	0.5	2	2	5	40	80	6
UR544 020050250	2	0.5	2	2	5	50	100	6
UR544 020050260	2	0.5	2	2	5	60	100	6
UR544 020050280	2	0.5	2	2	5	80	140	8
UR544 030020116	3	0.2	1	4.5	6	16	60	6
UR544 030020120	3	0.2	1	4.5	6	20	65	6
UR544 030020130	3	0.2	1	4.5	6	30	70	6
UR544 030020140	3	0.2	1	4.5	6	40	80	6
UR544 030020150	3	0.2	1	4.5	6	50	90	6
UR544 030020160	3	0.2	1	4.5	6	60	100	6
UR544 030020216	3	0.2	2	4.5	6	16	60	6
UR544 030020220	3	0.2	2	4.5	6	20	65	6
UR544 030020230	3	0.2	2	4.5	6	30	70	6
UR544 030020240	3	0.2	2	4.5	6	40	80	6
UR544 030020250	3	0.2	2	4.5	6	50	90	8
UR544 030020260	3	0.2	2	4.5	6	60	100	8
UR544 030020270	3	0.2	2	4.5	6	70	120	8
UR544 030030116	3	0.3	1	4.5	6	16	60	6
UR544 030030120	3	0.3	1	4.5	6	20	65	6
UR544 030030130	3	0.3	1	4.5	6	30	70	6
UR544 030030140	3	0.3	1	4.5	6	40	80	6
UR544 030030150	3	0.3	1	4.5	6	50	90	6
UR544 030030160	3	0.3	1	4.5	6	60	100	6
UR544 030030216	3	0.3	2	4.5	6	16	60	6
UR544 030030220	3	0.3	2	4.5	6	20	65	6
UR544 030030230	3	0.3	2	4.5	6	30	70	6
UR544 030030240	3	0.3	2	4.5	6	40	80	6
UR544 030030250	3	0.3	2	4.5	6	50	90	8
UR544 030030260	3	0.3	2	4.5	6	60	100	8
UR544 030030270	3	0.3	2	4.5	6	70	120	8
UR544 030050116	3	0.5	1	4.5	6	16	60	6
UR544 030050120	3	0.5	1	4.5	6	20	65	6
UR544 030050130	3	0.5	1	4.5	6	30	70	6
UR544 030050140	3	0.5	1	4.5	6	40	80	6
UR544 030050150	3	0.5	1	4.5	6	50	90	6

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UR544 | 4 FLUTES TAPERED NECK RADIUS ENDMILL

EDP No	SIZES (mm)							
	D	R	θ	L1	L4	L3	L2	D2
UR544 030050160	3	0.5	1	4.5	6	60	100	6
UR544 030050216	3	0.5	2	4.5	6	16	60	6
UR544 030050220	3	0.5	2	4.5	6	20	65	6
UR544 030050230	3	0.5	2	4.5	6	30	70	6
UR544 030050240	3	0.5	2	4.5	6	40	80	6
UR544 030050250	3	0.5	2	4.5	6	50	90	8
UR544 030050260	3	0.5	2	4.5	6	60	100	8
UR544 030050270	3	0.5	2	4.5	6	70	120	8
UR544 040020140	4	0.2	1	6	8	40	90	6
UR544 040020150	4	0.2	1	6	8	50	100	6
UR544 040020160	4	0.2	1	6	8	60	110	6
UR544 040020170	4	0.2	1	6	8	70	120	8
UR544 040020240	4	0.2	2	6	8	40	90	8
UR544 040020250	4	0.2	2	6	8	50	100	8
UR544 040020260	4	0.2	2	6	8	60	110	8
UR544 040020270	4	0.2	2	6	8	70	120	10
UR544 040030140	4	0.3	1	6	8	40	90	6
UR544 040030150	4	0.3	1	6	8	50	100	6
UR544 040030160	4	0.3	1	6	8	60	110	6
UR544 040030170	4	0.3	1	6	8	70	120	8
UR544 040030240	4	0.3	2	6	8	40	90	8
UR544 040030250	4	0.3	2	6	8	50	100	8
UR544 040030260	4	0.3	2	6	8	60	110	8
UR544 040030270	4	0.3	2	6	8	70	120	10
UR544 040050140	4	0.5	1	6	8	40	90	6
UR544 040050150	4	0.5	1	6	8	50	100	6
UR544 040050160	4	0.5	1	6	8	60	110	6
UR544 040050170	4	0.5	1	6	8	70	120	8
UR544 040050240	4	0.5	2	6	8	40	90	8
UR544 040050250	4	0.5	2	6	8	50	100	8
UR544 040050260	4	0.5	2	6	8	60	110	8
UR544 040050270	4	0.5	2	6	8	70	120	10

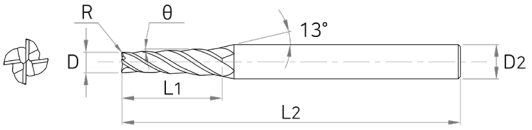
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UXR504 | 4 FLUTES MULTI HELIX RADIUS ENDMILL





■ Tolerance

D		Shank Dia
D1 ~ 20	0 ~ -0.03	h5

CARBIDE | AlCrN | 4 | 34° HELIX | 36° HELIX | R ±0.02 | DATA P.654

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
UXR504 010005	1	0.05	2.5	50	6
UXR504 01001	1	0.1	2.5	50	6
UXR504 01002	1	0.2	2.5	50	6
UXR504 01003	1	0.3	2.5	50	6
UXR504 012005	1.2	0.05	3	50	6
UXR504 01201	1.2	0.1	3	50	6
UXR504 01202	1.2	0.2	3	50	6
UXR504 01203	1.2	0.3	3	50	6
UXR504 015005	1.5	0.05	4	50	6
UXR504 01501	1.5	0.1	4	50	6
UXR504 01502	1.5	0.2	4	50	6
UXR504 01503	1.5	0.3	4	50	6
UXR504 01505	1.5	0.5	4	50	6
UXR504 02001	2	0.1	6	50	6
UXR504 02002	2	0.2	6	50	6
UXR504 02003	2	0.3	6	50	6
UXR504 02005	2	0.5	6	50	6
UXR504 02501	2.5	0.1	7	60	6
UXR504 02502	2.5	0.2	7	60	6
UXR504 02503	2.5	0.3	7	60	6
UXR504 02505	2.5	0.5	7	60	6
UXR504 03001	3	0.1	8	60	6
UXR504 03002	3	0.2	8	60	6
UXR504 03003	3	0.3	8	60	6

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
UXR504 03005	3	0.5	8	60	6
UXR504 03010	3	1	8	60	6
UXR504 03501	3.5	0.1	10	70	6
UXR504 03502	3.5	0.2	10	70	6
UXR504 03503	3.5	0.3	10	70	6
UXR504 03505	3.5	0.5	10	70	6
UXR504 04001	4	0.1	10	70	6
UXR504 04001100S4	4	0.1	10	100	4
UXR504 04001S4	4	0.1	10	70	4
UXR504 04002	4	0.2	10	70	6
UXR504 04002100S4	4	0.2	10	100	4
UXR504 04002S4	4	0.2	10	70	4
UXR504 04003	4	0.3	10	70	6
UXR504 04003100S4	4	0.3	10	100	4
UXR504 04003S4	4	0.3	10	70	4
UXR504 04005	4	0.5	10	70	6
UXR504 04005100S4	4	0.5	10	100	4
UXR504 04005S4	4	0.5	10	70	4
UXR504 04010	4	1	10	70	6
UXR504 04010100S4	4	1	10	100	4
UXR504 04010S4	4	1	10	70	4
UXR504 04501	4.5	0.1	11	80	6
UXR504 04502	4.5	0.2	11	80	6
UXR504 04503	4.5	0.3	11	80	6

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UXR504 | 4 FLUTES MULTI HELIX RADIUS ENDMILL

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
UXR504 04505	4.5	0.5	11	80	6
UXR504 05001	5	0.1	13	90	6
UXR504 05002	5	0.2	13	90	6
UXR504 05003	5	0.3	13	90	6
UXR504 05005	5	0.5	13	90	6
UXR504 05010	5	1	13	90	6
UXR504 05501	5.5	0.1	13	90	6
UXR504 05502	5.5	0.2	13	90	6
UXR504 05503	5.5	0.3	13	90	6
UXR504 05505	5.5	0.5	13	90	6
UXR504 05510	5.5	1	13	90	6
UXR504 06001	6	0.1	15	90	6
UXR504 06001060	6	0.1	15	60	6
UXR504 06002	6	0.2	15	90	6
UXR504 06002060	6	0.2	15	60	6
UXR504 06003	6	0.3	15	90	6
UXR504 06005	6	0.5	15	90	6
UXR504 06005060	6	0.5	15	60	6
UXR504 06005110	6	0.5	15	110	6
UXR504 06005130	6	0.5	15	130	6
UXR504 06010	6	1	15	90	6
UXR504 06010060	6	1	15	60	6
UXR504 06010110	6	1	15	110	6
UXR504 06010130	6	1	15	130	6
UXR504 06015	6	1.5	15	90	6
UXR504 06020	6	2	15	90	6
UXR504 07001	7	0.1	16	90	8
UXR504 07002	7	0.2	16	90	8
UXR504 07003	7	0.3	16	90	8
UXR504 07005	7	0.5	16	90	8
UXR504 07010	7	1	16	90	8
UXR504 07020	7	2	16	90	8
UXR504 08001	8	0.1	20	100	8
UXR504 08002	8	0.2	20	100	8
UXR504 08003	8	0.3	20	100	8
UXR504 08003070	8	0.3	20	70	8
UXR504 08005	8	0.5	20	100	8
UXR504 08005070	8	0.5	20	70	8
UXR504 08005120	8	0.5	20	120	8
UXR504 08005150	8	0.5	20	150	8
UXR504 08010	8	1	20	100	8

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
UXR504 08010070	8	1	20	70	8
UXR504 08010120	8	1	20	120	8
UXR504 08010150	8	1	20	150	8
UXR504 08015	8	1.5	20	100	8
UXR504 08015070	8	1.5	20	70	8
UXR504 08020	8	2	20	100	8
UXR504 08020070	8	2	20	70	8
UXR504 08025	8	2.5	20	100	8
UXR504 08030	8	3	20	100	8
UXR504 10001	10	0.1	25	100	10
UXR504 10002	10	0.2	25	100	10
UXR504 10003	10	0.3	25	100	10
UXR504 10003075	10	0.3	25	75	10
UXR504 10005	10	0.5	25	100	10
UXR504 10005075	10	0.5	25	75	10
UXR504 10005130	10	0.5	22	130	10
UXR504 10005150	10	0.5	22	150	10
UXR504 10010	10	1	25	100	10
UXR504 10010075	10	1	25	75	10
UXR504 10010130	10	1	22	130	10
UXR504 10010150	10	1	22	150	10
UXR504 10015	10	1.5	25	100	10
UXR504 10020	10	2	25	100	10
UXR504 10025	10	2.5	25	100	10
UXR504 10030	10	3	25	100	10
UXR504 10040	10	4	25	100	10
UXR504 11002	11	0.2	25	110	12
UXR504 11003	11	0.3	25	110	12
UXR504 11005	11	0.5	25	110	12
UXR504 11010	11	1	25	110	12
UXR504 11020	11	2	25	110	12
UXR504 12001	12	0.1	30	110	12
UXR504 12002	12	0.2	30	110	12
UXR504 12003	12	0.3	30	110	12
UXR504 12003080	12	0.3	30	80	12
UXR504 12005	12	0.5	30	110	12
UXR504 12005080	12	0.5	30	80	12
UXR504 12005130	12	0.5	30	130	12
UXR504 12005150	12	0.5	30	150	12
UXR504 12010	12	1	30	110	12
UXR504 12010080	12	1	30	80	12

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UXR504 | 4 FLUTES MULTI HELIX RADIUS ENDMILL

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
UXR504 12010130	12	1	30	130	12
UXR504 12010150	12	1	30	150	12
UXR504 12015	12	1.5	30	110	12
UXR504 12015080	12	1.5	30	80	12
UXR504 12020	12	2	30	110	12
UXR504 12020080	12	2	30	80	12
UXR504 12025	12	2.5	30	110	12
UXR504 12025080	12	2.5	30	80	12
UXR504 12030	12	3	30	110	12
UXR504 12030080	12	3	30	80	12
UXR504 12040	12	4	30	110	12
UXR504 12050	12	5	30	110	12
UXR504 14005	14	0.5	35	150	16
UXR504 14010	14	1	35	150	16
UXR504 14020	14	2	35	150	16
UXR504 16005	16	0.5	40	100	16
UXR504 16005150	16	0.5	40	150	16

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
UXR504 16010	16	1	40	100	16
UXR504 16010150	16	1	40	150	16
UXR504 16015	16	1.5	40	100	16
UXR504 16015150	16	1.5	40	150	16
UXR504 16020	16	2	40	100	16
UXR504 16020150	16	2	40	150	16
UXR504 16030	16	3	40	100	16
UXR504 20005	20	0.5	45	110	20
UXR504 20005150	20	0.5	45	150	20
UXR504 20010	20	1	45	110	20
UXR504 20010150	20	1	45	150	20
UXR504 20015	20	1.5	45	110	20
UXR504 20015150	20	1.5	45	150	20
UXR504 20020	20	2	45	110	20
UXR504 20020150	20	2	45	150	20
UXR504 20030	20	3	45	110	20

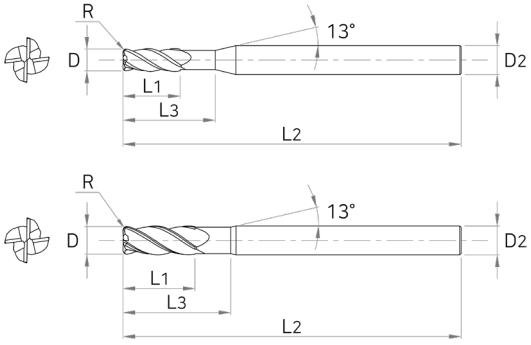
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UXR514 | 4 FLUTES MULTI HELIX NECK RADIUS ENDMILL





■ Tolerance

D		Shank Dia
D1 ~ 20	0 ~ -0.03	h5

CARBIDE | AlCrN | 4 | 34° HELIX | 36° HELIX | R ±0.02 | DATA P.653

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
UXR514 01000503	1	0.05	1.5	3	50	4
UXR514 01000504	1	0.05	1.5	4	50	4
UXR514 01000506	1	0.05	1.5	6	50	4
UXR514 01000508	1	0.05	1.5	8	50	4
UXR514 01000510	1	0.05	1.5	10	50	4
UXR514 01000512	1	0.05	1.5	12	50	4
UXR514 01000514	1	0.05	1.5	14	50	4
UXR514 01000516	1	0.05	1.5	16	50	4
UXR514 01000520	1	0.05	1.5	20	50	4
UXR514 0100103	1	0.1	1.5	3	50	4
UXR514 0100104	1	0.1	1.5	4	50	4
UXR514 0100106	1	0.1	1.5	6	50	4
UXR514 0100108	1	0.1	1.5	8	50	4
UXR514 0100110	1	0.1	1.5	10	50	4
UXR514 0100112	1	0.1	1.5	12	50	4
UXR514 0100114	1	0.1	1.5	14	50	4
UXR514 0100116	1	0.1	1.5	16	50	4
UXR514 0100120	1	0.1	1.5	20	50	4
UXR514 0100203	1	0.2	1.5	3	50	4
UXR514 0100204	1	0.2	1.5	4	50	4
UXR514 0100206	1	0.2	1.5	6	50	4
UXR514 0100208	1	0.2	1.5	8	50	4
UXR514 0100210	1	0.2	1.5	10	50	4
UXR514 0100212	1	0.2	1.5	12	50	4

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
UXR514 0100214	1	0.2	1.5	14	50	4
UXR514 0100216	1	0.2	1.5	16	50	4
UXR514 0100220	1	0.2	1.5	20	50	4
UXR514 0100303	1	0.3	1.5	3	50	4
UXR514 0100304	1	0.3	1.5	4	50	4
UXR514 0100306	1	0.3	1.5	6	50	4
UXR514 0100308	1	0.3	1.5	8	50	4
UXR514 0100310	1	0.3	1.5	10	50	4
UXR514 0100312	1	0.3	1.5	12	50	4
UXR514 0100314	1	0.3	1.5	14	50	4
UXR514 0100316	1	0.3	1.5	16	50	4
UXR514 0100320	1	0.3	1.5	20	50	4
UXR514 01200503	1.2	0.05	1.8	3	50	4
UXR514 01200504	1.2	0.05	1.8	4	50	4
UXR514 01200506	1.2	0.05	1.8	6	50	4
UXR514 01200508	1.2	0.05	1.8	8	50	4
UXR514 01200510	1.2	0.05	1.8	10	50	4
UXR514 01200512	1.2	0.05	1.8	12	50	4
UXR514 01200516	1.2	0.05	1.8	16	50	4
UXR514 01200520	1.2	0.05	1.8	20	50	4
UXR514 0120103	1.2	0.1	1.8	3	50	4
UXR514 0120104	1.2	0.1	1.8	4	50	4
UXR514 0120106	1.2	0.1	1.8	6	50	4
UXR514 0120108	1.2	0.1	1.8	8	50	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UXR514 | 4 FLUTES MULTI HELIX NECK RADIUS ENDMILL

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
UXR514 0120110	1.2	0.1	1.8	10	50	4
UXR514 0120112	1.2	0.1	1.8	12	50	4
UXR514 0120116	1.2	0.1	1.8	16	50	4
UXR514 0120120	1.2	0.1	1.8	20	50	4
UXR514 0120203	1.2	0.2	1.8	3	50	4
UXR514 0120204	1.2	0.2	1.8	4	50	4
UXR514 0120206	1.2	0.2	1.8	6	50	4
UXR514 0120208	1.2	0.2	1.8	8	50	4
UXR514 0120210	1.2	0.2	1.8	10	50	4
UXR514 0120212	1.2	0.2	1.8	12	50	4
UXR514 0120216	1.2	0.2	1.8	16	50	4
UXR514 0120220	1.2	0.2	1.8	20	50	4
UXR514 0120303	1.2	0.3	1.8	3	50	4
UXR514 0120304	1.2	0.3	1.8	4	50	4
UXR514 0120306	1.2	0.3	1.8	6	50	4
UXR514 0120308	1.2	0.3	1.8	8	50	4
UXR514 0120310	1.2	0.3	1.8	10	50	4
UXR514 0120312	1.2	0.3	1.8	12	50	4
UXR514 0120316	1.2	0.3	1.8	16	50	4
UXR514 0120320	1.2	0.3	1.8	20	50	4
UXR514 01500504	1.5	0.05	2.3	4	50	4
UXR514 01500506	1.5	0.05	2.3	6	50	4
UXR514 01500508	1.5	0.05	2.3	8	50	4
UXR514 01500510	1.5	0.05	2.3	10	50	4
UXR514 01500512	1.5	0.05	2.3	12	50	4
UXR514 01500514	1.5	0.05	2.3	14	50	4
UXR514 01500516	1.5	0.05	2.3	16	50	4
UXR514 01500520	1.5	0.05	2.3	20	50	4
UXR514 01500522	1.5	0.05	2.3	22	60	4
UXR514 01500526	1.5	0.05	2.3	26	60	4
UXR514 0150104	1.5	0.1	2.3	4	50	4
UXR514 0150106	1.5	0.1	2.3	6	50	4
UXR514 0150108	1.5	0.1	2.3	8	50	4
UXR514 0150110	1.5	0.1	2.3	10	50	4
UXR514 0150112	1.5	0.1	2.3	12	50	4
UXR514 0150114	1.5	0.1	2.3	14	50	4
UXR514 0150116	1.5	0.1	2.3	16	50	4
UXR514 0150120	1.5	0.1	2.3	20	50	4
UXR514 0150122	1.5	0.1	2.3	22	60	4
UXR514 0150126	1.5	0.1	2.3	26	60	4
UXR514 0150204	1.5	0.2	2.3	4	50	4

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
UXR514 0150206	1.5	0.2	2.3	6	50	4
UXR514 0150208	1.5	0.2	2.3	8	50	4
UXR514 0150210	1.5	0.2	2.3	10	50	4
UXR514 0150212	1.5	0.2	2.3	12	50	4
UXR514 0150214	1.5	0.2	2.3	14	50	4
UXR514 0150216	1.5	0.2	2.3	16	50	4
UXR514 0150220	1.5	0.2	2.3	20	50	4
UXR514 0150222	1.5	0.2	2.3	22	60	4
UXR514 0150226	1.5	0.2	2.3	26	60	4
UXR514 0150304	1.5	0.3	2.3	4	50	4
UXR514 0150306	1.5	0.3	2.3	6	50	4
UXR514 0150308	1.5	0.3	2.3	8	50	4
UXR514 0150310	1.5	0.3	2.3	10	50	4
UXR514 0150312	1.5	0.3	2.3	12	50	4
UXR514 0150314	1.5	0.3	2.3	14	50	4
UXR514 0150316	1.5	0.3	2.3	16	50	4
UXR514 0150320	1.5	0.3	2.3	20	50	4
UXR514 0150322	1.5	0.3	2.3	22	60	4
UXR514 0150326	1.5	0.3	2.3	26	60	4
UXR514 0150504	1.5	0.5	2.3	4	50	4
UXR514 0150506	1.5	0.5	2.3	6	50	4
UXR514 0150508	1.5	0.5	2.3	8	50	4
UXR514 0150510	1.5	0.5	2.3	10	50	4
UXR514 0150512	1.5	0.5	2.3	12	50	4
UXR514 0150514	1.5	0.5	2.3	14	50	4
UXR514 0150516	1.5	0.5	2.3	16	50	4
UXR514 0150520	1.5	0.5	2.3	20	50	4
UXR514 0150522	1.5	0.5	2.3	22	60	4
UXR514 0150526	1.5	0.5	2.3	26	60	4
UXR514 0200106	2	0.1	3	6	50	4
UXR514 0200108	2	0.1	3	8	50	4
UXR514 0200110	2	0.1	3	10	50	4
UXR514 0200112	2	0.1	3	12	50	4
UXR514 0200114	2	0.1	3	14	50	4
UXR514 0200116	2	0.1	3	16	50	4
UXR514 0200120	2	0.1	3	20	50	4
UXR514 0200122	2	0.1	3	22	60	4
UXR514 0200126	2	0.1	3	26	60	4
UXR514 0200130	2	0.1	3	30	70	4
UXR514 0200206	2	0.2	3	6	50	4
UXR514 0200208	2	0.2	3	8	50	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UXR514 | 4 FLUTES MULTI HELIX NECK RADIUS ENDMILL

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
UXR514 0200210	2	0.2	3	10	50	4
UXR514 0200212	2	0.2	3	12	50	4
UXR514 0200214	2	0.2	3	14	50	4
UXR514 0200216	2	0.2	3	16	50	4
UXR514 0200220	2	0.2	3	20	50	4
UXR514 0200222	2	0.2	3	22	60	4
UXR514 0200226	2	0.2	3	26	60	4
UXR514 0200230	2	0.2	3	30	70	4
UXR514 0200306	2	0.3	3	6	50	4
UXR514 0200308	2	0.3	3	8	50	4
UXR514 0200310	2	0.3	3	10	50	4
UXR514 0200312	2	0.3	3	12	50	4
UXR514 0200314	2	0.3	3	14	50	4
UXR514 0200316	2	0.3	3	16	50	4
UXR514 0200320	2	0.3	3	20	50	4
UXR514 0200322	2	0.3	3	22	60	4
UXR514 0200326	2	0.3	3	26	60	4
UXR514 0200330	2	0.3	3	30	70	4
UXR514 0200506	2	0.5	3	6	50	4
UXR514 0200508	2	0.5	3	8	50	4
UXR514 0200510	2	0.5	3	10	50	4
UXR514 0200512	2	0.5	3	12	50	4
UXR514 0200514	2	0.5	3	14	50	4
UXR514 0200516	2	0.5	3	16	50	4
UXR514 0200520	2	0.5	3	20	50	4
UXR514 0200522	2	0.5	3	22	60	4
UXR514 0200526	2	0.5	3	26	60	4
UXR514 0200530	2	0.5	3	30	70	4
UXR514 0250108	2.5	0.1	4	8	50	4
UXR514 0250110	2.5	0.1	4	10	50	4
UXR514 0250112	2.5	0.1	4	12	50	4
UXR514 0250114	2.5	0.1	4	14	50	4
UXR514 0250116	2.5	0.1	4	16	50	4
UXR514 0250120	2.5	0.1	4	20	50	4
UXR514 0250126	2.5	0.1	4	26	60	4
UXR514 0250130	2.5	0.1	4	30	70	4
UXR514 0250208	2.5	0.2	4	8	50	4
UXR514 0250210	2.5	0.2	4	10	50	4
UXR514 0250212	2.5	0.2	4	12	50	4
UXR514 0250214	2.5	0.2	4	14	50	4
UXR514 0250216	2.5	0.2	4	16	50	4

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
UXR514 0250220	2.5	0.2	4	20	50	4
UXR514 0250226	2.5	0.2	4	26	60	4
UXR514 0250230	2.5	0.2	4	30	70	4
UXR514 0250308	2.5	0.3	4	8	50	4
UXR514 0250310	2.5	0.3	4	10	50	4
UXR514 0250312	2.5	0.3	4	12	50	4
UXR514 0250314	2.5	0.3	4	14	50	4
UXR514 0250316	2.5	0.3	4	16	50	4
UXR514 0250320	2.5	0.3	4	20	50	4
UXR514 0250326	2.5	0.3	4	26	60	4
UXR514 0250330	2.5	0.3	4	30	70	4
UXR514 0250508	2.5	0.5	4	8	50	4
UXR514 0250510	2.5	0.5	4	10	50	4
UXR514 0250512	2.5	0.5	4	12	50	4
UXR514 0250514	2.5	0.5	4	14	50	4
UXR514 0250516	2.5	0.5	4	16	50	4
UXR514 0250520	2.5	0.5	4	20	50	4
UXR514 0250526	2.5	0.5	4	26	60	4
UXR514 0250530	2.5	0.5	4	30	70	4
UXR514 0300108	3	0.1	4.5	8	50	6
UXR514 0300110	3	0.1	4.5	10	50	6
UXR514 0300112	3	0.1	4.5	12	50	6
UXR514 0300114	3	0.1	4.5	14	60	6
UXR514 0300116	3	0.1	4.5	16	60	6
UXR514 0300120	3	0.1	4.5	20	60	6
UXR514 0300126	3	0.1	4.5	26	65	6
UXR514 0300130	3	0.1	4.5	30	70	6
UXR514 0300135	3	0.1	4.5	35	70	6
UXR514 0300140	3	0.1	4.5	40	80	6
UXR514 0300208	3	0.2	4.5	8	50	6
UXR514 0300210	3	0.2	4.5	10	50	6
UXR514 0300212	3	0.2	4.5	12	50	6
UXR514 0300214	3	0.2	4.5	14	60	6
UXR514 0300216	3	0.2	4.5	16	60	6
UXR514 0300220	3	0.2	4.5	20	60	6
UXR514 0300226	3	0.2	4.5	26	65	6
UXR514 0300230	3	0.2	4.5	30	70	6
UXR514 0300235	3	0.2	4.5	35	70	6
UXR514 0300240	3	0.2	4.5	40	80	6
UXR514 0300308	3	0.3	4.5	8	50	6
UXR514 0300310	3	0.3	4.5	10	50	6

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UXR514 | 4 FLUTES MULTI HELIX NECK RADIUS ENDMILL

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
UXR514 0300312	3	0.3	4.5	12	50	6
UXR514 0300314	3	0.3	4.5	14	60	6
UXR514 0300316	3	0.3	4.5	16	60	6
UXR514 0300320	3	0.3	4.5	20	60	6
UXR514 0300326	3	0.3	4.5	26	65	6
UXR514 0300330	3	0.3	4.5	30	70	6
UXR514 0300335	3	0.3	4.5	35	70	6
UXR514 0300340	3	0.3	4.5	40	80	6
UXR514 0300508	3	0.5	4.5	8	50	6
UXR514 0300510	3	0.5	4.5	10	50	6
UXR514 0300512	3	0.5	4.5	12	50	6
UXR514 0300514	3	0.5	4.5	14	60	6
UXR514 0300516	3	0.5	4.5	16	60	6
UXR514 0300520	3	0.5	4.5	20	60	6
UXR514 0300526	3	0.5	4.5	26	65	6
UXR514 0300530	3	0.5	4.5	30	70	6
UXR514 0300535	3	0.5	4.5	35	70	6
UXR514 0300540	3	0.5	4.5	40	80	6
UXR514 0301008	3	1	4.5	8	50	6
UXR514 0301010	3	1	4.5	10	50	6
UXR514 0301012	3	1	4.5	12	50	6
UXR514 0301014	3	1	4.5	14	60	6
UXR514 0301016	3	1	4.5	16	60	6
UXR514 0301020	3	1	4.5	20	60	6
UXR514 0301026	3	1	4.5	26	65	6
UXR514 0301030	3	1	4.5	30	70	6
UXR514 0301035	3	1	4.5	35	70	6
UXR514 0301040	3	1	4.5	40	80	6
UXR514 0400110	4	0.1	6	10	50	6
UXR514 0400112	4	0.1	6	12	50	6
UXR514 0400114	4	0.1	6	14	60	6
UXR514 0400116	4	0.1	6	16	60	6
UXR514 0400120	4	0.1	6	20	60	6
UXR514 0400126	4	0.1	6	26	65	6
UXR514 0400130	4	0.1	6	30	70	6
UXR514 0400135	4	0.1	6	35	70	6
UXR514 0400140	4	0.1	6	40	80	6
UXR514 0400145	4	0.1	6	45	90	6
UXR514 0400150	4	0.1	6	50	100	6
UXR514 0400210	4	0.2	6	10	50	6
UXR514 0400212	4	0.2	6	12	50	6

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
UXR514 0400214	4	0.2	6	14	60	6
UXR514 0400216	4	0.2	6	16	60	6
UXR514 0400220	4	0.2	6	20	60	6
UXR514 0400226	4	0.2	6	26	65	6
UXR514 0400230	4	0.2	6	30	70	6
UXR514 0400235	4	0.2	6	35	70	6
UXR514 0400240	4	0.2	6	40	80	6
UXR514 0400245	4	0.2	6	45	90	6
UXR514 0400250	4	0.2	6	50	100	6
UXR514 0400310	4	0.3	6	10	50	6
UXR514 0400312	4	0.3	6	12	50	6
UXR514 0400314	4	0.3	6	14	60	6
UXR514 0400316	4	0.3	6	16	60	6
UXR514 0400320	4	0.3	6	20	60	6
UXR514 0400326	4	0.3	6	26	65	6
UXR514 0400330	4	0.3	6	30	70	6
UXR514 0400335	4	0.3	6	35	70	6
UXR514 0400340	4	0.3	6	40	80	6
UXR514 0400345	4	0.3	6	45	90	6
UXR514 0400350	4	0.3	6	50	100	6
UXR514 0400510	4	0.5	6	10	50	6
UXR514 0400512	4	0.5	6	12	50	6
UXR514 0400514	4	0.5	6	14	60	6
UXR514 0400516	4	0.5	6	16	60	6
UXR514 0400520	4	0.5	6	20	60	6
UXR514 0400526	4	0.5	6	26	65	6
UXR514 0400530	4	0.5	6	30	70	6
UXR514 0400535	4	0.5	6	35	70	6
UXR514 0400540	4	0.5	6	40	80	6
UXR514 0400545	4	0.5	6	45	90	6
UXR514 0400550	4	0.5	6	50	100	6
UXR514 0401010	4	1	6	10	50	6
UXR514 0401012	4	1	6	12	50	6
UXR514 0401014	4	1	6	14	60	6
UXR514 0401016	4	1	6	16	60	6
UXR514 0401020	4	1	6	20	60	6
UXR514 0401026	4	1	6	26	65	6
UXR514 0401030	4	1	6	30	70	6
UXR514 0401035	4	1	6	35	70	6
UXR514 0401040	4	1	6	40	80	6
UXR514 0401045	4	1	6	45	90	6

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UXR514 | 4 FLUTES MULTI HELIX NECK RADIUS ENDMILL

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
UXR514 0401050	4	1	6	50	100	6
UXR514 05001	5	0.1	8	15	60	6
UXR514 05002	5	0.2	8	15	60	6
UXR514 05003	5	0.3	8	15	60	6
UXR514 05005	5	0.5	8	15	60	6
UXR514 05010	5	1	8	15	60	6
UXR514 05015	5	1.5	8	15	60	6
UXR514 05020	5	2	8	15	60	6
UXR514 06001	6	0.1	9	20	60	6
UXR514 06002	6	0.2	9	20	60	6
UXR514 06003	6	0.3	9	20	60	6
UXR514 06003090	6	0.3	15	30	90	6
UXR514 06005	6	0.5	9	20	60	6
UXR514 06005090	6	0.5	15	30	90	6
UXR514 06010	6	1	9	20	60	6
UXR514 06010090	6	1	15	30	90	6
UXR514 06015	6	1.5	9	20	60	6
UXR514 06020	6	2	9	20	60	6
UXR514 08001	8	0.1	12	25	70	8
UXR514 08002	8	0.2	12	25	70	8
UXR514 08003	8	0.3	12	25	70	8
UXR514 08003100	8	0.3	20	35	100	8
UXR514 08005	8	0.5	12	25	70	8
UXR514 08005100	8	0.5	20	35	100	8
UXR514 08010	8	1	12	25	70	8
UXR514 08010100	8	1	20	35	100	8
UXR514 08015	8	1.5	12	25	70	8
UXR514 08020	8	2	12	25	70	8

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
UXR514 10001	10	0.1	15	30	75	10
UXR514 10002	10	0.2	15	30	75	10
UXR514 10003	10	0.3	15	30	75	10
UXR514 10003100	10	0.3	25	40	100	10
UXR514 10005	10	0.5	15	30	75	10
UXR514 10005100	10	0.5	25	40	100	10
UXR514 10010	10	1	15	30	75	10
UXR514 10010100	10	1	25	40	100	10
UXR514 10015	10	1.5	15	30	75	10
UXR514 10020	10	2	15	30	75	10
UXR514 12002	12	0.2	18	32	80	12
UXR514 12003	12	0.3	18	32	80	12
UXR514 12003110	12	0.3	30	45	110	12
UXR514 12005	12	0.5	18	32	80	12
UXR514 12005110	12	0.5	30	45	110	12
UXR514 12010	12	1	18	32	80	12
UXR514 12010110	12	1	30	45	110	12
UXR514 12015	12	1.5	18	32	80	12
UXR514 12020	12	2	18	32	80	12
UXR514 16005	16	0.5	20	35	100	16
UXR514 16005150	16	0.5	35	50	150	16
UXR514 16010	16	1	20	35	100	16
UXR514 16010150	16	1	35	50	150	16
UXR514 20005	20	0.5	25	40	100	20
UXR514 20005150	20	0.5	40	55	150	20
UXR514 20010	20	1	25	40	100	20
UXR514 20010150	20	1	40	55	150	20

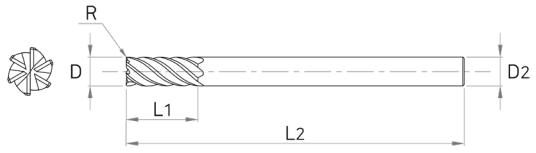
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UR506 | 6 FLUTES RADIUS ENDMILL





■ Tolerance

D		Shank Dia
D6 ~ 20	0 ~ -0.03	h5

CARBIDE | AlCrN | 6 | 45° HELIX | R ±0.015 | DATA P.654

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
UR506 06003	6	0.3	15	90	6
UR506 06005	6	0.5	15	90	6
UR506 06010	6	1	15	90	6
UR506 08003	8	0.3	20	100	8
UR506 08005	8	0.5	20	100	8
UR506 08010	8	1	20	100	8
UR506 10003	10	0.3	25	100	10
UR506 10005	10	0.5	25	100	10
UR506 10010	10	1	25	100	10
UR506 12003	12	0.3	30	110	12
UR506 12005	12	0.5	30	110	12
UR506 12010	12	1	30	110	12
UR506 16005	16	0.5	32	150	16
UR506 16010	16	1	32	150	16
UR506 16015	16	1.5	32	150	16
UR506 16020	16	2	32	150	16
UR506 20005	20	0.5	38	150	20
UR506 20010	20	1	38	150	20
UR506 20015	20	1.5	38	150	20
UR506 20020	20	2	38	150	20

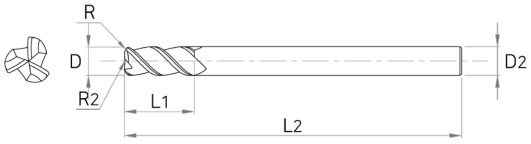
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UDR503 | 3 FLUTES DOUBLE RADIUS ENDMILL





■ Tolerance

D		Shank Dia
D6 ~ 20	0 ~ -0.02	h5

CARBIDE | AlCrN | 3 | 45° HELIX | R ±0.02 | DATA P.655

EDP No	SIZES (mm)					
	D	R	R2	L1	L2	D2
UDR503 06005	6	0.5	6	10	90	6
UDR503 06010	6	1	6	10	90	6
UDR503 06020	6	2	6	10	90	6
UDR503 08005	8	0.5	8	16	100	8
UDR503 08010	8	1	8	16	100	8
UDR503 08020	8	2	8	16	100	8
UDR503 10005	10	0.5	10	20	100	10
UDR503 10010	10	1	10	20	100	10
UDR503 10020	10	2	10	20	100	10
UDR503 12005	12	0.5	12	24	110	12
UDR503 12010	12	1	12	24	110	12
UDR503 12020	12	2	12	24	110	12
UDR503 16005	16	0.5	16	32	150	16
UDR503 16010	16	1	16	32	150	16
UDR503 20005	20	0.5	20	40	150	20
UDR503 20010	20	1	20	40	150	20

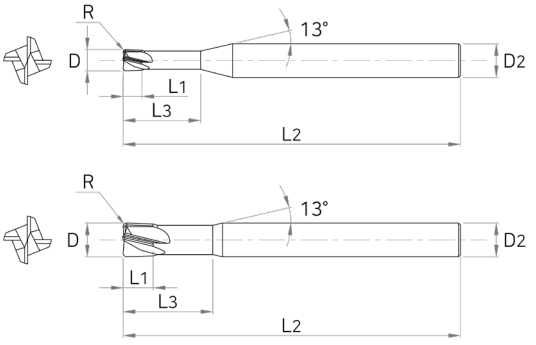
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

USPM4 | 4 FLUTES RADIUS ENDMILL FOR HIGH SPEED





■ Tolerance

D		Shank Dia
D1 ~ 20	0 ~ -0.03	h5

CARBIDE | AlCrN | 4 | 10° HELIX | R ±0.02 | DATA P.656

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
USPM4 010-01	1	0.1	1	2.5	50	6
USPM4 010-02	1	0.2	1	2.5	50	6
USPM4 010-03	1	0.3	1	2.5	50	6
USPM4 015-02	1.5	0.2	1.5	4	50	6
USPM4 015-03	1.5	0.3	1.5	4	50	6
USPM4 015-05	1.5	0.5	1.5	4	50	6
USPM4 020-02	2	0.2	2	6	50	6
USPM4 020-03	2	0.3	2	6	50	6
USPM4 020-05	2	0.5	2	6	50	6
USPM4 030-02	3	0.2	3	8	50	6
USPM4 030-03	3	0.3	3	8	50	6
USPM4 030-05	3	0.5	3	8	50	6
USPM4 040-02	4	0.2	4	10	50	6
USPM4 040-03	4	0.3	4	10	50	6
USPM4 040-05	4	0.5	4	10	50	6
USPM4 040-10	4	1	4	10	50	6
USPM4 060-02	6	0.2	6	15	60	6
USPM4 060-02L	6	0.2	6	15	90	6
USPM4 060-03	6	0.3	6	15	60	6
USPM4 060-03L	6	0.3	6	15	90	6
USPM4 060-05	6	0.5	6	15	60	6
USPM4 060-05L	6	0.5	6	15	90	6
USPM4 060-10	6	1	6	15	60	6
USPM4 060-10L	6	1	6	15	90	6

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
USPM4 060-20	6	2	6	15	60	6
USPM4 060-20L	6	2	6	15	90	6
USPM4 080-02	8	0.2	8	20	70	8
USPM4 080-02L	8	0.2	8	20	100	8
USPM4 080-03	8	0.3	8	20	70	8
USPM4 080-03L	8	0.3	8	20	100	8
USPM4 080-05	8	0.5	8	20	70	8
USPM4 080-05L	8	0.5	8	20	100	8
USPM4 080-10	8	1	8	20	70	8
USPM4 080-10L	8	1	8	20	100	8
USPM4 080-20	8	2	8	20	70	8
USPM4 080-20L	8	2	8	20	100	8
USPM4 100-02	10	0.2	10	25	75	10
USPM4 100-02L	10	0.2	10	25	100	10
USPM4 100-03	10	0.3	10	25	75	10
USPM4 100-03L	10	0.3	10	25	100	10
USPM4 100-05	10	0.5	10	25	75	10
USPM4 100-05L	10	0.5	10	25	100	10
USPM4 100-10	10	1	10	25	75	10
USPM4 100-10L	10	1	10	25	100	10
USPM4 100-15	10	1.5	10	25	75	10
USPM4 100-15L	10	1.5	10	25	100	10
USPM4 100-20	10	2	10	25	75	10
USPM4 100-20L	10	2	10	25	100	10

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

USPM4 | 4 FLUTES RADIUS ENDMILL FOR HIGH SPEED

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
USPM4 120-03	12	0.3	12	30	80	12
USPM4 120-03L	12	0.3	12	30	110	12
USPM4 120-05	12	0.5	12	30	80	12
USPM4 120-05L	12	0.5	12	30	110	12
USPM4 120-10	12	1	12	30	80	12
USPM4 120-10L	12	1	12	30	110	12
USPM4 120-15	12	1.5	12	30	80	12
USPM4 120-15L	12	1.5	12	30	110	12
USPM4 120-20	12	2	12	30	80	12
USPM4 120-20L	12	2	12	30	110	12
USPM4 120-30	12	3	12	30	80	12
USPM4 120-30L	12	3	12	30	110	12

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
USPM4 160-05	16	0.5	16	35	100	16
USPM4 160-05L	16	0.5	16	35	150	16
USPM4 160-10	16	1	16	35	100	16
USPM4 160-10L	16	1	16	35	150	16
USPM4 160-20	16	2	16	35	100	16
USPM4 160-20L	16	2	16	35	150	16
USPM4 200-05	20	0.5	20	40	100	20
USPM4 200-05L	20	0.5	20	40	150	20
USPM4 200-10	20	1	20	40	100	20
USPM4 200-10L	20	1	20	40	150	20
USPM4 200-20	20	2	20	40	100	20
USPM4 200-20L	20	2	20	40	150	20

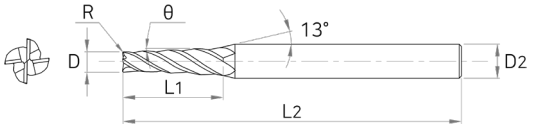
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UTR504 | 4 FLUTES TAPERED RADIUS ENDMILL





■ Tolerance

D		Shank Dia
D0.8 ~ 2.5	0 ~ -0.03	h5

CARBIDE | AlCrN | 4 | 30° HELIX | R ±0.01 | DATA P.656

EDP No	SIZES (mm)					
	D	R	L1	θ	L2	D2
UTR504 008010104	0.8	0.1	4	1	45	4
UTR504 008010106	0.8	0.1	6	1	45	4
UTR504 008010108	0.8	0.1	8	1	45	4
UTR504 0080101504	0.8	0.1	4	1.5	45	4
UTR504 0080101506	0.8	0.1	6	1.5	45	4
UTR504 0080101508	0.8	0.1	8	1.5	45	4
UTR504 008020104	0.8	0.2	4	1	45	4
UTR504 008020106	0.8	0.2	6	1	45	4
UTR504 008020108	0.8	0.2	8	1	45	4
UTR504 0080201504	0.8	0.2	4	1.5	45	4
UTR504 0080201506	0.8	0.2	6	1.5	45	4
UTR504 0080201508	0.8	0.2	8	1.5	45	4
UTR504 010010104	1	0.1	4	1	50	4
UTR504 010010106	1	0.1	6	1	50	4
UTR504 010010108	1	0.1	8	1	50	4
UTR504 010010110	1	0.1	10	1	50	4
UTR504 010010112	1	0.1	12	1	50	4
UTR504 0100101504	1	0.1	4	1.5	50	4
UTR504 0100101506	1	0.1	6	1.5	50	4
UTR504 0100101508	1	0.1	8	1.5	50	4
UTR504 0100101510	1	0.1	10	1.5	50	4
UTR504 0100101512	1	0.1	12	1.5	50	4
UTR504 010010204	1	0.1	4	2	50	4
UTR504 010010206	1	0.1	6	2	50	4

EDP No	SIZES (mm)					
	D	R	L1	θ	L2	D2
UTR504 010010208	1	0.1	8	2	50	4
UTR504 010010210	1	0.1	10	2	50	4
UTR504 010010212	1	0.1	12	2	50	4
UTR504 010010304	1	0.1	4	3	50	4
UTR504 010010306	1	0.1	6	3	50	4
UTR504 010010308	1	0.1	8	3	50	4
UTR504 010010310	1	0.1	10	3	50	4
UTR504 010010312	1	0.1	12	3	50	4
UTR504 010020104	1	0.2	4	1	50	4
UTR504 010020106	1	0.2	6	1	50	4
UTR504 010020108	1	0.2	8	1	50	4
UTR504 010020110	1	0.2	10	1	50	4
UTR504 010020112	1	0.2	12	1	50	4
UTR504 0100201504	1	0.2	4	1.5	50	4
UTR504 0100201506	1	0.2	6	1.5	50	4
UTR504 0100201508	1	0.2	8	1.5	50	4
UTR504 0100201510	1	0.2	10	1.5	50	4
UTR504 0100201512	1	0.2	12	1.5	50	4
UTR504 010020204	1	0.2	4	2	50	4
UTR504 010020206	1	0.2	6	2	50	4
UTR504 010020208	1	0.2	8	2	50	4
UTR504 010020210	1	0.2	10	2	50	4
UTR504 010020212	1	0.2	12	2	50	4
UTR504 010020304	1	0.2	4	3	50	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UTR504 | 4 FLUTES TAPERED RADIUS ENDMILL

EDP No	SIZES (mm)					
	D	R	L1	θ	L2	D2
UTR504 010020306	1	0.2	6	3	50	4
UTR504 010020308	1	0.2	8	3	50	4
UTR504 010020310	1	0.2	10	3	50	4
UTR504 010020312	1	0.2	12	3	50	4
UTR504 010030104	1	0.3	4	1	50	4
UTR504 010030106	1	0.3	6	1	50	4
UTR504 010030108	1	0.3	8	1	50	4
UTR504 010030110	1	0.3	10	1	50	4
UTR504 010030112	1	0.3	12	1	50	4
UTR504 0100301504	1	0.3	4	1.5	50	4
UTR504 0100301506	1	0.3	6	1.5	50	4
UTR504 0100301508	1	0.3	8	1.5	50	4
UTR504 0100301510	1	0.3	10	1.5	50	4
UTR504 0100301512	1	0.3	12	1.5	50	4
UTR504 010030204	1	0.3	4	2	50	4
UTR504 010030206	1	0.3	6	2	50	4
UTR504 010030208	1	0.3	8	2	50	4
UTR504 010030210	1	0.3	10	2	50	4
UTR504 010030212	1	0.3	12	2	50	4
UTR504 010030304	1	0.3	4	3	50	4
UTR504 010030306	1	0.3	6	3	50	4
UTR504 010030308	1	0.3	8	3	50	4
UTR504 010030310	1	0.3	10	3	50	4
UTR504 010030312	1	0.3	12	3	50	4
UTR504 012010106	1.2	0.1	6	1	50	4
UTR504 012010108	1.2	0.1	8	1	50	4
UTR504 012010110	1.2	0.1	10	1	50	4
UTR504 012010112	1.2	0.1	12	1	50	4
UTR504 012010206	1.2	0.1	6	2	50	4
UTR504 012010208	1.2	0.1	8	2	50	4
UTR504 012010210	1.2	0.1	10	2	50	4
UTR504 012010212	1.2	0.1	12	2	50	4
UTR504 012010306	1.2	0.1	6	3	50	4
UTR504 012010308	1.2	0.1	8	3	50	4
UTR504 012010310	1.2	0.1	10	3	50	4
UTR504 012010312	1.2	0.1	12	3	50	4
UTR504 012020106	1.2	0.2	6	1	50	4
UTR504 012020108	1.2	0.2	8	1	50	4
UTR504 012020110	1.2	0.2	10	1	50	4
UTR504 012020112	1.2	0.2	12	1	50	4
UTR504 012020206	1.2	0.2	6	2	50	4

EDP No	SIZES (mm)					
	D	R	L1	θ	L2	D2
UTR504 012020208	1.2	0.2	8	2	50	4
UTR504 012020210	1.2	0.2	10	2	50	4
UTR504 012020212	1.2	0.2	12	2	50	4
UTR504 012020306	1.2	0.2	6	3	50	4
UTR504 012020308	1.2	0.2	8	3	50	4
UTR504 012020310	1.2	0.2	10	3	50	4
UTR504 012020312	1.2	0.2	12	3	50	4
UTR504 012030106	1.2	0.3	6	1	50	4
UTR504 012030108	1.2	0.3	8	1	50	4
UTR504 012030110	1.2	0.3	10	1	50	4
UTR504 012030112	1.2	0.3	12	1	50	4
UTR504 012030206	1.2	0.3	6	2	50	4
UTR504 012030208	1.2	0.3	8	2	50	4
UTR504 012030210	1.2	0.3	10	2	50	4
UTR504 012030212	1.2	0.3	12	2	50	4
UTR504 012030306	1.2	0.3	6	3	50	4
UTR504 012030308	1.2	0.3	8	3	50	4
UTR504 012030310	1.2	0.3	10	3	50	4
UTR504 012030312	1.2	0.3	12	3	50	4
UTR504 015010106	1.5	0.1	6	1	50	4
UTR504 015010108	1.5	0.1	8	1	50	4
UTR504 015010110	1.5	0.1	10	1	50	4
UTR504 015010112	1.5	0.1	12	1	50	4
UTR504 015010116	1.5	0.1	16	1	50	4
UTR504 015010120	1.5	0.1	20	1	60	4
UTR504 015010206	1.5	0.1	6	2	50	4
UTR504 015010208	1.5	0.1	8	2	50	4
UTR504 015010210	1.5	0.1	10	2	50	4
UTR504 015010212	1.5	0.1	12	2	50	4
UTR504 015010216	1.5	0.1	16	2	50	4
UTR504 015010220	1.5	0.1	20	2	60	4
UTR504 015010306	1.5	0.1	6	3	50	4
UTR504 015010308	1.5	0.1	8	3	50	4
UTR504 015010310	1.5	0.1	10	3	50	4
UTR504 015010312	1.5	0.1	12	3	50	4
UTR504 015010316	1.5	0.1	16	3	50	4
UTR504 015010320	1.5	0.1	20	3	60	4
UTR504 015020106	1.5	0.2	6	1	50	4
UTR504 015020108	1.5	0.2	8	1	50	4
UTR504 015020110	1.5	0.2	10	1	50	4
UTR504 015020112	1.5	0.2	12	1	50	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UTR504 | 4 FLUTES TAPERED RADIUS ENDMILL

EDP No	SIZES (mm)					
	D	R	L1	θ	L2	D2
UTR504 015020116	1.5	0.2	16	1	50	4
UTR504 015020120	1.5	0.2	20	1	60	4
UTR504 015020206	1.5	0.2	6	2	50	4
UTR504 015020208	1.5	0.2	8	2	50	4
UTR504 015020210	1.5	0.2	10	2	50	4
UTR504 015020212	1.5	0.2	12	2	50	4
UTR504 015020216	1.5	0.2	16	2	50	4
UTR504 015020220	1.5	0.2	20	2	60	4
UTR504 015020306	1.5	0.2	6	3	50	4
UTR504 015020308	1.5	0.2	8	3	50	4
UTR504 015020310	1.5	0.2	10	3	50	4
UTR504 015020312	1.5	0.2	12	3	50	4
UTR504 015020316	1.5	0.2	16	3	50	4
UTR504 015020320	1.5	0.2	20	3	60	4
UTR504 015030106	1.5	0.3	6	1	50	4
UTR504 015030108	1.5	0.3	8	1	50	4
UTR504 015030110	1.5	0.3	10	1	50	4
UTR504 015030112	1.5	0.3	12	1	50	4
UTR504 015030116	1.5	0.3	16	1	50	4
UTR504 015030120	1.5	0.3	20	1	60	4
UTR504 015030206	1.5	0.3	6	2	50	4
UTR504 015030208	1.5	0.3	8	2	50	4
UTR504 015030210	1.5	0.3	10	2	50	4
UTR504 015030212	1.5	0.3	12	2	50	4
UTR504 015030216	1.5	0.3	16	2	50	4
UTR504 015030220	1.5	0.3	20	2	60	4
UTR504 015030306	1.5	0.3	6	3	50	4
UTR504 015030308	1.5	0.3	8	3	50	4
UTR504 015030310	1.5	0.3	10	3	50	4
UTR504 015030312	1.5	0.3	12	3	50	4
UTR504 015030316	1.5	0.3	16	3	50	4
UTR504 015030320	1.5	0.3	20	3	60	4
UTR504 020010108	2	0.1	8	1	50	4
UTR504 020010110	2	0.1	10	1	50	4
UTR504 020010112	2	0.1	12	1	50	4
UTR504 020010116	2	0.1	16	1	50	4
UTR504 020010120	2	0.1	20	1	60	4
UTR504 020010125	2	0.1	25	1	60	4
UTR504 020010208	2	0.1	8	2	50	4
UTR504 020010210	2	0.1	10	2	50	4
UTR504 020010212	2	0.1	12	2	50	4

EDP No	SIZES (mm)					
	D	R	L1	θ	L2	D2
UTR504 020010216	2	0.1	16	2	50	4
UTR504 020010220	2	0.1	20	2	60	4
UTR504 020010225	2	0.1	25	2	60	4
UTR504 020010308	2	0.1	8	3	50	4
UTR504 020010310	2	0.1	10	3	50	4
UTR504 020010312	2	0.1	12	3	50	4
UTR504 020010316	2	0.1	16	3	50	4
UTR504 020010320	2	0.1	20	3	60	6
UTR504 020010325	2	0.1	25	3	60	6
UTR504 020020108	2	0.2	8	1	50	4
UTR504 020020110	2	0.2	10	1	50	4
UTR504 020020112	2	0.2	12	1	50	4
UTR504 020020116	2	0.2	16	1	50	4
UTR504 020020120	2	0.2	20	1	60	4
UTR504 020020125	2	0.2	25	1	60	4
UTR504 020020208	2	0.2	8	2	50	4
UTR504 020020210	2	0.2	10	2	50	4
UTR504 020020212	2	0.2	12	2	50	4
UTR504 020020216	2	0.2	16	2	50	4
UTR504 020020220	2	0.2	20	2	60	4
UTR504 020020225	2	0.2	25	2	60	4
UTR504 020020308	2	0.2	8	3	50	4
UTR504 020020310	2	0.2	10	3	50	4
UTR504 020020312	2	0.2	12	3	50	4
UTR504 020020316	2	0.2	16	3	50	4
UTR504 020020320	2	0.2	20	3	60	6
UTR504 020020325	2	0.2	25	3	60	6
UTR504 020030108	2	0.3	8	1	50	4
UTR504 020030110	2	0.3	10	1	50	4
UTR504 020030112	2	0.3	12	1	50	4
UTR504 020030116	2	0.3	16	1	50	4
UTR504 020030120	2	0.3	20	1	60	4
UTR504 020030125	2	0.3	25	1	60	4
UTR504 020030208	2	0.3	8	2	50	4
UTR504 020030210	2	0.3	10	2	50	4
UTR504 020030212	2	0.3	12	2	50	4
UTR504 020030216	2	0.3	16	2	50	4
UTR504 020030220	2	0.3	20	2	60	4
UTR504 020030225	2	0.3	25	2	60	4
UTR504 020030308	2	0.3	8	3	50	4
UTR504 020030310	2	0.3	10	3	50	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UTR504 | 4 FLUTES TAPERED RADIUS ENDMILL

EDP No	SIZES (mm)					
	D	R	L1	θ	L2	D2
UTR504 010020306	1	0.2	6	3	50	4
UTR504 010020308	1	0.2	8	3	50	4
UTR504 010020310	1	0.2	10	3	50	4
UTR504 010020312	1	0.2	12	3	50	4
UTR504 010030104	1	0.3	4	1	50	4
UTR504 010030106	1	0.3	6	1	50	4
UTR504 010030108	1	0.3	8	1	50	4
UTR504 010030110	1	0.3	10	1	50	4
UTR504 010030112	1	0.3	12	1	50	4
UTR504 0100301504	1	0.3	4	1.5	50	4
UTR504 0100301506	1	0.3	6	1.5	50	4
UTR504 0100301508	1	0.3	8	1.5	50	4
UTR504 0100301510	1	0.3	10	1.5	50	4
UTR504 0100301512	1	0.3	12	1.5	50	4
UTR504 010030204	1	0.3	4	2	50	4
UTR504 010030206	1	0.3	6	2	50	4
UTR504 010030208	1	0.3	8	2	50	4
UTR504 010030210	1	0.3	10	2	50	4
UTR504 010030212	1	0.3	12	2	50	4
UTR504 010030304	1	0.3	4	3	50	4
UTR504 010030306	1	0.3	6	3	50	4
UTR504 010030308	1	0.3	8	3	50	4
UTR504 010030310	1	0.3	10	3	50	4
UTR504 010030312	1	0.3	12	3	50	4
UTR504 012010106	1.2	0.1	6	1	50	4
UTR504 012010108	1.2	0.1	8	1	50	4
UTR504 012010110	1.2	0.1	10	1	50	4
UTR504 012010112	1.2	0.1	12	1	50	4
UTR504 012010206	1.2	0.1	6	2	50	4
UTR504 012010208	1.2	0.1	8	2	50	4
UTR504 012010210	1.2	0.1	10	2	50	4
UTR504 012010212	1.2	0.1	12	2	50	4
UTR504 012010306	1.2	0.1	6	3	50	4
UTR504 012010308	1.2	0.1	8	3	50	4
UTR504 012010310	1.2	0.1	10	3	50	4
UTR504 012010312	1.2	0.1	12	3	50	4
UTR504 012020106	1.2	0.2	6	1	50	4
UTR504 012020108	1.2	0.2	8	1	50	4
UTR504 012020110	1.2	0.2	10	1	50	4
UTR504 012020112	1.2	0.2	12	1	50	4
UTR504 012020206	1.2	0.2	6	2	50	4

EDP No	SIZES (mm)					
	D	R	L1	θ	L2	D2
UTR504 012020208	1.2	0.2	8	2	50	4
UTR504 012020210	1.2	0.2	10	2	50	4
UTR504 012020212	1.2	0.2	12	2	50	4
UTR504 012020306	1.2	0.2	6	3	50	4
UTR504 012020308	1.2	0.2	8	3	50	4
UTR504 012020310	1.2	0.2	10	3	50	4
UTR504 012020312	1.2	0.2	12	3	50	4
UTR504 012030106	1.2	0.3	6	1	50	4
UTR504 012030108	1.2	0.3	8	1	50	4
UTR504 012030110	1.2	0.3	10	1	50	4
UTR504 012030112	1.2	0.3	12	1	50	4
UTR504 012030206	1.2	0.3	6	2	50	4
UTR504 012030208	1.2	0.3	8	2	50	4
UTR504 012030210	1.2	0.3	10	2	50	4
UTR504 012030212	1.2	0.3	12	2	50	4
UTR504 012030306	1.2	0.3	6	3	50	4
UTR504 012030308	1.2	0.3	8	3	50	4
UTR504 012030310	1.2	0.3	10	3	50	4
UTR504 012030312	1.2	0.3	12	3	50	4
UTR504 015010106	1.5	0.1	6	1	50	4
UTR504 015010108	1.5	0.1	8	1	50	4
UTR504 015010110	1.5	0.1	10	1	50	4
UTR504 015010112	1.5	0.1	12	1	50	4
UTR504 015010116	1.5	0.1	16	1	50	4
UTR504 015010120	1.5	0.1	20	1	60	4
UTR504 015010206	1.5	0.1	6	2	50	4
UTR504 015010208	1.5	0.1	8	2	50	4
UTR504 015010210	1.5	0.1	10	2	50	4
UTR504 015010212	1.5	0.1	12	2	50	4
UTR504 015010216	1.5	0.1	16	2	50	4
UTR504 015010220	1.5	0.1	20	2	60	4
UTR504 015010306	1.5	0.1	6	3	50	4
UTR504 015010308	1.5	0.1	8	3	50	4
UTR504 015010310	1.5	0.1	10	3	50	4
UTR504 015010312	1.5	0.1	12	3	50	4
UTR504 015010316	1.5	0.1	16	3	50	4
UTR504 015010320	1.5	0.1	20	3	60	4
UTR504 015020106	1.5	0.2	6	1	50	4
UTR504 015020108	1.5	0.2	8	1	50	4
UTR504 015020110	1.5	0.2	10	1	50	4
UTR504 015020112	1.5	0.2	12	1	50	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UTR504 | 4 FLUTES TAPERED RADIUS ENDMILL

EDP No	SIZES (mm)					
	D	R	L1	θ	L2	D2
UTR504 020030312	2	0.3	12	3	50	4
UTR504 020030316	2	0.3	16	3	50	4
UTR504 020030320	2	0.3	20	3	60	6
UTR504 020030325	2	0.3	25	3	60	6
UTR504 025010110	2.5	0.1	10	1	50	4
UTR504 025010112	2.5	0.1	12	1	50	4
UTR504 025010116	2.5	0.1	16	1	50	4
UTR504 025010120	2.5	0.1	20	1	60	4
UTR504 025010125	2.5	0.1	25	1	60	4
UTR504 025010130	2.5	0.1	30	1	60	4
UTR504 025010210	2.5	0.1	10	2	50	4
UTR504 025010212	2.5	0.1	12	2	50	4
UTR504 025010216	2.5	0.1	16	2	50	4
UTR504 025010220	2.5	0.1	20	2	60	4
UTR504 025010225	2.5	0.1	25	2	60	6
UTR504 025010230	2.5	0.1	30	2	60	6
UTR504 025010310	2.5	0.1	10	3	50	4
UTR504 025010312	2.5	0.1	12	3	50	4
UTR504 025010316	2.5	0.1	16	3	50	6
UTR504 025010320	2.5	0.1	20	3	60	6
UTR504 025010325	2.5	0.1	25	3	60	6
UTR504 025010330	2.5	0.1	30	3	60	6
UTR504 025020110	2.5	0.2	10	1	50	4
UTR504 025020112	2.5	0.2	12	1	50	4
UTR504 025020116	2.5	0.2	16	1	50	4
UTR504 025020120	2.5	0.2	20	1	60	4
UTR504 025020125	2.5	0.2	25	1	60	4
UTR504 025020130	2.5	0.2	30	1	60	4
UTR504 025020210	2.5	0.2	10	2	50	4
UTR504 025020212	2.5	0.2	12	2	50	4

EDP No	SIZES (mm)					
	D	R	L1	θ	L2	D2
UTR504 025020212	2.5	0.2	12	2	50	4
UTR504 025020216	2.5	0.2	16	2	50	4
UTR504 025020220	2.5	0.2	20	2	60	4
UTR504 025020225	2.5	0.2	25	2	60	6
UTR504 025020230	2.5	0.2	30	2	60	6
UTR504 025020310	2.5	0.2	10	3	50	4
UTR504 025020312	2.5	0.2	12	3	50	4
UTR504 025020316	2.5	0.2	16	3	50	6
UTR504 025020320	2.5	0.2	20	3	60	6
UTR504 025020325	2.5	0.2	25	3	60	6
UTR504 025020330	2.5	0.2	30	3	60	6
UTR504 025030110	2.5	0.3	10	1	50	4
UTR504 025030112	2.5	0.3	12	1	50	4
UTR504 025030116	2.5	0.3	16	1	50	4
UTR504 025030120	2.5	0.3	20	1	60	4
UTR504 025030125	2.5	0.3	25	1	60	4
UTR504 025030130	2.5	0.3	30	1	60	4
UTR504 025030210	2.5	0.3	10	2	50	4
UTR504 025030212	2.5	0.3	12	2	50	4
UTR504 025030216	2.5	0.3	16	2	50	4
UTR504 025030220	2.5	0.3	20	2	60	4
UTR504 025030225	2.5	0.3	25	2	60	6
UTR504 025030230	2.5	0.3	30	2	60	6
UTR504 025030310	2.5	0.3	10	3	50	4
UTR504 025030312	2.5	0.3	12	3	50	4
UTR504 025030316	2.5	0.3	16	3	50	6
UTR504 025030320	2.5	0.3	20	3	60	6
UTR504 025030325	2.5	0.3	25	3	60	6
UTR504 025030330	2.5	0.3	30	3	60	6

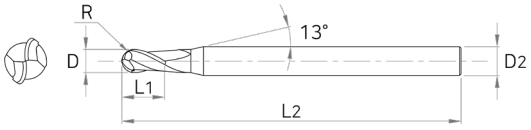
■ Applicable Working Material

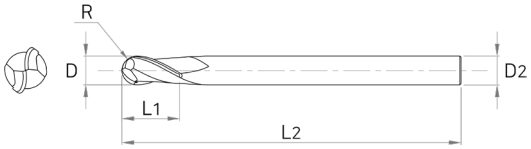
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UB502 | 2 FLUTES BALL ENDMILL

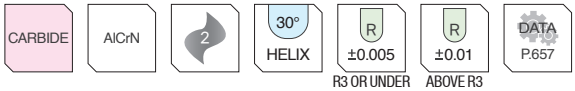






■ Tolerance

D		Shank Dia
D0.1 ~ 6	0 ~ -0.012	h5
D6.5 ~ 25	0 ~ -0.015	



EDP No	SIZES (mm)				
	D	R	L1	L2	D2
UB502 001S	0.1	0.05	0.1	40	4
UB502 001	0.1	0.05	0.2	40	4
UB502 001S3	0.1	0.05	0.2	40	3
UB502 0015S	0.15	0.075	0.15	40	4
UB502 0015	0.15	0.075	0.3	40	4
UB502 0015S3	0.15	0.075	0.3	40	3
UB502 002S	0.2	0.1	0.2	40	4
UB502 002	0.2	0.1	0.4	40	4
UB502 002S3	0.2	0.1	0.4	40	3
UB502 003S	0.3	0.15	0.3	40	4
UB502 003	0.3	0.15	0.6	40	4
UB502 003S3	0.3	0.15	0.6	40	3
UB502 004S	0.4	0.2	0.4	40	4
UB502 004	0.4	0.2	0.8	40	4
UB502 004S3	0.4	0.2	0.8	40	3
UB502 005S	0.5	0.25	0.5	40	4
UB502 005	0.5	0.25	1	40	4
UB502 005S3	0.5	0.25	1	40	3
UB502 006S	0.6	0.3	0.6	40	4
UB502 006	0.6	0.3	1.2	40	4
UB502 006S3	0.6	0.3	1.2	40	3
UB502 007S	0.7	0.35	0.7	40	4
UB502 007	0.7	0.35	1.4	40	4
UB502 007S3	0.7	0.35	1.4	40	3

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
UB502 008S	0.8	0.4	0.8	40	4
UB502 008	0.8	0.4	1.6	40	4
UB502 008S3	0.8	0.4	1.6	40	3
UB502 009S	0.9	0.45	0.9	40	4
UB502 009	0.9	0.45	1.8	40	4
UB502 009S3	0.9	0.45	1.8	40	3
UB502 010S	1	0.5	1.5	40	6
UB502 010S3	1	0.5	2.5	50	3
UB502 010S4	1	0.5	2.5	50	4
UB502 010	1	0.5	2.5	50	6
UB502 010070	1	0.5	2.5	70	6
UB502 010100	1	0.5	2.5	100	6
UB502 012S	1.2	0.6	2	40	6
UB502 012S3	1.2	0.6	3	50	3
UB502 012S4	1.2	0.6	3	50	4
UB502 012	1.2	0.6	3	50	6
UB502 012070	1.2	0.6	3	70	6
UB502 012100	1.2	0.6	3	100	6
UB502 015S	1.5	0.75	2.5	40	6
UB502 015S3	1.5	0.75	4	50	3
UB502 015S4	1.5	0.75	4	50	4
UB502 015	1.5	0.75	4	50	6
UB502 015070	1.5	0.75	4	70	6
UB502 015100	1.5	0.75	4	100	6

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UB502 | 2 FLUTES BALL ENDMILL

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
UB502 020S	2	1	3	40	6
UB502 020S3	2	1	5	50	3
UB502 020S4	2	1	5	50	4
UB502 020	2	1	5	50	6
UB502 020080	2	1	5	80	6
UB502 020100	2	1	5	100	6
UB502 025S	2.5	1.25	4	40	6
UB502 025S3	2.5	1.25	6	60	3
UB502 025S4	2.5	1.25	6	60	4
UB502 025	2.5	1.25	6	60	6
UB502 025080	2.5	1.25	6	80	6
UB502 025100	2.5	1.25	6	100	6
UB502 030S	3	1.5	4.5	40	6
UB502 030S3	3	1.5	6	60	3
UB502 030S4	3	1.5	6	60	4
UB502 030	3	1.5	6	60	6
UB502 030080	3	1.5	6	80	6
UB502 030100	3	1.5	6	100	6
UB502 035	3.5	1.75	8	70	6
UB502 040S	4	2	6	50	6
UB502 040S4	4	2	8	70	4
UB502 040	4	2	8	70	6
UB502 040100S4	4	2	8	100	4
UB502 040120S4	4	2	8	120	4
UB502 040100	4	2	8	100	6
UB502 040120	4	2	8	120	6
UB502 045	4.5	2.25	9	80	6
UB502 050S	5	2.5	7.5	60	6
UB502 050	5	2.5	10	80	6
UB502 050S5	5	2.5	10	80	5
UB502 055	5.5	2.75	11	90	6
UB502 060S	6	3	9	50	6
UB502 060060	6	3	9	60	6
UB502 060080	6	3	9	80	6
UB502 060	6	3	12	90	6
UB502 060110	6	3	12	110	6
UB502 060130	6	3	12	130	6
UB502 060150	6	3	12	150	6
UB502 065	6.5	3.25	13	90	8
UB502 070	7	3.5	14	90	8
UB502 080S	8	4	12	50	8

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
UB502 080060	8	4	12	60	8
UB502 080080	8	4	12	80	8
UB502 080090	8	4	12	90	8
UB502 080	8	4	14	100	8
UB502 080130	8	4	14	130	8
UB502 080150	8	4	14	150	8
UB502 085	8.5	4.25	16	100	10
UB502 090	9	4.5	18	100	10
UB502 100S	10	5	15	50	10
UB502 100060	10	5	15	60	10
UB502 100080	10	5	15	80	10
UB502 100090	10	5	15	90	10
UB502 100	10	5	18	100	10
UB502 100130	10	5	18	130	10
UB502 100150	10	5	18	150	10
UB502 100180	10	5	18	180	10
UB502 100200	10	5	18	200	10
UB502 110	11	5.5	20	100	12
UB502 120S	12	6	18	60	12
UB502 120080	12	6	18	80	12
UB502 120090	12	6	18	90	12
UB502 120100	12	6	18	100	12
UB502 120	12	6	24	110	12
UB502 120130	12	6	24	130	12
UB502 120150	12	6	24	150	12
UB502 120180	12	6	24	180	12
UB502 120200	12	6	24	200	12
UB502 130	13	6.5	24	100	12
UB502 140S12	14	7	26	100	12
UB502 140	14	7	26	100	14
UB502 140S16	14	7	26	100	16
UB502 150	15	7.5	28	140	16
UB502 160100	16	8	24	100	16
UB502 160130	16	8	24	130	16
UB502 160	16	8	30	150	16
UB502 160180	16	8	30	180	16
UB502 160200	16	8	30	200	16
UB502 180S16	18	9	34	150	16
UB502 180	18	9	34	150	18
UB502 200100	20	10	30	100	20
UB502 200130	20	10	30	130	20

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UB502 | 2 FLUTES BALL ENDMILL

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
UB502 200	20	10	38	150	20
UB502 200200	20	10	38	200	20

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
UB502 250120	25	12.5	50	120	25
UB502 250180	25	12.5	50	180	25

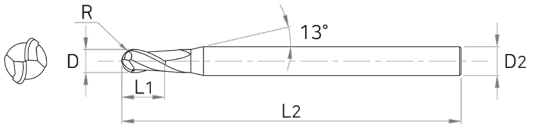
■ Applicable Working Material

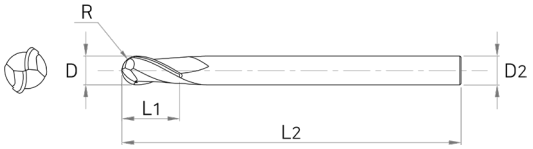
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UB502-P | 2 FLUTES HIGH PRECISION BALL ENDMILL







■ Tolerance

D		Shank Dia
D0.1 ~ 6	0 ~ -0.012	h5
D8 ~ 12	0 ~ -0.015	

CARBIDE | AlCrN | 2 | 30° HELIX | R ±0.002 R3 OR UNDER | R ±0.003 ABOVE R3 | DATA P.657

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
UB502 001P	0.1	0.05	0.2	40	4
UB502 0015P	0.15	0.075	0.3	40	4
UB502 002P	0.2	0.1	0.4	40	4
UB502 003P	0.3	0.15	0.6	40	4
UB502 004P	0.4	0.2	0.8	40	4
UB502 005P	0.5	0.25	1	40	4
UB502 006P	0.6	0.3	1.2	40	4
UB502 007P	0.7	0.35	1.4	40	4
UB502 008P	0.8	0.4	1.6	40	4
UB502 009P	0.9	0.45	1.8	40	4
UB502 010P	1	0.5	2.5	50	6
UB502 012P	1.2	0.6	3	50	6
UB502 015P	1.5	0.75	4	50	6
UB502 020P	2	1	5	50	6
UB502 025P	2.5	1.25	6	60	6
UB502 030P	3	1.5	6	60	6
UB502 040P	4	2	8	70	6
UB502 050P	5	2.5	10	80	6
UB502 060P	6	3	12	90	6
UB502 080P	8	4	14	100	8
UB502 100P	10	5	18	100	10
UB502 120P	12	6	24	110	12

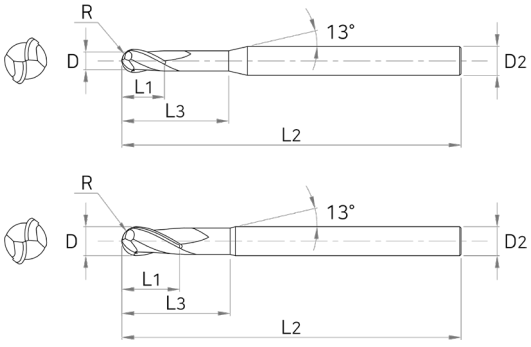
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UB512 | 2 FLUTES LONG NECK BALL ENDMILL





■ Tolerance

D		Shank Dia
D0.1 ~ 6	0 ~ -0.012	h5
D8 ~ 12	0 ~ -0.015	

CARBIDE | AlCrN | 2 | 30° HELIX | R ±0.005 R3 OR UNDER | R ±0.01 ABOVE R3 | DATA P.658

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
UB512 001002	0.1	0.05	0.1	0.2	40	4
UB512 001003	0.1	0.05	0.1	0.3	40	4
UB512 001005	0.1	0.05	0.1	0.5	40	4
UB512 00101	0.1	0.05	0.1	1	40	4
UB512 002005	0.2	0.1	0.2	0.5	40	4
UB512 00201	0.2	0.1	0.2	1	40	4
UB512 002015	0.2	0.1	0.2	1.5	40	4
UB512 00202	0.2	0.1	0.2	2	40	4
UB512 00203	0.2	0.1	0.2	3	40	4
UB512 00301	0.3	0.15	0.3	1	40	4
UB512 003015	0.3	0.15	0.3	1.5	40	4
UB512 00302	0.3	0.15	0.3	2	40	4
UB512 003025	0.3	0.15	0.3	2.5	40	4
UB512 00303	0.3	0.15	0.3	3	40	4
UB512 00304	0.3	0.15	0.3	4	40	4
UB512 00305	0.3	0.15	0.3	5	40	4
UB512 00401	0.4	0.2	0.4	1	40	4
UB512 004015	0.4	0.2	0.4	1.5	40	4
UB512 00402	0.4	0.2	0.4	2	40	4
UB512 004025	0.4	0.2	0.4	2.5	40	4
UB512 00403	0.4	0.2	0.4	3	40	4
UB512 00404	0.4	0.2	0.4	4	40	4
UB512 00405	0.4	0.2	0.4	5	40	4
UB512 00406	0.4	0.2	0.4	6	40	4

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
UB512 00408	0.4	0.2	0.4	8	40	4
UB512 00410	0.4	0.2	0.4	10	40	4
UB512 00501	0.5	0.25	0.5	1	45	4
UB512 005015	0.5	0.25	0.5	1.5	45	4
UB512 00502	0.5	0.25	0.5	2	45	4
UB512 005025	0.5	0.25	0.5	2.5	45	4
UB512 00503	0.5	0.25	0.5	3	45	4
UB512 00504	0.5	0.25	0.5	4	45	4
UB512 00505	0.5	0.25	0.5	5	45	4
UB512 00506	0.5	0.25	0.5	6	45	4
UB512 00508	0.5	0.25	0.5	8	45	4
UB512 00510	0.5	0.25	0.5	10	45	4
UB512 00512	0.5	0.25	0.5	12	45	4
UB512 00514	0.5	0.25	0.5	14	45	4
UB512 00516	0.5	0.25	0.5	16	45	4
UB512 00601	0.6	0.3	0.6	1	45	4
UB512 00602	0.6	0.3	0.6	2	45	4
UB512 00603	0.6	0.3	0.6	3	45	4
UB512 00604	0.6	0.3	0.6	4	45	4
UB512 00605	0.6	0.3	0.6	5	45	4
UB512 00606	0.6	0.3	0.6	6	45	4
UB512 00608	0.6	0.3	0.6	8	45	4
UB512 00610	0.6	0.3	0.6	10	45	4
UB512 00612	0.6	0.3	0.6	12	45	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UB512 | 2 FLUTES LONG NECK BALL ENDMILL

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
UB512 00614	0.6	0.3	0.6	14	45	4
UB512 00616	0.6	0.3	0.6	16	45	4
UB512 00702	0.7	0.35	0.7	2	45	4
UB512 00704	0.7	0.35	0.7	4	45	4
UB512 00706	0.7	0.35	0.7	6	45	4
UB512 00708	0.7	0.35	0.7	8	45	4
UB512 00710	0.7	0.35	0.7	10	45	4
UB512 00712	0.7	0.35	0.7	12	45	4
UB512 00801	0.8	0.4	0.8	1	45	4
UB512 00802	0.8	0.4	0.8	2	45	4
UB512 00803	0.8	0.4	0.8	3	45	4
UB512 00804	0.8	0.4	0.8	4	45	4
UB512 00805	0.8	0.4	0.8	5	45	4
UB512 00806	0.8	0.4	0.8	6	45	4
UB512 00807	0.8	0.4	0.8	7	45	4
UB512 00808	0.8	0.4	0.8	8	45	4
UB512 00810	0.8	0.4	0.8	10	45	4
UB512 00812	0.8	0.4	0.8	12	45	4
UB512 00814	0.8	0.4	0.8	14	45	4
UB512 00816	0.8	0.4	0.8	16	45	4
UB512 00820	0.8	0.4	0.8	20	45	4
UB512 00904	0.9	0.45	0.9	4	45	4
UB512 00906	0.9	0.45	0.9	6	45	4
UB512 00908	0.9	0.45	0.9	8	45	4
UB512 00910	0.9	0.45	0.9	10	45	4
UB512 01002	1	0.5	1	2	50	4
UB512 010025	1	0.5	1	2.5	50	4
UB512 01003	1	0.5	1	3	50	4
UB512 01004	1	0.5	1	4	50	4
UB512 01005	1	0.5	1	5	50	4
UB512 01006	1	0.5	1	6	50	4
UB512 01007	1	0.5	1	7	50	4
UB512 01008	1	0.5	1	8	50	4
UB512 01009	1	0.5	1	9	50	4
UB512 01010	1	0.5	1	10	50	4
UB512 01012	1	0.5	1	12	50	4
UB512 01014	1	0.5	1	14	50	4
UB512 01016	1	0.5	1	16	50	4
UB512 01018	1	0.5	1	18	50	4
UB512 01020	1	0.5	1	20	55	4
UB512 01022	1	0.5	1	22	60	4

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
UB512 01026	1	0.5	1	26	60	4
UB512 01030	1	0.5	1	30	70	4
UB512 01040	1	0.5	1	40	80	4
UB512 01050	1	0.5	1	50	100	4
UB512 01204	1.2	0.6	1.2	4	50	4
UB512 01206	1.2	0.6	1.2	6	50	4
UB512 01208	1.2	0.6	1.2	8	50	4
UB512 01210	1.2	0.6	1.2	10	50	4
UB512 01212	1.2	0.6	1.2	12	50	4
UB512 01214	1.2	0.6	1.2	14	50	4
UB512 01216	1.2	0.6	1.2	16	50	4
UB512 01220	1.2	0.6	1.2	20	55	4
UB512 01226	1.2	0.6	1.2	26	60	4
UB512 01406	1.4	0.7	1.4	6	50	4
UB512 01408	1.4	0.7	1.4	8	50	4
UB512 01410	1.4	0.7	1.4	10	50	4
UB512 01412	1.4	0.7	1.4	12	50	4
UB512 01416	1.4	0.7	1.4	16	50	4
UB512 01503	1.5	0.75	1.5	3	50	4
UB512 01504	1.5	0.75	1.5	4	50	4
UB512 01505	1.5	0.75	1.5	5	50	4
UB512 01506	1.5	0.75	1.5	6	50	4
UB512 01507	1.5	0.75	1.5	7	50	4
UB512 01508	1.5	0.75	1.5	8	50	4
UB512 01510	1.5	0.75	1.5	10	50	4
UB512 01512	1.5	0.75	1.5	12	50	4
UB512 01514	1.5	0.75	1.5	14	50	4
UB512 01516	1.5	0.75	1.5	16	50	4
UB512 01518	1.5	0.75	1.5	18	50	4
UB512 01520	1.5	0.75	1.5	20	55	4
UB512 01522	1.5	0.75	1.5	22	60	4
UB512 01526	1.5	0.75	1.5	26	60	4
UB512 01530	1.5	0.75	1.5	30	70	4
UB512 01535	1.5	0.75	1.5	35	70	4
UB512 01540	1.5	0.75	1.5	40	80	4
UB512 01604	1.6	0.8	1.6	4	50	4
UB512 01606	1.6	0.8	1.6	6	50	4
UB512 01608	1.6	0.8	1.6	8	50	4
UB512 01610	1.6	0.8	1.6	10	50	4
UB512 01612	1.6	0.8	1.6	12	50	4
UB512 01616	1.6	0.8	1.6	16	50	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UB512 | 2 FLUTES LONG NECK BALL ENDMILL

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
UB512 01620	1.6	0.8	1.6	20	50	4
UB512 01804	1.8	0.9	1.8	4	50	4
UB512 01806	1.8	0.9	1.8	6	50	4
UB512 01808	1.8	0.9	1.8	8	50	4
UB512 01810	1.8	0.9	1.8	10	50	4
UB512 01812	1.8	0.9	1.8	12	50	4
UB512 01816	1.8	0.9	1.8	16	50	4
UB512 01820	1.8	0.9	1.8	20	50	4
UB512 02004	2	1	2	4	50	4
UB512 02005	2	1	2	5	50	4
UB512 02006	2	1	2	6	50	4
UB512 02008	2	1	2	8	50	4
UB512 02010	2	1	2	10	50	4
UB512 02012	2	1	2	12	50	4
UB512 02014	2	1	2	14	50	4
UB512 02016	2	1	2	16	50	4
UB512 02018	2	1	2	18	55	4
UB512 02020	2	1	2	20	55	4
UB512 02022	2	1	2	22	60	4
UB512 02026	2	1	2	26	60	4
UB512 02030	2	1	2	30	70	4
UB512 02035	2	1	2	35	70	4
UB512 02040	2	1	2	40	80	4
UB512 02045	2	1	2	45	90	4
UB512 02050	2	1	2	50	100	4
UB512 02060	2	1	2	60	110	4
UB512 02508	2.5	1.25	2.5	8	50	4
UB512 02510	2.5	1.25	2.5	10	50	4
UB512 02512	2.5	1.25	2.5	12	50	4
UB512 02516	2.5	1.25	2.5	16	50	4
UB512 02520	2.5	1.25	2.5	20	50	4
UB512 02522	2.5	1.25	2.5	22	60	4
UB512 02526	2.5	1.25	2.5	26	60	4
UB512 02530	2.5	1.25	2.5	30	70	4
UB512 02535	2.5	1.25	2.5	35	70	4
UB512 02540	2.5	1.25	2.5	40	80	4
UB512 02545	2.5	1.25	2.5	45	90	4
UB512 02550	2.5	1.25	2.5	50	100	4
UB512 03006	3	1.5	3	6	50	6
UB512 03008	3	1.5	3	8	50	6
UB512 03010	3	1.5	3	10	50	6

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
UB512 03012	3	1.5	3	12	50	6
UB512 03014	3	1.5	3	14	60	6
UB512 03016	3	1.5	3	16	60	6
UB512 03018	3	1.5	3	18	60	6
UB512 03020	3	1.5	3	20	60	6
UB512 03022	3	1.5	3	22	65	6
UB512 03026	3	1.5	3	26	65	6
UB512 03030	3	1.5	3	30	70	6
UB512 03035	3	1.5	3	35	70	6
UB512 03040	3	1.5	3	40	80	6
UB512 03045	3	1.5	3	45	90	6
UB512 03050	3	1.5	3	50	100	6
UB512 03060	3	1.5	3	60	100	6
UB512 04008	4	2	4	8	50	6
UB512 04010	4	2	4	10	50	6
UB512 04012	4	2	4	12	50	6
UB512 04014	4	2	4	14	60	6
UB512 04016	4	2	4	16	60	6
UB512 04018	4	2	4	18	60	6
UB512 04020	4	2	4	20	60	6
UB512 04022	4	2	4	22	65	6
UB512 04026	4	2	4	26	65	6
UB512 04030	4	2	4	30	70	6
UB512 04035	4	2	4	35	70	6
UB512 04040	4	2	4	40	80	6
UB512 04045	4	2	4	45	90	6
UB512 04050	4	2	4	50	100	6
UB512 04055	4	2	4	55	100	6
UB512 04060	4	2	4	60	100	6
UB512 05015	5	2.5	6	15	60	6
UB512 05020	5	2.5	6	20	60	6
UB512 05026	5	2.5	6	26	65	6
UB512 05030	5	2.5	6	30	70	6
UB512 05035	5	2.5	6	35	70	6
UB512 05040	5	2.5	6	40	80	6
UB512 05045	5	2.5	6	45	90	6
UB512 05050	5	2.5	6	50	100	6
UB512 05055	5	2.5	6	55	100	6
UB512 05060	5	2.5	6	60	100	6
UB512 06020	6	3	8	20	60	6
UB512 0602090	6	3	12	20	90	6

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UB512 | 2 FLUTES LONG NECK BALL ENDMILL

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
UB512 06030	6	3	8	30	60	6
UB512 0603090	6	3	12	30	90	6
UB512 08025	8	4	10	25	70	8
UB512 08025100	8	4	14	25	100	8
UB512 08035	8	4	10	35	70	8
UB512 08035100	8	4	14	35	100	8
UB512 10030	10	5	12	30	75	10

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
UB512 10030100	10	5	18	30	100	10
UB512 10040	10	5	12	40	75	10
UB512 10040100	10	5	18	40	100	10
UB512 12032	12	6	14	32	80	12
UB512 12032110	12	6	22	32	110	12
UB512 12045	12	6	14	45	80	12
UB512 12045110	12	6	22	45	110	12

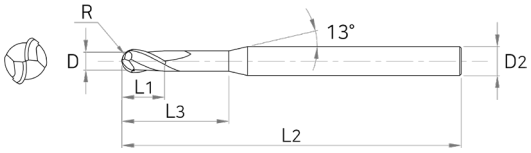
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
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○ : GOOD ◎ : EXCELLENT

UB512S6 | 2 FLUTES LONG NECK BALL ENDMILL





■ Tolerance

D		Shank Dia
D0.5 ~ 2	0 ~ -0.012	h5



EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
UB512 00501S6	0.5	0.25	0.5	1	45	6
UB512 00502S6	0.5	0.25	0.5	2	45	6
UB512 00504S6	0.5	0.25	0.5	4	45	6
UB512 00601S6	0.6	0.3	0.6	1	45	6
UB512 00602S6	0.6	0.3	0.6	2	45	6
UB512 00603S6	0.6	0.3	0.6	3	45	6
UB512 00604S6	0.6	0.3	0.6	4	45	6
UB512 00605S6	0.6	0.3	0.6	5	45	6
UB512 00606S6	0.6	0.3	0.6	6	45	6
UB512 00608S6	0.6	0.3	0.6	8	45	6
UB512 00610S6	0.6	0.3	0.6	10	45	6
UB512 00612S6	0.6	0.3	0.6	12	45	6
UB512 00614S6	0.6	0.3	0.6	14	45	6
UB512 00616S6	0.6	0.3	0.6	16	45	6
UB512 00801S6	0.8	0.4	0.8	1	45	6
UB512 00802S6	0.8	0.4	0.8	2	45	6
UB512 00803S6	0.8	0.4	0.8	3	45	6
UB512 00804S6	0.8	0.4	0.8	4	45	6
UB512 00805S6	0.8	0.4	0.8	5	45	6
UB512 00806S6	0.8	0.4	0.8	6	45	6
UB512 00808S6	0.8	0.4	0.8	8	45	6
UB512 00810S6	0.8	0.4	0.8	10	45	6
UB512 00812S6	0.8	0.4	0.8	12	45	6
UB512 00814S6	0.8	0.4	0.8	14	45	6

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
UB512 00816S6	0.8	0.4	0.8	16	45	6
UB512 00820S6	0.8	0.4	0.8	20	55	6
UB512 01002S6	1	0.5	1	2	50	6
UB512 01003S6	1	0.5	1	3	50	6
UB512 01004S6	1	0.5	1	4	50	6
UB512 01005S6	1	0.5	1	5	50	6
UB512 01006S6	1	0.5	1	6	50	6
UB512 01007S6	1	0.5	1	7	50	6
UB512 01008S6	1	0.5	1	8	50	6
UB512 01009S6	1	0.5	1	9	50	6
UB512 01010S6	1	0.5	1	10	50	6
UB512 01012S6	1	0.5	1	12	50	6
UB512 01014S6	1	0.5	1	14	50	6
UB512 01016S6	1	0.5	1	16	50	6
UB512 01018S6	1	0.5	1	18	50	6
UB512 01020S6	1	0.5	1	20	55	6
UB512 01022S6	1	0.5	1	22	60	6
UB512 01026S6	1	0.5	1	26	60	6
UB512 01030S6	1	0.5	1	30	70	6
UB512 01503S6	1.5	0.75	1.5	3	50	6
UB512 01504S6	1.5	0.75	1.5	4	50	6
UB512 01506S6	1.5	0.75	1.5	6	50	6
UB512 01508S6	1.5	0.75	1.5	8	50	6
UB512 01510S6	1.5	0.75	1.5	10	50	6

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UB512S6 | 2 FLUTES LONG NECK BALL ENDMILL

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
UB512 01512S6	1.5	0.75	1.5	12	50	6
UB512 01514S6	1.5	0.75	1.5	14	50	6
UB512 01516S6	1.5	0.75	1.5	16	50	6
UB512 01518S6	1.5	0.75	1.5	18	50	6
UB512 01520S6	1.5	0.75	1.5	20	55	6
UB512 01522S6	1.5	0.75	1.5	22	60	6
UB512 01526S6	1.5	0.75	1.5	26	60	6
UB512 01530S6	1.5	0.75	1.5	30	70	6
UB512 01535S6	1.5	0.75	1.5	35	70	6
UB512 01540S6	1.5	0.75	1.5	40	80	6
UB512 02004S6	2	1	2	4	50	6
UB512 02006S6	2	1	2	6	50	6
UB512 02008S6	2	1	2	8	50	6
UB512 02010S6	2	1	2	10	50	6

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
UB512 02010S6	2	1	2	10	50	6
UB512 02012S6	2	1	2	12	50	6
UB512 02014S6	2	1	2	14	50	6
UB512 02016S6	2	1	2	16	50	6
UB512 02018S6	2	1	2	18	50	6
UB512 02020S6	2	1	2	20	50	6
UB512 02022S6	2	1	2	22	60	6
UB512 02026S6	2	1	2	26	60	6
UB512 02030S6	2	1	2	30	70	6
UB512 02035S6	2	1	2	35	70	6
UB512 02040S6	2	1	2	40	80	6
UB512 02045S6	2	1	2	45	90	6
UB512 02050S6	2	1	2	50	100	6

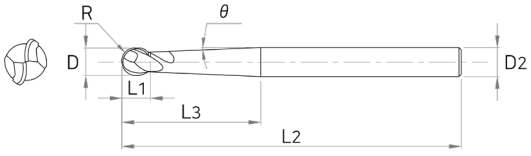
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UB532 | 2 FLUTES LOLLIPOP STYLE BALL ENDMILL





■ Tolerance

D		Shank Dia
D3 ~ 12	0 ~ -0.03	h5

CARBIDE | AlCrN | 2 | 30° HELIX | R ±0.01 | DATA P.663

EDP No	SIZES (mm)						
	D	R	θ	L1	L3	L2	D2
UB532 030	3	1.5	1.5	2.3	16	80	6
UB532 040	4	2	1.5	3.1	20	80	6
UB532 050	5	2.5	1.5	3.9	25	80	6
UB532 060	6	3	1.5	4.9	30	100	6
UB532 080	8	4	1.5	6.3	35	100	8
UB532 100	10	5	1.5	7.9	40	100	10
UB532 120	12	6	1.5	9.5	50	100	12

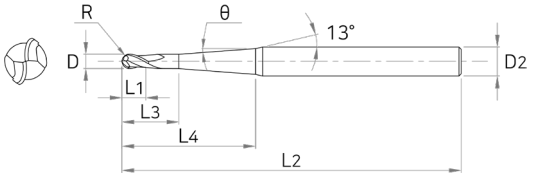
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UB542 | 2 FLUTES TAPERED NECK BALL ENDMILL





■ Tolerance

D		Shank Dia
D0.1 ~ 6	0 ~ -0.012	h5
D8 ~ 12	0 ~ -0.015	

CARBIDE | AlCrN | 2 | 30° HELIX | R ±0.005 R3 OR UNDER | R ±0.01 ABOVE R3 | DATA P.664

EDP No	SIZES (mm)							
	D	R	θ	L1	L3	L4	L2	D2
UB542 00105005	0.1	0.05	0.5	0.1	-	0.5	40	4
UB542 0010501	0.1	0.05	0.5	0.1	-	1	40	4
UB542 00110005	0.1	0.05	1	0.1	-	0.5	40	4
UB542 0011001	0.1	0.05	1	0.1	-	1	40	4
UB542 00115005	0.1	0.05	1.5	0.1	-	0.5	40	4
UB542 0011501	0.1	0.05	1.5	0.1	-	1	40	4
UB542 00120005	0.1	0.05	2	0.1	-	0.5	40	4
UB542 0012001	0.1	0.05	2	0.1	-	1	40	4
UB542 00130005	0.1	0.05	3	0.1	-	0.5	40	4
UB542 0013001	0.1	0.05	3	0.1	-	1	40	4
UB542 0020501	0.2	0.1	0.5	0.2	0.4	1	40	4
UB542 0020502	0.2	0.1	0.5	0.2	0.4	2	40	4
UB542 0020503	0.2	0.1	0.5	0.2	0.4	3	40	4
UB542 0021001	0.2	0.1	1	0.2	0.4	1	40	4
UB542 0021002	0.2	0.1	1	0.2	0.4	2	40	4
UB542 0021003	0.2	0.1	1	0.2	0.4	3	40	4
UB542 0021501	0.2	0.1	1.5	0.2	0.4	1	40	4
UB542 0021502	0.2	0.1	1.5	0.2	0.4	2	40	4
UB542 0021503	0.2	0.1	1.5	0.2	0.4	3	40	4
UB542 0022001	0.2	0.1	2	0.2	0.4	1	40	4
UB542 0022002	0.2	0.1	2	0.2	0.4	2	40	4
UB542 0022003	0.2	0.1	2	0.2	0.4	3	40	4
UB542 0023001	0.2	0.1	3	0.2	0.4	1	40	4
UB542 0023002	0.2	0.1	3	0.2	0.4	2	40	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UB542 | 2 FLUTES TAPERED NECK BALL ENDMILL

EDP No	SIZES (mm)							
	D	R	θ	L1	L3	L4	L2	D2
UB542 0023003	0.2	0.1	3	0.2	0.4	3	40	4
UB542 0025002	0.2	0.1	5	0.2	0.4	2	40	4
UB542 0025003	0.2	0.1	5	0.2	0.4	3	40	4
UB542 0030502	0.3	0.15	0.5	0.3	0.6	2	40	4
UB542 0030503	0.3	0.15	0.5	0.3	0.6	3	40	4
UB542 0030504	0.3	0.15	0.5	0.3	0.6	4	40	4
UB542 0030505	0.3	0.15	0.5	0.3	0.6	5	40	4
UB542 0031002	0.3	0.15	1	0.3	0.6	2	40	4
UB542 0031003	0.3	0.15	1	0.3	0.6	3	40	4
UB542 0031004	0.3	0.15	1	0.3	0.6	4	40	4
UB542 0031005	0.3	0.15	1	0.3	0.6	5	40	4
UB542 0031502	0.3	0.15	1.5	0.3	0.6	2	40	4
UB542 0031503	0.3	0.15	1.5	0.3	0.6	3	40	4
UB542 0031504	0.3	0.15	1.5	0.3	0.6	4	40	4
UB542 0031505	0.3	0.15	1.5	0.3	0.6	5	40	4
UB542 0032002	0.3	0.15	2	0.3	0.6	2	40	4
UB542 0032003	0.3	0.15	2	0.3	0.6	3	40	4
UB542 0032004	0.3	0.15	2	0.3	0.6	4	40	4
UB542 0032005	0.3	0.15	2	0.3	0.6	5	40	4
UB542 0033002	0.3	0.15	3	0.3	0.6	2	40	4
UB542 0033003	0.3	0.15	3	0.3	0.6	3	40	4
UB542 0033004	0.3	0.15	3	0.3	0.6	4	40	4
UB542 0033005	0.3	0.15	3	0.3	0.6	5	40	4
UB542 0035005	0.3	0.15	5	0.3	0.6	5	40	4
UB542 0040502	0.4	0.2	0.5	0.4	0.8	2	50	4
UB542 0040503	0.4	0.2	0.5	0.4	0.8	3	50	4
UB542 0040504	0.4	0.2	0.5	0.4	0.8	4	50	4
UB542 0040505	0.4	0.2	0.5	0.4	0.8	5	50	4
UB542 0040506	0.4	0.2	0.5	0.4	0.8	6	50	4
UB542 0041002	0.4	0.2	1	0.4	0.8	2	50	4
UB542 0041003	0.4	0.2	1	0.4	0.8	3	50	4
UB542 0041004	0.4	0.2	1	0.4	0.8	4	50	4
UB542 0041005	0.4	0.2	1	0.4	0.8	5	50	4
UB542 0041006	0.4	0.2	1	0.4	0.8	6	50	4
UB542 0041502	0.4	0.2	1.5	0.4	0.8	2	50	4
UB542 0041503	0.4	0.2	1.5	0.4	0.8	3	50	4
UB542 0041504	0.4	0.2	1.5	0.4	0.8	4	50	4
UB542 0041505	0.4	0.2	1.5	0.4	0.8	5	50	4
UB542 0041506	0.4	0.2	1.5	0.4	0.8	6	50	4
UB542 0042002	0.4	0.2	2	0.4	0.8	2	50	4
UB542 0042003	0.4	0.2	2	0.4	0.8	3	50	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UB542 | 2 FLUTES TAPERED NECK BALL ENDMILL

EDP No	SIZES (mm)							
	D	R	θ	L1	L3	L4	L2	D2
UB542 0042004	0.4	0.2	2	0.4	0.8	4	50	4
UB542 0042005	0.4	0.2	2	0.4	0.8	5	50	4
UB542 0042006	0.4	0.2	2	0.4	0.8	6	50	4
UB542 0043002	0.4	0.2	3	0.4	0.8	2	50	4
UB542 0043003	0.4	0.2	3	0.4	0.8	3	50	4
UB542 0043004	0.4	0.2	3	0.4	0.8	4	50	4
UB542 0043005	0.4	0.2	3	0.4	0.8	5	50	4
UB542 0043006	0.4	0.2	3	0.4	0.8	6	50	4
UB542 0045004	0.4	0.2	5	0.4	0.8	4	50	4
UB542 0045006	0.4	0.2	5	0.4	0.8	6	50	4
UB542 0050504	0.5	0.25	0.5	0.5	1	4	50	4
UB542 0050506	0.5	0.25	0.5	0.5	1	6	50	4
UB542 0050508	0.5	0.25	0.5	0.5	1	8	50	4
UB542 0050510	0.5	0.25	0.5	0.5	1	10	50	4
UB542 0051004	0.5	0.25	1	0.5	1	4	50	4
UB542 0051006	0.5	0.25	1	0.5	1	6	50	4
UB542 0051008	0.5	0.25	1	0.5	1	8	50	4
UB542 0051010	0.5	0.25	1	0.5	1	10	50	4
UB542 0051504	0.5	0.25	1.5	0.5	1	4	50	4
UB542 0051506	0.5	0.25	1.5	0.5	1	6	50	4
UB542 0051508	0.5	0.25	1.5	0.5	1	8	50	4
UB542 0051510	0.5	0.25	1.5	0.5	1	10	50	4
UB542 0052004	0.5	0.25	2	0.5	1	4	50	4
UB542 0052006	0.5	0.25	2	0.5	1	6	50	4
UB542 0052008	0.5	0.25	2	0.5	1	8	50	4
UB542 0052010	0.5	0.25	2	0.5	1	10	50	4
UB542 0053004	0.5	0.25	3	0.5	1	4	50	4
UB542 0053006	0.5	0.25	3	0.5	1	6	50	4
UB542 0053008	0.5	0.25	3	0.5	1	8	50	4
UB542 0053010	0.5	0.25	3	0.5	1	10	50	4
UB542 0060504	0.6	0.3	0.5	0.6	1.2	4	50	4
UB542 0060506	0.6	0.3	0.5	0.6	1.2	6	50	4
UB542 0060508	0.6	0.3	0.5	0.6	1.2	8	50	4
UB542 0060510	0.6	0.3	0.5	0.6	1.2	10	50	4
UB542 0060512	0.6	0.3	0.5	0.6	1.2	12	50	4
UB542 0061004	0.6	0.3	1	0.6	1.2	4	50	4
UB542 0061006	0.6	0.3	1	0.6	1.2	6	50	4
UB542 0061008	0.6	0.3	1	0.6	1.2	8	50	4
UB542 0061010	0.6	0.3	1	0.6	1.2	10	50	4
UB542 0061012	0.6	0.3	1	0.6	1.2	12	50	4
UB542 0061504	0.6	0.3	1.5	0.6	1.2	4	50	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UB542 | 2 FLUTES TAPERED NECK BALL ENDMILL

EDP No	SIZES (mm)							
	D	R	θ	L1	L3	L4	L2	D2
UB542 0061506	0.6	0.3	1.5	0.6	1.2	6	50	4
UB542 0061508	0.6	0.3	1.5	0.6	1.2	8	50	4
UB542 0061510	0.6	0.3	1.5	0.6	1.2	10	50	4
UB542 0061512	0.6	0.3	1.5	0.6	1.2	12	50	4
UB542 0062004	0.6	0.3	2	0.6	1.2	4	50	4
UB542 0062006	0.6	0.3	2	0.6	1.2	6	50	4
UB542 0062008	0.6	0.3	2	0.6	1.2	8	50	4
UB542 0062010	0.6	0.3	2	0.6	1.2	10	50	4
UB542 0062012	0.6	0.3	2	0.6	1.2	12	50	4
UB542 0063004	0.6	0.3	3	0.6	1.2	4	50	4
UB542 0063006	0.6	0.3	3	0.6	1.2	6	50	4
UB542 0063008	0.6	0.3	3	0.6	1.2	8	50	4
UB542 0063010	0.6	0.3	3	0.6	1.2	10	50	4
UB542 0063012	0.6	0.3	3	0.6	1.2	12	50	4
UB542 0080504	0.8	0.4	0.5	0.8	1.6	4	50	4
UB542 0080506	0.8	0.4	0.5	0.8	1.6	6	50	4
UB542 0080508	0.8	0.4	0.5	0.8	1.6	8	50	4
UB542 0080510	0.8	0.4	0.5	0.8	1.6	10	50	4
UB542 0080512	0.8	0.4	0.5	0.8	1.6	12	50	4
UB542 0080516	0.8	0.4	0.5	0.8	1.6	16	50	4
UB542 0081004	0.8	0.4	1	0.8	1.6	4	50	4
UB542 0081006	0.8	0.4	1	0.8	1.6	6	50	4
UB542 0081008	0.8	0.4	1	0.8	1.6	8	50	4
UB542 0081010	0.8	0.4	1	0.8	1.6	10	50	4
UB542 0081012	0.8	0.4	1	0.8	1.6	12	50	4
UB542 0081016	0.8	0.4	1	0.8	1.6	16	50	4
UB542 0081504	0.8	0.4	1.5	0.8	1.6	4	50	4
UB542 0081506	0.8	0.4	1.5	0.8	1.6	6	50	4
UB542 0081508	0.8	0.4	1.5	0.8	1.6	8	50	4
UB542 0081510	0.8	0.4	1.5	0.8	1.6	10	50	4
UB542 0081512	0.8	0.4	1.5	0.8	1.6	12	50	4
UB542 0081516	0.8	0.4	1.5	0.8	1.6	16	50	4
UB542 0082004	0.8	0.4	2	0.8	1.6	4	50	4
UB542 0082006	0.8	0.4	2	0.8	1.6	6	50	4
UB542 0082008	0.8	0.4	2	0.8	1.6	8	50	4
UB542 0082010	0.8	0.4	2	0.8	1.6	10	50	4
UB542 0082012	0.8	0.4	2	0.8	1.6	12	50	4
UB542 0082016	0.8	0.4	2	0.8	1.6	16	50	4
UB542 0083004	0.8	0.4	3	0.8	1.6	4	50	4
UB542 0083006	0.8	0.4	3	0.8	1.6	6	50	4
UB542 0083008	0.8	0.4	3	0.8	1.6	8	50	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UB542 | 2 FLUTES TAPERED NECK BALL ENDMILL

EDP No	SIZES (mm)							
	D	R	θ	L1	L3	L4	L2	D2
UB542 0083010	0.8	0.4	3	0.8	1.6	10	50	4
UB542 0083012	0.8	0.4	3	0.8	1.6	12	50	4
UB542 0083016	0.8	0.4	3	0.8	1.6	16	50	4
UB542 0100506	1	0.5	0.5	1	2.5	6	50	4
UB542 0100508	1	0.5	0.5	1	2.5	8	50	4
UB542 0100510	1	0.5	0.5	1	2.5	10	50	4
UB542 0100512	1	0.5	0.5	1	2.5	12	50	4
UB542 0100516	1	0.5	0.5	1	2.5	16	50	4
UB542 0100520	1	0.5	0.5	1	2.5	20	50	4
UB542 0100525	1	0.5	0.5	1	2.5	25	60	4
UB542 0100530	1	0.5	0.5	1	2.5	30	70	4
UB542 0100540	1	0.5	0.5	1	2.5	40	80	4
UB542 0100550	1	0.5	0.5	1	2.5	50	90	4
UB542 0101006	1	0.5	1	1	2.5	6	50	4
UB542 0101008	1	0.5	1	1	2.5	8	50	4
UB542 0101010	1	0.5	1	1	2.5	10	50	4
UB542 0101012	1	0.5	1	1	2.5	12	50	4
UB542 0101016	1	0.5	1	1	2.5	16	50	4
UB542 0101020	1	0.5	1	1	2.5	20	50	4
UB542 0101025	1	0.5	1	1	2.5	25	60	4
UB542 0101030	1	0.5	1	1	2.5	30	70	4
UB542 0101040	1	0.5	1	1	2.5	40	80	4
UB542 0101050	1	0.5	1	1	2.5	50	90	4
UB542 0101506	1	0.5	1.5	1	2.5	6	50	4
UB542 0101508	1	0.5	1.5	1	2.5	8	50	4
UB542 0101510	1	0.5	1.5	1	2.5	10	50	4
UB542 0101512	1	0.5	1.5	1	2.5	12	50	4
UB542 0101516	1	0.5	1.5	1	2.5	16	50	4
UB542 0101520	1	0.5	1.5	1	2.5	20	50	4
UB542 0101525	1	0.5	1.5	1	2.5	25	60	4
UB542 0101530	1	0.5	1.5	1	2.5	30	70	4
UB542 0101540	1	0.5	1.5	1	2.5	40	80	4
UB542 0101550	1	0.5	1.5	1	2.5	50	90	4
UB542 0102006	1	0.5	2	1	2.5	6	50	4
UB542 0102008	1	0.5	2	1	2.5	8	50	4
UB542 0102010	1	0.5	2	1	2.5	10	50	4
UB542 0102030	1	0.5	2	1	2.5	30	70	4
UB542 0102040	1	0.5	2	1	2.5	40	80	4
UB542 0102050	1	0.5	2	1	2.5	50	90	6
UB542 0103006	1	0.5	3	1	2.5	6	50	4
UB542 0102030	1	0.5	2	1	2.5	30	70	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UB542 | 2 FLUTES TAPERED NECK BALL ENDMILL

EDP No	SIZES (mm)							
	D	R	θ	L1	L3	L4	L2	D2
UB542 0102040	1	0.5	2	1	2.5	40	80	4
UB542 0102050	1	0.5	2	1	2.5	50	90	6
UB542 0103006	1	0.5	3	1	2.5	6	50	4
UB542 0103008	1	0.5	3	1	2.5	8	50	4
UB542 0103010	1	0.5	3	1	2.5	10	50	4
UB542 0103012	1	0.5	3	1	2.5	12	50	4
UB542 0103016	1	0.5	3	1	2.5	16	50	4
UB542 0103020	1	0.5	3	1	2.5	20	50	4
UB542 0103025	1	0.5	3	1	2.5	25	60	4
UB542 0103030	1	0.5	3	1	2.5	30	70	6
UB542 0103040	1	0.5	3	1	2.5	40	80	6
UB542 0103050	1	0.5	3	1	2.5	50	90	6
UB542 0105030	1	0.5	5	1	2.5	30	70	6
UB542 0120508	1.2	0.6	0.5	1.2	3	8	50	4
UB542 0120512	1.2	0.6	0.5	1.2	3	12	50	4
UB542 0120516	1.2	0.6	0.5	1.2	3	16	50	4
UB542 0120520	1.2	0.6	0.5	1.2	3	20	50	4
UB542 0120525	1.2	0.6	0.5	1.2	3	25	60	4
UB542 0120530	1.2	0.6	0.5	1.2	3	30	70	4
UB542 0121008	1.2	0.6	1	1.2	3	8	50	4
UB542 0121012	1.2	0.6	1	1.2	3	12	50	4
UB542 0121016	1.2	0.6	1	1.2	3	16	50	4
UB542 0121020	1.2	0.6	1	1.2	3	20	50	4
UB542 0121025	1.2	0.6	1	1.2	3	25	60	4
UB542 0121030	1.2	0.6	1	1.2	3	30	70	4
UB542 0121508	1.2	0.6	1.5	1.2	3	8	50	4
UB542 0121512	1.2	0.6	1.5	1.2	3	12	50	4
UB542 0121516	1.2	0.6	1.5	1.2	3	16	50	4
UB542 0121520	1.2	0.6	1.5	1.2	3	20	50	4
UB542 0121525	1.2	0.6	1.5	1.2	3	25	60	4
UB542 0121530	1.2	0.6	1.5	1.2	3	30	70	4
UB542 0122008	1.2	0.6	2	1.2	3	8	50	4
UB542 0122012	1.2	0.6	2	1.2	3	12	50	4
UB542 0122016	1.2	0.6	2	1.2	3	16	50	4
UB542 0122020	1.2	0.6	2	1.2	3	20	50	4
UB542 0122025	1.2	0.6	2	1.2	3	25	60	4
UB542 0122030	1.2	0.6	2	1.2	3	30	70	4
UB542 0123008	1.2	0.6	3	1.2	3	8	50	4
UB542 0123012	1.2	0.6	3	1.2	3	12	50	4
UB542 0123016	1.2	0.6	3	1.2	3	16	50	4
UB542 0123020	1.2	0.6	3	1.2	3	20	50	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UB542 | 2 FLUTES TAPERED NECK BALL ENDMILL

EDP No	SIZES (mm)							
	D	R	θ	L1	L3	L4	L2	D2
UB542 0123025	1.2	0.6	3	1.2	3	25	60	4
UB542 0123030	1.2	0.6	5	1.2	3	30	70	6
UB542 0150508	1.5	0.75	0.5	1.5	4	8	50	4
UB542 0150510	1.5	0.75	0.5	1.5	4	10	50	4
UB542 0150512	1.5	0.75	0.5	1.5	4	12	50	4
UB542 0150516	1.5	0.75	0.5	1.5	4	16	50	4
UB542 0150520	1.5	0.75	0.5	1.5	4	20	50	4
UB542 0150525	1.5	0.75	0.5	1.5	4	25	60	4
UB542 0150530	1.5	0.75	0.5	1.5	4	30	70	4
UB542 0150540	1.5	0.75	0.5	1.5	4	40	80	4
UB542 0150550	1.5	0.75	0.5	1.5	4	50	90	4
UB542 0151008	1.5	0.75	1	1.5	4	8	50	4
UB542 0151010	1.5	0.75	1	1.5	4	10	50	4
UB542 0151012	1.5	0.75	1	1.5	4	12	50	4
UB542 0151016	1.5	0.75	1	1.5	4	16	50	4
UB542 0151020	1.5	0.75	1	1.5	4	20	50	4
UB542 0151025	1.5	0.75	1	1.5	4	25	60	4
UB542 0151030	1.5	0.75	1	1.5	4	30	70	4
UB542 0151040	1.5	0.75	1	1.5	4	40	80	4
UB542 0151050	1.5	0.75	1	1.5	4	50	90	4
UB542 0151508	1.5	0.75	1.5	1.5	4	8	50	4
UB542 0151510	1.5	0.75	1.5	1.5	4	10	50	4
UB542 0151512	1.5	0.75	1.5	1.5	4	12	50	4
UB542 0151516	1.5	0.75	1.5	1.5	4	16	50	4
UB542 0151520	1.5	0.75	1.5	1.5	4	20	50	4
UB542 0151525	1.5	0.75	1.5	1.5	4	25	60	4
UB542 0151530	1.5	0.75	1.5	1.5	4	30	70	4
UB542 0151540	1.5	0.75	1.5	1.5	4	40	80	4
UB542 0151550	1.5	0.75	1.5	1.5	4	50	90	4
UB542 0121016	1.2	0.6	1	1.2	3	16	50	4
UB542 0121020	1.2	0.6	1	1.2	3	20	50	4
UB542 0121025	1.2	0.6	1	1.2	3	25	60	4
UB542 0121030	1.2	0.6	1	1.2	3	30	70	4
UB542 0121508	1.2	0.6	1.5	1.2	3	8	50	4
UB542 0121512	1.2	0.6	1.5	1.2	3	12	50	4
UB542 0121516	1.2	0.6	1.5	1.2	3	16	50	4
UB542 0121520	1.2	0.6	1.5	1.2	3	20	50	4
UB542 0121525	1.2	0.6	1.5	1.2	3	25	60	4
UB542 0121530	1.2	0.6	1.5	1.2	3	30	70	4
UB542 0122008	1.2	0.6	2	1.2	3	8	50	4
UB542 0122012	1.2	0.6	2	1.2	3	12	50	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UB542 | 2 FLUTES TAPERED NECK BALL ENDMILL

EDP No	SIZES (mm)							
	D	R	θ	L1	L3	L4	L2	D2
UB542 0122016	1.2	0.6	2	1.2	3	16	50	4
UB542 0122020	1.2	0.6	2	1.2	3	20	50	4
UB542 0122025	1.2	0.6	2	1.2	3	25	60	4
UB542 0122030	1.2	0.6	2	1.2	3	30	70	4
UB542 0123008	1.2	0.6	3	1.2	3	8	50	4
UB542 0123012	1.2	0.6	3	1.2	3	12	50	4
UB542 0123016	1.2	0.6	3	1.2	3	16	50	4
UB542 0123020	1.2	0.6	3	1.2	3	20	50	4
UB542 0123025	1.2	0.6	3	1.2	3	25	60	4
UB542 0123030	1.2	0.6	5	1.2	3	30	70	6
UB542 0150508	1.5	0.75	0.5	1.5	4	8	50	4
UB542 0150510	1.5	0.75	0.5	1.5	4	10	50	4
UB542 0150512	1.5	0.75	0.5	1.5	4	12	50	4
UB542 0150516	1.5	0.75	0.5	1.5	4	16	50	4
UB542 0150520	1.5	0.75	0.5	1.5	4	20	50	4
UB542 0150525	1.5	0.75	0.5	1.5	4	25	60	4
UB542 0150530	1.5	0.75	0.5	1.5	4	30	70	4
UB542 0150540	1.5	0.75	0.5	1.5	4	40	80	4
UB542 0150550	1.5	0.75	0.5	1.5	4	50	90	4
UB542 0151008	1.5	0.75	1	1.5	4	8	50	4
UB542 0151010	1.5	0.75	1	1.5	4	10	50	4
UB542 0151012	1.5	0.75	1	1.5	4	12	50	4
UB542 0151016	1.5	0.75	1	1.5	4	16	50	4
UB542 0151020	1.5	0.75	1	1.5	4	20	50	4
UB542 0151025	1.5	0.75	1	1.5	4	25	60	4
UB542 0151030	1.5	0.75	1	1.5	4	30	70	4
UB542 0151040	1.5	0.75	1	1.5	4	40	80	4
UB542 0151050	1.5	0.75	1	1.5	4	50	90	4
UB542 0151508	1.5	0.75	1.5	1.5	4	8	50	4
UB542 0151510	1.5	0.75	1.5	1.5	4	10	50	4
UB542 0151512	1.5	0.75	1.5	1.5	4	12	50	4
UB542 0151516	1.5	0.75	1.5	1.5	4	16	50	4
UB542 0151520	1.5	0.75	1.5	1.5	4	20	50	4
UB542 0151525	1.5	0.75	1.5	1.5	4	25	60	4
UB542 0151530	1.5	0.75	1.5	1.5	4	30	70	4
UB542 0151540	1.5	0.75	1.5	1.5	4	40	80	4
UB542 0151550	1.5	0.75	1.5	1.5	4	50	90	4
UB542 0152008	1.5	0.75	2	1.5	4	8	50	4
UB542 0152010	1.5	0.75	2	1.5	4	10	50	4
UB542 0152012	1.5	0.75	2	1.5	4	12	50	4
UB542 0152016	1.5	0.75	2	1.5	4	16	50	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UB542 | 2 FLUTES TAPERED NECK BALL ENDMILL

EDP No	SIZES (mm)							
	D	R	θ	L1	L3	L4	L2	D2
UB542 0152020	1.5	0.75	2	1.5	4	20	50	4
UB542 0152025	1.5	0.75	2	1.5	4	25	60	4
UB542 0152030	1.5	0.75	2	1.5	4	30	70	4
UB542 0152040	1.5	0.75	2	1.5	4	40	80	6
UB542 0152050	1.5	0.75	2	1.5	4	50	90	6
UB542 0153020	1.5	0.75	3	1.5	4	20	50	6
UB542 0153030	1.5	0.75	3	1.5	4	30	70	6
UB542 0153040	1.5	0.75	3	1.5	4	40	80	6
UB542 0153050	1.5	0.75	3	1.5	4	50	90	8
UB542 0155030	1.5	0.75	5	1.5	4	30	70	8
UB542 0200510	2	1	0.5	2	5	10	50	4
UB542 0200512	2	1	0.5	2	5	12	50	4
UB542 0200516	2	1	0.5	2	5	16	50	4
UB542 0200520	2	1	0.5	2	5	20	50	4
UB542 0200525	2	1	0.5	2	5	25	60	4
UB542 0200530	2	1	0.5	2	5	30	70	4
UB542 0200540	2	1	0.5	2	5	40	80	4
UB542 0200550	2	1	0.5	2	5	50	100	6
UB542 0200560	2	1	0.5	2	5	60	100	6
UB542 0200580	2	1	0.5	2	5	80	140	6
UB542 0201010	2	1	1	2	5	10	50	4
UB542 0201012	2	1	1	2	5	12	50	4
UB542 0201016	2	1	1	2	5	16	50	4
UB542 0201020	2	1	1	2	5	20	50	4
UB542 0201025	2	1	1	2	5	25	60	4
UB542 0201030	2	1	1	2	5	30	70	4
UB542 0201040	2	1	1	2	5	40	80	6
UB542 0201050	2	1	1	2	5	50	100	6
UB542 0201060	2	1	1	2	5	60	100	6
UB542 0201080	2	1	1	2	5	80	140	6
UB542 0201510	2	1	1.5	2	5	10	50	4
UB542 0201512	2	1	1.5	2	5	12	50	4
UB542 0201516	2	1	1.5	2	5	16	50	4
UB542 0201520	2	1	1.5	2	5	20	50	4
UB542 0201525	2	1	1.5	2	5	25	60	4
UB542 0201530	2	1	1.5	2	5	30	70	6
UB542 0201540	2	1	1.5	2	5	40	80	6
UB542 0201550	2	1	1.5	2	5	50	100	6
UB542 0201560	2	1	1.5	2	5	60	100	6
UB542 0201580	2	1	1.5	2	5	80	140	6
UB542 0202010	2	1	2	2	5	10	50	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UB542 | 2 FLUTES TAPERED NECK BALL ENDMILL

EDP No	SIZES (mm)							
	D	R	θ	L1	L3	L4	L2	D2
UB542 0202012	2	1	2	2	5	12	50	4
UB542 0202016	2	1	2	2	5	16	50	4
UB542 0202020	2	1	2	2	5	20	55	4
UB542 0202025	2	1	2	2	5	25	60	4
UB542 0202030	2	1	2	2	5	30	70	4
UB542 0202040	2	1	2	2	5	40	80	6
UB542 0202050	2	1	2	2	5	50	90	6
UB542 0202060	2	1	2	2	5	60	100	6
UB542 0202080	2	1	2	2	5	80	140	8
UB542 0203030	2	1	3	2	5	30	70	6
UB542 0203040	2	1	3	2	5	40	80	6
UB542 0203050	2	1	3	2	5	50	90	8
UB542 0203060	2	1	3	2	5	60	100	8
UB542 0203080	2	1	3	2	5	80	140	10
UB542 0205030	2	1	5	2	5	30	70	8
UB542 0205040	2	1	5	2	5	40	90	10
UB542 0300516	3	1.5	0.5	4.5	6	16	60	6
UB542 0300520	3	1.5	0.5	4.5	6	20	65	6
UB542 0300530	3	1.5	0.5	4.5	6	30	70	6
UB542 0300540	3	1.5	0.5	4.5	6	40	80	6
UB542 0300550	3	1.5	0.5	4.5	6	50	90	6
UB542 0300560	3	1.5	0.5	4.5	6	60	100	6
UB542 0301016	3	1.5	1	4.5	6	16	60	6
UB542 0301020	3	1.5	1	4.5	6	20	65	6
UB542 0301030	3	1.5	1	4.5	6	30	70	6
UB542 0301040	3	1.5	1	4.5	6	40	80	6
UB542 0301050	3	1.5	1	4.5	6	50	90	6
UB542 0301060	3	1.5	1	4.5	6	60	100	6
UB542 0301070	3	1.5	1	4.5	6	70	120	6
UB542 0301516	3	1.5	1.5	4.5	6	16	60	6
UB542 0301520	3	1.5	1.5	4.5	6	20	65	6
UB542 0301530	3	1.5	1.5	4.5	6	30	70	6
UB542 0301540	3	1.5	1.5	4.5	6	40	80	6
UB542 0301550	3	1.5	1.5	4.5	6	50	90	6
UB542 0301560	3	1.5	1.5	4.5	6	60	100	6
UB542 0302016	3	1.5	2	4.5	6	16	60	6
UB542 0302020	3	1.5	2	4.5	6	20	65	6
UB542 0302030	3	1.5	2	4.5	6	30	70	6
UB542 0302040	3	1.5	2	4.5	6	40	80	6
UB542 0302050	3	1.5	2	4.5	6	50	90	8
UB542 0303030	3	1.5	3	4.5	6	30	70	6

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UB542 | 2 FLUTES TAPERED NECK BALL ENDMILL

EDP No	SIZES (mm)							
	D	R	θ	L1	L3	L4	L2	D2
UB542 0303040	3	1.5	3	4.5	6	40	90	8
UB542 0305030	3	1.5	5	4.5	6	30	70	8
UB542 0305040	3	1.5	5	4.5	6	40	90	10
UB542 0400540	4	2	0.5	6	8	40	90	6
UB542 0400550	4	2	0.5	6	8	50	100	6
UB542 0400560	4	2	0.5	6	8	60	110	6
UB542 0400570	4	2	0.5	6	8	70	120	6
UB542 0401040	4	2	1	6	8	40	90	6
UB542 0401050	4	2	1	6	8	50	100	6
UB542 0401060	4	2	1	6	8	60	110	8
UB542 0401070	4	2	1	6	8	70	120	8
UB542 0401540	4	2	1.5	6	8	40	90	6
UB542 0401550	4	2	1.5	6	8	50	100	8
UB542 0401560	4	2	1.5	6	8	60	110	8
UB542 0401570	4	2	1.5	6	8	70	120	8
UB542 0403050	4	2	3	6	8	50	100	10
UB542 0405050	4	2	5	6	8	50	100	12
UB542 0501060	5	2.5	1	10	13	60	120	8
UB542 0501560	5	2.5	1.5	10	13	60	120	8
UB542 0503040	5	2.5	3	10	13	40	120	8
UB542 0601060	6	3	1	12	15	60	120	8
UB542 0601090	6	3	1	12	15	90	150	10
UB542 0601560	6	3	1.5	12	15	60	120	10
UB542 0601590	6	3	1.5	12	15	90	150	10
UB542 0602060	6	3	2	12	15	60	120	10
UB542 0602090	6	3	2	12	15	90	150	12
UB542 0603060	6	3	3	12	15	60	120	12
UB542 0603090	6	3	3	12	15	90	150	14
UB542 08010100	8	4	1	14	18	100	150	12
UB542 0801070	8	4	1	14	18	70	130	10
UB542 08015100	8	4	1.5	14	18	100	150	14
UB542 0801570	8	4	1.5	14	18	70	130	12
UB542 08020100	8	4	2	14	18	100	150	14
UB542 0802070	8	4	2	14	18	70	130	12
UB542 08030100	8	4	3	14	18	100	150	18
UB542 0803070	8	4	3	14	18	70	130	14
UB542 10010100	10	5	1	18	22	100	200	14
UB542 1001070	10	5	1	18	22	70	130	12
UB542 1001080	10	5	1	18	22	80	150	14
UB542 10015100	10	5	1.5	18	22	100	200	16
UB542 1001570	10	5	1.5	18	22	70	130	14

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UB542 | 2 FLUTES TAPERED NECK BALL ENDMILL

EDP No	SIZES (mm)							
	D	R	θ	L1	L3	L4	L2	D2
UB542 1001580	10	5	1.5	18	22	80	150	14
UB542 10020100	10	5	2	18	22	100	200	16
UB542 1002070	10	5	2	18	22	70	130	14
UB542 1002080	10	5	2	18	22	80	150	16
UB542 10030100	10	5	3	18	22	100	200	20
UB542 1003070	10	5	3	18	22	70	130	16
UB542 1003080	10	5	3	18	22	80	150	18
UB542 12010100	12	6	1	22	25	100	200	16
UB542 1201060	12	6	1	22	25	60	130	14
UB542 1201080	12	6	1	22	25	80	150	14
UB542 1201090	12	6	1	22	25	90	180	16
UB542 12015100	12	6	1.5	22	25	100	200	16
UB542 1201560	12	6	1.5	22	25	60	130	14
UB542 1201580	12	6	1.5	22	25	80	150	16
UB542 1201590	12	6	1.5	22	25	90	180	16
UB542 12020100	12	6	2	22	25	100	200	18
UB542 1202060	12	6	2	22	25	60	130	16
UB542 1202080	12	6	2	22	25	80	150	16
UB542 1202090	12	6	2	22	25	90	180	18
UB542 12030100	12	6	3	22	25	100	200	20
UB542 1203060	12	6	3	22	25	60	130	16
UB542 1203080	12	6	3	22	25	80	150	18
UB542 1203090	12	6	3	22	25	90	180	20

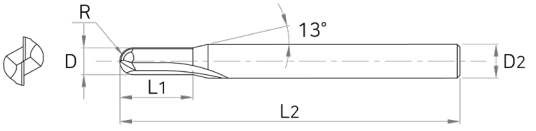
■ Applicable Working Material

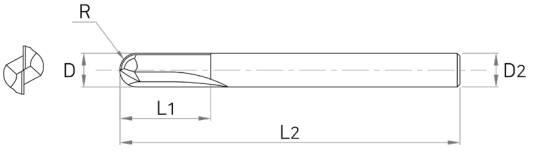
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

USB502 | 2 FLUTES STRAIGHT BALL ENDMILL







■ Tolerance

D		Shank Dia
D3 ~ 6	0 ~ -0.012	h5
D8 ~ 20	0 ~ -0.015	

CARBIDE | AlCrN | 2 | 0° HELIX | R ±0.005 R3 OR UNDER | R ±0.01 ABOVE R3 | DATA P.665

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
USB502 030	3	1.5	10	70	6
USB502 040	4	2	12	70	6
USB502 050	5	2.5	18	90	6
USB502 060	6	3	20	90	6
USB502 080	8	4	25	100	8
USB502 100	10	5	30	100	10
USB502 120	12	6	32	110	12
USB502 160	16	8	35	150	16
USB502 200	20	10	40	150	20

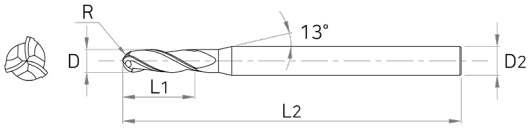
■ Applicable Working Material

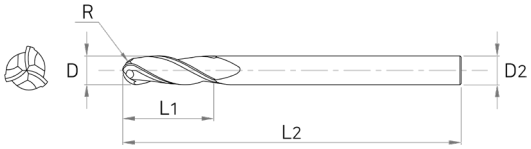
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UB503 | 3 FLUTES BALL ENDMILL







■ Tolerance

D		Shank Dia
D1 ~ 12	0 ~ -0.02	h5

CARBIDE | AlCrN | 3 | 30° HELIX | R ±0.005 R3 OR UNDER | R ±0.01 ABOVE R3 | DATA P.665

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
UB503 010	1	0.5	1	50	6
UB503 015	1.5	0.75	1.5	50	6
UB503 020	2	1	2	50	6
UB503 030	3	1.5	3	60	6
UB503 040	4	2	4	70	6
UB503 050	5	2.5	5	80	6
UB503 060	6	3	6	90	6
UB503 080	8	4	8	100	8
UB503 100	10	5	10	100	10
UB503 120	12	6	12	110	12

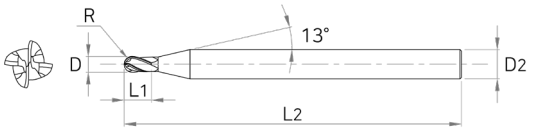
■ Applicable Working Material

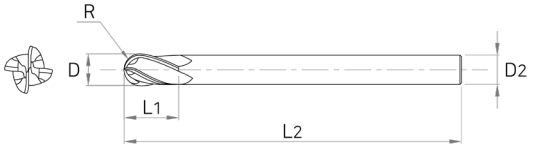
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UB504 | 4 FLUTES BALL ENDMILL







■ Tolerance

D		Shank Dia
D1 ~ 12	0 ~ -0.02	h5

CARBIDE | AlCrN | 4 | 30° HELIX | R ±0.005 R3 OR UNDER | R ±0.01 ABOVE R3 | DATA P.666

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
UB504 010	1	0.5	1	50	6
UB504 015	1.5	0.75	1.5	50	6
UB504 020	2	1	2	50	6
UB504 030	3	1.5	3	60	6
UB504 040	4	2	4	70	6
UB504 050	5	2.5	5	80	6
UB504 060	6	3	6	90	6
UB504 080	8	4	8	100	8
UB504 100	10	5	10	100	10
UB504 120	12	6	12	110	12

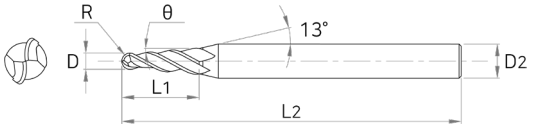
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UTB502 | 2 FLUTES TAPERED BALL ENDMILL





■ Tolerance

D		Shank Dia
D0.3 ~ 2	0 ~ -0.03	h5

CARBIDE | AlCrN | 2 | 30° HELIX | R ±0.01 | DATA P.666

EDP No	SIZES (mm)					
	D	R	θ	L1	L2	D2
UTB502 00305	0.3	0.15	5	1.2	40	4
UTB502 00303	0.3	0.15	3	1.2	40	4
UTB502 00302	0.3	0.15	2	1.2	40	4
UTB502 003015	0.3	0.15	1.5	1.2	40	4
UTB502 00301	0.3	0.15	1	1.2	40	4
UTB502 003005	0.3	0.15	0.5	1.2	40	4
UTB502 00310	0.3	0.15	10	1.5	40	4
UTB502 00307	0.3	0.15	7	1.5	40	4
UTB502 00405	0.4	0.2	5	1.6	40	4
UTB502 00403	0.4	0.2	3	1.6	40	4
UTB502 00402	0.4	0.2	2	1.6	40	4
UTB502 004015	0.4	0.2	1.5	1.6	40	4
UTB502 00401	0.4	0.2	1	1.6	40	4
UTB502 004005	0.4	0.2	0.5	1.6	40	4
UTB502 00410	0.4	0.2	10	2	40	4
UTB502 00407	0.4	0.2	7	2	40	4
UTB502 00505	0.5	0.25	5	2	45	4
UTB502 00503	0.5	0.25	3	2	45	4
UTB502 00502	0.5	0.25	2	2	45	4
UTB502 005015	0.5	0.25	1.5	2	45	4
UTB502 00501	0.5	0.25	1	2	45	4
UTB502 005005	0.5	0.25	0.5	2	45	4
UTB502 00510	0.5	0.25	10	2.5	45	4
UTB502 00507	0.5	0.25	7	2.5	45	4

EDP No	SIZES (mm)					
	D	R	θ	L1	L2	D2
UTB502 00605	0.6	0.3	5	2	45	4
UTB502 00603	0.6	0.3	3	2	45	4
UTB502 00602	0.6	0.3	2	2	45	4
UTB502 006015	0.6	0.3	1.5	2	45	4
UTB502 00601	0.6	0.3	1	2	45	4
UTB502 006005	0.6	0.3	0.5	2	45	4
UTB502 00610	0.6	0.3	10	2.5	45	4
UTB502 00607	0.6	0.3	7	2.5	45	4
UTB502 00705	0.7	0.35	5	2.5	45	4
UTB502 00703	0.7	0.35	3	2.5	45	4
UTB502 00702	0.7	0.35	2	2.5	45	4
UTB502 007015	0.7	0.35	1.5	2.5	45	4
UTB502 00701	0.7	0.35	1	2.5	45	4
UTB502 007005	0.7	0.35	0.5	2.5	45	4
UTB502 00710	0.7	0.35	10	3	45	4
UTB502 00707	0.7	0.35	7	3	45	4
UTB502 00810	0.8	0.4	10	3.2	45	4
UTB502 00807	0.8	0.4	7	3.2	45	4
UTB502 00805	0.8	0.4	5	3.2	45	4
UTB502 00803	0.8	0.4	3	3.2	45	4
UTB502 00802	0.8	0.4	2	3.2	45	4
UTB502 008015	0.8	0.4	1.5	3.2	45	4
UTB502 00801	0.8	0.4	1	3.2	45	4
UTB502 008005	0.8	0.4	0.5	3.2	45	4

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UTB502 | 2 FLUTES TAPERED BALL ENDMILL

EDP No	SIZES (mm)					
	D	R	θ	L1	L2	D2
UTB502 01010	1	0.5	10	4	50	4
UTB502 01007	1	0.5	7	4	50	4
UTB502 01005	1	0.5	5	4	50	4
UTB502 01003	1	0.5	3	4	50	4
UTB502 01002	1	0.5	2	4	50	4
UTB502 010015	1	0.5	1.5	4	50	4
UTB502 01001	1	0.5	1	4	50	4
UTB502 010005	1	0.5	0.5	4	50	4
UTB502 015015	1.5	0.75	1.5	6	50	4
UTB502 01501	1.5	0.75	1	6	50	4
UTB502 015005	1.5	0.75	0.5	6	50	4
UTB502 01502	1.5	0.75	2	7	50	4

EDP No	SIZES (mm)					
	D	R	θ	L1	L2	D2
UTB502 01503	1.5	0.75	3	8	50	4
UTB502 01510	1.5	0.75	10	10	50	6
UTB502 01507	1.5	0.75	7	10	50	4
UTB502 01505	1.5	0.75	5	10	50	4
UTB502 020015	2	1	1.5	6	50	4
UTB502 02001	2	1	1	6	50	4
UTB502 020005	2	1	0.5	6	50	4
UTB502 02007	2	1	7	10	50	6
UTB502 02005	2	1	5	10	50	4
UTB502 02003	2	1	3	10	50	4
UTB502 02002	2	1	2	10	50	4
UTB502 02010	2	1	10	11	50	6

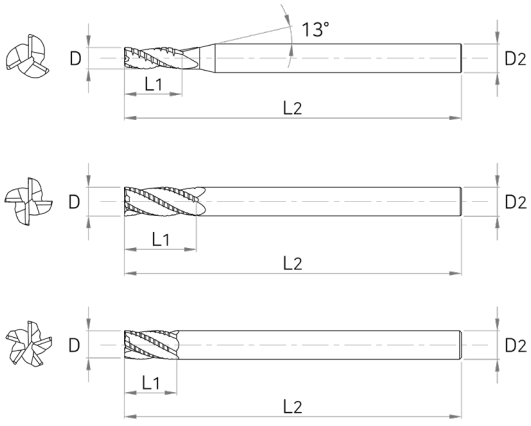
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

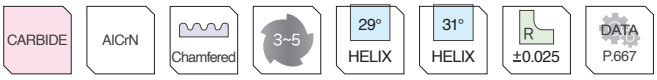
UF50 | 3~5 FLUTES CHAMFER PITCH ROUGHING ENDMILL





■ Tolerance

D		Shank Dia
D3 ~ 25	0 ~ -0.05	h5



EDP No	SIZES (mm)					
	D	R	L1	L2	D2	Z
UF50 3030	3	0.2	8	50	6	3
UF50 3040	4	0.2	10	50	6	3
UF50 4050	5	0.2	13	50	6	4
UF50 4060	6	0.2	10	50	6	4
UF50 406015	6	0.2	15	60	6	4
UF50 4070	7	0.2	18	70	8	4
UF50 4080	8	0.2	12	60	8	4
UF50 408020	8	0.2	20	70	8	4
UF50 4090	9	0.3	22	75	10	4
UF50 4100	10	0.3	15	65	10	4
UF50 410025	10	0.3	25	75	10	4
UF50 4110	11	0.3	27	80	12	4
UF50 4120	12	0.3	20	70	12	4
UF50 412030	12	0.3	30	80	12	4
UF50 5130	13	0.5	35	100	12	5
UF50 5140S16	14	0.5	35	100	16	5
UF50 5140	14	0.5	35	100	14	5
UF50 5150	15	0.5	35	100	16	5
UF50 5160	16	1	25	80	16	5
UF50 516040	16	1	40	100	16	5
UF50 5180S20	18	1	40	100	20	5
UF50 5180	18	1	40	100	18	5
UF50 5200	20	1	25	80	20	5
UF50 520045	20	1	45	100	20	5
UF50 5250	25	1	45	100	25	5

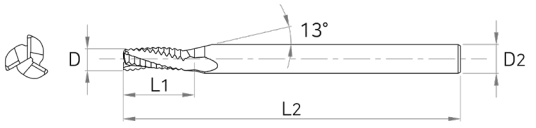
■ Applicable Working Material

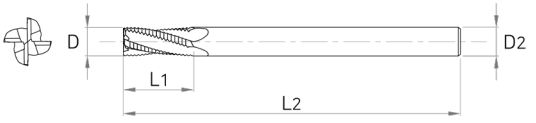
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UF51 | 3~5 FLUTES PINE PITCH ROUGHING ENDMILL







■ Tolerance

D		Shank Dia
D3	0 ~ -0.04	h5
D4 ~ 6	0 ~ -0.048	
D7 ~ 10	0 ~ -0.058	
D11 ~ 18	0 ~ -0.07	
D20 ~ 25	0 ~ -0.084	

CARBIDE | AlCrN | FINE | 3~5 | 20° HELIX | DATA P.667

EDP No	SIZES (mm)				
	D	L1	L2	D2	Z
UF51 3030	3	8	50	6	3
UF51 3040	4	10	50	6	3
UF51 3050	5	13	50	6	3
UF51 3060	6	15	60	6	3
UF51 306020	6	20	60	6	3
UF51 3070	7	18	70	8	3
UF51 3080	8	20	70	8	3
UF51 308025	8	25	70	8	3
UF51 4090	9	22	75	10	4
UF51 4100	10	25	75	10	4
UF51 410030	10	30	75	10	4
UF51 4110	11	27	80	12	4
UF51 4120	12	30	80	12	4
UF51 412035	12	35	80	12	4
UF51 4130	13	35	100	12	4
UF51 4140	14	35	100	16	4
UF51 4160	16	40	100	16	4
UF51 4180	18	40	100	18	4
UF51 4200	20	50	100	20	4
UF51 5250	25	50	100	25	5

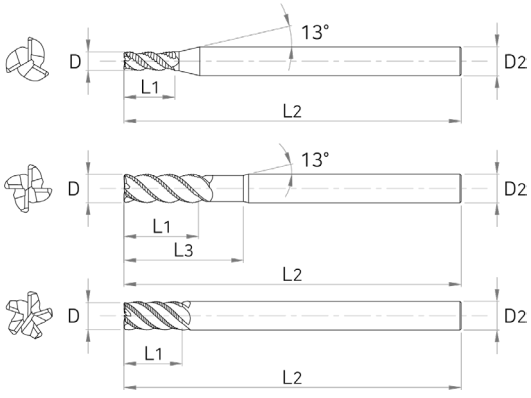
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

○ : GOOD ◎ : EXCELLENT

UF51-H | 3~5 FLUTES 45° HELIX PINE PITCH ROUGHING ENDMILL





■ Tolerance

D		Shank Dia
D3 ~ 25	0 ~ -0.05	h5

CARBIDE | AlCrN | FINE | 3~5 | 45° HELIX | DATA P.668

EDP No	SIZES (mm)				
	D	L1	L2	D2	Z
UF51 3030H	3	8	50	6	3
UF51 3040H	4	10	50	6	3
UF51 4050H	5	13	50	6	4
UF51 4060H	6	10	50	6	4
UF51 406015H	6	15	60	6	4
UF51 4070H	7	18	70	8	4
UF51 4080H	8	12	60	8	4
UF51 408020H	8	20	70	8	4
UF51 4090H	9	22	75	10	4
UF51 4100H	10	15	65	10	4
UF51 410025H	10	25	75	10	4
UF51 4110H	11	27	80	12	4
UF51 4120H	12	20	70	12	4
UF51 412030H	12	30	80	12	4
UF51 5130H	13	35	100	12	5
UF51 5140S16H	14	35	100	16	5
UF51 5140H	14	35	100	14	5
UF51 5160H	16	25	80	16	5
UF51 516040H	16	40	100	16	5
UF51 5180S20H	18	40	100	20	5
UF51 5180H	18	40	100	18	5
UF51 5200H	20	25	80	20	5
UF51 520045H	20	45	100	20	5
UF51 5250H	25	45	100	25	5

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○		○				

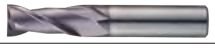
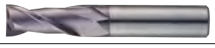
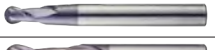
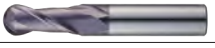
○ : GOOD ◎ : EXCELLENT

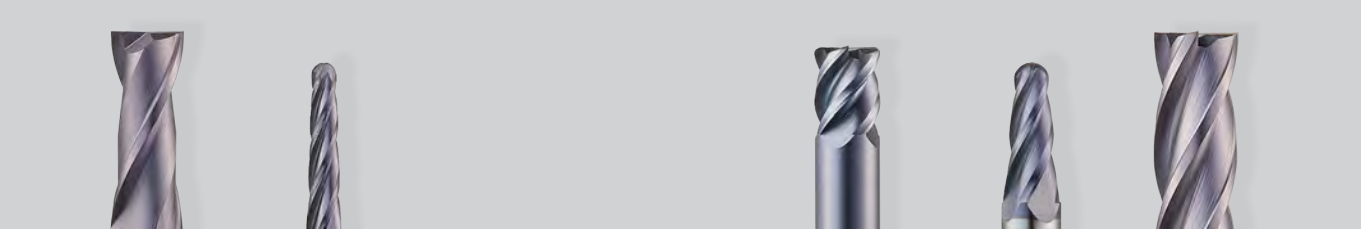
ZAMUS THUNDER SERIES

Low Hardness HRc 10 ~ 30



Contents

Section		EDP No	Geometry	Type	Diameter(mm)		Page
Type	Flutes				Min	Max	
SQUARE	2F	TX202		2 FLUTES SHORT SHANK SQUARE ENDMILL	D1	D20	267
	4F	TX204		4 FLUTES SHORT SHANK SQUARE ENDMILL	D1	D20	268
	2F	TX222		2 FLUTES LONG SQUARE ENDMILL	D3	D20	269
	4F	TX224		4 FLUTES LONG SQUARE ENDMILL	D3	D20	270
	2F	TX302		2 FLUTES SQUARE ENDMILL	D1	D20	271
	4F	TX304		4 FLUTES SQUARE ENDMILL	D1	D20	272
	4F	TX304H		4 FLUTES 45° HELIX SQUARE ENDMILL	D3	D20	273
	2F	ZE302P		2 FLUTES SQUARE ENDMILL	D1	D20	274
	4F	ZE304P		4 FLUTES SQUARE ENDMILL	D1	D20	275
	2F	ZE322		2 FLUTES EXTRA LONG SQUARE ENDMILL	D3	D20	276
	4F	ZE324		4 FLUTES EXTRA LONG SQUARE ENDMILL	D3	D20	277
RADIUS	4F	ZR304H		4 FLUTES 45° HELIX RADIUS ENDMILL	D3	D12	278
	2F	ZR322		2 FLUTES LONG SHANK RADIUS ENDMILL	D3	D12	279
	4F	ZR324		4 FLUTES LONG SHANK RADIUS ENDMILL	D3	D12	280
	4F	ZR324H		4 FLUTES 45° HELIX RADIUS ENDMILL	D6	D12	281
BALL	2F	DB312		2 FLUTES BALL NOSE ENDMILL	R0.5	R10	282
	2F	DB342		2 FLUTES TAPERED NECK BALL NOSE ENDMILL	R0.5	R6	283
	2F	TXB202		2 FLUTES SHORT SHANK BALL NOSE ENDMILL	R0.5	R10	284
	4F	TXB204		4 FLUTES SHORT SHANK BALL NOSE ENDMILL	R1	R10	285
	2F	TXB222		2 FLUTES LONG BALL NOSE ENDMILL	R1.5	R10	286
	2F	TXB232		2 FLUTES LONG SHANK BALL NOSE ENDMILL	R1.5	R10	287
	2F	TXB302		2 FLUTES BALL NOSE ENDMILL	R0.5	R10	288
	4F	TXB304		4 FLUTES BALL NOSE ENDMILL	R0.5	R10	289



EDP No. System

*If expressed as an integer, the decimal point is omitted.

Z	R	3	2	4H	08	10

Type	Appearance	Grade	Length, Shank Type	Flute	Cutting Dia	Corner R	Shank Dia
D : Dynamic	E : Square	2 : Grade	0 : Straight	2 : 2 Flutes	1	0.2	4
Z : Zamus Endmill	R : Radius	3 : Grade	1 : Long Cutting Length	4 : 4 Flutes	~	~	~
T : Thunder	B : Ball		2 : Long Cutting Length	4H : 4 Flutes (Helix 45°)	20	3	20
	X : Square		3 : Long Shank				
	S : Square		4 : Tapered Neck				
	XB : Ball						

Ex) 4 Flutes 45° Helix / Cutting Dia Ø8 / Corner R 1.0 / 30 Grade / Corner Radius Long Cutting Length Type Zamus Endmill

ZAMUS THUNDER SERIES

Low Hardness HRc 10 ~ 30



General Features

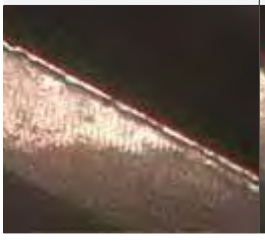
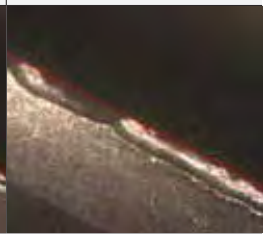
· Suitable for low hardness steel(HRc 10 ~ 30) ; alloy steel, carbon steel, pre-harden, hardened steel etc.
· General purpose suitable for rough machining, finishing and curved and sloped surfaces

Characteristics

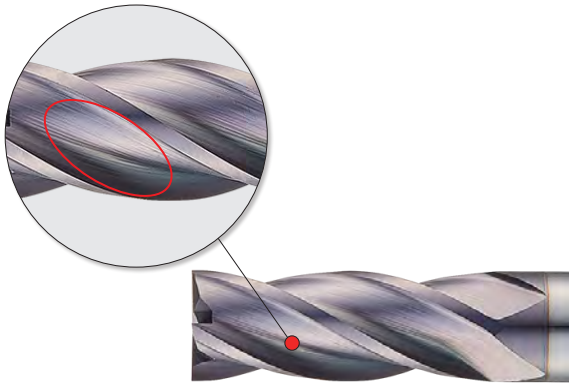
· Excellent Rake angle and Cutting edge considered the characteristics of workpiece.
· Improved chipping resistance and enhanced machinability by using high toughness materials
· TiAlN coating for enhanced oxidation resistance and chipping resistance

Case Study

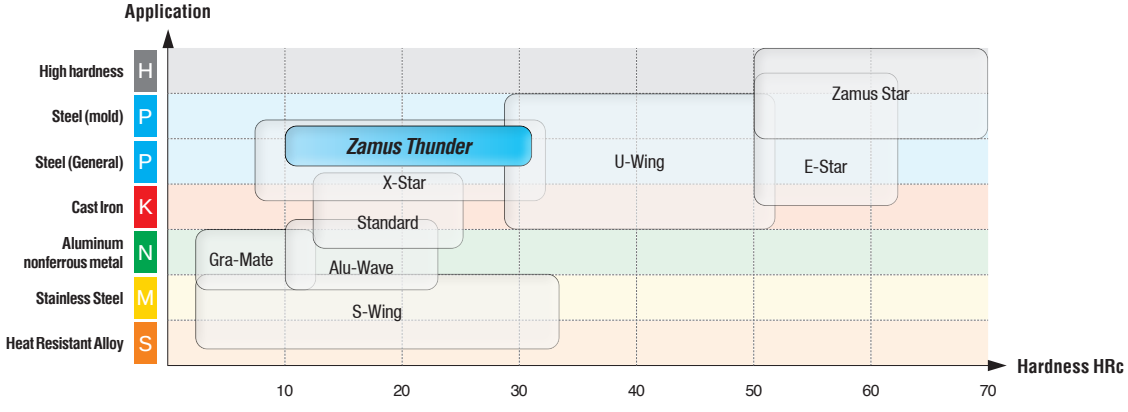
4F D3.0 SQUARE ENDMILL

Zamus Thunder	Competitor
	

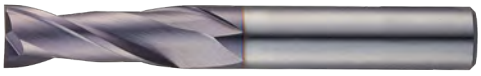
· TEST TOOL : ZE304100P
· Workpiece : STC3, rpm : 4,515, feed : 845, ap : 10, ae : 0.4

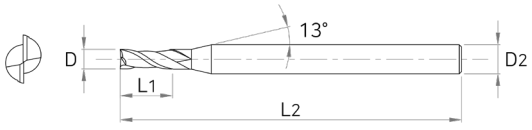


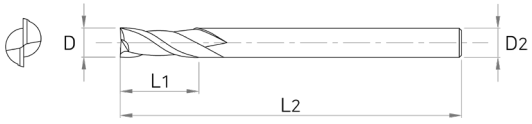
Applications



TX202 | 2 FLUTES SHORT SHANK SQUARE ENDMILL







■ Tolerance

D		Shank Dia
D1 ~ 3	-0.014 ~ -0.028	h6
D4 ~ 6	-0.02 ~ -0.038	
D7 ~ 10	-0.025 ~ -0.047	
D12 ~ 18	-0.032 ~ -0.059	
D20 ~	-0.04 ~ -0.073	

CARBIDE | TiAlN | 2 | 30° HELIX | DATA P.669

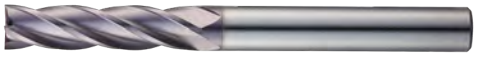
EDP No	SIZES (mm)			
	D	L1	L2	D2
TX202 010	1	3	39	3
TX202 015	1.5	5	39	3
TX202 020	2	7	39	3
TX202 025	2.5	8	39	3
TX202 030	3	10	39	3
TX202 040	4	14	51	4
TX202 050	5	16	51	5
TX202 060	6	19	64	6
TX202 080	8	21	64	8
TX202 100	10	25	70	10
TX202 120	12	25	76	12
TX202 160	16	32	89	16
TX202 200	20	38	102	20

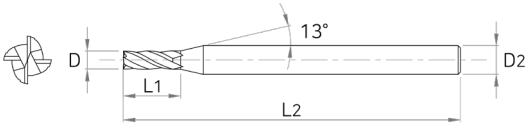
■ Applicable Working Material

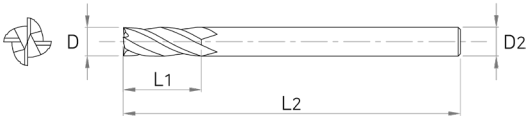
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○							

○ : GOOD ◎ : EXCELLENT

TX204 | 4 FLUTES SHORT SHANK SQUARE ENDMILL







■ Tolerance

D		Shank Dia
D1 ~ 3	-0.014 ~ -0.028	h6
D4 ~ 6	-0.02 ~ -0.038	
D7 ~ 10	-0.025 ~ -0.047	
D12 ~ 18	-0.032 ~ -0.059	
D20 ~	-0.04 ~ -0.073	

CARBIDE | TiAlN | 4 | 30° HELIX | DATA P.670

EDP No	SIZES (mm)			
	D	L1	L2	D2
TX204 010	1	3	39	3
TX204 015	1.5	5	39	3
TX204 020	2	7	39	3
TX204 025	2.5	8	39	3
TX204 030	3	10	39	3
TX204 040	4	14	51	4
TX204 050	5	16	51	5
TX204 060	6	19	64	6
TX204 080	8	21	64	8
TX204 100	10	25	70	10
TX204 120	12	25	76	12
TX204 160	16	32	89	16
TX204 200	20	38	102	20

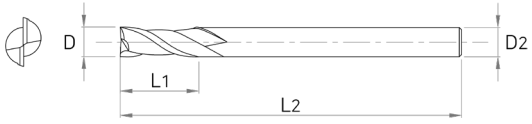
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○							

○ : GOOD ◎ : EXCELLENT

TX222 | 2 FLUTES LONG SQUARE ENDMILL





■ Tolerance

D		Shank Dia
D1 ~ 3	-0.014 ~ -0.028	h6
D4 ~ 6	-0.02 ~ -0.038	
D7 ~ 10	-0.025 ~ -0.047	
D12 ~ 18	-0.032 ~ -0.059	
D20 ~	-0.04 ~ -0.073	

CARBIDE | TiAlN | 2 | 30° HELIX | DATA P.669

EDP No	SIZES (mm)			
	D	L1	L2	D2
TX222 030	3	20	60	3
TX222 040	4	20	60	4
TX222 050	5	25	75	5
TX222 060	6	30	75	6
TX222 080	8	30	75	8
TX222 100	10	40	100	10
TX222 120	12	45	100	12
TX222 140	14	45	100	14
TX222 160	16	45	100	16
TX222 180	18	45	100	18
TX222 200	20	45	100	20

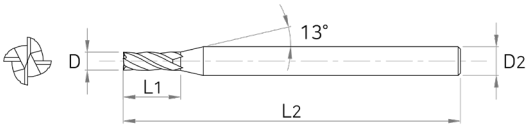
■ Applicable Working Material

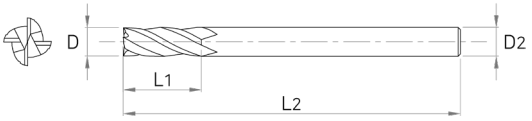
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○							

○ : GOOD ◎ : EXCELLENT

TX224 | 4 FLUTES LONG SQUARE ENDMILL







■ Tolerance

D		Shank Dia
D1 ~ 3	-0.014 ~ -0.028	h6
D4 ~ 6	-0.02 ~ -0.038	
D7 ~ 10	-0.025 ~ -0.047	
D12 ~ 18	-0.032 ~ -0.059	
D20 ~	-0.04 ~ -0.073	

CARBIDE | TiAlN | 4 | 30° HELIX | DATA P.670

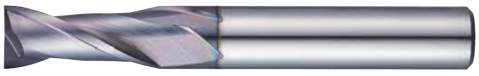
EDP No	SIZES (mm)			
	D	L1	L2	D2
TX224 030	3	20	60	3
TX224 040	4	20	60	4
TX224 050	5	25	75	5
TX224 060	6	30	75	6
TX224 080	8	30	75	8
TX224 081	8	30	100	8
TX224 100	10	40	100	10
TX224 120	12	45	100	12
TX224 140	14	45	100	14
TX224 160	16	45	100	16
TX224 180	18	45	100	18
TX224 200	20	45	100	20
TX202 200	20	38	102	20

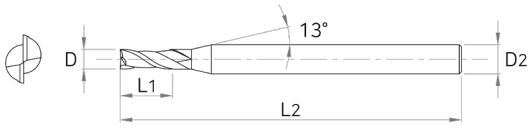
■ Applicable Working Material

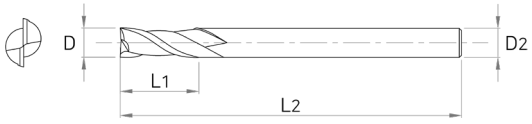
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○							

○ : GOOD ◎ : EXCELLENT

TX302 | 2 FLUTES SQUARE ENDMILL







■ Tolerance

D		Shank Dia
D1 ~ 3	-0.014 ~ -0.028	h6
D4 ~ 6	-0.02 ~ -0.038	
D7 ~ 10	-0.025 ~ -0.047	
D12 ~ 18	-0.032 ~ -0.059	
D20 ~	-0.04 ~ -0.073	

CARBIDE | TiAlN | 2 | 30° HELIX | DATA P.669

EDP No	SIZES (mm)			
	D	L1	L2	D2
TX302 010	1	3	50	4
TX302 015	1.5	4	50	4
TX302 020	2	6	50	4
TX302 025	2.5	8	50	4
TX302 030	3	9	50	4
TX302 040	4	11	50	4
TX302 050	5	13	50	6
TX302 060	6	16	50	6
TX302 070	7	16	60	8
TX302 080	8	19	60	8
TX302 090	9	19	60	10
TX302 100	10	25	75	10
TX302 120	12	30	75	12
TX302 140	14	32	75	14
TX302 160	16	32	100	16
TX302 180	18	32	100	18
TX302 200	20	38	100	20

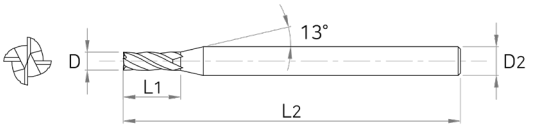
■ Applicable Working Material

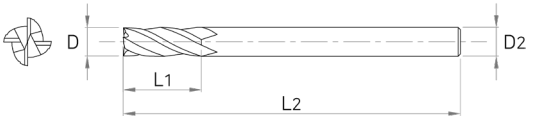
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○							

○ : GOOD ◎ : EXCELLENT

TX304 | 4 FLUTES SQUARE ENDMILL







■ Tolerance

D		Shank Dia
D1 ~ 3	-0.014 ~ -0.028	h6
D4 ~ 6	-0.02 ~ -0.038	
D7 ~ 10	-0.025 ~ -0.047	
D12 ~ 18	-0.032 ~ -0.059	
D20 ~	-0.04 ~ -0.073	

CARBIDE | TiAlN | 4 | 30° HELIX | DATA P.670

EDP No	SIZES (mm)			
	D	L1	L2	D2
TX304 010	1	3	50	4
TX304 015	1.5	4	50	4
TX304 020	2	6	50	4
TX304 025	2.5	8	50	4
TX304 030	3	9	50	4
TX304 040	4	11	50	4
TX304 050	5	13	50	6
TX304 060	6	16	50	6
TX304 070	7	16	60	8
TX304 080	8	19	60	8
TX304 090	9	19	60	10
TX304 100	10	25	75	10
TX304 120	12	30	75	12
TX304 140	14	32	75	14
TX304 160	16	32	100	16
TX304 180	18	32	100	18
TX304 200	20	38	100	20

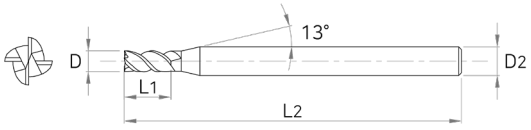
■ Applicable Working Material

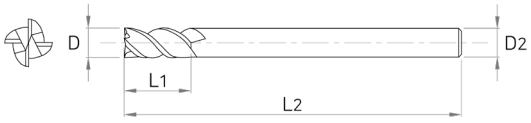
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○							

○ : GOOD ◎ : EXCELLENT

TX304H | 4 FLUTES 45° HELIX SQUARE ENDMILL







■ Tolerance

D		Shank Dia
D1 ~ 3	-0.014 ~ -0.028	h6
D4 ~ 6	-0.02 ~ -0.038	
D7 ~ 10	-0.025 ~ -0.047	
D12 ~ 18	-0.032 ~ -0.059	
D20 ~	-0.04 ~ -0.073	

CARBIDE | TiAlN | 4 | 45° HELIX | DATA P.671

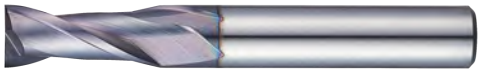
EDP No	SIZES (mm)			
	D	L1	L2	D2
TX304H 030	3	8	50	6
TX304H 030 S3	3	8	50	3
TX304H 030 S4	3	8	50	4
TX304H 040	4	11	50	6
TX304H 040 S4	4	11	50	4
TX304H 050	5	13	50	6
TX304H 060	6	13	50	6
TX304H 080	8	19	60	8
TX304H 100	10	22	70	10
TX304H 120	12	26	75	12
TX304H 130	13	26	80	12
TX304H 140	14	26	80	14
TX304H 160	16	32	90	16
TX304H 180	18	32	100	18
TX304H 200	20	38	100	20

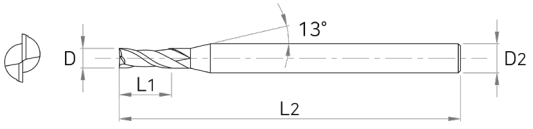
■ Applicable Working Material

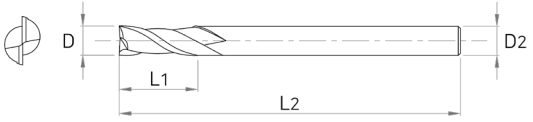
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○							

○ : GOOD ◎ : EXCELLENT

ZE302P | 2 FLUTES SQUARE ENDMILL







■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.02	h6

CARBIDE | TiAlN | 2 | 30° HELIX | DATA P.672

EDP No	SIZES (mm)			
	D	L1	L2	D2
ZE302 010P	1	2.5	50	6
ZE302 015P	1.5	4	50	6
ZE302 020P	2	6	50	6
ZE302 025P	2.5	8	50	6
ZE302 030P	3	10	50	6
ZE302 035P	3.5	10	50	6
ZE302 040P	4	12	50	6
ZE302 045P	4.5	14	50	6
ZE302 050P	5	15	60	6
ZE302 055P	5.5	15	60	6
ZE302 060P	6	15	60	6
ZE302 065P	6.5	18	60	8
ZE302 070P	7	20	65	8
ZE302 075P	7.5	20	65	8
ZE302 080P	8	20	65	8

EDP No	SIZES (mm)			
	D	L1	L2	D2
ZE302 085P	8.5	22	70	10
ZE302 090P	9	22	70	10
ZE302 095P	9.5	24	70	10
ZE302 100P	10	25	70	10
ZE302 105P	10.5	26	80	12
ZE302 110P	11	30	80	12
ZE302 115P	11.5	30	80	12
ZE302 120P	12	30	80	12
ZE302 130P	13	35	90	12
ZE302 140P	14	35	100	14
ZE302 150P	15	40	100	16
ZE302 160P	16	40	100	16
ZE302 180P	18	45	100	18
ZE302 200P	20	45	100	20

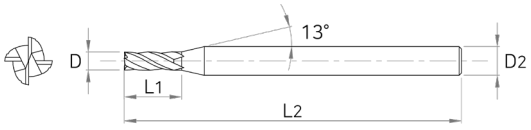
■ Applicable Working Material

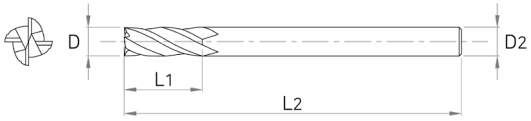
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○							

○ : GOOD ◎ : EXCELLENT

ZE304P | 4 FLUTES SQUARE ENDMILL







■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.02	h6

CARBIDE | TiAlN | 4 | 30° HELIX | DATA P.674

EDP No	SIZES (mm)			
	D	L1	L2	D2
ZE304 010P	1	2.5	50	6
ZE304 015P	1.5	4	50	6
ZE304 020P	2	6	50	6
ZE304 025P	2.5	8	50	6
ZE304 030P	3	10	50	6
ZE304 035P	3.5	10	50	6
ZE304 040P	4	12	50	6
ZE304 045P	4.5	14	50	6
ZE304 050P	5	15	60	6
ZE304 055P	5.5	15	60	6
ZE304 060P	6	15	60	6
ZE304 065P	6.5	18	60	8
ZE304 070P	7	20	65	8
ZE304 075P	7.5	20	65	8
ZE304 080P	8	20	65	8

EDP No	SIZES (mm)			
	D	L1	L2	D2
ZE304 085P	8.5	22	70	10
ZE304 090P	9	22	70	10
ZE304 095P	9.5	24	70	10
ZE304 100P	10	25	70	10
ZE304 105P	10.5	26	80	12
ZE304 110P	11	30	80	12
ZE304 115P	11.5	30	80	12
ZE304 120P	12	30	80	12
ZE304 130P	13	35	90	12
ZE304 140P	14	35	100	14
ZE304 150P	15	40	100	16
ZE304 160P	16	40	100	16
ZE304 180P	18	45	100	18
ZE304 200P	20	45	100	20

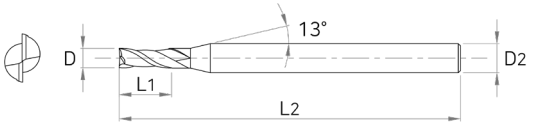
■ Applicable Working Material

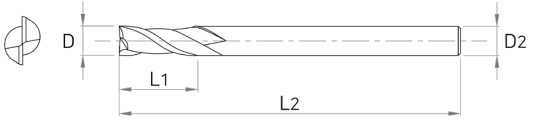
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○							

○ : GOOD ◎ : EXCELLENT

ZE322 | 2 FLUTES EXTRA LONG SQUARE ENDMILL







■ Tolerance

D		Shank Dia
ALL SIZE	0 ~ -0.03	h6

CARBIDE | TiAlN | 2 | 30° HELIX | DATA P.672

EDP No	SIZES (mm)			
	D	L1	L2	D2
ZE322 030	3	15	60	6
ZE322 031	3	20	70	6
ZE322 030S	3	20	100	3
ZE322 040	4	15	60	6
ZE322 041	4	20	70	6
ZE322 040S	4	20	100	4
ZE322 050	5	20	60	6
ZE322 051	5	20	80	6
ZE322 052	5	25	100	6
ZE322 060	6	20	80	6
ZE322 061	6	30	100	6
ZE322 062	6	40	150	6
ZE322 080	8	30	90	8
ZE322 081	8	35	100	8
ZE322 082	8	40	150	8
ZE322 100	10	30	90	10

EDP No	SIZES (mm)			
	D	L1	L2	D2
ZE322 101	10	35	100	10
ZE322 102	10	45	150	10
ZE322 103	10	55	180	10
ZE322 120	12	30	90	12
ZE322 121	12	40	110	12
ZE322 122	12	50	150	12
ZE322 123	12	60	200	12
ZE322 140	14	40	120	14
ZE322 141	14	60	150	14
ZE322 160	16	50	140	16
ZE322 161	16	70	160	16
ZE322 162	16	80	200	16
ZE322 180	18	50	140	18
ZE322 200	20	60	150	20
ZE322 201	20	100	200	20
ZE322 202	20	130	250	20

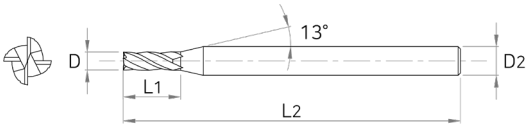
■ Applicable Working Material

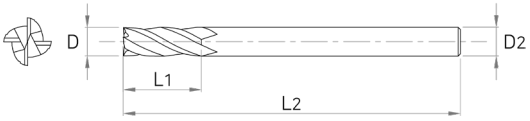
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○							

○ : GOOD ◎ : EXCELLENT

ZE324 | 4 FLUTES EXTRA LONG SQUARE ENDMILL







■ Tolerance

D		Shank Dia
ALL SIZE	0 ~ -0.03	h6

CARBIDE | TiAlN | 4 | 30° HELIX | DATA P.674

EDP No	SIZES (mm)			
	D	L1	L2	D2
ZE324 030	3	15	60	6
ZE324 031	3	20	70	6
ZE324 030S	3	20	100	3
ZE324 040	4	15	60	6
ZE324 041	4	20	70	6
ZE324 040S	4	20	100	4
ZE324 050	5	20	60	6
ZE324 051	5	20	80	6
ZE324 052	5	25	100	6
ZE324 060	6	20	80	6
ZE324 061	6	30	100	6
ZE324 062	6	40	150	6
ZE324 080	8	30	90	8
ZE324 081	8	35	100	8
ZE324 082	8	40	150	8
ZE324 100	10	30	90	10

EDP No	SIZES (mm)			
	D	L1	L2	D2
ZE324 101	10	35	100	10
ZE324 102	10	45	150	10
ZE324 103	10	55	180	10
ZE324 120	12	30	90	12
ZE324 121	12	40	110	12
ZE324 122	12	50	150	12
ZE324 123	12	60	200	12
ZE324 140	14	40	120	14
ZE324 141	14	60	150	14
ZE324 160	16	50	140	16
ZE324 161	16	70	160	16
ZE324 162	16	80	200	16
ZE324 180	18	50	140	18
ZE324 200	20	60	150	20
ZE324201	20	100	200	20
ZE324202	20	130	250	20

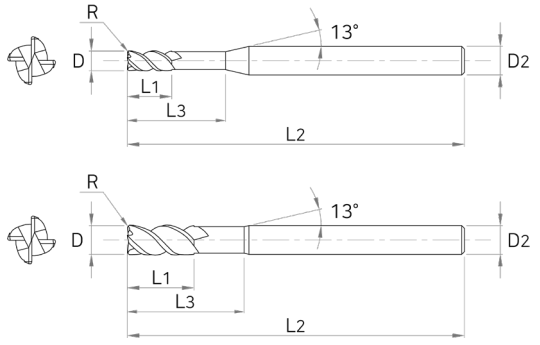
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○							

○ : GOOD ◎ : EXCELLENT

ZR304H | 4 FLUTES 45° HELIX RADIUS ENDMILL





■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.03	h6

CARBIDE | TiAlN | 4 | 45° HELIX | R ±0.02 All Sizes | DATA P.676

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ZR304H 0303	3	0.3	4	12	55	6
ZR304H 0302S3	3	0.2	4	12	55	3
ZR304H 0303S4	3	0.3	4	12	55	4
ZR304H 0305	3	0.5	4	12	55	6
ZR304H 0305S3	3	0.5	4	12	55	3
ZR304H 0305S4	3	0.5	4	12	55	4
ZR304H 0402S4	4	0.2	5	16	55	4
ZR304H 0403	4	0.3	5	16	55	6
ZR304H 0403S4	4	0.3	5	16	55	4
ZR304H 0405	4	0.5	5	16	55	6
ZR304H 0405S4	4	0.5	5	16	55	4
ZR304H 0605	6	0.5	7	20	60	6
ZR304H 0610	6	1	7	20	60	6
ZR304H 0805	8	0.5	10	25	65	8
ZR304H 0810	8	1	10	25	65	8
ZR304H 1005	10	0.5	12	30	70	10
ZR304H 1010	10	1	12	30	70	10
ZR304H 1015	10	1.5	12	30	70	10
ZR304H 1020	10	2	12	30	70	10
ZR304H 1205	12	0.5	15	30	80	12
ZR304H 1210	12	1	15	30	80	12
ZR304H 1215	12	1.5	15	30	80	12
ZR304H 1220	12	2	15	30	80	12

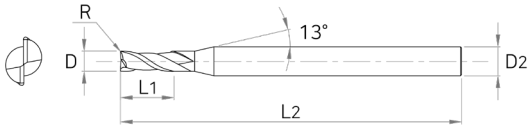
■ Applicable Working Material

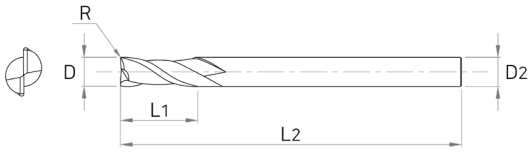
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○							

○ : GOOD ◎ : EXCELLENT

ZR322 | 2 FLUTES LONG SHANK RADIUS ENDMILL







■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.03	h6

CARBIDE | TiAlN | 4 | 30° HELIX | R ±0.02 All Sizes | DATA P.676

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
ZR322 0302S4	3	0.2	8	60	4
ZR322 0302	3	0.2	8	60	6
ZR322 0303	3	0.3	8	60	6
ZR322 0305S4	3	0.5	8	60	4
ZR322 0305	3	0.5	8	60	6
ZR322 0402S4	4	0.2	11	70	4
ZR322 0402	4	0.2	11	70	6
ZR322 0403	4	0.3	11	70	6
ZR322 0405S4	4	0.5	11	70	4
ZR322 0405	4	0.5	11	70	6
ZR322 0410S4	4	1	11	70	4
ZR322 0410	4	1	11	70	6
ZR322 0502	5	0.2	13	80	6
ZR322 0503	5	0.3	13	80	6
ZR322 0505	5	0.5	13	80	6
ZR322 0510	5	1	13	80	6
ZR322 0602	6	0.2	13	90	6
ZR322 0603	6	0.3	13	90	6
ZR322 0605	6	0.5	13	90	6

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
ZR322 0610	6	1	13	90	6
ZR322 0803	8	0.3	19	100	8
ZR322 0805	8	0.5	19	100	8
ZR322 0810	8	1	19	100	8
ZR322 0815	8	1.5	19	100	8
ZR322 0820	8	2	19	100	8
ZR322 1003	10	0.3	22	100	10
ZR322 1005	10	0.5	22	100	10
ZR322 1010	10	1	22	100	10
ZR322 1015	10	1.5	22	100	10
ZR322 1020	10	2	22	100	10
ZR322 1025	10	2.5	22	100	10
ZR322 1205	12	0.5	26	110	12
ZR322 1210	12	1	26	110	12
ZR322 1215	12	1.5	26	110	12
ZR322 1220	12	2	26	110	12
ZR322 1225	12	2.5	26	110	12
ZR322 1230	12	3	26	110	12

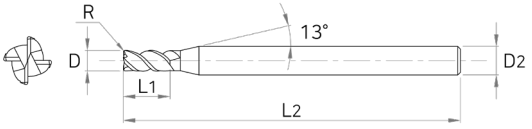
■ Applicable Working Material

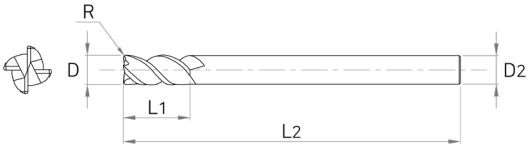
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○							

○ : GOOD ◎ : EXCELLENT

ZR324 | 4 FLUTES LONG SHANK RADIUS ENDMILL







■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.03	h6

CARBIDE | TiAlN | 4 | 30° HELIX | R ±0.02 | DATA P.677

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
ZR324 0302S4	3	0.2	8	60	4
ZR324 0302	3	0.2	8	60	6
ZR324 0303	3	0.3	8	60	6
ZR324 0305S4	3	0.5	8	60	4
ZR324 0305	3	0.5	8	60	6
ZR324 0402S4	4	0.2	11	70	4
ZR324 0402	4	0.2	11	70	6
ZR324 0403	4	0.3	11	70	6
ZR324 0405S4	4	0.5	11	70	4
ZR324 0405	4	0.5	11	70	6
ZR324 0410S4	4	1	11	70	4
ZR324 0410	4	1	11	70	6
ZR324 0502	5	0.2	13	80	6
ZR324 0503	5	0.3	13	80	6
ZR324 0505	5	0.5	13	80	6
ZR324 0510	5	1	13	80	6
ZR324 0602	6	0.2	13	90	6
ZR324 0603	6	0.3	13	90	6
ZR324 0605	6	0.5	13	90	6

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
ZR324 0610	6	1	13	90	6
ZR324 0803	8	0.3	19	100	8
ZR324 0805	8	0.5	19	100	8
ZR324 0810	8	1	19	100	8
ZR324 0815	8	1.5	19	100	8
ZR324 0820	8	2	19	100	8
ZR324 1003	10	0.3	22	100	10
ZR324 1005	10	0.5	22	100	10
ZR324 1010	10	1	22	100	10
ZR324 1015	10	1.5	22	100	10
ZR324 1020	10	2	22	100	10
ZR324 1025	10	2.5	22	100	10
ZR324 1205	12	0.5	26	110	12
ZR324 1210	12	1	26	110	12
ZR324 1215	12	1.5	26	110	12
ZR324 1220	12	2	26	110	12
ZR324 1225	12	2.5	26	110	12
ZR324 1230	12	3	26	110	12

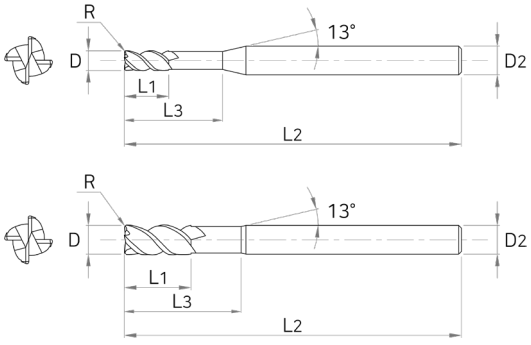
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○							

○ : GOOD ◎ : EXCELLENT

ZR324H | 4 FLUTES 45° HELIX RADIUS ENDMILL





■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.03	h6

CARBIDE | TiAlN | 4 | 45° HELIX | R ±0.02 | DATA P.676

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
ZR324H 0605	6	0.5	9	20	90	6
ZR324H 0610	6	1	9	20	90	6
ZR324H 0805	8	0.5	12	25	100	8
ZR324H 0810	8	1	12	25	100	8
ZR324H 1005	10	0.5	15	32	100	10
ZR324H 1010	10	1	15	32	100	10
ZR324H 1015	10	1.5	15	32	100	10
ZR324H 1020	10	2	15	32	100	10
ZR324H 1205	12	0.5	18	38	110	12
ZR324H 1210	12	1	18	38	110	12
ZR324H 1215	12	1.5	18	38	110	12
ZR324H 1220	12	2	18	38	110	12

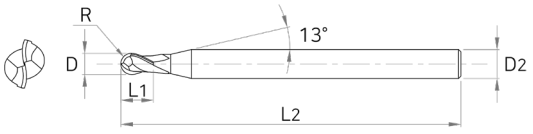
■ Applicable Working Material

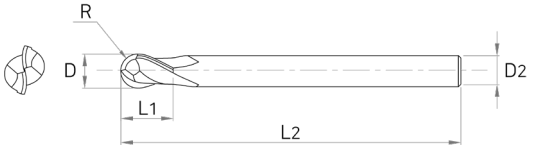
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○							

○ : GOOD ◎ : EXCELLENT

DB312 | 2 FLUTES BALL ENDMILL







■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.02	h6

CARBIDE | TiAlN | 2 | 30° HELIX | R ±0.01 All Sizes | DATA P.678

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
DB312 010 S4	1	0.5	2.5	50	4
DB312 010	1	0.5	2.5	50	6
DB312 012	1.2	0.6	3	50	6
DB312 015	1.5	0.75	4	50	6
DB312 020 S4	2	1	5	50	4
DB312 020	2	1	5	50	6
DB312 025	2.5	1.25	6	60	6
DB312 030 S3	3	1.5	8	60	3
DB312 030 S4	3	1.5	8	60	4
DB312 030	3	1.5	8	60	6
DB312 035	3.5	1.75	8	70	6
DB312 040 S4	4	2	8	70	4
DB312 040	4	2	8	70	6
DB312 045	4.5	2.25	8	70	6
DB312 050	5	2.5	10	80	6

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
DB312 055	5.5	2.75	10	80	6
DB312 060S	6	3	12	60	6
DB312 060	6	3	12	90	6
DB312 065	6.5	3.25	12	90	8
DB312 070	7	3.5	14	90	8
DB312 080S	8	4	14	60	8
DB312 080	8	4	14	100	8
DB312 090	9	4.5	18	100	10
DB312 100S	10	5	18	60	10
DB312 100	10	5	18	100	10
DB312 120	12	6	22	110	12
DB312 140	14	7	26	110	14
DB312 160	16	8	30	140	16
DB312 180	18	9	34	140	18
DB312 200	20	10	38	160	20

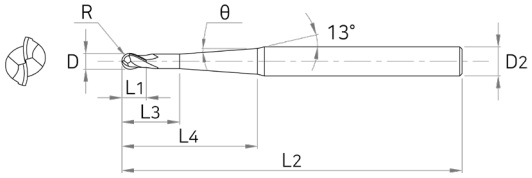
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○							

○ : GOOD ◎ : EXCELLENT

DB342 | 2 FLUTES TAPERED NECK BALL ENDMILL





■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.02	h6

CARBIDE | TiAlN | 2 | 30° HELIX | R ±0.01 All Sizes | DATA P.678

EDP No	SIZES (mm)							
	D	R	L1	L3	L4	L2	D2	θ
DB342 01015	1	0.5	2	4	23	60	6	1°30′
DB342 01050	1	0.5	2	4	23	60	6	5°
DB342 01030	1	0.5	2	4	42	80	6	3°
DB342 02015	2	1	4	6	23	60	6	1°30′
DB342 02050	2	1	4	6	23	60	6	5°
DB342 02030	2	1	4	6	41	80	6	3°
DB342 03030	3	1.5	6	8	32	70	6	3°
DB342 03015	3	1.5	6	8	52	90	6	1°30′
DB342 04030	4	2	8	10	28	70	6	3°
DB342 04015	4	2	8	10	49	90	6	1°30′
DB342 05030	5	2.5	10	12	41	90	8	3°
DB342 05015	5	2.5	10	12	61	110	8	1°30′
DB342 06030	6	3	12	15	34	90	8	3°
DB342 06015	6	3	12	15	53	110	8	1°30′
DB342 08030	8	4	14	17	36	100	10	3°
DB342 08015	8	4	14	17	55	120	10	1°30′
DB342 10030	10	5	18	21	40	110	12	3°
DB342 10015	10	5	18	21	59	130	12	1°30′
DB342 12030	12	6	22	25	63	140	16	3°
DB342 12015	12	6	22	25	83	160	16	1°30′

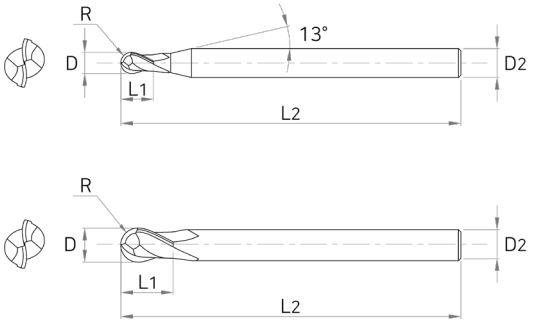
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○							

○ : GOOD ◎ : EXCELLENT

TXB202 | 2 FLUTES SHORT SHANK BALL ENDMILL





■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.04	h6

CARBIDE | TiAlN | 2 | 30° HELIX | R ±0.02 All Sizes | DATA P.680

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
TXB202 010	1	0.5	3	39	3
TXB202 015	1.5	0.75	5	39	3
TXB202 020	2	1	7	39	3
TXB202 025	2.5	1.25	8	39	3
TXB202 030	3	1.5	10	39	3
TXB202 040	4	2	14	51	4
TXB202 050	5	2.5	16	51	5
TXB202 060	6	3	19	64	6
TXB202 080	8	4	21	64	8
TXB202 100	10	5	25	70	10
TXB202 120	12	6	25	76	12
TXB202 160	16	8	32	89	16
TXB202 200	20	10	38	100	20

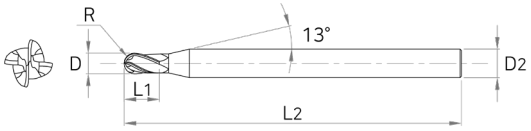
■ Applicable Working Material

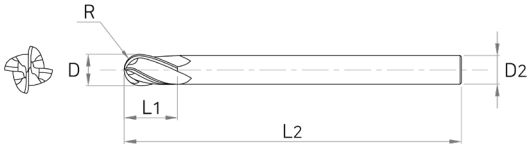
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○							

○ : GOOD ◎ : EXCELLENT

TXB204 | 4 FLUTES SHORT SHANK BALL ENDMILL







■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.04	h6

CARBIDE | TiAlN | 4 | 30° HELIX | R ±0.01 All Sizes | DATA P.680

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
TXB204 020	2	1	7	39	3
TXB204 030	3	1.5	10	39	3
TXB204 040	4	2	14	51	4
TXB204 050	5	2.5	16	51	5
TXB204 060	6	3	19	64	6
TXB204 080	8	4	21	64	8
TXB204 100	10	5	25	70	10
TXB204 120	12	6	25	76	12
TXB204 160	16	8	32	89	16
TXB204 200	20	10	38	100	20

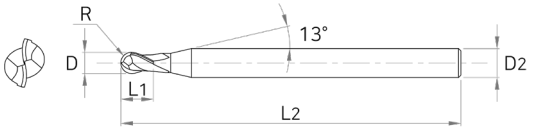
■ Applicable Working Material

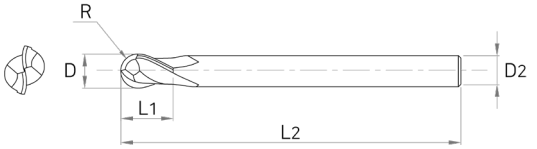
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○							

○ : GOOD ◎ : EXCELLENT

TXB222 | 2 FLUTES LONG BALL ENDMILL







■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.04	h6

CARBIDE | TiAlN | 2 | 30° HELIX | R ±0.02 All Sizes | DATA P.680

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
TXB222 030	3	1.5	20	60	3
TXB222 040	4	2	20	60	4
TXB222 050	5	2.5	25	75	5
TXB222 060	6	3	30	75	6
TXB222 080	8	4	30	100	8
TXB222 100	10	5	40	100	10
TXB222 120	12	6	45	100	12
TXB222 140	14	7	45	100	14
TXB222 160	16	8	45	100	16
TXB222 180	18	9	45	100	18
TXB222 200	20	10	45	100	20

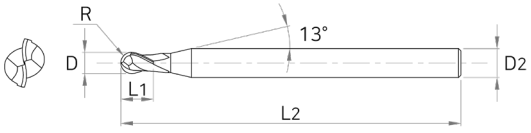
■ Applicable Working Material

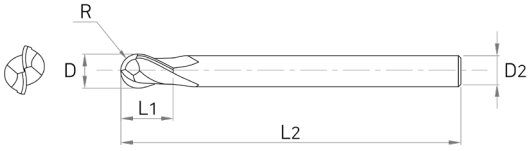
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○							

○ : GOOD ◎ : EXCELLENT

TXB232 | 2 FLUTES LONG SHANK BALL ENDMILL







■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.04	h6

CARBIDE | TiAlN | 2 | 30° HELIX | R ±0.02 All Sizes | DATA P.680

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
TXB232 030	3	1.5	5	75	3
TXB232 040	4	2	8	75	4
TXB232 050	5	2.5	9	75	5
TXB232 060	6	3	10	100	6
TXB232 060-75	6	3	10	75	6
TXB232 080	8	4	12	100	8
TXB232 080-75	8	4	12	75	8
TXB232 100	10	5	14	100	10
TXB232 100L	10	5	14	150	10
TXB232 120	12	6	16	100	12
TXB232 120L	12	6	16	150	12
TXB232 140	14	7	18	100	14
TXB232 160	16	8	22	150	16
TXB232 200	20	10	26	150	20

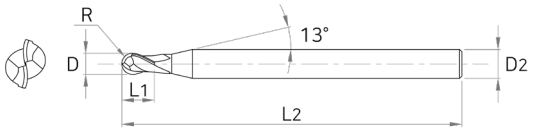
■ Applicable Working Material

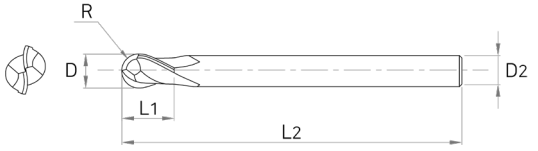
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○							

○ : GOOD ◎ : EXCELLENT

TXB302 | 2 FLUTES BALL ENDMILL







■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.04	h6

CARBIDE | TiAlN | 2 | 30° HELIX | R ±0.02 All Sizes | DATA P.680

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
TXB302 010	1	0.5	2	50	4
TXB302 015	1.5	0.75	3	50	4
TXB302 020	2	1	4	50	4
TXB302 025	2.5	1.25	6	50	4
TXB302 030	3	1.5	6	50	4
TXB302 040	4	2	8	50	4
TXB302 050	5	2.5	10	50	6
TXB302 060	6	3	12	50	6
TXB302 080	8	4	14	60	8
TXB302 100	10	5	18	75	10
TXB302 120	12	6	22	75	12
TXB302 140	14	7	32	75	14
TXB302 160	16	8	32	100	16
TXB302 180	18	9	32	100	18
TXB302 200	20	10	38	100	20

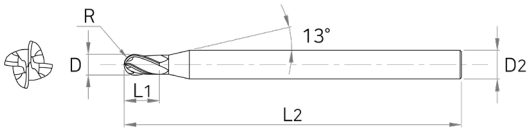
■ Applicable Working Material

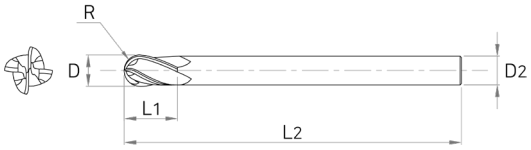
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○							

○ : GOOD ◎ : EXCELLENT

TXB304 | 4 FLUTES BALL ENDMILL

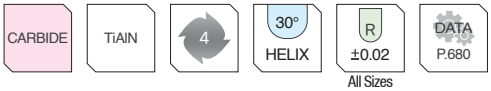






■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.04	h6



EDP No	SIZES (mm)				
	D	R	L1	L2	D2
TXB304 010	1	0.5	2	50	4
TXB304 015	1.5	0.75	3	50	4
TXB304 020	2	1	4	50	4
TXB304 030	3	1.5	6	50	4
TXB304 040	4	2	8	50	4
TXB304 050	5	2.5	10	50	6
TXB304 060	6	3	12	50	6
TXB304 080	8	4	14	60	8
TXB304 100	10	5	18	75	10
TXB304 120	12	6	22	75	12
TXB304 140	14	7	32	75	14
TXB304 160	16	8	32	100	16
TXB304 180	18	9	32	100	18
TXB304 200	20	10	38	100	20

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○							

○ : GOOD ◎ : EXCELLENT

X-STAR ENDMILL

Difficult To Cut Material and Low Hardness Material HRc ~ 35



Contents

Section		EDP No.	Geometry	Type	Diameter(mm)		Page
Type	Flutes				Min	Max	
SQUARE	3F	XCE503		3 FLUTES DOUBLE CORE SQUARE ENDMILL	D2	D25	292
	4F	XCE504		4 FLUTES DOUBLE CORE SQUARE ENDMILL	D6	D25	293
	4F	XE504		4 FLUTES VARIABLE HELIX SQUARE ENDMILL	D1	D25	294
	5F	XE505		5 FLUTES VARIABLE HELIX SQUARE ENDMILL	D6	D25	295
	4F	XE514		4 FLUTES VARIABLE HELIX NECK SQUARE ENDMILL	D1	D20	296
	5F	XE515		5 FLUTES VARIABLE HELIX NECK SQUARE ENDMILL	D6	D20	297
	4F	XE524		4 FLUTES VARIABLE HELIX LONG SHANK SQUARE	D6	D16	298
RADIUS	3F	XCR503		3 FLUTES DOUBLE CORE RADIUS ENDMILL	D5	D25	299
	4F	XCR504		4 FLUTES DOUBLE CORE RADIUS ENDMILL	D6	D25	300
	4F	XR504		4 FLUTES VARIABLE HELIX RADIUS ENDMILL	D2	D25	301
	5F	XR505		5 FLUTES VARIABLE HELIX RADIUS ENDMILL	D6	D25	302
	4F	XR514		4 FLUTES VARIABLE HELIX RADIUS ENDMILL	D2	D20	303
BALL	4F	XXB504		4 FLUTES VARIABLE HELIX BALL ENDMILL	R2	R6	304
CHAMFER	3F	XCC503		3 FLUTES DOUBLE CORE CHAMFER ENDMILL	D2	D25	305
	4F	XCC504		4 FLUTES DOUBLE CORE CHAMFER ENDMILL	D6	D25	306

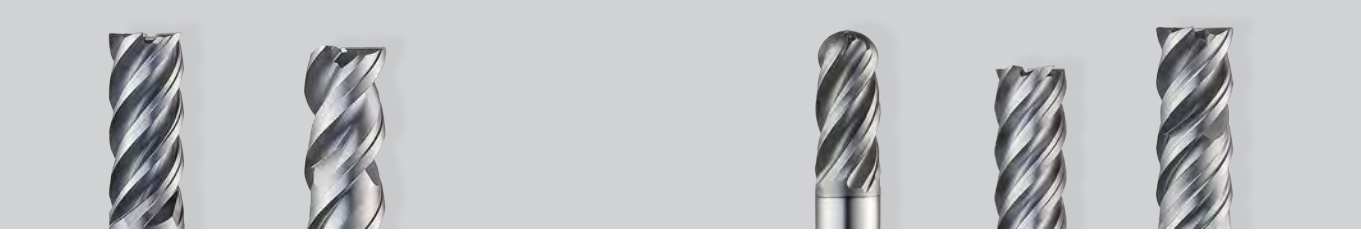
EDP No. System

*If expressed as an integer, the decimal point is omitted.

X	CR	5	0	3	12	05

Section	Appearance	Grade	Length, Shank Type	Flutes	Cutting Dia	Corner R
X : X-STAR (Unequal Pitch)	E : Sqaure	3 : Grade	0 : Straight	3 : 3 Flutes	1	0.1
	R : Radius	5 : Grade	1 : Neck	4 : 4 Flutes	~	~
	XE : Square (Edge protection)		2 : Long neck	5 : 5 Flutes	25.4	5
	XB : Ball					
	XR : Radius (Edge Protection)					
	CE : Square (Double Core)					
	CC : Chamfer (Double Core)					
	CR : Radius (Double Core)					

Ex) 3 Flutes / Cutting Dia Ø12 / 50 Grade / Straight type Double Core Radius X-Star Endmill

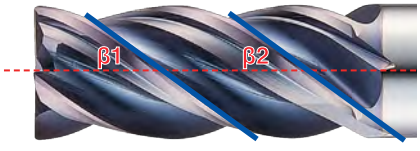


Characteristics

· Suitable for the difficult to cut material and low hardness material (HRc ~ 35) Stainless and Inconel etc.
· Various product line considered machining methods for rough and finishing for the difficult to cut materials and flat, sloped surfaces.

Features

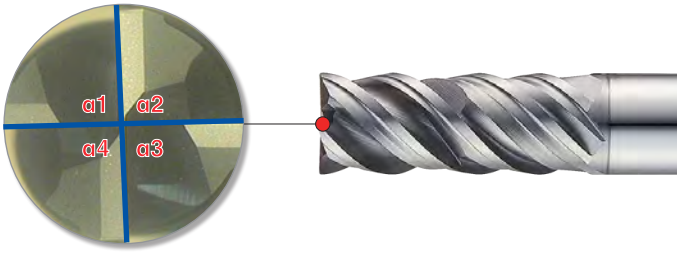
· High machining efficiency through unequal index cutting edge in all series
· Excellent chipping resistance and Minimized sudden breakage by using high toughness materials
· TiAlN, AlTiN coating for enhanced oxidation resistance and high hardness on surface
· Superb Groove design to improve chip emission according to workpiece's characteristics



β1° ≠ β2°

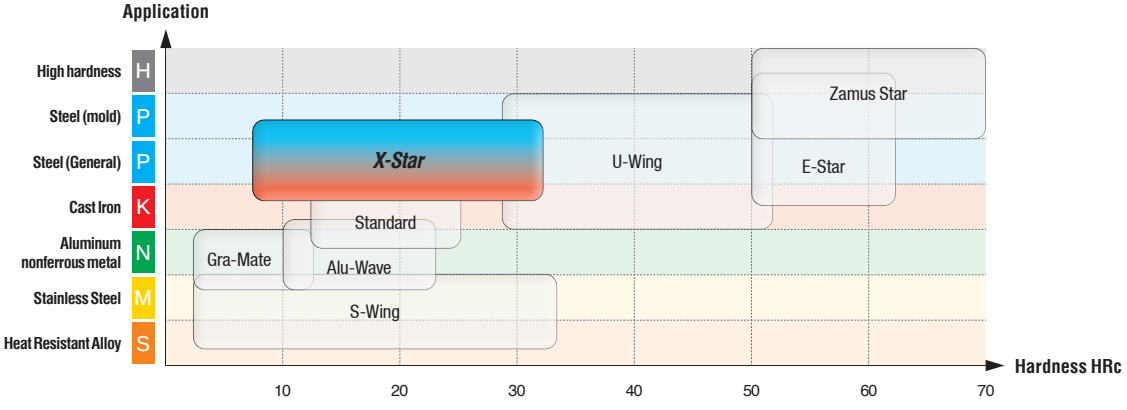


Cutting edge with High strength
by applying double core type



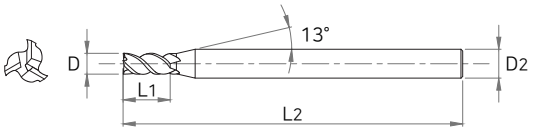
α1° ≠ α2° ≠ α3° ≠ α4°

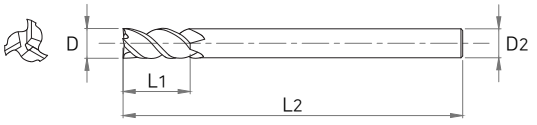
Applications



XCE503 | 3 FLUTES DOUBLE CORE SQUARE ENDMILL







■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.02	h6

CARBIDE | TiAlN | 3 | M HELIX | DATA P.681

EDP No	SIZES (mm)			
	D	L1	L2	D2
XCE503 020	2	6	50	6
XCE503 025	2.5	8	50	6
XCE503 030	3	10	50	6
XCE503 035	3.5	10	50	6
XCE503 040	4	12	50	6
XCE503 045	4.5	14	50	6
XCE503 050	5	15	50	6
XCE503 055	5.5	15	50	6
XCE503 060	6	15	50	6
XCE503 080	8	20	60	8
XCE503 100	10	25	70	10
XCE503 120	12	30	75	12
XCE503 160	16	40	90	16
XCE503 200	20	45	100	20
XCE503 250	25	50	120	25

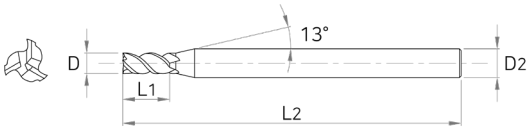
■ Applicable Working Material

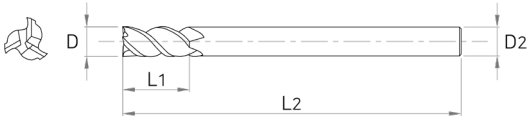
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○			○				◎

○ : GOOD ◎ : EXCELLENT

XCE504 | 4 FLUTES DOUBLE CORE SQUARE ENDMILL







■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.02	h6

CARBIDE | TiAlN | 4 | M HELIX | DATA P.681

EDP No	SIZES (mm)			
	D	L1	L2	D2
XCE504 060	6	15	50	6
XCE504 080	8	20	60	8
XCE504 100	10	25	70	10
XCE504 120	12	30	75	12
XCE504 160	16	40	90	16
XCE504 200	20	45	100	20
XCE504 250	25	50	120	25

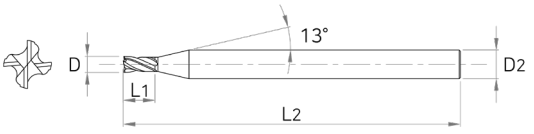
■ Applicable Working Material

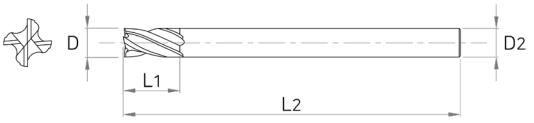
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○			○				◎

○ : GOOD ◎ : EXCELLENT

XE504 | 4 FLUTES VARIABLE HELIX SQUARE ENDMILL







■ Tolerance

D		Shank Dia
D1 ~ 12	0 ~ -0.02	h6
D13 ~ 25	0 ~ -0.03	

CARBIDE | AlTiN | 4 | M HELIX | DATA P.681

EDP No	SIZES (mm)			
	D	L1	L2	D2
XE504 010	1	2.5	45	4
XE504 020	2	5	45	4
XE504 030	3	8	50	6
XE504 040	4	11	50	6
XE504 050	5	13	50	6
XE504 060	6	13	50	6
XE504 070	7	16	60	8
XE504 080	8	19	60	8
XE504 090	9	19	70	10
XE504 100	10	22	70	10
XE504 110	11	22	75	12
XE504 120	12	26	75	12
XE504 130	13	26	80	12
XE504 140	14	26	80	14
XE504 160	16	32	90	16
XE504 180	18	32	100	18
XE504 200	20	38	100	20
XE504 250	25	45	120	25

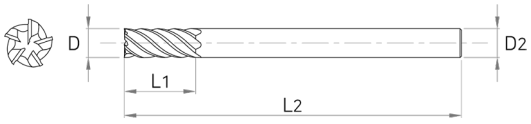
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○			○				◎

○ : GOOD ◎ : EXCELLENT

XE505 | 4 FLUTES VARIABLE HELIX SQUARE ENDMILL





■ Tolerance

D		Shank Dia
D1 ~ 8	0 ~ -0.04	h6
D10 ~ 25	0 ~ -0.05	

CARBIDE | TiAlN | 5 | M HELIX | DATA P.681

EDP No	SIZES (mm)			
	D	L1	L2	D2
XE505 060	6	13	57	6
XE505 080	8	19	63	8
XE505 100	10	22	72	10
XE505 120	12	26	83	12
XE505 140	14	26	83	14
XE505 160	16	32	92	16
XE505 180	18	32	92	18
XE505 200	20	38	104	20
XE505 250	25	38	104	25

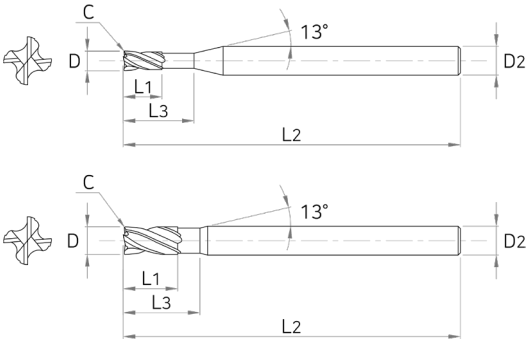
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○			○				◎

○ : GOOD ◎ : EXCELLENT

XE514 | 4 FLUTES VARIABLE HELIX NECK SQUARE ENDMILL





■ Tolerance

D		Shank Dia
D1 ~ 12	0 ~ -0.02	h6
D13 ~ 20	0 ~ -0.03	

CARBIDE | AlTiN | 4 | M HELIX | C | DATA P.681

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
XE514 010	1	2	10	45	4
XE514 020	2	3	12	45	4
XE514 030	3	4	14	50	6
XE514 040	4	5	16	50	6
XE514 050	5	6	18	50	6
XE514 060	6	7	20	50	6
XE514 080	8	9	26	60	8
XE514 100	10	11	31	70	10
XE514 120	12	13	37	75	12
XE514 160	16	17	43	90	16
XE514 200	20	21	53	100	20

■ Applicable Working Material

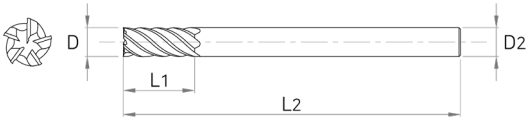
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○			○				◎

○ : GOOD ◎ : EXCELLENT

XE515

5 FLUTES VARIABLE HELIX NECK SQUARE ENDMILL





■ Tolerance

D		Shank Dia
D1 ~ 8	0 ~ -0.04	h6
D10 ~ 25	0 ~ -0.05	

CARBIDE | TiAlN | 5 | M HELIX | DATA P.681

EDP No	SIZES (mm)			
	D	L1	L2	D2
XE515 060	6	25	75	6
XE515 080	8	30	75	8
XE515 100	10	45	100	10
XE515 120	12	75	150	12
XE515 160	16	75	150	16
XE515 200	20	75	150	20

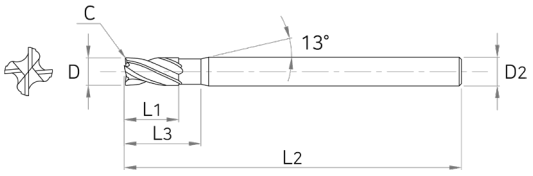
■ Applicable Working Material

Carbon Steel ~ HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○			○				◎

○ : GOOD ◎ : EXCELLENT

XE524 | 4 FLUTES VARIABLE HELIX LONG SHANK SQUARE ENDMILL





■ Tolerance

D		Shank Dia
D6 ~ 12	0 ~ -0.02	h6
D16	0 ~ -0.03	

CARBIDE | AlTiN | 4 | M HELIX | C | DATA P.681

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
XE524 060	6	7	33	70	6
XE524 080	8	9	43	80	8
XE524 100	10	11	43	84	10
XE524 120	12	13	51	97	12
XE524 160	16	17	66	115	16

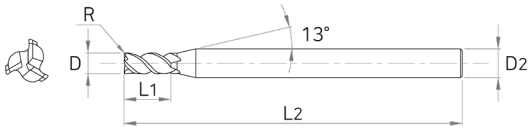
■ Applicable Working Material

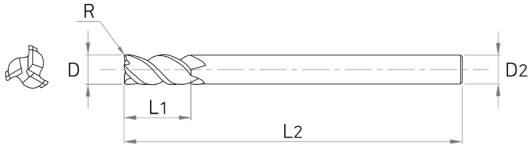
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○			○				◎

○ : GOOD ◎ : EXCELLENT

XCR503 | 3 FLUTES DOUBLE CORE RADIUS ENDMILL







■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.02	h6

CARBIDE | TiAlN | 3 | M HELIX | R ±0.02 All Sizes | DATA P.681

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
XCR503 05 02	5	0.2	15	50	6
XCR503 06 02	6	0.2	15	50	6
XCR503 06 05	6	0.5	15	50	6
XCR503 06 10	6	1	15	50	6
XCR503 08 05	8	0.5	20	60	8
XCR503 08 10	8	1	20	60	8
XCR503 10 05	10	0.5	25	70	10
XCR503 10 10	10	1	25	70	10
XCR503 12 05	12	0.5	30	75	12
XCR503 12 10	12	1	30	75	12
XCR503 16 05	16	0.5	40	90	16
XCR503 16 10	16	1	40	90	16
XCR503 20 05	20	0.5	45	100	20
XCR503 20 10	20	1	45	100	20
XCR503 25 05	25	0.5	50	120	25
XCR503 25 10	25	1	50	120	25

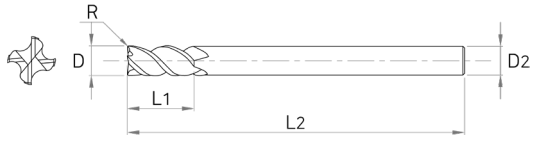
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○			○				◎

○ : GOOD ◎ : EXCELLENT

XCR504 | 4 FLUTES DOUBLE CORE RADIUS ENDMILL





■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.02	h6

CARBIDE | TiAlN | 4 | M HELIX | R ±0.02 All Sizes | DATA P.681

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
XCR504 0602	6	0.2	15	50	6
XCR504 0605	6	0.5	15	50	6
XCR504 0610	6	1	15	50	6
XCR504 0805	8	0.5	20	60	8
XCR504 0810	8	1	20	60	8
XCR504 1005	10	0.5	25	70	10
XCR504 1010	10	1	25	70	10
XCR504 1205	12	0.5	30	75	12
XCR504 1210	12	1	30	75	12
XCR504 1605	16	0.5	40	90	16
XCR504 1610	16	1	40	90	16
XCR504 2005	20	0.5	45	100	20
XCR504 2010	20	1	45	100	20
XCR504 2505	25	0.5	50	120	25
XCR504 2510	25	1	50	120	25

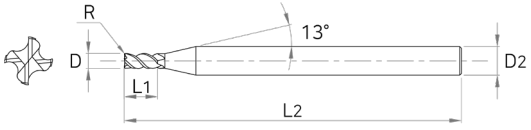
■ Applicable Working Material

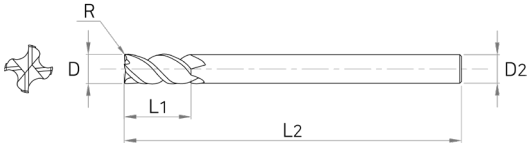
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○			○				◎

○ : GOOD ◎ : EXCELLENT

XR504 | 4 FLUTES VARIABLE HELIX RADIUS ENDMILL







■ Tolerance

D		Shank Dia
D1 ~ 12	0 ~ -0.02	h6
D13 ~ 25	0 ~ -0.03	

CARBIDE | AlTiN | 4 | M HELIX | R ±0.02 All Sizes | DATA P.681

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
XR504 020	2	0.1	5	45	4
XR504 030	3	0.1	8	50	6
XR504 040	4	0.2	11	50	6
XR504 050	5	0.2	13	50	6
XR504 060	6	0.2	13	50	6
XR504 070	7	0.2	16	60	8
XR504 080	8	0.2	19	60	8
XR504 090	9	0.2	19	70	10
XR504 100	10	0.3	22	70	10
XR504 110	11	0.3	22	75	12
XR504 120	12	0.3	26	75	12
XR504 130	13	0.3	26	80	12
XR504 140	14	0.3	26	80	14
XR504 160	16	0.3	32	90	16
XR504 180	18	0.3	32	100	18
XR504 200	20	0.3	38	100	20
XR504 250	25	0.3	45	120	25

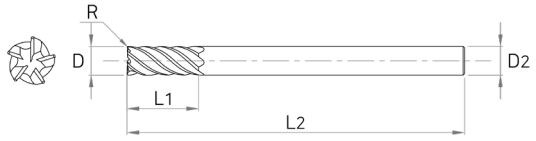
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○			○				◎

○ : GOOD ◎ : EXCELLENT

XR505 | 5 FLUTES VARIABLE HELIX RADIUS ENDMILL





■ Tolerance

D		Shank Dia
D1 ~ 8	0 ~ -0.04	h6
D10 ~ 25	0 ~ -0.05	

CARBIDE | TiAlN | 5 | M HELIX | R ±0.02 All Sizes | DATA P.681

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
XR505 06 050	6	0.5	13	57	6
XR505 08 050	8	0.5	19	63	8
XR505 10 050	10	0.5	22	72	10
XR505 12 075	12	0.75	26	83	12
XR505 14 075	14	0.75	26	83	14
XR505 14 075 S16	14	0.75	26	92	16
XR505 16 100	16	1	32	92	16
XR505 18 100	18	1	32	92	18
XR505 18 100 S20	18	1	32	104	20
XR505 20 100	20	1	38	104	20
XR505 25 100	25	1	38	104	25

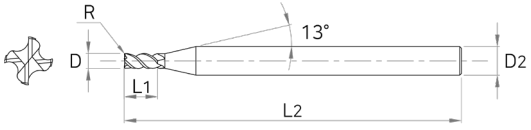
■ Applicable Working Material

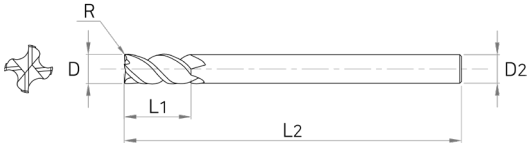
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○			○				◎

○ : GOOD ◎ : EXCELLENT

XR514 | 4 FLUTES VARIABLE HELIX RADIUS ENDMILL







■ Tolerance

D		Shank Dia
D2 ~ 12	0 ~ -0.02	h6
D13 ~ 25	0 ~ -0.03	

CARBIDE | AlTiN | 4 | M HELIX | R ±0.02 All Sizes | DATA P.681

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
XR514 0201	2	0.1	5	45	4
XR514 0202	2	0.2	5	45	4
XR514 0302	3	0.2	8	50	6
XR514 0303	3	0.3	8	50	6
XR514 0305	3	0.5	8	50	6
XR514 0403	4	0.3	10	50	6
XR514 0405	4	0.5	10	50	6
XR514 0410	4	1	10	50	6
XR514 0505	5	0.5	13	50	6
XR514 0510	5	1	13	50	6
XR514 0605	6	0.5	13	50	6
XR514 0610	6	1	13	50	6
XR514 0615	6	1.5	13	50	6
XR514 0805	8	0.5	19	60	8
XR514 0810	8	1	19	60	8
XR514 0815	8	1.5	19	60	8

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
XR514 0820	8	2	19	60	8
XR514 1005	10	0.5	22	70	10
XR514 1010	10	1	22	70	10
XR514 1015	10	1.5	22	70	10
XR514 1020	10	2	22	70	10
XR514 1205	12	0.5	26	75	12
XR514 1210	12	1	26	75	12
XR514 1215	12	1.5	26	75	12
XR514 1220	12	2	26	75	12
XR514 1230	12	3	26	75	12
XR514 1615	16	1.5	32	90	16
XR514 1620	16	2	32	90	16
XR514 1630	16	3	32	90	16
XR514 2030	20	3	38	100	20
XR514 2040	20	4	38	100	20
XR514 2050	20	5	38	100	20

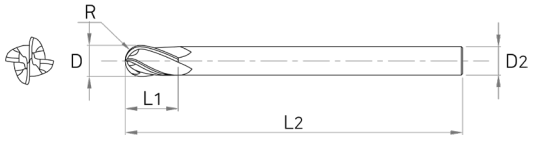
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○			○				◎

○ : GOOD ◎ : EXCELLENT

XXB504 | 4 FLUTES VARIABLE HELIX BALL ENDMILL





■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.02	h6

CARBIDE | TiAlN | 4 | M HELIX | R ±0.01 All Sizes | DATA P.681

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
XXB504 040	4	2	8	70	4
XXB504 060	6	3	12	90	6
XXB504 080	8	4	15	100	8
XXB504 100	10	5	20	100	10
XXB504 120	12	6	25	110	12

■ Applicable Working Material

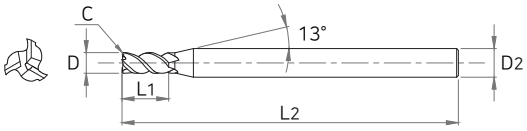
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○			○				◎

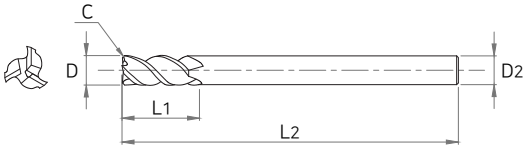
○ : GOOD ◎ : EXCELLENT

XCC503

3 FLUTES DOUBLE CORE CHAMFER ENDMILL







■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.02	h6

CARBIDE | TiAlN | 3 | M HELIX | C | DATA P.681

EDP No	SIZES (mm)				
	D	C	L1	L2	D2
XCC503 020	2	0.025	6	50	6
XCC503 025	2.5	0.025	8	50	6
XCC503 030	3	0.035	10	50	6
XCC503 035	3.5	0.035	10	50	6
XCC503 040	4	0.045	12	50	6
XCC503 045	4.5	0.045	14	50	6
XCC503 050	5	0.055	15	50	6
XCC503 055	5.5	0.055	15	50	6
XCC503 060	6	0.075	15	50	6
XCC503 080	8	0.1	20	60	8
XCC503 100	10	0.125	25	70	10
XCC503 120	12	0.15	30	75	12
XCC503 160	16	0.2	40	90	16
XCC503 200	20	0.25	45	100	20
XCC503 250	25	0.3	50	120	25

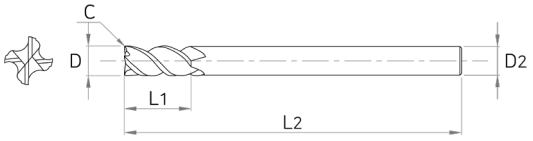
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○			○				◎

○ : GOOD ◎ : EXCELLENT

XCC504 | 4 FLUTES DOUBLE CORE CHAMFER ENDMILL





■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.02	h6

CARBIDE | TiAlN | 4 | M HELIX | C | DATA P.681

EDP No	SIZES (mm)				
	D	C	L1	L2	D2
XCC504 060	6	0.075	15	50	6
XCC504 080	8	0.1	20	60	8
XCC504 100	10	0.125	25	70	10
XCC504 120	12	0.15	30	75	12
XCC504 160	16	0.2	40	90	16
XCC504 200	20	0.3	45	100	20
XCC504 250	25	0.3	50	120	25

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○			○				◎

○ : GOOD ◎ : EXCELLENT

S-WING ENDMILL

Difficult To Cut Material (STS, Ti, Ni and Inconel)



Contents

Section		EDP No	Geometry	Type	Diameter(mm)		Page
Type	Flutes				Min	Max	
SQUARE	2F	SE502		2 FLUTES SQUARE ENDMILL	D1	D20	311
	3F	SE503		3 FLUTES SQUARE ENDMILL	D1	D20	312
	4F	SE504		4 FLUTES SQUARE ENDMILL	D1	D20	313
	6F	SE506		6 FLUTES SQUARE ENDMILL	D6	D20	315
RADIUS	4F	SR504		4 FLUTES RADIUS ENDMILL	D1	D20	316
	5F	SR505		5 FLUTES CHIP BREAKER TYPE RADIUS ENDMILL	D6	D20	318
	7F	SR507		7 FLUTES CHIP BREAKER TYPE RADIUS ENDMILL	D6	D20	319
BALL	2F	SB502		2 FLUTES BALL ENDMILL	R1	R12	320
	4F	SB504		4 FLUTES BALL ENDMILL	R3	R20	321
ROUGHING	3~5F	SF51H		3~5 FLUTES ROUGHING ENDMILL	D3	D20	322

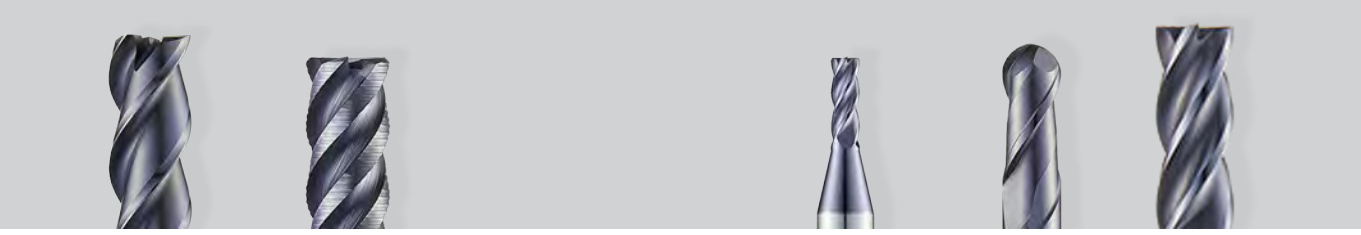
EDP No. System

*If expressed as an integer, the decimal point is omitted.

S F 5 1 4 120 03 H

Section	Appearance	Grade	Length, Shank Type	Flutes	Cutting Dia	Corner R	Note
S : SUS high performance	E : Square Type R : Radius Type B : Ball Type F : Roughing	5 : Grade	0, 1 - Standard(Neck)	2 : 2 Flute 3 : 3 Flute 4 : 4 Flute 5 : 5 Flute 6 : 6 Flute 7 : 7 Flute	1 ~ 20	0.1 ~ 2	H : High Helix F : Weldon Shank (DIN 6535 HB)

Ex) 4 Flute / Cutting Dia Ø2 / Corner R 0.3 / Shank Dia Ø4 / 50 Grade / Corner Radius Standard Type STS high Performance Endmill



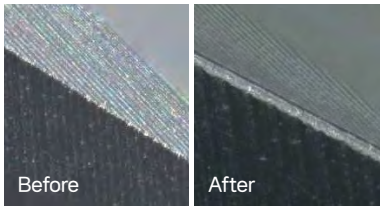
Characteristics

· Suitable for difficult to cut material such as STS, Ti, Ni and Inconel
· New coatings with high oxidation resistance and surface hardness
· Advanced surface roughness with improved chip emission and deposition resistance

Features

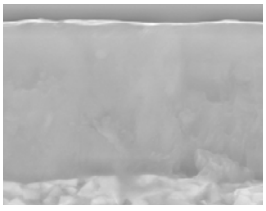
· Stable high speed processing with minimum vibration, unequal index and optimal rake angle
· High processability and low vibration by applying unequal index in cutting edge
· Minimum vibration through optimized helix angle and R gash, enhanced chip emission with stiffness supplementation
· Reduced friction resistance and improved chip emission by applying new coatings with high surface hardness oxidation resistance
· Enhanced chipping resistance and deposition resistance with new strengthened flute

Cutting edge

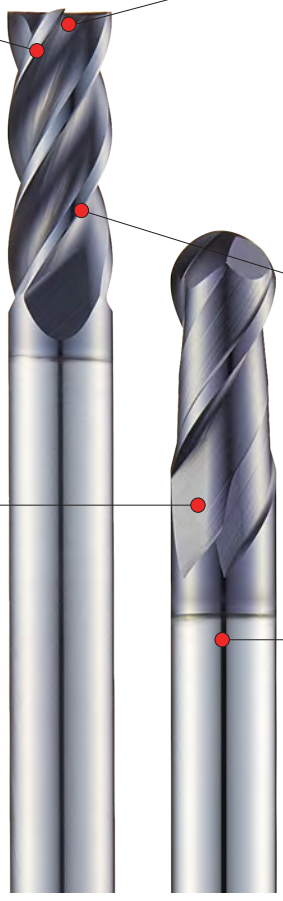


1) Settled initial chipping resistance in processing
2) Enhancing wear resistance and inducing stable processing
3) High quality by stabilizing cutting edge

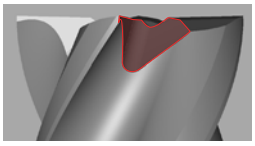
AlCrN coating



1) Improved lubrication through containing Cr
2) improved heat resistance

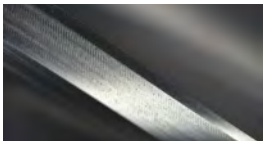


Unequal Index / R gash



1) High chip emission through R gash shape
2) Stability when shouldering machining

Additional finishing edge



1) Improved surface roughness by enhancing the first O.D grinding roughness
2) High quality of cutting edge and improved deposition resistance

Raw-material for high performance



1) Chipping resistance and working stability through high performance raw-material

S-WING ENDMILL

Difficult To Cut Material (STS, Ti, Ni and Inconel)

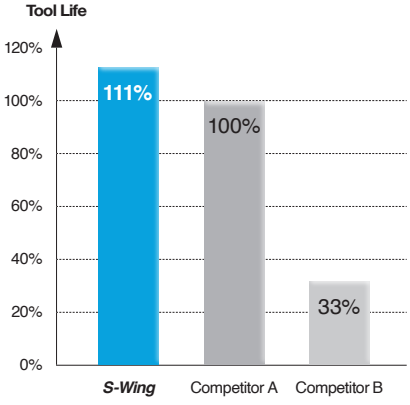


Case Study

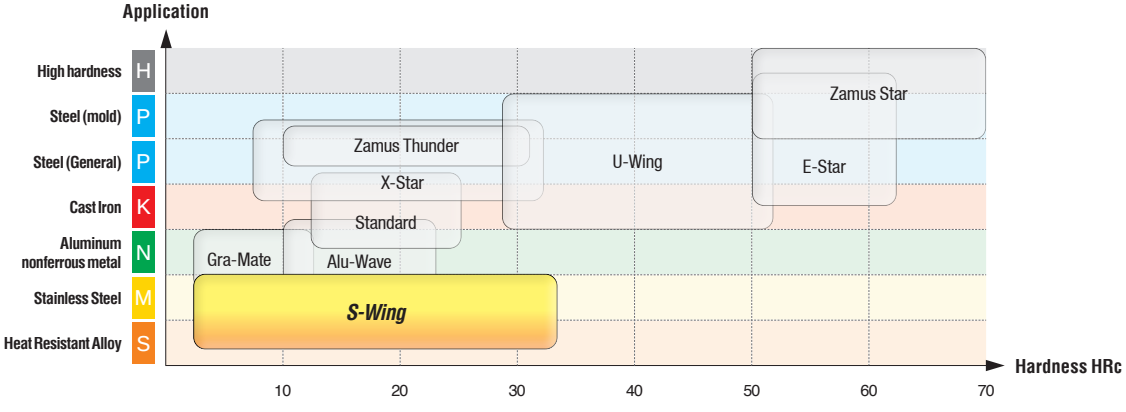
4F D6.0 SQUARE ENDMILL

S-Wing	Competitor A	Competitor B
		

· TEST TOOL : STS304 SERIES
· Shouldering, rpm : 3,200, feed : 380, ap : 9, ae : 0.6, Note : Wet Machining



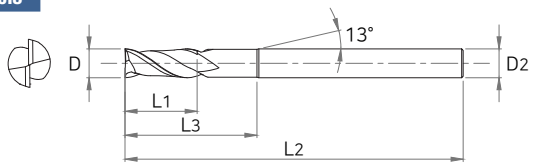
Applications



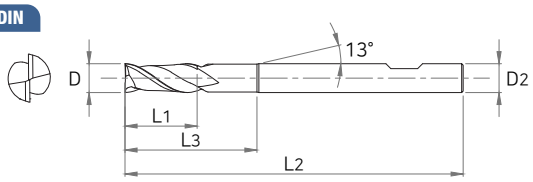
SE502 | 2 FLUTES SQUARE ENDMILL



JIS



DIN



■ Tolerance

D		Shank Dia
D1 ~ 5	0 ~ -0.015	h5
D6	0 ~ -0.02	
D8 ~ 20	0 ~ -0.03	



EDP No		SIZES (mm)				
JIS	DIN	D	L1	L3	L2	D2
SE502 010	SE502 010F	1	2.5	7.5	50	6
SE502 012	SE502 012F	1.2	3	8	50	6
SE502 015	SE502 015F	1.5	4	9	50	6
SE502 020	SE502 020F	2	6	11	50	6
SE502 025	SE502 025F	2.5	7	12	50	6
SE502 030	SE502 030F	3	8	13	55	6
SE502 040	SE502 040F	4	10	15	55	6
SE502 050	SE502 050F	5	15	20	55	6
SE502 060	SE502 060F	6	15	22	60	6
SE502 080	SE502 080F	8	20	27	70	8
SE502 100	SE502 100F	10	25	33	75	10
SE502 120	SE502 120F	12	30	40	80	12
SE502 140	SE502 140F	14	35	45	90	16
SE502 160	SE502 160F	16	42	52	100	16
SE502 180	SE502 180F	18	45	-	100	16
SE502 200	SE502 200F	20	48	58	100	20

※ The tools of DIN standard do not consider of holding inventory

■ Applicable Working Material

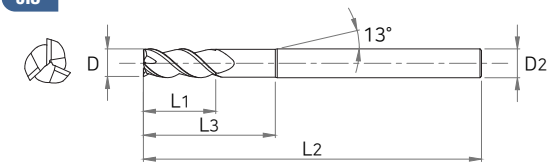
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	○	○					◎	○	○

○ : GOOD ◎ : EXCELLENT

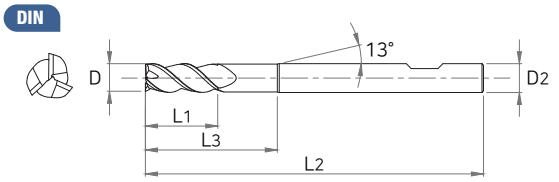
SE503 | 3 FLUTES SQUARE ENDMILL



JIS



DIN



■ Tolerance

D		Shank Dia
D1 ~ 5	0 ~ -0.015	h5
D6	0 ~ -0.02	
D8 ~ 20	0 ~ -0.03	

DIN 6535HB | CARBIDE | AlCrN | 3 | 42° HELIX | 43.5° HELIX | 45° HELIX | DATA P.685

EDP No		SIZES (mm)				
JIS	DIN	D	L1	L3	L2	D2
SE503 010	SE503 010F	1	2.5	7.5	50	6
SE503 012	SE503 012F	1.2	3	8	50	6
SE503 015	SE503 015F	1.5	4	9	50	6
SE503 020	SE503 020F	2	6	11	50	6
SE503 025	SE503 025F	2.5	7	12	50	6
SE503 030	SE503 030F	3	8	13	55	6
SE503 03010	SE503 03010F	3	10	15	60	6
SE503 040	SE503 040F	4	10	15	55	6
SE503 04012	SE503 04012F	4	12	17	60	6
SE503 050	SE503 050F	5	13	18	55	6
SE503 060	SE503 060F	6	15	22	60	6
SE503 06020	SE503 06020F	6	20	27	65	6
SE503 080	SE503 080F	8	20	27	70	8
SE503 08030	SE503 08030F	8	30	37	80	8
SE503 100	SE503 100F	10	25	33	75	10
SE503 10035	SE503 10035F	10	35	43	85	10
SE503 120	SE503 120F	12	30	40	80	12
SE503 12040	SE503 12040F	12	40	50	90	12
SE503 140	SE503 140F	14	35	45	90	16
SE503 160	SE503 160F	16	42	52	100	16
SE503 180	SE503 180F	18	45	-	100	16
SE503 200	SE503 200F	20	48	58	100	20

※ The tools of DIN standard do not consider of holding inventory

■ Applicable Working Material

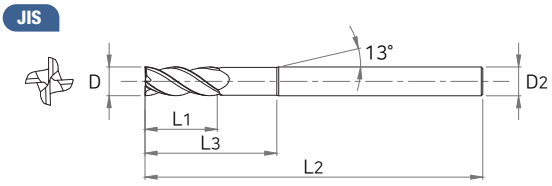
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	○	○					◎	○	○

○ : GOOD ◎ : EXCELLENT

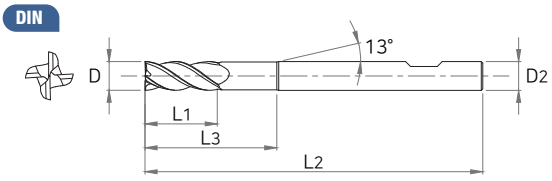
SE504 | 4 FLUTES SQUARE ENDMILL



JIS



DIN



■ Tolerance

D		Shank Dia
D1 ~ 5.5	0 ~ -0.015	h5
D6 ~ 7	0 ~ -0.02	
D8 ~ 20	0 ~ -0.03	



EDP No		SIZES (mm)				
JIS	DIN	D	L1	L3	L2	D2
SE504 010	SE504 010F	1	2.5	7.5	50	6
SE504 012	SE504 012F	1.2	3	8	50	6
SE504 015	SE504 015F	1.5	4	9	50	6
SE504 020	SE504 020F	2	6	11	50	6
SE504 025	SE504 025F	2.5	7	12	50	6
SE504 030	SE504 030F	3	8	13	55	6
SE504 03010	SE504 03010F	3	10	15	60	6
SE504 035	SE504 035F	3.5	10	15	55	6
SE504 040	SE504 040F	4	10	15	55	6
SE504 04012	SE504 04012F	4	12	17	60	6
SE504 045	SE504 045F	4.5	12	17	55	6
SE504 050	SE504 050F	5	15	20	55	6
SE504 055	SE504 055F	5.5	15	20	60	6
SE504 060	SE504 060F	6	15	22	60	6
SE504 06020	SE504 06020F	6	20	27	65	6
SE504 065	SE504 065F	6.5	15	22	60	8
SE504 070	SE504 070F	7	20	27	80	8
SE504 080	SE504 080F	8	20	27	70	8
SE504 08025	SE504 08025F	8	25	32	70	8
SE504 08030	SE504 08030F	8	30	37	80	8
SE504 085	SE504 085F	8.5	20	27	70	10
SE504 090	SE504 090F	9	25	32	80	10
SE504 100	SE504 100F	10	25	33	75	10
SE504 10035	SE504 10035F	10	35	43	85	10

※ The tools of DIN standard do not consider of holding inventory

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	○	○					◎	○	○

○ : GOOD ◎ : EXCELLENT

SE504 | 4 FLUTES SQUARE ENDMILL

EDP No		SIZES (mm)				
JIS	DIN	D	L1	L3	L2	D2
SE504 120	SE504 120F	12	30	40	80	12
SE504 12040	SE504 12040F	12	40	50	90	12
SE504 140	SE504 140F	14	35	45	90	16
SE504 160	SE504 160F	16	42	52	100	16
SE504 180	SE504 180F	18	45	-	100	16
SE504 200	SE504 200F	20	48	58	100	20

※ The tools of DIN standard do not consider of holding inventory

■ Applicable Working Material

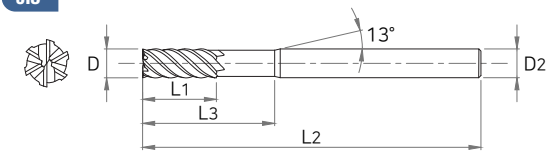
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	○	○					◎	○	○

○ : GOOD ◎ : EXCELLENT

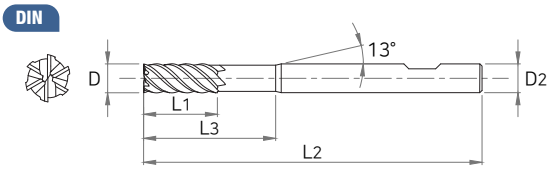
SE506 | 6 FLUTES SQUARE ENDMILL



JIS



DIN



■ Tolerance

D		Shank Dia
D6	0 ~ -0.02	h5
D8 ~ 20	0 ~ -0.03	

DIN 6535HB | CARBIDE | AlCrN | 6 | 45° HELIX | DATA P.688

EDP No		SIZES (mm)				
JIS	DIN	D	L1	L3	L2	D2
SE506 060	SE506 060F	6	15	22	60	6
SE506 080	SE506 080F	8	20	27	70	8
SE506 100	SE506 100F	10	25	33	75	10
SE506 120	SE506 120F	12	30	40	80	12
SE506 160	SE506 160F	16	42	52	100	16
SE506 200	SE506 200F	20	48	58	100	20

※ The tools of DIN standard do not consider of holding inventory

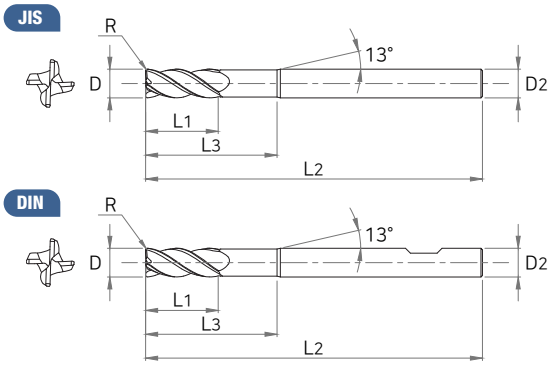
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	○	○					◎	○	○

○ : GOOD ◎ : EXCELLENT

SR504 | 4 FLUTES RADIUS ENDMILL





■ Tolerance

D		Shank Dia
D1 ~ 5	0 ~ -0.015	h5
D6 ~ 7	0 ~ -0.02	
D8 ~ 20	0 ~ -0.03	

DIN 6535HB | CARBIDE | AlCrN | 4 | 35° HELIX | 37° HELIX | R ±0.01 | DATA P.687

EDP No		SIZES (mm)					
JIS	DIN	D	R	L1	L3	L2	D2
SR504 01001	SR504 01001F	1	0.1	2.5	7.5	50	6
SR504 01002	SR504 01002F	1	0.2	2.5	7.5	50	6
SR504 01201	SR504 01201F	1.2	0.1	3	8	50	6
SR504 01501	SR504 01501F	1.5	0.1	4	9	50	6
SR504 01502	SR504 01502F	1.5	0.2	4	9	50	6
SR504 02001	SR504 02001F	2	0.1	6	11	50	6
SR504 02002	SR504 02002F	2	0.2	6	11	50	6
SR504 02502	SR504 02502F	2.5	0.2	7	12	50	6
SR504 03002	SR504 03002F	3	0.2	8	13	55	6
SR504 03003	SR504 03003F	3	0.3	8	13	55	6
SR504 03005	SR504 03005F	3	0.5	8	13	55	6
SR504 04002	SR504 04002F	4	0.2	10	15	55	6
SR504 04003	SR504 04003F	4	0.3	10	15	55	6
SR504 04005	SR504 04005F	4	0.5	10	15	55	6
SR504 05002	SR504 05002F	5	0.2	15	20	55	6
SR504 05003	SR504 05003F	5	0.3	15	20	55	6
SR504 05005	SR504 05005F	5	0.5	15	20	55	6
SR504 06003	SR504 06003F	6	0.3	15	22	60	6
SR504 06005	SR504 06005F	6	0.5	15	22	60	6
SR504 06010	SR504 06010F	6	1	15	22	60	6
SR504 07003	SR504 07003F	7	0.3	15	22	60	8
SR504 08002	SR504 08002F	8	0.2	20	27	70	8
SR504 08003	SR504 08003F	8	0.3	20	27	70	8
SR504 08005	SR504 08005F	8	0.5	20	27	70	8

※ The tools of DIN standard do not consider of holding inventory

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	○	○					◎	○	○

○ : GOOD ◎ : EXCELLENT

SR504 | 4 FLUTES RADIUS ENDMILL

EDP No		SIZES (mm)					
JIS	DIN	D	R	L1	L3	L2	D2
SR504 08010	SR504 08010F	8	1	20	27	70	8
SR504 10003	SR504 10003F	10	0.3	25	33	75	10
SR504 10005	SR504 10005F	10	0.5	25	33	75	10
SR504 10010	SR504 10010F	10	1	25	33	75	10
SR504 10015	SR504 10015F	10	1.5	25	33	75	10
SR504 10020	SR504 10020F	10	2	25	33	75	10
SR504 10030	SR504 10030F	10	3	25	33	75	10
SR504 12003	SR504 12003F	12	0.3	30	40	80	12
SR504 12005	SR504 12005F	12	0.5	30	40	80	12
SR504 12010	SR504 12010F	12	1	30	40	80	12
SR504 12015	SR504 12015F	12	1.5	30	40	80	12
SR504 12020	SR504 12020F	12	2	30	40	80	12
SR504 12030	SR504 12030F	12	3	30	40	80	12
SR504 12040	SR504 12040F	12	4	30	40	80	12
SR504 14005	SR504 14005F	14	0.5	35	45	90	16
SR504 14010	SR504 14010F	14	1	35	45	90	16
SR504 14020	SR504 14020F	14	2	35	45	90	16
SR504 14030	SR504 14030F	14	3	35	45	90	16
SR504 14040	SR504 14040F	14	4	35	45	90	16
SR504 16005	SR504 16005F	16	0.5	42	52	100	16
SR504 16010	SR504 16010F	16	1	42	52	100	16
SR504 16020	SR504 16020F	16	2	42	52	100	16
SR504 16030	SR504 16030F	16	3	42	52	100	16
SR504 16040	SR504 16040F	16	4	42	52	100	16
SR504 16050	SR504 16050F	16	5	42	52	100	16
SR504 18005	SR504 18005F	18	0.5	45	-	100	16
SR504 20005	SR504 20005F	20	0.5	48	58	100	20
SR504 20010	SR504 20010F	20	1	48	58	100	20
SR504 20020	SR504 20020F	20	2	48	58	100	20
SR504 20030	SR504 20030F	20	3	48	58	100	20
SR504 20040	SR504 20040F	20	4	48	58	100	20
SR504 20050	SR504 20050F	20	5	48	58	100	20

※ The tools of DIN standard do not consider of holding inventory

■ Applicable Working Material

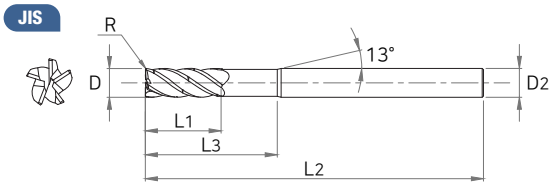
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	○	○					◎	○	○

○ : GOOD ◎ : EXCELLENT

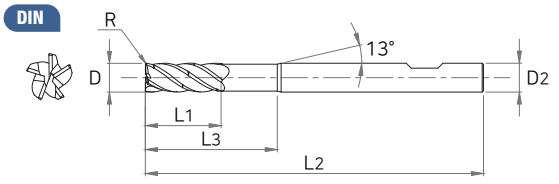
SR505 | 5 FLUTES CHIP BREAKER TYPE RADIUS ENDMILL



JIS



DIN



■ Tolerance

D		Shank Dia
D6	0 ~ -0.02	h5
D8 ~ 20	0 ~ -0.03	

DIN 6535HB | CARBIDE | AlCrN | 5 | 35° HELIX | 38° HELIX | R ±0.01 | DATA P.687

EDP No		SIZES (mm)					
JIS	DIN	D	R	L1	L3	L2	D2
SR505 06005	SR505 06005F	6	0.5	15	22	60	6
SR505 0602405	SR505 0602405F	6	0.5	24	31	70	6
SR505 08005	SR505 08005F	8	0.5	20	27	70	8
SR505 0803205	SR505 0803205F	8	0.5	32	39	90	8
SR505 10005	SR505 10005F	10	0.5	25	33	75	10
SR505 1004005	SR505 1004005F	10	0.5	40	48	100	10
SR505 12005	SR505 12005F	12	0.5	30	40	80	12
SR505 12010	SR505 12010F	12	1	30	40	80	12
SR505 12020	SR505 12020F	12	2	30	40	80	12
SR505 12030	SR505 12030F	12	3	30	40	80	12
SR505 1204805	SR505 1204805F	12	0.5	48	58	110	12
SR505 16005	SR505 16005F	16	0.5	42	52	100	16
SR505 16010	SR505 16010F	16	1	42	52	100	16
SR505 16020	SR505 16020F	16	2	42	52	100	16
SR505 16030	SR505 16030F	16	3	42	52	100	16
SR505 16040	SR505 16040F	16	4	42	52	100	16
SR505 1606505	SR505 1606505F	16	0.5	65	75	130	16
SR505 20005	SR505 20005F	20	0.5	48	58	110	20
SR505 2006505	SR505 2006505F	20	0.5	65	75	130	20

※ The tools of DIN standard do not consider of holding inventory

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	○	○					◎	○	○

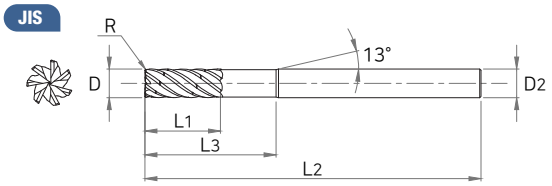
※ Trochoidal Milling Possible

○ : GOOD ◎ : EXCELLENT

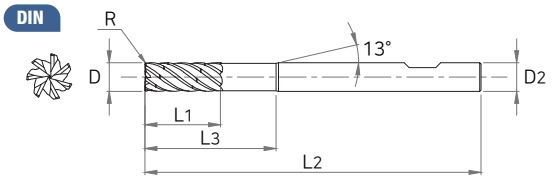
SR507 | 7 FLUTES CHIP BREAKER TYPE RADIUS ENDMILL



JIS



DIN



■ Tolerance

D		Shank Dia
D6	0 ~ -0.02	h5
D8 ~ 20	0 ~ -0.03	



EDP No		SIZES (mm)					
JIS	DIN	D	R	L1	L3	L2	D2
SR507 06005	SR507 06005F	6	0.5	15	22	60	6
SR507 0602405	SR507 0602405F	6	0.5	24	31	70	6
SR507 08005	SR507 08005F	8	0.5	20	27	70	8
SR507 0803205	SR507 0803205F	8	0.5	32	39	90	8
SR507 10005	SR507 10005F	10	0.5	25	33	75	10
SR507 1004005	SR507 1004005F	10	0.5	40	48	100	10
SR507 12005	SR507 12005F	12	0.5	30	40	80	12
SR507 12010	SR507 12010F	12	1	30	40	80	12
SR507 12020	SR507 12020F	12	2	30	40	80	12
SR507 12030	SR507 12030F	12	3	30	40	80	12
SR507 12040	SR507 12040F	12	4	30	40	80	12
SR507 1204805	SR507 1204805F	12	0.5	48	58	110	12
SR507 16005	SR507 16005F	16	0.5	42	52	100	16
SR507 16010	SR507 16010F	16	1	42	52	100	16
SR507 16020	SR507 16020F	16	2	42	52	100	16
SR507 16030	SR507 16030F	16	3	42	52	100	16
SR507 16040	SR507 16040F	16	4	42	52	100	16
SR507 16050	SR507 16050F	16	5	42	52	100	16
SR507 1606505	SR507 1606505F	16	0.5	65	75	130	16
SR507 20005	SR507 20005F	20	0.5	48	58	110	20
SR507 2006505	SR507 2006505F	20	0.5	65	75	130	20

※ The tools of DIN standard do not consider of holding inventory

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	○	○					◎	○	○

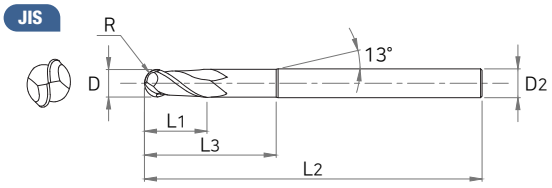
※ Trochoidal Milling Possible

○ : GOOD ◎ : EXCELLENT

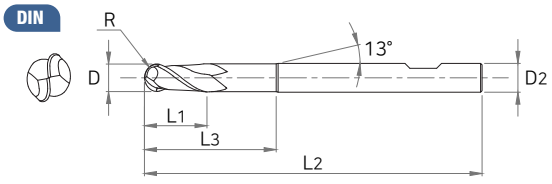
SB502 | 2 FLUTES BALL ENDMILL



JIS



DIN



■ Tolerance

D		Shank Dia
D1 ~ 5	0 ~ -0.015	h5
D6 ~ 7	0 ~ -0.02	
D8 ~ 20	0 ~ -0.03	

DIN 6535HB | CARBIDE | AlCrN | 2 | 38° HELIX | R ±0.01 | DATA P.690

EDP No		SIZES (mm)					
JIS	DIN	D	R	L1	L3	L2	D2
SB502 010	SB502 010F	1	0.5	3	8	50	6
SB502 020	SB502 020F	2	1	6	11	50	6
SB502 030	SB502 030F	3	1.5	8	13	50	6
SB502 030L	SB502 030LF	3	1.5	8	13	70	6
SB502 040	SB502 040F	4	2	10	15	50	6
SB502 040L	SB502 040LF	4	2	10	15	70	6
SB502 050	SB502 050F	5	2.5	13	18	50	6
SB502 050L	SB502 050LF	5	2.5	13	18	80	6
SB502 060	SB502 060F	6	3	13	20	50	6
SB502 060L	SB502 060LF	6	3	13	20	90	6
SB502 080	SB502 080F	8	4	19	26	60	8
SB502 080L	SB502 080LF	8	4	19	26	100	8
SB502 100	SB502 100F	10	5	22	30	70	10
SB502 100L	SB502 100LF	10	5	22	30	100	10
SB502 120	SB502 120F	12	6	26	36	75	12
SB502 120L	SB502 120LF	12	6	26	36	110	12

※ The tools of DIN standard do not consider of holding inventory

■ Applicable Working Material

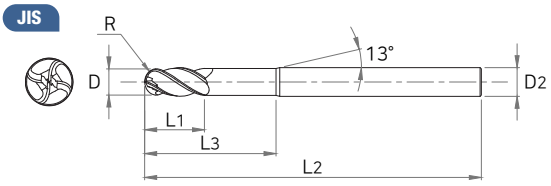
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	○	○					◎	○	○

○ : GOOD ◎ : EXCELLENT

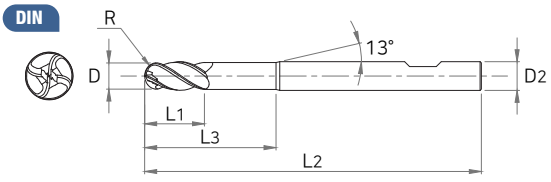
SB504 | 4 FLUTES BALL ENDMILL



JIS



DIN



■ Tolerance

D		Shank Dia
D1 ~ 5	0 ~ -0.015	h5
D6	0 ~ -0.02	
D8 ~ 20	0 ~ -0.03	



EDP No		SIZES (mm)					
JIS	DIN	D	R	L1	L3	L2	D2
SB504 030	SB504 030F	3	1.5	8	13	60	6
SB504 040	SB504 040F	4	2	8	13	70	6
SB504 050	SB504 050F	5	2.5	12	17	80	6
SB504 060	SB504 060F	6	3	12	19	90	6
SB504 080	SB504 080F	8	4	16	23	100	8
SB504 100	SB504 100F	10	5	20	28	100	10
SB504 120	SB504 120F	12	6	25	35	100	12
SB504 160	SB504 160F	16	8	30	40	100	16
SB504 200	SB504 200F	20	10	38	48	100	20

※ The tools of DIN standard do not consider of holding inventory

■ Applicable Working Material

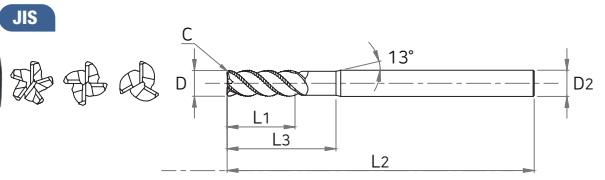
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	○	○					◎	○	○

○ : GOOD ◎ : EXCELLENT

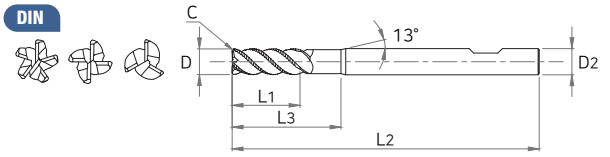
SF51H | 3~5 FLUTES ROUGHING ENDMILL



JIS



DIN



■ Tolerance

D		Shank Dia
D3 ~ 20	0 ~ -0.05	h5

DIN 6535HB | CARBIDE | AlCrN | 3~5 | 45° HELIX | DATA P.691

EDP No		SIZES (mm)						
JIS	DIN	D	C	L1	L3	L2	D2	Z
SF51 303002H	SF51 303002HF	3	0.2	8	13	50	6	3
SF51 304002H	SF51 304002HF	4	0.2	10	15	50	6	3
SF51 405002H	SF51 405002HF	5	0.3	13	18	50	6	4
SF51 406002H	SF51 406002HF	6	0.3	13	20	60	6	4
SF51 406002NH	SF51 406002NHF	6	0.3	10	20	60	6	4
SF51 407002H	SF51 407002HF	7	0.4	18	25	70	8	4
SF51 408002H	SF51 408002HF	8	0.4	19	26	70	8	4
SF51 408002NH	SF51 408002NHF	8	0.4	12	25	70	8	4
SF51 409003H	SF51 409003HF	9	0.4	20	27	70	10	4
SF51 410003H	SF51 410003HF	10	0.4	22	30	75	10	4
SF51 410003NH	SF51 410003NHF	10	0.4	15	30	75	10	4
SF51 411003H	SF51 411003HF	11	0.5	25	33	80	12	4
SF51 412003H	SF51 412003HF	12	0.5	26	36	80	12	4
SF51 412003NH	SF51 412003NHF	12	0.5	20	35	80	12	4
SF51 506002H	SF51 506002HF	6	0.5	13	20	60	6	5
SF51 508002H	SF51 508002HF	8	0.5	19	26	65	8	5
SF51 510003H	SF51 510003HF	10	0.5	22	30	70	10	5
SF51 512003H	SF51 512003HF	12	0.5	26	36	80	12	5
SF51 514005H	SF51 514005HF	14	0.5	28	38	90	16	5
SF51 516005H	SF51 516005HF	16	0.5	32	42	100	16	5
SF51 51600542H	SF51 51600542HF	16	0.5	42	52	100	16	5
SF51 520005H	SF51 520005HF	20	0.5	38	48	100	20	5
SF51 52000545H	SF51 52000545HF	20	0.5	45	55	100	20	5

※ The tools of DIN standard do not consider of holding inventory

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Cast Iron ~FCD500	Aluminum	Stainless Steel	Ti-Alloy	Ni-Alloy
			SKD61 ~HRc55	SKD11 HRc55~					
○	○	○					◎	○	○

○ : GOOD ◎ : EXCELLENT

ALU-WAVE ENDMILL

Aluminum, Aluminum Alloy and Non-ferrous Materials



Contents

Section		EDP No	Geometry	Type	Diameter(mm)		Page
Type	Flutes				Min	Max	
SQUARE	1F	WAE301		1 FLUTE SQUARE ENDMILL	D0.2	D12	326
	2F	WAE302		2 FLUTES SQUARE ENDMILL	D1	D25	327
	3F	WAE30(2)3		3 FLUTES SQUARE ENDMILL	D1	D25	328
RADIUS	2F	WAR302		2 FLUTES RADIUS ENDMILL	D6	D20	330
	3F	WAR303		3 FLUTES RADIUS ENDMILL	D6	D20	331
	2F	WAR502		2 FLUTES RADIUS ENDMILL	D1	D12	332
	3F	WAR503		3 FLUTES RADIUS ENDMILL	D4	D20	333
BALL	2F	WAB312		2 FLUTES BALL NOSE ENDMILL	R3	R10	334
ROUGHING	3F	WAF303		3 FLUTES ROUGHING ENDMILL	D4	D20	335

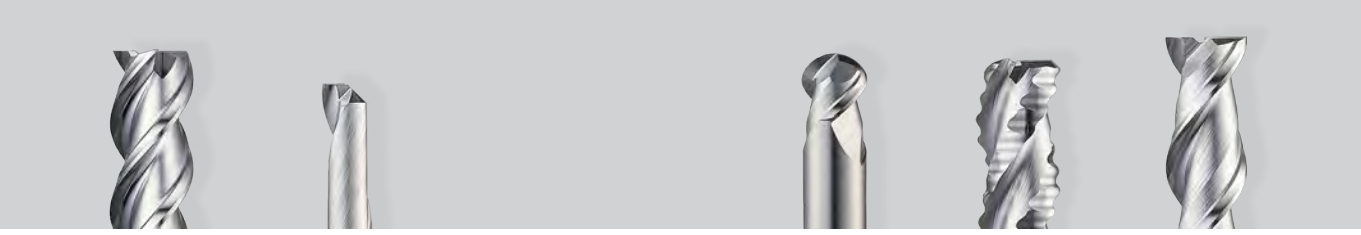
EDP No. System

*If expressed as an integer, the decimal point is omitted.

WA	R	3	0	3	14	10

Section	Appearance	Grade	Length, Shank Type	Flutes	Cutting Dia	Corner R
WA : Winner Aluminium	E : Square	3 : NON Coating	0 : Stub Length	1 : 1 Flute	0.2	0.05
	R : Radius	5 : D.L.C Coating	1 : Regula Length	2 : 2 Flutes	~	~
	B : Ball		2 : Long Length	3 : 3 Flutes	25	5
	F : Roughing					

Ex) 3 Flute / Cutting Dia Ø14 / Corner R 1.0 / NON Coating Corner Radius Alu Wave Endmill



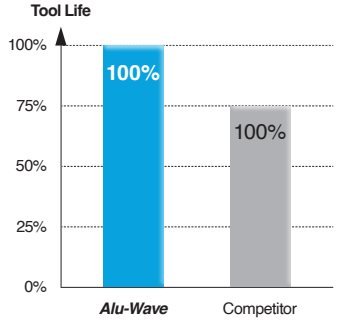
General Features

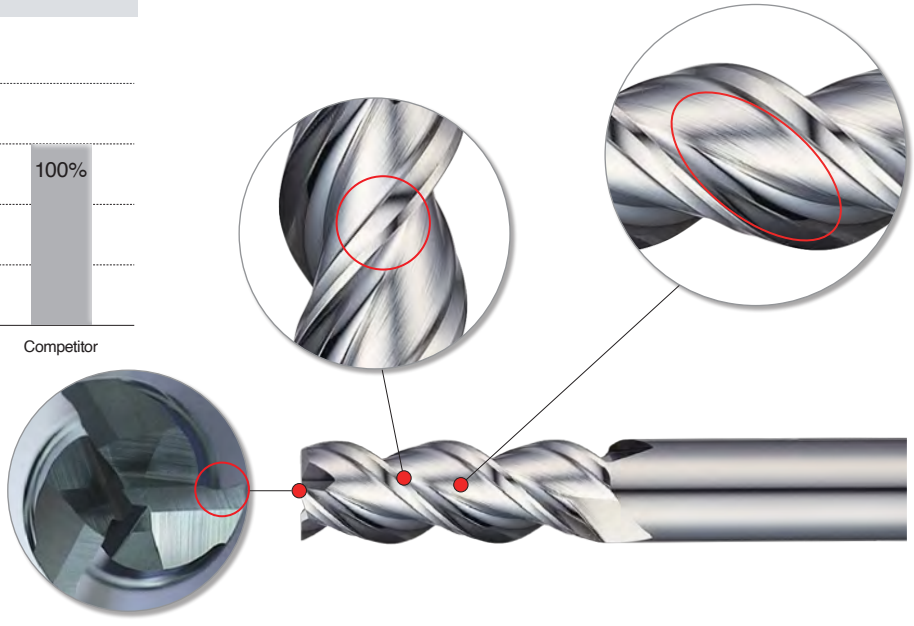
· Suitable for Aluminum, Aluminum alloy and Non-ferrous materials.
· Various specifications in the line such as Ball, single flute and roughing etc. for wide range in machining.

Characteristics

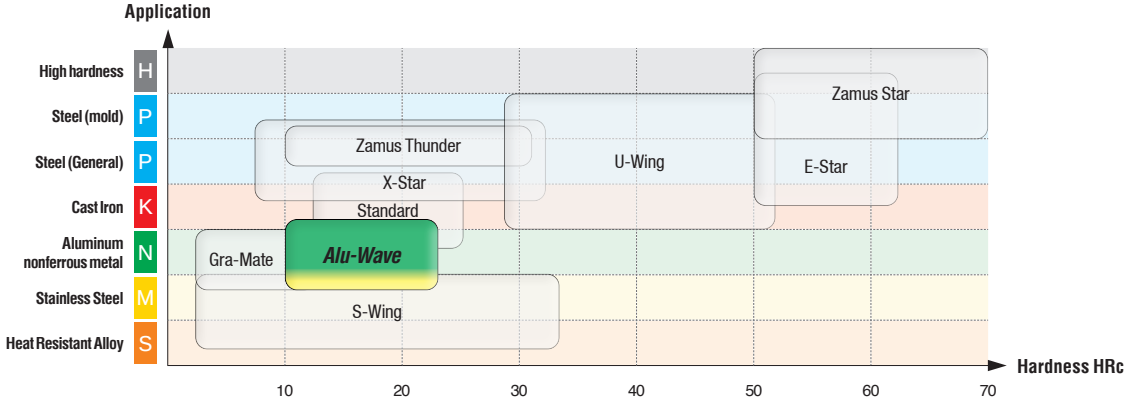
· Sharp cutting edge considered the characteristics of workpiece
· High deposition resistance and enhanced chip emission through the surface of a mirror in the groove.

Case Study



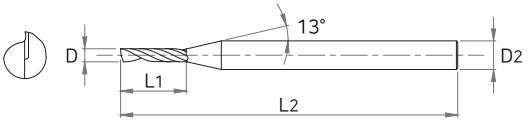


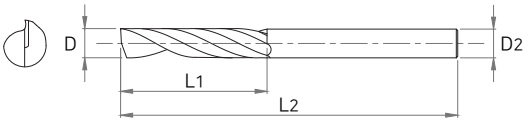
Applications



WAE301 | 1 FLUTE SQUARE ENDMILL







■ Tolerance

D		Shank Dia
D0.2 ~ 5	0 ~ -0.02	h6
D6 ~ 12	0 ~ -0.03	

CARBIDE | Uncoated | 1 | 30° HELIX | DATA P.692

EDP No	SIZES (mm)			
	D	L1	L2	D2
WAE301 002	0.2	0.3	40	4
WAE301 003	0.3	0.9	40	4
WAE301 004	0.4	1.2	40	4
WAE301 005	0.5	1.5	40	4
WAE301 006	0.6	1.8	40	4
WAE301 007	0.7	2.1	40	4
WAE301 008	0.8	2.4	40	4
WAE301 009	0.9	2.7	40	4
WAE301 010	1	3	45	6
WAE301 010-4.5	1	4.5	45	6
WAE301 010-6	1	6	50	6
WAE301 012	1.2	3	45	6
WAE301 012-5	1.2	5	45	6
WAE301 012-6	1.2	6	50	6
WAE301 015	1.5	4	45	6
WAE301 015-6	1.5	6	50	6
WAE301 015-8	1.5	8	50	6
WAE301 020	2	6	50	6
WAE301 020-8	2	8	50	6
WAE301 020-10	2	10	50	6
WAE301 025	2.5	7	50	6

EDP No	SIZES (mm)			
	D	L1	L2	D2
WAE301 025-8	2.5	8	50	6
WAE301 025-10	2.5	10	50	6
WAE301 025-12	2.5	12	50	6
WAE301 030	3	8	50	6
WAE301 030-12	3	12	50	6
WAE301 030-15	3	15	50	6
WAE301 040	4	10	50	6
WAE301 040-15	4	15	50	6
WAE301 040-20	4	20	60	6
WAE301 050	5	13	60	6
WAE301 050-20	5	20	60	6
WAE301 050-25	5	25	60	6
WAE301 060	6	15	60	6
WAE301 060-20	6	20	60	6
WAE301 060-25	6	25	60	6
WAE301 080	8	20	70	8
WAE301 080-25	8	25	75	8
WAE301 100	10	22	75	10
WAE301 100-30	10	30	80	10
WAE301 120	12	26	75	12
WAE301 120-35	12	35	90	12

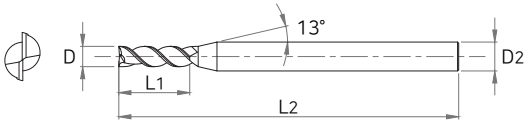
■ Applicable Working Material

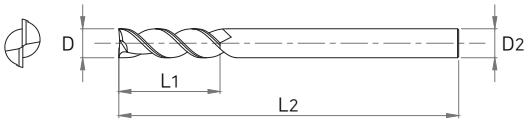
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
					○			◎	

○ : GOOD ◎ : EXCELLENT

WAE302 | 2 FLUTES SQUARE ENDMILL







■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.02	h6

CARBIDE | Uncoated | 2 | 45° HELIX | SHARP EDGE | DATA P.693

EDP No	SIZES (mm)			
	D	L1	L2	D2
WAE302 010	1	3	50	4
WAE302 010-6	1	6	60	6
WAE302 012	1.2	4	50	6
WAE302 015	1.5	6	50	6
WAE302 015-8	1.5	8	60	6
WAE302 020 S4	2	6	50	4
WAE302 020	2	6	50	6
WAE302 020-10	2	10	60	6
WAE302 025	2.5	12	55	6
WAE302 030	3	12	55	6
WAE302 030-15	3	15	65	6
WAE302 035	3.5	14	57	6
WAE302 040	4	14	55	6
WAE302 040-16	4	16	65	6
WAE302 050	5	17	55	6
WAE302 050-22	5	22	60	6
WAE302 060	6	17	60	6
WAE302 060-22	6	22	60	6
WAE302 070	7	20	63	8

EDP No	SIZES (mm)			
	D	L1	L2	D2
WAE302 080	8	23	70	8
WAE302 080-31	8	31	80	8
WAE302 090	9	25	72	10
WAE302 100	10	28	75	10
WAE302 100-36	10	36	90	10
WAE302 110	11	30	80	12
WAE302 120	12	33	80	12
WAE302 120-41	12	41	95	12
WAE302 122	12	45	100	12
WAE302 130	13	35	85	14
WAE302 140	14	38	90	14
WAE302 150	15	40	90	16
WAE302 160	16	45	100	16
WAE302 160-53	16	53	110	16
WAE302 180	18	49	100	18
WAE302 200	20	50	100	20
WAE302 200-55	20	55	110	20
WAE302 250	25	50	120	25

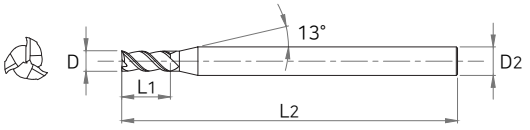
■ Applicable Working Material

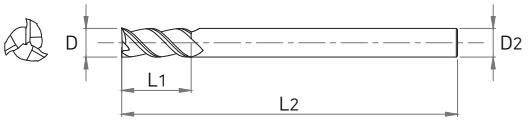
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
					○			◎	

○ : GOOD ◎ : EXCELLENT

WAE30(2)3 | 3 FLUTES SQUARE ENDMILL







■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.02	h6



EDP No	SIZES (mm)			
	D	L1	L2	D2
WAE303 010-02	1	2	40	6
WAE303 010-025	1	2.5	40	6
WAE303 010	1	3	50	6
WAE303 010-04	1	4	60	6
WAE303 010-06	1	6	60	6
WAE303 012	1.2	4	50	6
WAE303 015-03	1.5	3	40	6
WAE303 015	1.5	5	50	6
WAE303 015-06	1.5	6	60	6
WAE303 015-08	1.5	8	60	6
WAE303 015-10	1.5	10	60	6
WAE303 020-03	2	3	40	6
WAE303 020	2	6	50	6
WAE303 020-08	2	8	60	6
WAE303 020-10	2	10	60	6
WAE303 020-12	2	12	60	6
WAE303 025	2.5	8	40	6
WAE303 025-10	2.5	10	55	6
WAE303 025-12	2.5	12	60	6
WAE303 030-04	3	4	45	6
WAE303 030-08	3	8	45	6
WAE303 030	3	12	55	6
WAE303 031	3	15	65	6
WAE323 030	3	20	70	6

EDP No	SIZES (mm)			
	D	L1	L2	D2
WAE323 031	3	25	75	6
WAE323 032	3	30	80	6
WAE303 035	3.5	12	55	6
WAE303 040-05	4	5	45	6
WAE303 040-08	4	8	45	6
WAE303 040-11	4	11	45	6
WAE303 040	4	14	55	6
WAE303 040-16	4	16	65	6
WAE303 041	4	20	70	6
WAE323 040	4	26	75	6
WAE323 041	4	30	80	6
WAE303 045	4.5	15	55	6
WAE303 050-06	5	6	45	6
WAE303 050	5	17	55	6
WAE303 051	5	22	60	6
WAE303 052	5	26	70	6
WAE323 050	5	31	75	6
WAE323 051	5	36	80	6
WAE323 052	5	41	85	6
WAE323 053	5	46	90	6
WAE303 055	5.5	17	55	6
WAE303 060-07	6	7	50	6
WAE303 060-13	6	13	50	6
WAE303 060	6	17	60	6

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
					○			◎	

○ : GOOD ◎ : EXCELLENT

WAE30(2)3 | 3 FLUTES SQUARE ENDMILL

EDP No	SIZES (mm)			
	D	L1	L2	D2
WAE303 061	6	22	60	6
WAE303 062	6	26	70	6
WAE303 063	6	31	75	6
WAE323 060	6	36	80	6
WAE323 061	6	43	90	6
WAE323 062	6	51	100	6
WAE303 070	7	23	65	8
WAE303 080-10	8	10	60	8
WAE303 080-20	8	20	60	8
WAE303 080	8	23	70	8
WAE303 080-29	8	29	80	8
WAE303 081	8	31	80	8
WAE303 082	8	36	85	8
WAE323 080	8	41	90	8
WAE323 081	8	46	95	8
WAE323 082	8	51	100	8
WAE323 083	8	56	105	8
WAE323 084	8	66	110	8
WAE303 090	9	28	70	10
WAE303 100-12	10	12	65	10
WAE303 100-23	10	23	65	10
WAE303 100	10	28	75	10
WAE303 100-33	10	33	90	10
WAE303 101	10	36	90	10
WAE303 100-41	10	41	90	10
WAE303 102	10	46	100	10
WAE303 103	10	51	100	10
WAE323 100	10	56	110	10
WAE323 100-61	10	61	110	10
WAE323 101	10	66	120	10
WAE303 110	11	30	80	12
WAE303 120-14	12	14	70	12
WAE303 120-27	12	27	70	12
WAE303 120	12	33	80	12
WAE303 121	12	41	95	12

EDP No	SIZES (mm)			
	D	L1	L2	D2
WAE303 122	12	46	100	12
WAE303 122-51	12	51	100	12
WAE303 123	12	56	110	12
WAE303 124-61	12	61	110	12
WAE323 120	12	66	120	12
WAE323 120-71	12	71	120	12
WAE323 121	12	76	135	12
WAE303 130	13	35	85	14
WAE303 140	14	38	90	14
WAE303 150	15	40	90	16
WAE303 160-19	16	19	90	16
WAE303 160-33	16	33	90	16
WAE303 160	16	45	100	16
WAE303 160-53	16	53	105	16
WAE303 161	16	56	110	16
WAE303 162	16	66	130	16
WAE303 163	16	76	150	16
WAE323 160	16	86	160	16
WAE323 161	16	96	180	16
WAE323 162	16	106	190	16
WAE323 163	16	116	200	16
WAE303 180	18	49	100	18
WAE303 200-23	20	23	90	20
WAE303 200-39	20	39	90	20
WAE303 200	20	50	100	20
WAE303 201	20	60	110	20
WAE303 202	20	70	130	20
WAE303 203	20	76	150	20
WAE323 200	20	86	160	20
WAE323 201	20	96	180	20
WAE323 202	20	106	190	20
WAE323 203	20	116	200	20
WAE323 204	20	126	220	20
WAE303 250	25	50	120	25

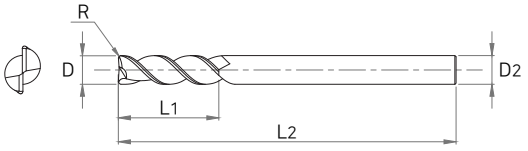
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
					○			◎	

○ : GOOD ◎ : EXCELLENT

WAR302 | 2 FLUTES RADIUS ENDMILL





■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.02	h6

CARBIDE | Uncoated | 2 | 45° HELIX | R ±0.015 All Sizes | DATA P.695

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
WAR302 06 05	6	0.5	15	50	6
WAR302 06 10	6	1	15	50	6
WAR302 06 15	6	1.5	15	50	6
WAR302 06 20	6	2	15	50	6
WAR302 08 05	8	0.5	20	60	8
WAR302 08 10	8	1	20	60	8
WAR302 08 15	8	1.5	20	60	8
WAR302 08 20	8	2	20	60	8
WAR302 08 30	8	3	20	60	8
WAR302 10 05	10	0.5	25	70	10
WAR302 10 10	10	1	25	70	10
WAR302 10 15	10	1.5	25	70	10
WAR302 10 20	10	2	25	70	10
WAR302 10 30	10	3	25	70	10
WAR302 10 40	10	4	25	70	10
WAR302 12 10	12	1	30	75	12
WAR302 12 20	12	2	30	75	12

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
WAR302 12 30	12	3	30	75	12
WAR302 12 40	12	4	30	75	12
WAR302 14 10	14	1	35	80	14
WAR302 14 20	14	2	35	80	14
WAR302 14 30	14	3	35	80	14
WAR302 14 40	14	4	35	80	14
WAR302 14 50	14	5	35	80	14
WAR302 16 10	16	1	40	90	16
WAR302 16 20	16	2	40	90	16
WAR302 16 30	16	3	40	90	16
WAR302 16 40	16	4	40	90	16
WAR302 16 50	16	5	40	90	16
WAR302 20 10	20	1	45	100	20
WAR302 20 20	20	2	45	100	20
WAR302 20 30	20	3	45	100	20
WAR302 20 40	20	4	45	100	20
WAR302 20 50	20	5	45	100	20

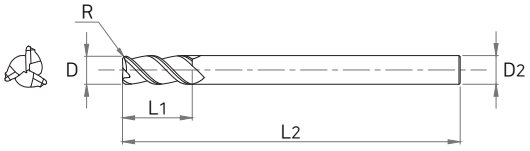
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
					○			◎	

○ : GOOD ◎ : EXCELLENT

WAR303 | 3 FLUTES RADIUS ENDMILL





■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.02	h6

CARBIDE | Uncoated | 3 | 45° HELIX | R ±0.015 All Sizes | DATA P.694

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
WAR303 06 05	6	0.5	15	50	6
WAR303 06 10	6	1	15	50	6
WAR303 06 15	6	1.5	15	50	6
WAR303 06 20	6	2	15	50	6
WAR303 08 05	8	0.5	20	60	8
WAR303 08 10	8	1	20	60	8
WAR303 08 15	8	1.5	20	60	8
WAR303 08 20	8	2	20	60	8
WAR303 10 05	10	0.5	25	70	10
WAR303 10 10	10	1	25	70	10
WAR303 10 15	10	1.5	25	70	10
WAR303 10 20	10	2	25	70	10
WAR303 10 30	10	3	25	70	10
WAR303 10 40	10	4	25	70	10
WAR303 12 10	12	1	30	75	12
WAR303 12 20	12	2	30	75	12
WAR303 12 30	12	3	30	75	12

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
WAR303 12 40	12	4	30	75	12
WAR303 14 10	14	1	35	80	14
WAR303 14 20	14	2	35	80	14
WAR303 14 30	14	3	35	80	14
WAR303 14 40	14	4	35	80	14
WAR303 14 50	14	5	35	80	14
WAR303 16 10	16	1	40	90	16
WAR303 16 20	16	2	40	90	16
WAR303 16 30	16	3	40	90	16
WAR303 16 40	16	4	40	90	16
WAR303 16 50	16	5	40	90	16
WAR303 20 10	20	1	45	100	20
WAR303 20 20	20	2	45	100	20
WAR303 20 30	20	3	45	100	20
WAR303 20 40	20	4	45	100	20
WAR303 20 50	20	5	45	100	20

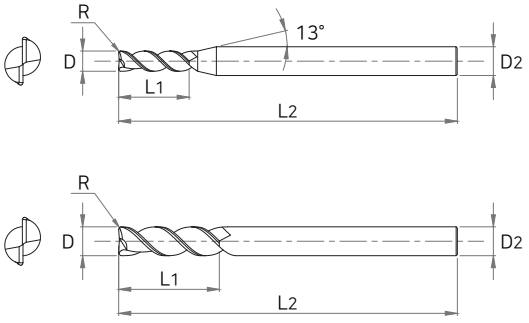
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
					○			◎	

○ : GOOD ◎ : EXCELLENT

WAR502 | 2 FLUTES RADIUS ENDMILL





■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.02	h6

CARBIDE | D.L.C | 2 | 45° HELIX | R ±0.015 All Sizes | DATA P.696

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
WAR502 010	1	0.05	3	40	6
WAR502 015	1.5	0.05	5	40	6
WAR502 020	2	0.1	6	40	6
WAR502 021	2	0.1	12	50	6
WAR502 030	3	0.1	10	50	6
WAR502 031	3	0.1	20	60	6
WAR502 040	4	0.1	12	50	6
WAR502 041	4	0.1	20	60	6
WAR502 050	5	0.1	15	57	6
WAR502 060	6	0.1	15	57	6
WAR502 061	6	0.1	22	65	6
WAR502 070	7	0.1	20	63	8
WAR502 080	8	0.1	20	63	8
WAR502 081	8	0.1	28	70	8
WAR502 090	9	0.1	25	72	10
WAR502 100	10	0.2	28	72	10
WAR502 101	10	0.2	32	80	10
WAR502 110	11	0.2	30	80	12
WAR502 120	12	0.2	32	80	12
WAR502 121	12	0.2	40	100	12

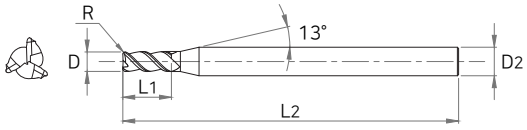
■ Applicable Working Material

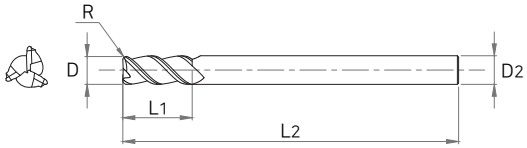
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
					○			◎	

○ : GOOD ◎ : EXCELLENT

WAR503 | 3 FLUTES RADIUS ENDMILL







■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.02	h6

CARBIDE | D.L.C | 4 | 45° HELIX | R ±0.015 All Sizes | DATA P.697

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
WAR503 040	4	0.5	14	57	6
WAR503 041	4	1	25	62	6
WAR503 060	6	0.5	16	57	6
WAR503 061	6	1	25	62	6
WAR503 080	8	0.5	22	63	8
WAR503 081	8	1	35	80	8
WAR503 100	10	0.5	28	72	10
WAR503 101	10	1	45	100	10
WAR503 120	12	0.5	32	80	12
WAR503 121	12	1	45	100	12
WAR503 160	16	0.5	45	90	16
WAR503 161	16	1	65	125	16
WAR503 200	20	0.5	50	100	20
WAR503 201	20	1	70	130	20

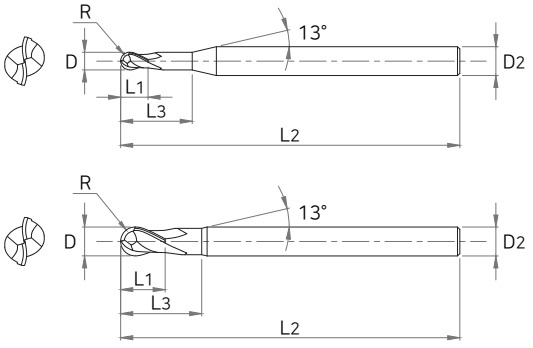
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
					○			◎	

○ : GOOD ◎ : EXCELLENT

WAB312 | 2 FLUTES BALL ENDMILL





■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.03	h6

CARBIDE | Uncoated | 2 | 50° HELIX | R ±0.02 All Sizes | DATA P.699

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
WAB312 060	6	3	5.5	25	55	6
WAB312 061	6	3	5.5	40	90	6
WAB312 080	8	4	7	30	65	8
WAB312 081	8	4	7	50	100	8
WAB312 100	10	5	8.5	35	75	10
WAB312 101	10	5	10	50	100	10
WAB312 102	10	5	10	60	150	10
WAB312 120	12	6	10.5	40	75	12
WAB312 121	12	6	12	50	110	12
WAB312 122	12	6	12	60	150	12
WAB312 160	16	8	14	50	90	16
WAB312 161	16	8	16	70	150	16
WAB312 162	16	8	16	90	200	16
WAB312 200	20	10	17	50	100	20

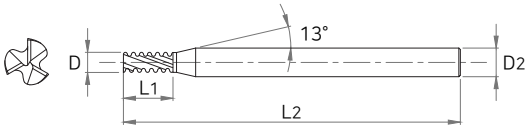
■ Applicable Working Material

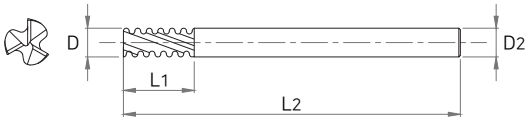
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
					○			◎	

○ : GOOD ◎ : EXCELLENT

WAF303 | 3 FLUTES ROUGHING ENDMILL







■ Tolerance

D		Shank Dia
D4 ~ 6	0 ~ -0.048	h6
D7 ~ 10	0 ~ -0.058	
D12 ~ 18	0 ~ -0.07	
D20 ~	0 ~ -0.084	
D6 ~ 12	0 ~ -0.03	

CARBIDE | Uncoated | 3 | COARSE | DIN 6535HA | DIN 6535HB | 38° HELIX | DATA P.699

EDP No	SIZES (mm)			
	D	L1	L2	D2
WAF303 040	4	10	55	6
WAF303 050	5	15	55	6
WAF303 060	6	16	60	6
WAF303 061	6	25	80	6
WAF303 070	7	16	63	8
WAF303 080	8	20	65	8
WAF303 081	8	30	90	8
WAF303 090	9	19	72	10
WAF303 100	10	25	75	10
WAF303 101	10	40	100	10
WAF303 120	12	30	80	12
WAF303 121	12	50	110	12
WAF303 140	14	35	90	14
WAF303 160	16	42	100	16
WAF303 161	16	52	150	16
WAF303 162	16	65	125	16
WAF303 180	18	32	92	18
WAF303 200	20	38	104	20
WAF303 201	20	55	160	20

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
					○			◎	

○ : GOOD ◎ : EXCELLENT

STANDARD ENDMILL

Low hardness materials under HRc 30



Contents

Section		EDP No	Geometry	Type	Diameter(mm)		Page
Type	Flutes				Min	Max	
SQUARE	2F	E302		2 FLUTES SQUARE ENDMILL	D1	D25	338
	4F	E304		4 FLUTES SQUARE ENDMILL	D2	D25	339
	2F	E322		2 FLUTES LONG SHANK SQUARE ENDMILL	D3	D20	340
	2F	EL422		2 FLUTES EXTRA LONG SQUARE ENDMILL	D3	D10	341
	4F	E324		4 FLUTES LONG SHANK SQUARE ENDMILL	D3	D20	342
	2F	EB302-W		2 FLUTES BRAZED SQUARE ENDMILL	D14	D50	343
	4F	EB304-W		4 FLUTES BRAZED SQUARE ENDMILL	D14	D50	344
	2F	EB322-W		2 FLUTES LONG BRAZED SQUARE ENDMILL	D14	D45	345
	4F	EB324-W		4 FLUTES LONG BRAZED SQUARE ENDMILL	D14	D50	346
BALL	2F	B302		2 FLUTES BALL NOSE ENDMILL	R0.5	R12.5	347
	4F	B304		4 FLUTES BALL NOSE ENDMILL	R1.5	R12.5	348
	2F	BL422		2 FLUTES EXTRA LONG BALL NOSE ENDMILL	R1.5	R10	349
	2F	BB302-W		2 FLUTES BRAZED BALL NOSE ENDMILL	R7.5	R16	350

EDP No. System

*If expressed as an integer, the decimal point is omitted.

E	3	0	4	130	S16

Section	Appearance	Length, Shank Type	Flutes	Cutting Dia	Shank Dia
B : Ball Endmill	3 : Standard	0 : Regular Length	2 : 2 Flutes	1	3
E : Square Endmill	4 : Long Length	2 : Long Length	4 : 4 Flutes	~	~
BL : Long Length Ball				50	42
EB : Brazed Square					
BB : Brazed Ball					

Ex) 4 Flutes / Cutting Dia Ø13 / Shank Dia 16 / Standard Type Square Endmill



Characteristics

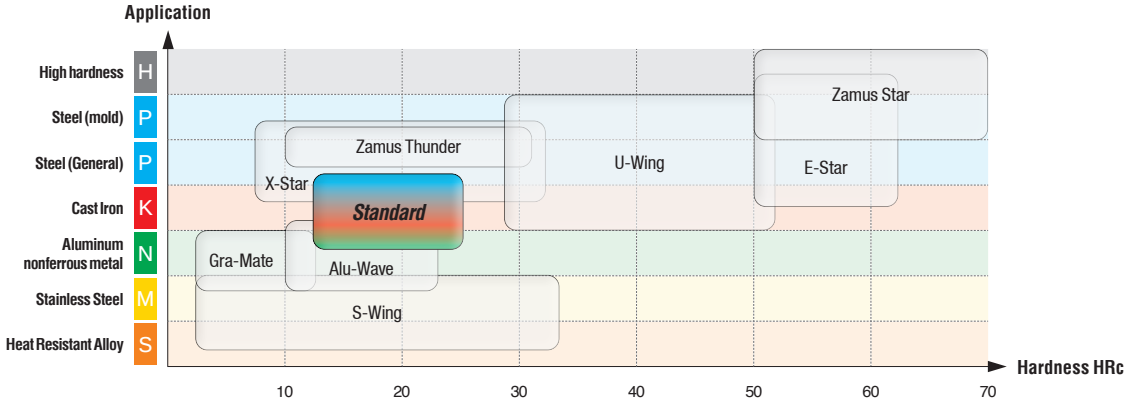
· Suitable for low hardness materials under HRc 30
· Various product line : Square, Ball, Brazing type

Features

· Improved chipping resistance by using high toughness materials
· Proper cutting edge for low hardness materials

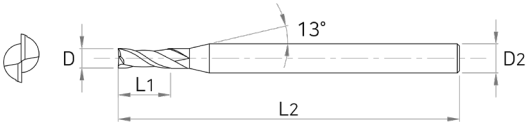


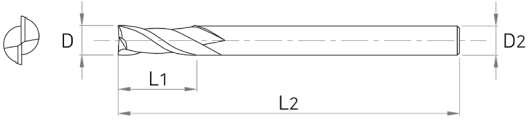
Applications



E302 | 2 FLUTES SQUARE ENDMILL







■ Tolerance

D		Shank Dia
~D3	0 ~ -0.04	h7
D3.5 ~ 6	0 ~ -0.048	
D6.5 ~ 10	0 ~ -0.058	
D10.5 ~ 18	0 ~ -0.07	
D20 ~	0 ~ -0.084	

CARBIDE | Uncoated | 2 | 30° HELIX | DATA P.700

EDP No	SIZES (mm)			
	D	L1	L2	D2
E302 010S4	1	3	42	4
E302 010	1	3	42	6
E302 015S4	1.5	4	42	4
E302 015	1.5	4	42	6
E302 020S4	2	6	42	4
E302 020	2	6	42	6
E302 025S4	2.5	8	42	4
E302 025	2.5	8	42	6
E302 030	3	10	50	6
E302 035	3.5	10	50	6
E302 040	4	12	50	6
E302 045	4.5	14	50	6
E302 050	5	15	50	6
E302 055	5.5	15	50	6
E302 060	6	15	50	6
E302 065	6.5	18	60	8
E302 070	7	20	60	8
E302 075	7.5	20	60	8

EDP No	SIZES (mm)			
	D	L1	L2	D2
E302 080	8	20	60	8
E302 085	8.5	23	70	10
E302 090	9	25	70	10
E302 095	9.5	25	70	10
E302 100	10	25	70	10
E302 105	10.5	28	75	12
E302 110	11	30	75	12
E302 115	11.5	30	75	12
E302 120	12	30	75	12
E302 130	13	35	85	14
E302 130S16	13	35	90	16
E302 140	14	35	85	14
E302 140S16	14	35	90	16
E302 150	15	40	90	16
E302 160	16	40	90	16
E302 180	18	45	100	18
E302 200	20	45	100	20
E302 250	25	50	120	25

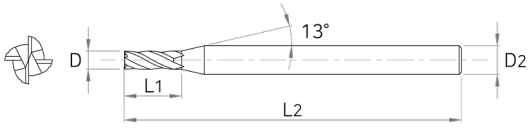
■ Applicable Working Material

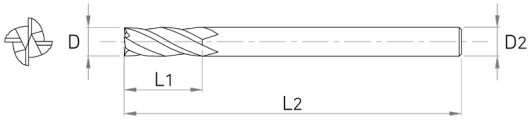
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	○								

○ : GOOD ◎ : EXCELLENT

E304 | 4 FLUTES SQUARE ENDMILL







■ Tolerance

D		Shank Dia
~D3	0~-0.04	h7
D3.5~6	0~-0.048	
D6.5~10	0~-0.058	
D10.5~18	0~-0.07	
D20~	0~-0.084	

CARBIDE | Uncoated | 4 | 30° HELIX | DATA P.700

EDP No	SIZES (mm)			
	D	L1	L2	D2
E304 020S4	2	6	42	4
E304 020	2	6	42	6
E304 025	2.5	8	42	6
E304 030	3	10	50	6
E304 035	3.5	10	50	6
E304 040	4	12	50	6
E304 045	4.5	14	50	6
E304 050	5	15	50	6
E304 055	5.5	15	50	6
E304 060	6	15	50	6
E304 065	6.5	18	60	8
E304 070	7	20	60	8
E304 075	7.5	20	60	8
E304 080	8	20	60	8
E304 085	8.5	23	70	10
E304 090	9	25	70	10

EDP No	SIZES (mm)			
	D	L1	L2	D2
E304 095	9.5	25	70	10
E304 100	10	25	70	10
E304 105	10.5	28	75	12
E304 110	11	30	75	12
E304 115	11.5	30	75	12
E304 120	12	30	75	12
E304 130	13	35	85	14
E304 130S16	13	35	90	16
E304 140	14	35	85	14
E304 140S16	14	35	90	16
E304 150	15	40	90	16
E304 160	16	40	90	16
E304 180	18	45	100	18
E304 200	20	45	100	20
E304 250	25	50	120	25

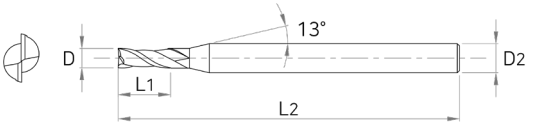
■ Applicable Working Material

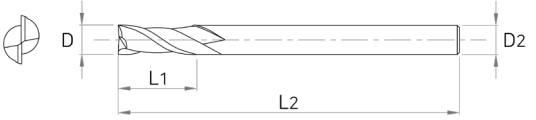
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	○								

○ : GOOD ◎ : EXCELLENT

E322 | 2 FLUTES LONG SHANK SQUARE ENDMILL







■ Tolerance

D		Shank Dia
~D3	0 ~ -0.04	h7
D4 ~ 6	0 ~ -0.048	
D7 ~ 10	0 ~ -0.058	
D12 ~ 18	0 ~ -0.07	
D20 ~	0 ~ -0.084	

CARBIDE | Uncoated | 2 | 30° HELIX | DATA P.700

EDP No	SIZES (mm)			
	D	L1	L2	D2
E322 030	3	25	75	6
E322 040	4	25	75	6
E322 050	5	30	85	6
E322 060	6	30	85	6
E322 070	7	35	85	8
E322 080	8	35	85	8
E322 090	9	45	100	10
E322 100	10	45	100	10
E322 101	10	60	155	10
E322 120	12	55	120	12
E322 121	12	65	155	12
E322 140	14	60	120	14
E322 160	16	60	120	16
E322 161	16	75	165	16
E322 180	18	60	120	18
E322 200	20	60	120	20
E322 201	20	75	165	20

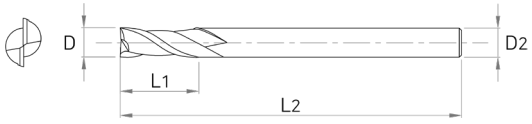
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	○								

○ : GOOD ◎ : EXCELLENT

EL422 | 2 FLUTES EXTRA LONG SQUARE ENDMILL





■ Tolerance

D		Shank Dia
~D3	0 ~ -0.04	h7
D4 ~ 6	0 ~ -0.048	
D7 ~ 10	0 ~ -0.058	
D12 ~ 18	0 ~ -0.07	
D20 ~	0 ~ -0.084	

CARBIDE | Uncoated | 2 | 30° HELIX | DATA P.700

EDP No	SIZES (mm)			
	D	L1	L2	D2
EL422 030	3	30	75	3
EL422 040	4	30	75	4
EL422 050	5	40	100	5
EL422 060	6	50	150	6
EL422 080	8	50	150	8
EL422 100	10	60	150	10

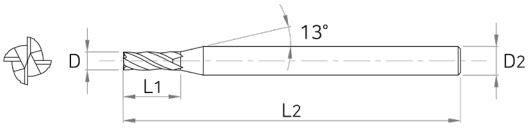
■ Applicable Working Material

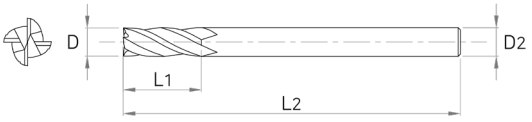
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	○								

○ : GOOD ◎ : EXCELLENT

E324 | 4 FLUTES LONG SHANK SQUARE ENDMILL







■ Tolerance

D		Shank Dia
~D3	0 ~ -0.04	h7
D4 ~ 6	0 ~ -0.048	
D7 ~ 10	0 ~ -0.058	
D12 ~ 18	0 ~ -0.07	
D20 ~	0 ~ -0.084	

CARBIDE | Uncoated | 4 | 30° HELIX | DATA P.700

EDP No	SIZES (mm)			
	D	L1	L2	D2
E324 030	3	25	75	6
E324 040	4	25	75	6
E324 050	5	30	85	6
E324 060	6	30	85	6
E324 070	7	35	85	8
E324 080	8	35	85	8
E324 090	9	45	100	10
E324 100	10	45	100	10
E324 101	10	60	155	10
E324 120	12	55	120	12
E324 121	12	65	155	12
E324 140	14	60	120	14
E324 160	16	60	120	16
E324 161	16	75	165	16
E324 180	18	60	120	18
E324 200	20	60	120	20
E324 201	20	75	165	20

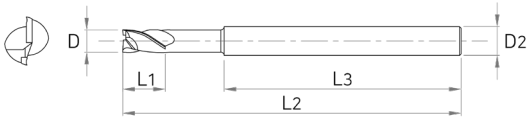
■ Applicable Working Material

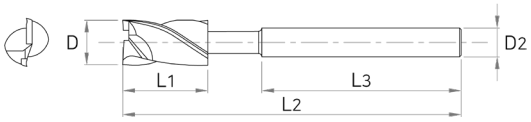
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	○								

○ : GOOD ◎ : EXCELLENT

EB302-W | 2 FLUTES BRAZED SQUARE ENDMILL







■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.05	h7

CARBIDE | Uncoated | 2 | 30° HELIX

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
EB302 140W	14	28	60	98	16
EB302 150W	15	28	60	98	16
EB302 160W	16	28	60	98	16
EB302 170W	17	32	70	115	20
EB302 180W	18	32	70	115	20
EB302 190W	19	32	70	115	20
EB302 200W	20	32	70	115	20
EB302 210W	21	32	70	115	20
EB302 220W	22	32	70	115	20
EB302 230W	23	40	85	140	25
EB302 240W	24	40	85	140	25
EB302 250W	25	40	85	140	25
EB302 260W	26	40	85	140	25

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
EB302 270W	27	40	85	140	25
EB302 280W	28	40	85	140	25
EB302 290W	29	50	85	150	32
EB302 300W	30	50	85	150	32
EB302 310W	31	50	85	150	32
EB302 320W	32	50	85	150	32
EB302 350W	35	50	85	150	32
EB302 360W	36	50	85	150	32
EB302 380W	38	55	85	155	32
EB302 400W	40	55	85	155	32
EB302 420W	42	55	85	155	32
EB302 450W	45	63	85	160	32
EB302 500W	50	63	85	160	32

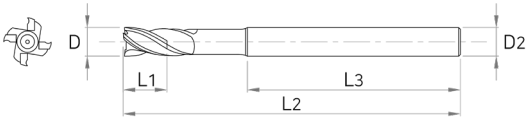
■ Applicable Working Material

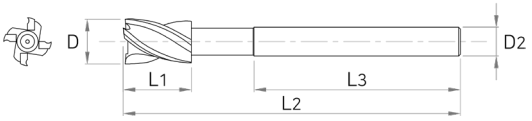
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	○								

○ : GOOD ◎ : EXCELLENT

EB304-W | 4 FLUTES BRAZED SQUARE ENDMILL







■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.05	h7

CARBIDE | Uncoated | 4 | 30° HELIX

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
EB304 140W	14	28	60	98	16
EB304 150W	15	28	60	98	16
EB304 160W	16	28	60	98	16
EB304 170W	17	32	70	115	20
EB304 180W	18	32	70	115	20
EB304 190W	19	32	70	115	20
EB304 200W	20	32	70	115	20
EB304 210W	21	32	70	115	20
EB304 220W	22	32	70	115	20
EB304 230W	23	40	85	140	25
EB304 240W	24	40	85	140	25
EB304 250W	25	40	85	140	25
EB304 260W	26	40	85	140	25

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
EB304 270W	27	40	85	140	25
EB304 280W	28	40	85	140	25
EB304 290W	29	50	85	150	32
EB304 300W	30	50	85	150	32
EB304 310W	31	50	85	150	32
EB304 320W	32	50	85	150	32
EB304 350W	35	50	85	150	32
EB304 360W	36	50	85	150	32
EB304 380W	38	55	85	155	32
EB304 400W	40	55	85	155	32
EB304 420W	42	55	85	155	32
EB304 450W	45	63	85	160	32
EB304 500W	50	63	85	160	32

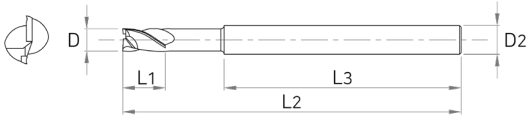
■ Applicable Working Material

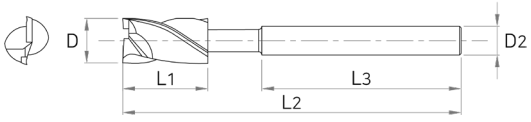
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	○								

○ : GOOD ◎ : EXCELLENT

EB322-W | 2 FLUTES LONG BRAZED SQUARE ENDMILL







■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.05	h7

CARBIDE | Uncoated | 2 | 30° HELIX

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
EB322 140W	14	50	60	130	16
EB322 150W	15	50	60	130	16
EB322 160W	16	50	60	130	16
EB322 180W	18	60	60	140	20
EB322 200W	20	60	60	140	20
EB322 220W	22	60	60	140	20
EB322 240W	24	70	60	150	25
EB322 250W	25	70	60	150	25
EB322 260W	26	70	60	150	25
EB322 280W	28	70	60	150	25
EB322 300W	30	80	70	180	32
EB322 320W	32	90	70	190	32
EB322 350W	35	100	70	200	32
EB322 380W	38	100	70	220	32
EB322 400W	40	100	70	220	32
EB322 450W	45	120	80	230	32

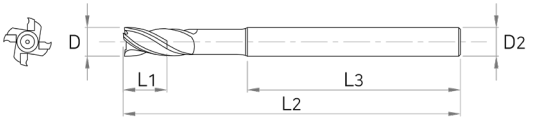
■ Applicable Working Material

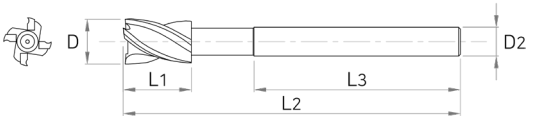
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	○								

○ : GOOD ◎ : EXCELLENT

EB324-W | 4 FLUTES LONG BRAZED SQUARE ENDMILL







■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.05	h6

CARBIDE | Uncoated | 4 | 30° HELIX

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
EB324 140W	14	50	60	130	16
EB324 150W	15	50	60	130	16
EB324 160W	16	50	60	130	16
EB324 180W	18	60	60	140	20
EB324 200W	20	60	60	140	20
EB324 220W	22	60	60	140	20
EB324 240W	24	70	60	150	25
EB324 250W	25	70	60	150	25
EB324 260W	26	70	60	150	25
EB324 280W	28	70	60	150	25
EB324 300W	30	80	70	180	32
EB324 320W	32	90	70	190	32
EB324 350W	35	100	70	200	32
EB324 380W	38	100	70	220	32
EB324 400W	40	100	70	220	32
EB324 450W	45	120	80	230	32
EB324 500W	50	140	80	240	32

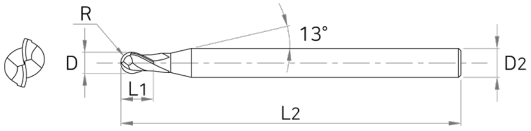
■ Applicable Working Material

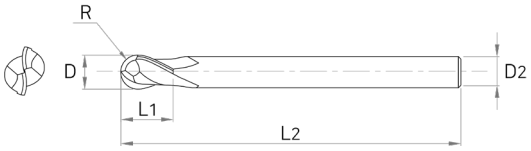
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	○								

○ : GOOD ◎ : EXCELLENT

B302 | 2 FLUTES BALL ENDMILL







■ Tolerance

D		Shank Dia
D1 ~ 3	0 ~ -0.04	h6
D3.5 ~ 6	0 ~ -0.048	
D6.5 ~ 10	0 ~ -0.058	
D11 ~ 18	0 ~ -0.07	
D20 ~	0 ~ -0.084	

CARBIDE | Uncoated | 2 | 30° HELIX | R ±0.02 All Sizes | DATA P.701

EDP No	SIZES (mm)			
	D	L1	L2	D2
WAF303 040	4	10	55	6
WAF303 050	5	15	55	6
WAF303 060	6	16	60	6
WAF303 061	6	25	80	6
WAF303 070	7	16	63	8
WAF303 080	8	20	65	8
WAF303 081	8	30	90	8
WAF303 090	9	19	72	10
WAF303 100	10	25	75	10
WAF303 101	10	40	100	10
WAF303 120	12	30	80	12
WAF303 121	12	50	110	12
WAF303 140	14	35	90	14
WAF303 160	16	42	100	16
WAF303 161	16	52	150	16
WAF303 162	16	65	125	16
WAF303 180	18	32	92	18
WAF303 200	20	38	104	20
WAF303 201	20	55	160	20

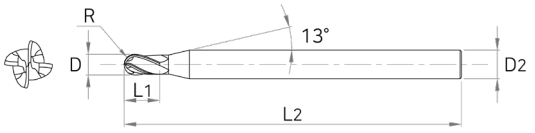
■ Applicable Working Material

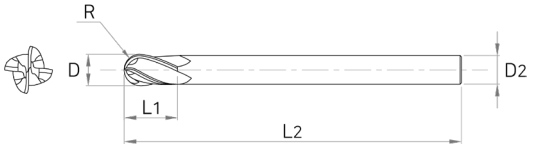
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	○								

○ : GOOD ◎ : EXCELLENT

B304 | 4 FLUTES BALL ENDMILL







■ Tolerance

D		Shank Dia
~D3	0 ~ -0.04	h6
D4 ~ 6	0 ~ -0.048	
D7 ~ 10	0 ~ -0.058	
D11 ~ 18	0 ~ -0.07	
D20 ~	0 ~ -0.084	

CARBIDE | Uncoated | 4 | 30° HELIX | R ±0.02 All Sizes | DATA P.701

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
B304 030	3	1.5	8	70	6
B304 040	4	2	8	70	6
B304 050	5	2.5	12	80	6
B304 060	6	3	12	90	6
B304 070	7	3.5	20	90	8
B304 080	8	4	20	100	8
B304 090	9	4.5	25	100	10
B304 100	10	5	25	100	10
B304 110	11	5.5	30	110	12
B304 120	12	6	30	110	12
B304 130	13	6.5	35	120	14
B304 140	14	7	35	120	14
B304 150	15	7.5	40	140	16
B304 160	16	8	40	140	16
B304 180	18	9	45	150	18
B304 200	20	10	45	160	20
B304 250	25	12.5	50	180	25

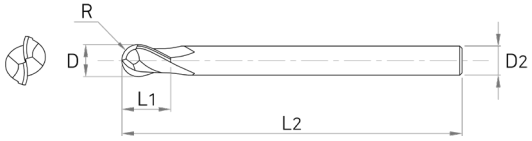
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	○								

○ : GOOD ◎ : EXCELLENT

BL422 | 2 FLUTES EXTRA LONG BALL ENDMILL





■ Tolerance

D		Shank Dia
~D3	0~-0.04	h6
D4~6	0~-0.048	
D7~10	0~-0.058	
D11~18	0~-0.07	
D20~	0~-0.084	

CARBIDE | Uncoated | 2 | 30° HELIX | R ±0.02 | DATA P.701

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
BL422 030	3	1.5	30	75	3
BL422 040	4	2	30	75	4
BL422 050	5	2.5	40	100	5
BL422 060	6	3	50	150	6
BL422 080	8	4	50	150	8
BL422 090	9	4.5	60	150	10
BL422 100	10	5	60	150	10
BL422 120	12	6	75	150	12
BL422 140	14	7	75	150	14
BL422 160	16	8	75	150	16
BL422 180	18	9	75	150	18
BL422 200	20	10	75	150	20

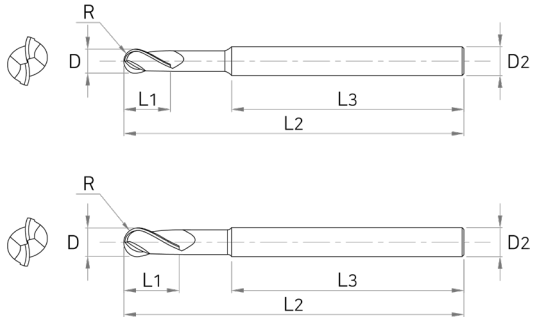
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	○								

○ : GOOD ◎ : EXCELLENT

BB302-W | 2 FLUTES BRAZED BALL ENDMILL





■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.05	h7

CARBIDE | Uncoated | 2 | 30° HELIX | R ±0.005 All Sizes

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
BB302 150W	15	7.5	28	55	100	16
BB302 160W	16	8	28	55	100	16
BB302 180W	18	9	29	55	110	20
BB302 200W	20	10	29	55	110	20
BB302 220W	22	11	36	60	110	25
BB302 240W	24	12	37	60	110	25
BB302 250W	25	12.5	38	60	120	25
BB302 280W	28	14	40	65	120	32
BB302 300W	30	15	46	65	130	32
BB302 320W	32	16	47	65	140	32

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	○								

○ : GOOD ◎ : EXCELLENT

COPPER-MATE ENDMILL

Copper, Bronze and Non-ferrous materials



Contents

Section		EDP No	Geometry	Type	Diameter(mm)		Page
Type	Flutes				Min	Max	
RADIUS	2F	RC502		2 FLUTES RADIUS ENDMILL	D2	D12	353
BALL	2F	BC502		2 FLUTES BALL ENDMILL	R0.5	R6	354

EDP No. System

*If expressed as an integer, the decimal point is omitted.

R C 5 0 2 020 05 09

Appearance	Shape	Grade	Length, Shank Type	Flutes	Cutting Dia	Corner R	Shank Dia
R : Radius B : Ball	C : Copper	5 : Grade	0 : Neck	2 : 2 Flutes	1 ~ 12	0.5 ~ 1	3 ~ 38

Ex) 2 Flutes / Cutting Dia Ø2 / Corner R 0.5 / Shank Dia 9 / 50 Grade / Corner Radius Neck Type Radius Endmill

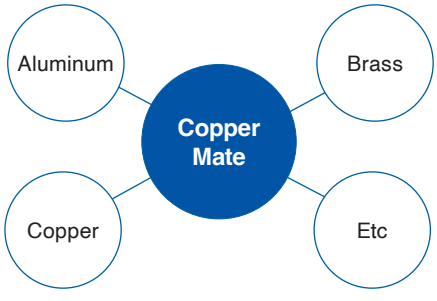
General Features

· Suitable for Copper, Bronze and Non-ferrous materials
· Ball, Radius type

Characteristics

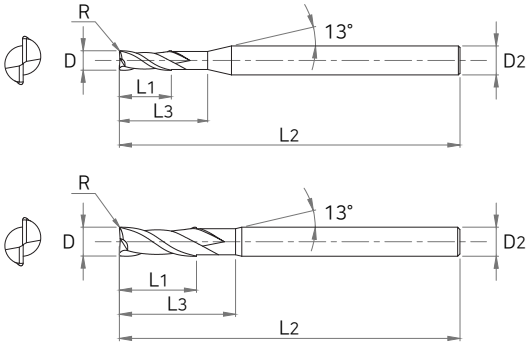
· Cutting edge considered the characteristics of non-ferrous materials
· CrN coating for enhanced oxidation resistance and corrosion resistance

Applications



RC502 | 2 FLUTES RADIUS ENDMILL





■ Tolerance

D		Shank Dia
D2 ~ 6	0 ~ -0.012	h5
D8 ~ 12	0 ~ -0.015	

CARBIDE | CrN | 2 | 30° HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.702

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
RC502 020 05 09	2	0.5	3	9	55	6
RC502 030 05 09	3	0.5	4	9	55	6
RC502 030 05 16	3	0.5	4	16	55	6
RC502 030 05 20	3	0.5	4	20	55	6
RC502 040 05 12	4	0.5	5	12	55	6
RC502 040 05 16	4	0.5	5	16	55	6
RC502 040 05 20	4	0.5	5	20	55	6
RC502 060 05 20	6	0.5	7	20	60	6
RC502 060 10 20	6	1	7	20	60	6
RC502 080 05 25	8	0.5	9	25	60	8
RC502 080 10 25	8	1	9	25	60	8
RC502 100 05 32	10	0.5	11	32	70	10
RC502 100 10 32	10	1	11	32	70	10
RC502 120 05 38	12	0.5	12	38	80	12
RC502 120 10 38	12	1	12	38	80	12

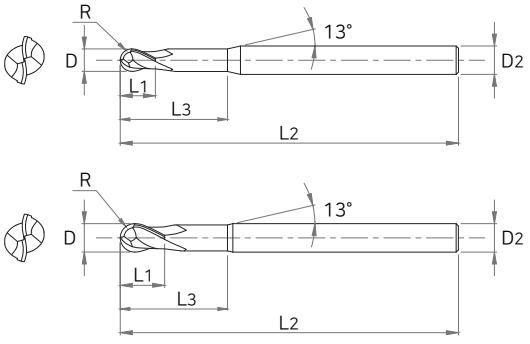
■ Applicable Working Material

Carbon Steel ~ HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	○				○			○	

○ : GOOD ◎ : EXCELLENT

BC502 | 2 FLUTES BALL ENDMILL





■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.02	h6

CARBIDE | CrN | 2 | 30° HELIX | R ±0.01 All Sizes | DATA P.702

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
BC502 010	1	0.5	1.5	3	50	6
BC502 015	1.5	0.75	2	4	50	6
BC502 020	2	1	2.5	5	50	6
BC502 025	2.5	1.25	3	7	50	6
BC502 030	3	1.5	4	10	60	6
BC502 040	4	2	5	10	60	6
BC502 050	5	2.5	6	12	60	6
BC502 060	6	3	7	12	60	6
BC502 061	6	3	7	12	90	6
BC502 080	8	4	9	15	70	8
BC502 081	8	4	9	16	100	8
BC502 100	10	5	11	25	75	10
BC502 101	10	5	11	25	100	10
BC502 120	12	6	12	25	80	12
BC502 121	12	6	12	25	110	12

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	○				○			○	

○ : GOOD ◎ : EXCELLENT

GRA-MATE ENDMILL

Graphite, Reinforced Plastics, Non-ferrous materials



Contents

Section		EDP No	Geometry	Type	Diameter(mm)		Page
Type	Flutes				Min	Max	
SQUARE	2F	GE		2 FLUTES NECK SQUARE ENDMILL	D0.5	D12	357
	4F	WGE504		4 FLUTES SQUARE ENDMILL	D2	D20	358
RADIUS	2F	WGR502		2 FLUTES NECK RADIUS ENDMILL	D0.2	D6	359
	4F	WGR504		4 FLUTES RADIUS ENDMILL	D3	D20	360
BALL	2F	G		2 FLUTES NECK BALL ENDMILL	R0.25	R6	361
	4F	WGB504		4 FLUTES BALL ENDMILL	R0.5	R10	363

EDP No. System

*If expressed as an integer, the decimal point is omitted.

WG	R	5	0	4	080	10	130

Section	Appearance	Grade	Length, Shank Type	Flutes	Cutting Dia	Corner R	Shank Dia
G : Graphite	E : Square	5 : Grade	0 : Straight, Neck	2 : 2 Flutes	0.2	0.05	40
WG : Winner Graphite	R : Radius			4 : 4 Flutes	~	~	~
					20	1	200

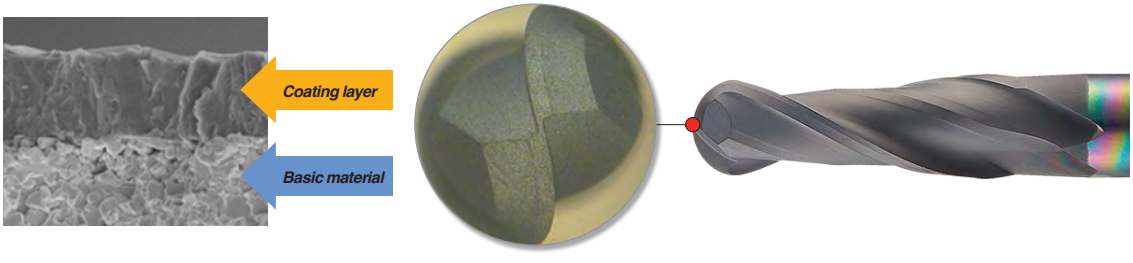
Ex) 4 Flutes / Cutting Dia Ø8 / Corner R 1.0 / Shank Dia 130 / 50 Grade / Corner Radius Endmill For Graphith

General Features

· Suitable for Graphite, Reinforced Plastics, Non-ferrous materials
· High hardness Diamond Coating for better tool life
· Maximizing and Stabilizing Coating Thickness for Improved Wear Resistance
· Various specifications for a variety of machining methods

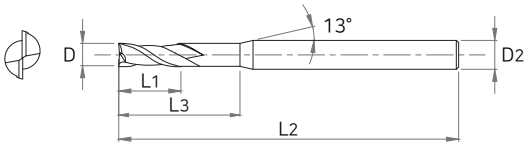
Characteristics

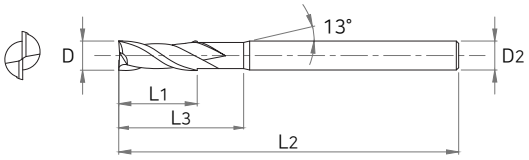
· High surface hardness and tool life with high adhesion diamond coating
· Minimize accidental damage by using dedicated materials with excellent wear resistance



GE | 2 FLUTES NECK SQUARE ENDMILL







■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.03	h6

CARBIDE | Diamond | 2 | 30° HELIX | DATA P.703

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
GE 005 010 06	0.5	1	6	50	4
GE 006 012 06	0.6	1.2	6	50	4
GE 006 012 10	0.6	1.2	10	50	4
GE 007 015 06	0.7	1.5	6	50	4
GE 008 020 06	0.8	2	6	50	4
GE 010 03 08	1	3	8	60	4
GE 010 03 10	1	3	10	60	4
GE 010 03 12	1	3	12	60	4
GE 015 04 12	1.5	4	12	60	4
GE 020 06 12	2	6	12	60	4
GE 020 06 12 S6	2	6	12	60	6
GE 025 08 12	2.5	8	12	60	4
GE 030 10 12	3	10	12	60	4
GE 030 10 16	3	10	16	60	4
GE 030 10 12 S6	3	10	12	60	6
GE 030 10 16 S6	3	10	16	60	6

EDP No	SIZES (mm)				
	D	L1	L3	L2	D2
GE 040 12S	4	12	-	60	6
GE 040 12 16	4	12	16	60	6
GE 040 12 20	4	12	20	60	6
GE 050 15 20	5	15	20	60	6
GE 060 20S	6	20	-	60	6
GE 060 20 30	6	20	30	80	6
GE 060 30 50	6	30	50	150	6
GE 080 25S	8	25	-	70	8
GE 080 25 40	8	25	40	100	8
GE 080 40 70	8	40	70	150	8
GE 100 30S	10	30	-	80	10
GE 100 30 50	10	30	50	100	10
GE 100 45 80	10	45	80	160	10
GE 120 30S	12	30	-	80	12
GE 120 30 50	12	30	50	110	12
GE 120 50 80	12	50	80	160	12

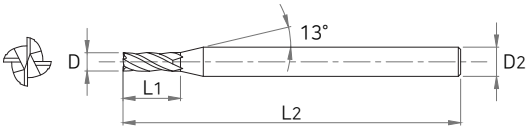
■ Applicable Working Material

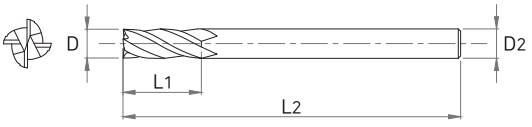
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
						◎		○	

○ : GOOD ◎ : EXCELLENT

WGE504 | 4 FLUTES SQUARE ENDMILL







■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.03	h6

CARBIDE | Diamond | 4 | 30° HELIX | DATA P.703

EDP No	SIZES (mm)			
	D	L1	L2	D2
WGE504 020	2	6	50	4
WGE504 020 08	2	8	50	4
WGE504 020 10	2	10	50	4
WGE504 025	2.5	8	50	4
WGE504 030	3	8	50	6
WGE504 030 10	3	10	50	6
WGE504 030 12	3	12	50	6
WGE504 030 16	3	16	60	6
WGE504 030 20	3	20	60	6
WGE504 040	4	10	50	6
WGE504 040 12	4	12	50	6
WGE504 040 16	4	16	60	6
WGE504 040 20	4	20	60	6
WGE504 040 25	4	25	60	6
WGE504 050	5	15	60	6
WGE504 060	5	15	60	6
WGE504 060 20	6	20	110	6

EDP No	SIZES (mm)			
	D	L1	L2	D2
WGE504 060 30	6	30	150	6
WGE504 080	8	20	70	8
WGE504 080 30	8	30	110	8
WGE504 080 40	8	40	150	8
WGE504 100	10	25	75	10
WGE504 100 40	10	40	110	10
WGE504 100 50	10	50	150	10
WGE504 120	12	30	80	12
WGE504 120 50	12	50	120	12
WGE504 120 60	12	60	160	12
WGE504 160	16	50	110	16
WGE504 160 70	16	70	160	16
WGE504 160 90	16	90	160	16
WGE504 160 100	16	100	200	16
WGE504 200	20	70	160	20
WGE504 200 90	20	90	160	20
WGE504 200 100	20	100	200	20

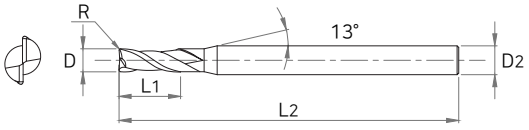
■ Applicable Working Material

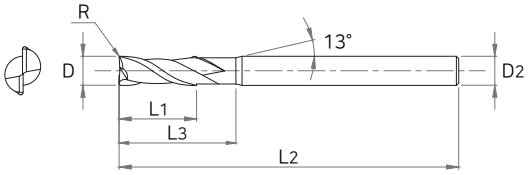
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
						◎		○	

○ : GOOD ◎ : EXCELLENT

WGR502 | 2 FLUTES NECK RADIUS ENDMILL







■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.02	h6

CARBIDE | Diamond | 2 | 30° HELIX | R ±0.01 All Sizes | DATA P.704

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
WGR502 002	0.2	-	0.3	-	40	3
WGR502 003	0.3	-	0.5	-	40	3
WGR502 004	0.4	-	0.6	-	40	3
WGR502 005 025	0.5	0.05	0.7	2.5	40	3
WGR502 005 040	0.5	0.05	0.7	4	40	3
WGR502 006 030	0.6	0.05	0.9	3	40	3
WGR502 006 050	0.6	0.05	0.9	5	40	3
WGR502 008 040	0.8	0.05	1.2	4	40	3
WGR502 008 070	0.8	0.05	1.2	7	40	3
WGR502 010 050	1	0.1	1.5	5	40	3
WGR502 010 085	1	0.1	1.5	8.5	40	3
WGR502 010 120	1	0.1	1.5	12	40	3
WGR502 012 060	1.2	0.1	1.8	6	50	3
WGR502 012 100	1.2	0.1	1.8	10	50	3
WGR502 015 075	1.5	0.15	2.2	7.5	50	3
WGR502 015 120	1.5	0.15	2.2	12	50	3
WGR502 015 180	1.5	0.15	2.2	18	50	3
WGR502 020 100	2	0.15	2.2	10	60	3

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
WGR502 020 160	2	0.15	2.2	16	60	3
WGR502 020 250	2	0.15	2.2	25	60	3
WGR502 030 100	3	0.2	3	10	65	4
WGR502 030 150	3	0.2	3	15	65	4
WGR502 030 200	3	0.2	3	20	65	4
WGR502 030 250	3	0.2	3	25	75	4
WGR502 030 300	3	0.2	3	30	75	4
WGR502 040 200	4	0.2	4	20	65	6
WGR502 040 300	4	0.2	4	30	75	6
WGR502 040 400	4	0.2	4	40	90	6
WGR502 050 200	5	0.3	5	20	75	6
WGR502 050 300	5	0.3	5	30	75	6
WGR502 050 400	5	0.3	5	40	90	6
WGR502 050 500	5	0.3	5	50	90	6
WGR502 060 300	6	0.3	6	30	75	6
WGR502 060 400	6	0.3	6	40	90	6
WGR502 060 500	6	0.3	6	50	90	6
WGR502 060 600	6	0.3	6	60	100	6

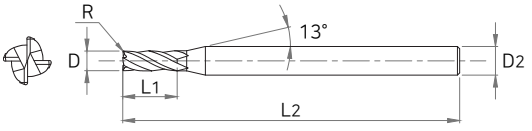
■ Applicable Working Material

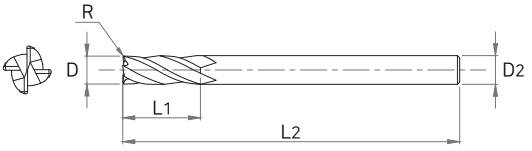
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
						◎		○	

○ : GOOD ◎ : EXCELLENT

WGR504 | 4 FLUTES NECK RADIUS ENDMILL







■ Tolerance

D		Shank Dia
D3 ~ 12	0 ~ -0.02	h5
D16 ~ 20	0 ~ -0.03	

CARBIDE | Diamond | 4 | 30° HELIX | R ±0.01 Ø12 OR UNDER | R ±0.015 ABOVE Ø12 | DATA P.704

EDP No	SIZES (mm)				
	D	R	L1	L2	D2
WGR504 030 02 080	3	0.2	8	80	4
WGR504 030 03 080	3	0.3	8	80	4
WGR504 030 05 080	3	0.5	8	80	4
WGR504 040 03 100	4	0.3	10	100	4
WGR504 040 05 100	4	0.5	10	100	4
WGR504 040 10 100	4	1	10	100	4
WGR504 060 03 110	6	0.3	15	110	6
WGR504 060 05 110	6	0.5	15	110	6
WGR504 060 10 110	6	1	15	110	6
WGR504 080 05 110	8	0.5	20	110	8
WGR504 080 10 110	8	1	20	110	8
WGR504 080 05 130	8	0.5	20	130	8
WGR504 080 10 130	8	1	20	130	8

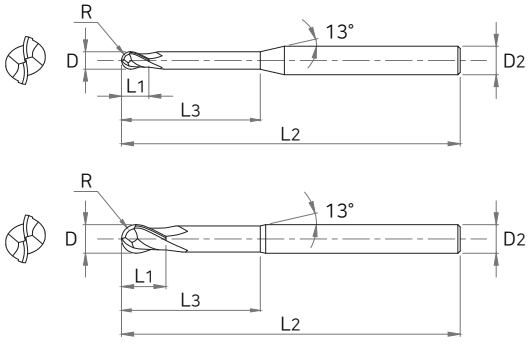
EDP No	SIZES (mm)				
	D	R	L1	L2	D2
WGR504 100 05 130	10	0.5	25	130	10
WGR504 100 10 130	10	1	25	130	10
WGR504 100 05 150	10	0.5	25	150	10
WGR504 100 10 150	10	1	25	150	10
WGR504 120 05 130	12	0.5	30	130	12
WGR504 120 10 130	12	1	30	130	12
WGR504 120 05 150	12	0.5	30	150	12
WGR504 120 10 150	12	1	30	150	12
WGR504 160 05 200	16	0.5	32	200	16
WGR504 160 10 200	16	1	32	200	16
WGR504 200 05 200	20	0.5	40	200	20
WGR504 200 10 200	20	1	40	200	20

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
						◎		○	

○ : GOOD ◎ : EXCELLENT





■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.03	h6

CARBIDE | Diamond | 2 | 30° HELIX | R ±0.015 All Sizes | DATA P.705

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
G 005 010 03	0.5	0.25	1	3	50	4
G 005 010 06	0.5	0.25	1	6	50	4
G 005 010 10	0.5	0.25	1	10	50	4
G 006 012 03	0.6	0.3	1.2	3	50	4
G 006 012 06	0.6	0.3	1.2	6	50	4
G 006 012 08	0.6	0.3	1.2	8	50	4
G 006 012 10	0.6	0.3	1.2	10	50	4
G 006 012 12	0.6	0.3	1.2	12	50	4
G 008 016 4	0.8	0.4	1.6	4	50	4
G 008 016 6	0.8	0.4	1.6	6	50	4
G 008 016 8	0.8	0.4	1.6	8	50	4
G 010 030 6	1	0.5	3	6	60	4
G 010 030 8	1	0.5	3	8	60	4
G 010 03 10	1	0.5	3	10	60	4
G 010 03 12	1	0.5	3	12	60	4
G 010 03 14	1	0.5	3	14	60	4
G 010 03 16	1	0.5	3	16	60	4
G 010 03 18	1	0.5	3	18	60	4
G 010 03 20	1	0.5	3	20	60	4
G 012 04 10	1.2	0.6	4	10	70	4
G 015 05 10	1.5	0.75	5	10	60	4
G 015 05 12	1.5	0.75	5	12	60	4
G 015 05 16	1.5	0.75	5	16	60	4
G 015 05 20	1.5	0.75	5	20	60	4

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
G 015 05 25	1.5	0.75	5	25	70	4
G 015 05 30	1.5	0.75	5	30	70	4
G 020 08 12	2	1	8	12	60	4
G 020 08 16	2	1	8	16	60	4
G 020 08 20	2	1	8	20	60	4
G 020 08 25	2	1	8	25	70	4
G 020 08 30	2	1	8	30	70	4
G 020 08 35	2	1	8	35	80	4
G 020 08 40	2	1	8	40	80	4
G 020 10 20	2	1	10	20	80	4
G 020 10 20L	2	1	10	20	100	4
G 025 10 20	2.5	1.25	10	20	80	4
G 030 12 16	3	1.5	12	16	60	6
G 030 12 20	3	1.5	12	20	70	6
G 030 12 25	3	1.5	12	25	70	6
G 030 12 30	3	1.5	12	30	80	6
G 030 12 35	3	1.5	12	35	80	6
G 030 12 40	3	1.5	12	40	90	6
G 030 12 45	3	1.5	12	45	90	6
G 030 15 25	3	1.5	15	25	80	4
G 040 15S	4	2	15	-	50	4
G 040 15M	4	2	15	-	80	4
G 040 15L	4	2	15	-	120	4
G 040 15 20	4	2	15	20	60	6

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
						◎		○	

○ : GOOD ◎ : EXCELLENT

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
G 040 15 25	4	2	15	25	70	6
G 040 15 30	4	2	15	30	80	6
G 040 15 35	4	2	15	35	80	6
G 040 15 40	4	2	15	40	90	6
G 040 15 45	4	2	15	45	90	6
G 040 15 50	4	2	15	50	100	6
G 040 20 30	4	2	20	30	80	4
G 050 30 50	5	2.5	30	50	100	6
G 050 30 50L	5	2.5	30	50	150	6
G 060 20L	6	3	20	-	70	6
G 060 20M	6	3	20	-	100	6
G 060 20S	6	3	20	-	70	6
G 060 30 50	6	3	30	50	100	6
G 060 30 50L	6	3	30		150	6
G 080 25L	8	4	25	-	70	8

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
G 080 25M	8	4	25	-	110	8
G 080 25S	8	4	25	-	160	8
G 080 40 60	8	4	40	60	110	8
G 080 40 60L	8	4	40		200	8
G 100 30L	10	5	30	-	80	10
G 100 30M	10	5	30	-	120	10
G 100 30S	10	5	30	-	170	10
G 100 50 70	10	5	50	70	120	10
G 100 50 70L	10	5	50	70	200	10
G 120 35S	12	6	35	-	80	12
G 120 35M	12	6	35	-	130	12
G 120 35L	12	6	35	-	180	12
G 120 55 75	12	6	55	75	130	12
G 120 55 75L	12	6	55	75	200	12

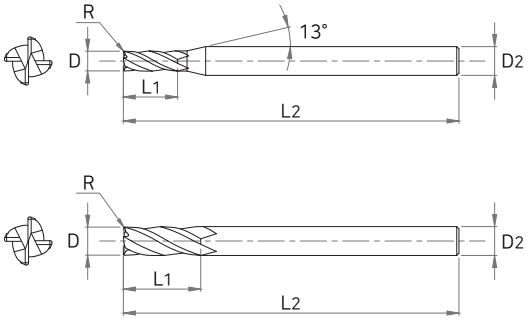
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
						◎		○	

○ : GOOD ◎ : EXCELLENT

WGB504 | 4 FLUTES BALL ENDMILL





■ Tolerance

D		Shank Dia
D8 ~ 12	0 ~ -0.02	h6
D16 ~ 20	0 ~ -0.03	

CARBIDE | Diamond | 4 | 30° HELIX | R ±0.01 All Sizes | DATA P.705

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
WGB504 010	1	0.5	3	-	60	4
WGB504 010 10	1	0.5	3	10	60	4
WGB504 010 15	1	0.5	3	15	60	4
WGB504 010 20	1	0.5	3	20	60	4
WGB504 010 25	1	0.5	3	25	80	4
WGB504 010 30	1	0.5	3	30	80	4
WGB504 015	1.5	0.75	4	-	60	4
WGB504 015 10	1.5	0.75	4	10	80	4
WGB504 015 15	1.5	0.75	4	15	80	4
WGB504 015 20	1.5	0.75	4	20	80	4
WGB504 015 25	1.5	0.75	4	25	80	4
WGB504 015 30	1.5	0.75	4	30	80	4
WGB504 020	2	1	6	-	60	4
WGB504 020 10	2	1	6	10	80	4
WGB504 020 15	2	1	6	15	80	4
WGB504 020 20	2	1	6	20	80	4
WGB504 020 25	2	1	6	25	80	4
WGB504 020 30	2	1	6	30	80	4
WGB504 020 40	2	1	6	40	100	4
WGB504 030	3	1.5	9	-	60	4
WGB504 030 15	3	1.5	9	15	100	4
WGB504 030 20	3	1.5	9	20	100	4
WGB504 030 25	3	1.5	9	25	100	4
WGB504 030 30	3	1.5	9	30	100	4

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
WGB504 030 40	3	1.5	9	40	100	4
WGB504 030 50	3	1.5	9	50	100	4
WGB504 040 060	4	2	12	-	60	4
WGB504 040 080	4	2	12	-	80	4
WGB504 040 110	4	2	12	-	110	4
WGB504 040 130	4	2	12	-	130	4
WGB504 040 150	4	2	12	-	150	4
WGB504 050 080	5	2.5	15	25	80	6
WGB504 050 110	5	2.5	15	25	110	6
WGB504 060 090	6	3	20	-	90	6
WGB504 060 110	6	3	20	-	110	6
WGB504 060 130	6	3	20	-	130	6
WGB504 060 150	6	3	20	-	150	6
WGB504 060 180	6	3	20	-	180	6
WGB504 080 110	8	4	25	-	110	8
WGB504 080 130	8	4	25	-	130	8
WGB504 080 150	8	4	25	-	150	8
WGB504 080 200	8	4	25	-	200	8
WGB504 100 110	10	5	30	-	110	10
WGB504 100 130	10	5	30	-	130	10
WGB504 100 150	10	5	30	-	150	10
WGB504 100 180	10	5	30	-	180	10
WGB504 100 200	10	5	30	-	200	10
WGB504 120 110	12	6	35	-	110	12

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
						◎		○	

○ : GOOD ◎ : EXCELLENT

WGB504 | 4 FLUTES BALL ENDMILL

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
WGB504 120 130	12	6	35	-	130	12
WGB504 120 150	12	6	35	-	150	12
WGB504 120 180	12	6	35	-	180	12
WGB504 120 200	12	6	35	-	200	12

EDP No	SIZES (mm)					
	D	R	L1	L3	L2	D2
WGB504 160 150	16	8	50	-	150	16
WGB504 160 200	16	8	50	-	200	16
WGB504 200 150	20	10	60	-	150	20
WGB504 200 200	20	10	60	-	200	20

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
						◎		○	

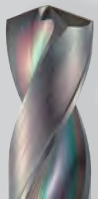
○ : GOOD ◎ : EXCELLENT

DRILL SERIES



NEW DOLPHIN DRILL new	368	
POWER MAX DRILL	388	
SOLID SPIRAL DRILL	434	

NEW DOLPHIN DRILL



Contents

(INCH : ◆ / METRIC : ◇)

EDP No / SPEC	Flutes	Geometry	Length 3D	Length 4D	Length 7D	Coolant Type	Margin	Tolerance	Diameter(Ø) Min	Diameter(Ø) Max	Page
NDPG503 ◆◇	2F		○			-	Single	h7	1	13	372
NDPG504 ◆◇				○		-	Single	h7	1	20	375
NDPG507 ◆◇					○	-	Single	h7	3	20	378
NDPK504 (NDPR/L) ◆◇				○		-	Single	h7	1	20	381
NDPK507 (NDPR/L) ◆◇					○	-	Single	h7	3	20	384

EDP No. System

*If expressed as an integer, the decimal point is omitted.

NDP G 5 04 100

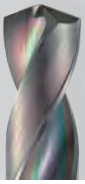
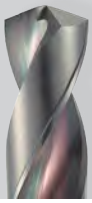
Section	Appearance	Coolant Type	Grade	Drilling Depth	Cutting Dia
NDP : New Dolphin	G (General) : General K (ISO K : Cast Iron)	Internal coolant	Grade : 5	03 : 3D 04 : 4D 07 : 7D	Ø10 ~ Ø20

Ex) Internal coolant / Drilling Depth 4D / Cutting Dia Ø10 / NDPG Drill

<New DolPhin>

It is a new brand name for all of Widin's rotating tools representing straight and dynamic image of cylindrical rotation pattern of tools when machining



Characteristics

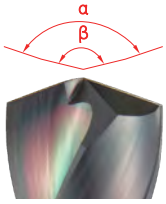
· Improved Cutting force, Stable Chip emission Reduced cutting workload, Improved working surface
· Drill for a wide range of workpieces Carbon steel, Alloy steel, Stainless etc.
· Satisfy Differing needs of the customers as 3D, 4D, 7D Standard

Features

· Reduced cutting workload on starting by shorten cutting edge parts.
· Reduced cutting workload by Improved XR-Thinning
· Designed flutes for strength and chip emission
· Enhanced wear resistance and lubricity by AlCrN Base surface treatment.

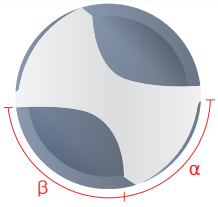
Multi Point angle

Multi Point angle



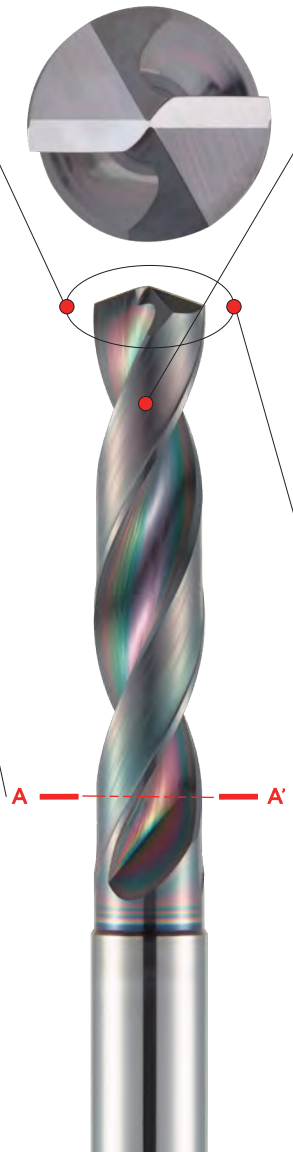
1) Cutting force dispersion by optimal match up on point angle.
2) Enhanced strength on point by streamlined 1st Multi point angle
: Breakage reduction at the beginning of drilling

Flute Design

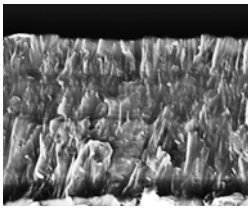


Section View A - A'

1) Flute groove for strength and chip emission (Wider β angle)
2) Improved chip emission and reduced frictional heat by improved flute roughness

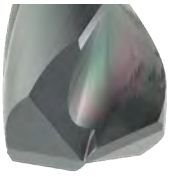


AlCrN base New Coating



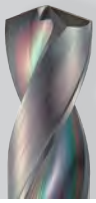
1) Improved chip emission by improved flute lubricity
2) Improved wear resistance and oxidation resistant by multi-layer coating

XR-Thinning



1) Cutting force dispersion and reduced cutting workload by streamlined thinning design
2) Reduced hole scratch by improved chip braking

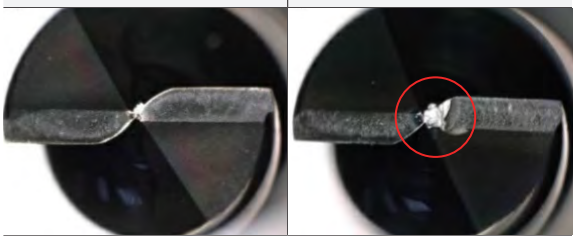
NEW DOLPHIN DRILL



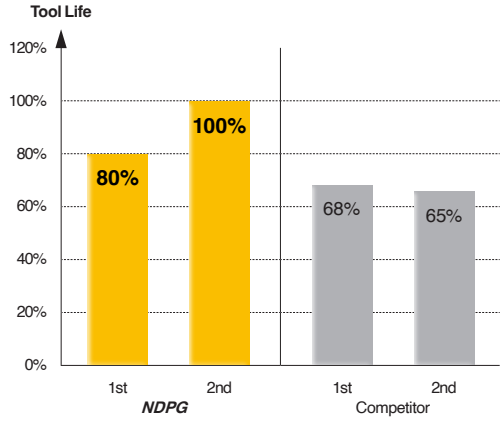
Case Study

Carbon steels (SM45C)

NDPG	Competitor



· SPEC : D6.0-50/83-6
· Cutting condition : Vc : 120m/min, fn : 0.12mm/rev, Depth : 30mm, External Coolant

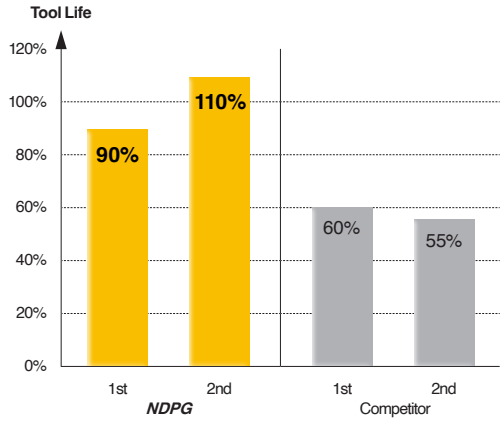


Alloy steels (SCM440)

NDPG	Competitor

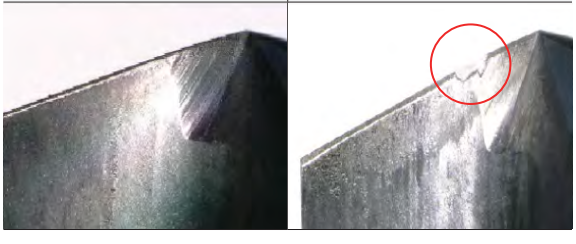


· SPEC : D6.0-50/83-6
· Cutting condition : Vc : 100m/min, fn : 0.12mm/rev, Depth : 30mm, External Coolant

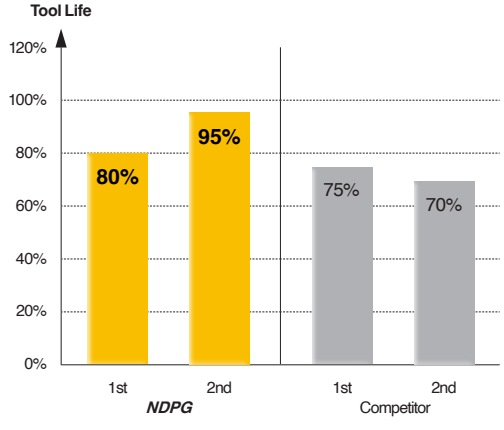


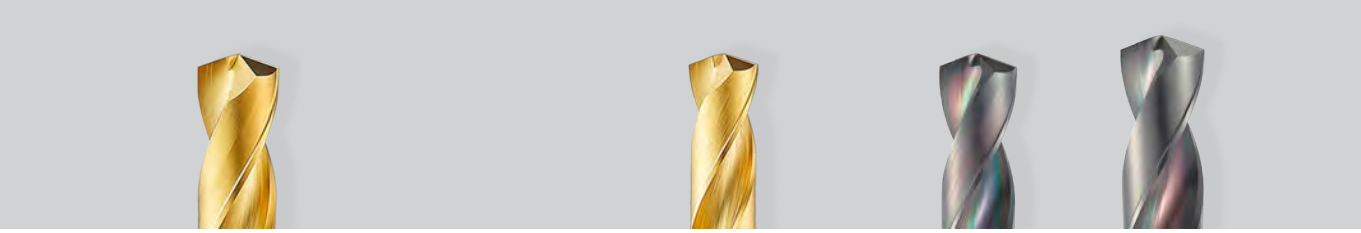
Stainless steels (STS304)

NDPG	Competitor

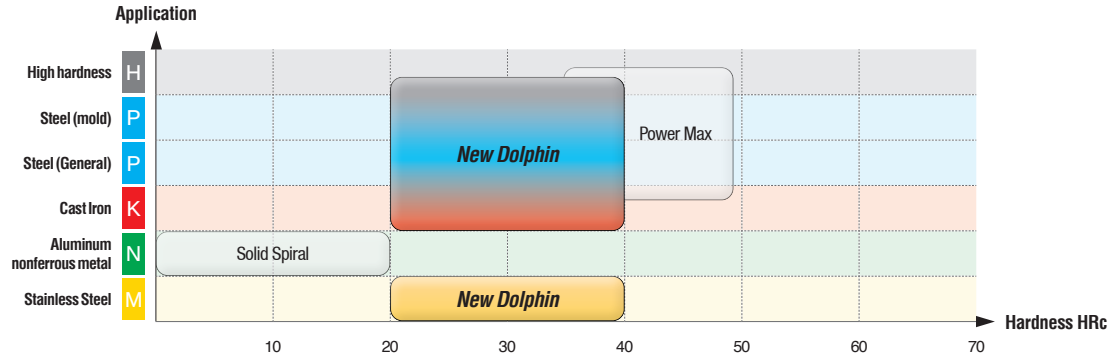


· SPEC : D6.0-50/83-6
· Cutting condition : Vc : 30m/min, fn : 0.04mm/rev, Depth : 5mm, External Coolant

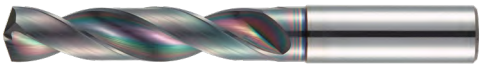




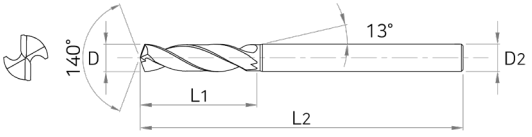
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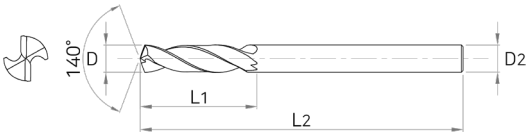


NDPG503 | NEW DOLPHIN GENERAL PURPOSE DRILL









■ Tolerance

D		Shank Dia
D1 ~ D3	0 ~ -0.010	h6
D3.1 ~ D6	0 ~ -0.012	
D6.1 ~ D10	0 ~ -0.015	
D10.1 ~ D13	0 ~ -0.084	

CARBIDE | AlCrN | 3D | 30° HELIX | 140° | DATA P.708

EDP No	SIZES (mm)				TAP	
	D	L1	L2	D2	Size	Limit
NDPG503 010	1	5	38	3	-	-
NDPG503 011	1.1	6	42	3	-	-
NDPG503 012	1.2	6	42	3	-	-
NDPG503 013	1.3	6	42	3	-	-
NDPG503 014	1.4	7	42	3	-	-
NDPG503 015	1.5	7	42	3	-	-
NDPG503 016	1.6	8	42	3	-	-
NDPG503 017	1.7	8	42	3	-	-
NDPG503 018	1.8	9	42	3	-	-
NDPG503 019	1.9	9	42	3	-	-
NDPG503 020	2	10	50	3	-	-
NDPG503 021	2.1	10	50	3	-	-
NDPG503 022	2.2	11	50	3	-	-
NDPG503 023	2.3	11	50	3	-	-
NDPG503 024	2.4	12	50	3	-	-
NDPG503 025	2.5	12	50	3	M3x0.5	WH1~4
NDPG503 026	2.6	12	50	3	M3x0.5	WH5~6
NDPG503 027	2.7	14	50	3	-	-
NDPG503 028	2.8	14	50	3	-	-
NDPG503 029	2.9	14	50	3	-	-
NDPG503 030	3	14	55	3	-	-
NDPG503 031	3.1	16	55	4	-	-
NDPG503 03175	3.175	16	55	4	-	-
NDPG503 032	3.2	16	55	4	-	-

EDP No	SIZES (mm)				TAP	
	D	L1	L2	D2	Size	Limit
NDPG503 03264	3.264	16	55	4	-	-
NDPG503 033	3.3	16	55	4	M4x0.7	WH1~4
NDPG503 034	3.4	16	55	4	M4x0.7	WH5~6
NDPG503 035	3.5	16	55	4	-	-
NDPG503 03572	3.572	18	55	4	-	-
NDPG503 036	3.6	18	55	4	-	-
NDPG503 037	3.7	18	55	4	-	-
NDPG503 038	3.8	20	55	4	-	-
NDPG503 039	3.9	20	55	4	-	-
NDPG503 040	4	20	55	4	-	-
NDPG503 04039	4.039	20	55	5	-	-
NDPG503 041	4.1	20	55	5	-	-
NDPG503 042	4.2	20	62	5	M5x0.8	WH1~4
NDPG503 043	4.3	22	62	5	M5x0.8	WH5~6
NDPG503 044	4.4	22	62	5	-	-
NDPG503 045	4.5	22	62	5	-	-
NDPG503 046	4.6	22	62	5	-	-
NDPG503 047	4.7	22	62	5	-	-
NDPG503 04763	4.763	24	62	5	-	-
NDPG503 048	4.8	24	62	5	-	-
NDPG503 049	4.9	24	62	5	-	-
NDPG503 050	5	24	62	5	M6x1.0	WH1~4
NDPG503 051	5.1	24	62	6	M6x1.0	WH5~6
NDPG503 05159	5.159	28	66	6	-	-

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○	○				○		◎

○ : GOOD ◎ : EXCELLENT

NDPG503 | NEW DOLPHIN GENERAL PURPOSE DRILL

EDP No	SIZES (mm)				TAP	
	D	L1	L2	D2	Size	Limit
NDPG503 052	5.2	28	66	6	-	-
NDPG503 053	5.3	28	66	6	-	-
NDPG503 054	5.4	28	66	6	-	-
NDPG503 055	5.5	28	66	6	-	-
NDPG503 05556	5.556	28	66	6	-	-
NDPG503 056	5.6	28	66	6	-	-
NDPG503 057	5.7	28	66	6	-	-
NDPG503 058	5.8	28	66	6	-	-
NDPG503 059	5.9	28	66	6	-	-
NDPG503 05953	5.953	28	66	6	-	-
NDPG503 060	6	28	66	6	-	-
NDPG503 061	6.1	30	66	7	-	-
NDPG503 062	6.2	34	74	7	-	-
NDPG503 063	6.3	34	74	7	-	-
NDPG503 0635	6.35	34	74	7	-	-
NDPG503 064	6.4	34	74	7	-	-
NDPG503 065	6.5	34	74	7	-	-
NDPG503 066	6.6	34	74	7	-	-
NDPG503 067	6.7	37	74	7	-	-
NDPG503 06747	6.747	37	74	7	-	-
NDPG503 068	6.8	37	74	7	M8x1.25	WH1~4
NDPG503 069	6.9	37	74	7	M8x1.25	WH5~6
NDPG503 070	7	37	74	7	M8x1.0	WH1~4
NDPG503 071	7.1	37	74	8	M8x1.0	WH5~6
NDPG503 07144	7.144	40	79	8	-	-
NDPG503 072	7.2	40	79	8	-	-
NDPG503 073	7.3	40	79	8	-	-
NDPG503 074	7.4	40	79	8	-	-
NDPG503 075	7.5	40	79	8	-	-
NDPG503 07541	7.541	40	79	8	-	-
NDPG503 076	7.6	40	79	8	-	-
NDPG503 077	7.7	40	79	8	-	-
NDPG503 078	7.8	40	79	8	-	-
NDPG503 079	7.9	40	79	8	-	-
NDPG503 07938	7.938	40	79	8	-	-
NDPG503 080	8	40	79	8	-	-
NDPG503 081	8.1	40	79	9	-	-
NDPG503 082	8.2	43	84	9	-	-
NDPG503 083	8.3	43	84	9	-	-
NDPG503 084	8.4	43	84	9	-	-
NDPG503 085	8.5	43	84	9	M10x1.5	WH1~4

EDP No	SIZES (mm)				TAP	
	D	L1	L2	D2	Size	Limit
NDPG503 086	8.6	43	84	9	M10x1.5	WH5~6
NDPG503 087	8.7	43	84	9	-	-
NDPG503 08731	8.731	43	84	9	-	-
NDPG503 088	8.8	43	84	9	M10x1.25	WH1~4
NDPG503 089	8.9	43	84	9	M10x1.25	WH5~6
NDPG503 090	9	43	84	9	M10x1.0	WH1~4
NDPG503 091	9.1	43	84	10	M10x1.0	WH5~6
NDPG503 092	9.2	47	89	10	-	-
NDPG503 093	9.3	47	89	10	-	-
NDPG503 094	9.4	47	89	10	-	-
NDPG503 095	9.5	47	89	10	-	-
NDPG503 09525	9.525	47	89	10	-	-
NDPG503 096	9.6	47	89	10	-	-
NDPG503 097	9.7	47	89	10	-	-
NDPG503 098	9.8	47	89	10	-	-
NDPG503 099	9.9	47	89	10	-	-
NDPG503 100	10	47	89	10	-	-
NDPG503 101	10.1	47	89	11	-	-
NDPG503 102	10.2	51	95	11	-	-
NDPG503 103	10.3	51	95	11	M12x1.75	WH1~2
NDPG503 10319	10.319	51	95	11	M12x1.75	WH3~4
NDPG503 104	10.4	51	95	11	M12x1.75	WH5~6
NDPG503 105	10.5	51	95	11	M12x1.5	WH1~4
NDPG503 106	10.6	51	95	11	M12x1.5	WH5~6
NDPG503 107	10.7	51	95	11	-	-
NDPG503 10716	10.716	51	95	11	-	-
NDPG503 108	10.8	51	95	11	M12x1.25	WH1~4
NDPG503 109	10.9	51	95	11	M12x1.25	WH5~6
NDPG503 110	11	51	95	11	M12x1.0	WH1~4
NDPG503 111	11.1	51	95	12	M12x1.0	WH5~6
NDPG503 11113	11.113	54	102	12	-	-
NDPG503 112	11.2	54	102	12	-	-
NDPG503 113	11.3	54	102	12	-	-
NDPG503 114	11.4	54	102	12	-	-
NDPG503 115	11.5	54	102	12	-	-
NDPG503 116	11.6	54	102	12	-	-
NDPG503 117	11.7	54	102	12	-	-
NDPG503 118	11.8	54	102	12	-	-
NDPG503 119	11.9	54	102	12	-	-
NDPG503 120	12	54	102	12	M14x2.0	WH1~4
NDPG503 121	12.1	54	102	13	M14x2.0	WH5~6

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○	○				○		◎

○ : GOOD ◎ : EXCELLENT

NDPG503 | NEW DOLPHIN GENERAL PURPOSE DRILL

EDP No	SIZES (mm)				TAP	
	D	L1	L2	D2	Size	Limit
NDPG503 122	12.2	57	102	13	-	-
NDPG503 123	12.3	57	102	13	-	-
NDPG503 124	12.4	57	102	13	-	-
NDPG503 125	12.5	57	102	13	M14x1.5	WH1~4
NDPG503 126	12.6	57	102	13	M14x1.5	WH5~6

EDP No	SIZES (mm)				TAP	
	D	L1	L2	D2	Size	Limit
NDPG503 127	12.7	57	102	13	-	-
NDPG503 128	12.8	57	102	13	-	-
NDPG503 129	12.9	57	102	13	-	-
NDPG503 130	13	57	102	13	-	-

■ Applicable Working Material

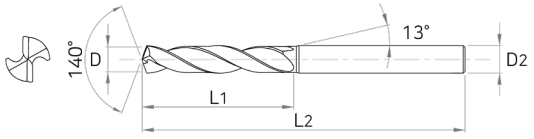
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○	○				○		◎

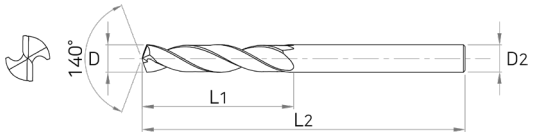
○ : GOOD ◎ : EXCELLENT

NDPG504 | NEW DOLPHIN GENERAL PURPOSE DRILL









■ Tolerance

D		Shank Dia
D1 ~ D3	0 ~ -0.010	h6
D3.1 ~ D6	0 ~ -0.012	
D6.1 ~ D10	0 ~ -0.015	
D10.1 ~ D18	0 ~ -0.018	
D18.1 ~	0 ~ -0.021	

CARBIDE | AlCrN | 4D | 30° HELIX | 140° | DATA P.708

EDP No	SIZES (mm)				TAP	
	D	L1	L2	D2	Size	Limit
NDPG504 010	1	8	38	3	-	-
NDPG504 011	1.1	9	42	3	-	-
NDPG504 012	1.2	10	42	3	-	-
NDPG504 013	1.3	10	42	3	-	-
NDPG504 014	1.4	11	42	3	-	-
NDPG504 015	1.5	11	42	3	-	-
NDPG504 016	1.6	12	42	3	-	-
NDPG504 017	1.7	12	42	3	-	-
NDPG504 018	1.8	13	42	3	-	-
NDPG504 019	1.9	13	42	3	-	-
NDPG504 020	2	18	50	3	-	-
NDPG504 021	2.1	18	50	3	-	-
NDPG504 022	2.2	18	50	3	-	-
NDPG504 023	2.3	18	50	3	-	-
NDPG504 024	2.4	18	50	3	-	-
NDPG504 025	2.5	18	50	3	M3x0.5	WH1~4
NDPG504 026	2.6	18	50	3	M3x0.5	WH5~6
NDPG504 027	2.7	18	50	3	-	-
NDPG504 028	2.8	18	50	3	-	-
NDPG504 029	2.9	18	50	3	-	-
NDPG504 030	3	20	55	3	-	-
NDPG504 031	3.1	20	55	4	-	-
NDPG504 03175	3.175	20	55	4	-	-
NDPG504 032	3.2	20	55	4	-	-

EDP No	SIZES (mm)				TAP	
	D	L1	L2	D2	Size	Limit
NDPG504 03264	3.264	20	55	4	-	-
NDPG504 033	3.3	20	55	4	M4x0.7	WH1~4
NDPG504 034	3.4	20	55	4	M4x0.7	WH 5~6
NDPG504 035	3.5	20	55	4	-	-
NDPG504 03572	3.572	25	55	4	-	-
NDPG504 036	3.6	25	55	4	-	-
NDPG504 037	3.7	25	55	4	-	-
NDPG504 038	3.8	25	55	4	-	-
NDPG504 039	3.9	25	55	4	-	-
NDPG504 040	4	25	55	4	-	-
NDPG504 04039	4.039	25	55	5	-	-
NDPG504 041	4.1	25	55	5	-	-
NDPG504 042	4.2	33	63	5	M5x0.8	WH1~4
NDPG504 043	4.3	33	63	5	M5x0.8	WH5~6
NDPG504 044	4.4	33	63	5	-	-
NDPG504 045	4.5	33	63	5	-	-
NDPG504 046	4.6	33	63	5	-	-
NDPG504 047	4.7	33	63	5	-	-
NDPG504 04763	4.763	33	63	5	-	-
NDPG504 048	4.8	33	63	5	-	-
NDPG504 049	4.9	33	63	5	-	-
NDPG504 050	5	33	63	5	M6x1.0	WH1~4
NDPG504 051	5.1	33	63	6	M6x1.0	WH5~6
NDPG504 05159	5.159	36	66	6	-	-

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○	○				○		◎

○ : GOOD ◎ : EXCELLENT

NDPG504 | NEW DOLPHIN GENERAL PURPOSE DRILL

EDP No	SIZES (mm)				TAP	
	D	L1	L2	D2	Size	Limit
NDPG504 052	5.2	36	66	6	-	-
NDPG504 053	5.3	36	66	6	-	-
NDPG504 054	5.4	36	66	6	-	-
NDPG504 055	5.5	36	66	6	-	-
NDPG504 05556	5.556	36	66	6	-	-
NDPG504 056	5.6	36	66	6	-	-
NDPG504 057	5.7	36	66	6	-	-
NDPG504 058	5.8	36	66	6	-	-
NDPG504 059	5.9	36	66	6	-	-
NDPG504 05953	5.953	36	66	6	-	-
NDPG504 060	6	36	66	6	-	-
NDPG504 061	6.1	36	66	7	-	-
NDPG504 062	6.2	42	75	7	-	-
NDPG504 063	6.3	42	75	7	-	-
NDPG504 0635	6.35	42	75	7	-	-
NDPG504 064	6.4	42	75	7	-	-
NDPG504 065	6.5	42	75	7	-	-
NDPG504 066	6.6	42	75	7	-	-
NDPG504 067	6.7	42	75	7	-	-
NDPG504 06747	6.747	42	75	7	-	-
NDPG504 068	6.8	42	75	7	M8x1.25	WH1~4
NDPG504 069	6.9	42	75	7	M8x1.25	WH5~6
NDPG504 070	7	42	75	7	M8x1.0	WH1~4
NDPG504 071	7.1	42	75	8	M8x1.0	WH5~6
NDPG504 07144	7.144	46	80	8	-	-
NDPG504 072	7.2	46	80	8	-	-
NDPG504 073	7.3	46	80	8	-	-
NDPG504 074	7.4	46	80	8	-	-
NDPG504 075	7.5	46	80	8	-	-
NDPG504 07541	7.541	46	80	8	-	-
NDPG504 076	7.6	46	80	8	-	-
NDPG504 077	7.7	46	80	8	-	-
NDPG504 078	7.8	46	80	8	-	-
NDPG504 079	7.9	46	80	8	-	-
NDPG504 07938	7.938	46	80	8	-	-
NDPG504 080	8	46	80	8	-	-
NDPG504 081	8.1	46	80	9	-	-
NDPG504 082	8.2	50	85	9	-	-
NDPG504 083	8.3	50	85	9	-	-
NDPG504 084	8.4	50	85	9	-	-
NDPG504 085	8.5	50	85	9	M10x1.5	WH1~4

EDP No	SIZES (mm)				TAP	
	D	L1	L2	D2	Size	Limit
NDPG504 086	8.6	50	85	9	M10x1.5	WH5~6
NDPG504 087	8.7	50	85	9	-	-
NDPG504 08731	8.731	50	85	9	-	-
NDPG504 088	8.8	50	85	9	M10x1.25	WH1~4
NDPG504 089	8.9	50	85	9	M10x1.25	WH5~6
NDPG504 090	9	50	85	9	M10x1.0	WH1~4
NDPG504 091	9.1	50	85	10	M10x1.0	WH5~6
NDPG504 092	9.2	55	90	10	-	-
NDPG504 093	9.3	55	90	10	-	-
NDPG504 094	9.4	55	90	10	-	-
NDPG504 095	9.5	55	90	10	-	-
NDPG504 09525	9.525	55	90	10	-	-
NDPG504 096	9.6	55	90	10	-	-
NDPG504 097	9.7	55	90	10	-	-
NDPG504 098	9.8	55	90	10	-	-
NDPG504 099	9.9	55	90	10	-	-
NDPG504 100	10	55	90	10	-	-
NDPG504 101	10.1	55	90	11	-	-
NDPG504 102	10.2	57	95	11	-	-
NDPG504 103	10.3	57	95	11	M12x1.75	WH1~2
NDPG504 10319	10.319	57	95	11	M12x1.75	WH3~4
NDPG504 104	10.4	57	95	11	M12x1.75	WH5~6
NDPG504 105	10.5	57	95	11	M12x1.5	WH1~4
NDPG504 106	10.6	57	95	11	M12x1.5	WH5~6
NDPG504 107	10.7	57	95	11	-	-
NDPG504 10716	10.716	57	95	11	-	-
NDPG504 108	10.8	57	95	11	M12x1.25	WH1~4
NDPG504 109	10.9	57	95	11	M12x1.25	WH5~6
NDPG504 110	11	57	95	11	M12x1.0	WH1~4
NDPG504 111	11.1	57	95	12	M12x1.0	WH5~6
NDPG504 11113	11.113	63	102	12	-	-
NDPG504 112	11.2	63	102	12	-	-
NDPG504 113	11.3	63	102	12	-	-
NDPG504 114	11.4	63	102	12	-	-
NDPG504 115	11.5	63	102	12	-	-
NDPG504 116	11.6	63	102	12	-	-
NDPG504 117	11.7	63	102	12	-	-
NDPG504 118	11.8	63	102	12	-	-
NDPG504 119	11.9	63	102	12	-	-
NDPG504 120	12	63	102	12	M14x2.0	WH1~4
NDPG504 121	12.1	63	102	13	M14x2.0	WH5~6

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○	○				○		◎

○ : GOOD ◎ : EXCELLENT

NDPG504 | NEW DOLPHIN GENERAL PURPOSE DRILL

EDP No	SIZES (mm)				TAP	
	D	L1	L2	D2	Size	Limit
NDPG504 122	12.2	63	102	13	-	-
NDPG504 123	12.3	63	102	13	-	-
NDPG504 124	12.4	63	102	13	-	-
NDPG504 125	12.5	63	102	13	M14x1.5	WH1~4
NDPG504 126	12.6	63	102	13	M14x1.5	WH5~6
NDPG504 127	12.7	63	102	13	-	-
NDPG504 128	12.8	63	102	13	-	-
NDPG504 129	12.9	63	102	13	-	-
NDPG504 130	13	63	102	13	-	-
NDPG504 131	13.1	63	102	14	-	-
NDPG504 132	13.2	65	107	14	-	-
NDPG504 133	13.3	65	107	14	-	-
NDPG504 134	13.4	65	107	14	-	-
NDPG504 13494	13.494	65	107	14	-	-
NDPG504 135	13.5	65	107	14	-	-
NDPG504 136	13.6	65	107	14	-	-
NDPG504 137	13.7	65	107	14	-	-
NDPG504 138	13.8	65	107	14	-	-
NDPG504 139	13.9	65	107	14	-	-
NDPG504 140	14	65	107	14	M16x2.0	WH1~4
NDPG504 141	14.1	65	107	15	M16x2.0	WH5~6
NDPG504 142	14.2	67	111	15	-	-
NDPG504 143	14.3	67	111	15	-	-
NDPG504 144	14.4	67	111	15	-	-
NDPG504 145	14.5	67	111	15	M16x1.5	WH1~4
NDPG504 146	14.6	67	111	15	M16x1.5	WH5~6
NDPG504 147	14.7	67	111	15	-	-
NDPG504 148	14.8	67	111	15	-	-
NDPG504 149	14.9	67	111	15	-	-

EDP No	SIZES (mm)				TAP	
	D	L1	L2	D2	Size	Limit
NDPG504 150	15	67	111	15	-	-
NDPG504 151	15.1	67	111	16	-	-
NDPG504 152	15.2	69	115	16	-	-
NDPG504 154	15.4	69	115	16	-	-
NDPG504 155	15.5	69	115	16	M18x2.5	WH1~4
NDPG504 156	15.6	69	115	16	M18x2.5	WH5~6
NDPG504 157	15.7	69	115	16	-	-
NDPG504 158	15.8	69	115	16	-	-
NDPG504 15875	15.875	69	115	16	-	-
NDPG504 160	16	69	115	16	-	-
NDPG504 161	16.1	69	115	17	-	-
NDPG504 163	16.3	71	119	17	-	-
NDPG504 165	16.5	71	119	17	M18x1.5	WH1~6
NDPG504 16669	16.669	71	119	17	-	-
NDPG504 170	17	71	119	17	-	-
NDPG504 171	17.1	71	119	18	-	-
NDPG504 172	17.2	74	123	18	-	-
NDPG504 175	17.5	74	123	18	M20x2.5	WH1~6
NDPG504 177	17.7	74	123	18	-	-
NDPG504 178	17.8	74	123	18	-	-
NDPG504 180	18	74	123	18	-	-
NDPG504 181	18.1	74	123	19	-	-
NDPG504 182	18.2	76	127	19	-	-
NDPG504 185	18.5	76	127	19	M20x1.5	WH1~6
NDPG504 190	19	76	127	19	-	-
NDPG504 191	19.1	76	127	20	-	-
NDPG504 195	19.5	80	131	20	M22x2.5	WH1~6
NDPG504 197	19.7	80	131	20	-	-
NDPG504 200	20	80	131	20	-	-

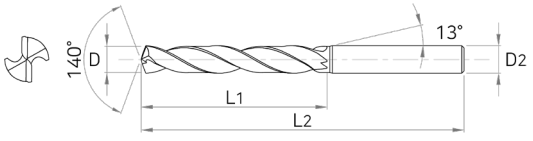
■ Applicable Working Material

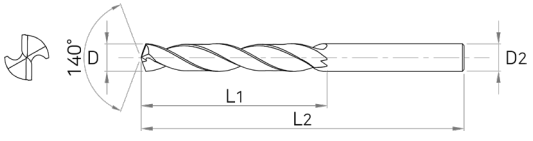
Carbon Steel ~ HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○	○				○		◎

○ : GOOD ◎ : EXCELLENT

NDPG507 | NEW DOLPHIN GENERAL PURPOSE DRILL







■ Tolerance

D		Shank Dia
D3	0 ~ -0.010	h6
D3.1 ~ D6	0 ~ -0.012	
D6.1 ~ D10	0 ~ -0.015	
D10.1 ~ D18	0 ~ -0.018	
D18.1 ~	0 ~ -0.021	

CARBIDE | AlCrN | 7D | 30° HELIX | 140° | DATA P.708

EDP No	SIZES (mm)				TAP	
	D	L1	L2	D2	Size	Limit
NDPG507 030	3	45	80	3	-	-
NDPG507 031	3.1	45	80	4	-	-
NDPG507 03175	3.175	45	80	4	-	-
NDPG507 032	3.2	45	80	4	-	-
NDPG507 03264	3.264	45	80	4	-	-
NDPG507 033	3.3	45	80	4	M4x0.7	WH1~4
NDPG507 034	3.4	45	80	4	M4x0.7	WH5~6
NDPG507 035	3.5	45	80	4	-	-
NDPG507 03572	3.572	45	80	4	-	-
NDPG507 036	3.6	45	80	4	-	-
NDPG507 037	3.7	45	80	4	-	-
NDPG507 038	3.8	45	80	4	-	-
NDPG507 039	3.9	45	80	4	-	-
NDPG507 040	4	45	80	4	-	-
NDPG507 041	4.1	45	80	5	-	-
NDPG507 042	4.2	45	80	5	M5x0.8	WH1~4
NDPG507 043	4.3	45	80	5	M5x0.8	WH5~6
NDPG507 044	4.4	45	80	5	-	-
NDPG507 045	4.5	45	80	5	-	-
NDPG507 046	4.6	45	80	5	-	-
NDPG507 047	4.7	45	80	5	-	-
NDPG507 04763	4.763	45	80	5	-	-
NDPG507 048	4.8	45	80	5	-	-
NDPG507 049	4.9	45	80	5	-	-

EDP No	SIZES (mm)				TAP	
	D	L1	L2	D2	Size	Limit
NDPG507 050	5	45	80	5	M6x1.0	WH1~4
NDPG507 051	5.1	45	80	6	M6x1.0	WH5~6
NDPG507 05159	5.159	50	83	6	-	-
NDPG507 052	5.2	50	83	6	-	-
NDPG507 053	5.3	50	83	6	-	-
NDPG507 054	5.4	50	83	6	-	-
NDPG507 055	5.5	50	83	6	-	-
NDPG507 05556	5.556	50	83	6	-	-
NDPG507 056	5.6	50	83	6	-	-
NDPG507 057	5.7	50	83	6	-	-
NDPG507 058	5.8	50	83	6	-	-
NDPG507 059	5.9	50	83	6	-	-
NDPG507 060	6	50	83	6	-	-
NDPG507 061	6.1	50	83	7	-	-
NDPG507 062	6.2	53	85	7	-	-
NDPG507 063	6.3	53	85	7	-	-
NDPG507 0635	6.35	53	85	7	-	-
NDPG507 064	6.4	53	85	7	-	-
NDPG507 065	6.5	53	85	7	-	-
NDPG507 066	6.6	53	85	7	-	-
NDPG507 067	6.7	53	85	7	-	-
NDPG507 06747	6.747	53	85	7	-	-
NDPG507 068	6.8	53	85	7	M8x1.25	WH1~4
NDPG507 069	6.9	53	85	7	M8x1.25	WH5~6

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○	○				○		◎

○ : GOOD ◎ : EXCELLENT

NDPG507 | NEW DOLPHIN GENERAL PURPOSE DRILL

EDP No	SIZES (mm)				TAP	
	D	L1	L2	D2	Size	Limit
NDPG507 070	7	53	85	7	M8x1.0	WH1~4
NDPG507 071	7.1	53	85	8	M8x1.0	WH5~6
NDPG507 07144	7.144	58	90	8	-	-
NDPG507 072	7.2	58	90	8	-	-
NDPG507 073	7.3	58	90	8	-	-
NDPG507 074	7.4	58	90	8	-	-
NDPG507 075	7.5	58	90	8	-	-
NDPG507 076	7.6	58	90	8	-	-
NDPG507 077	7.7	58	90	8	-	-
NDPG507 078	7.8	58	90	8	-	-
NDPG507 079	7.9	58	90	8	-	-
NDPG507 07938	7.938	58	90	8	-	-
NDPG507 080	8	58	90	8	-	-
NDPG507 081	8.1	58	90	9	-	-
NDPG507 082	8.2	64	98	9	-	-
NDPG507 083	8.3	64	98	9	-	-
NDPG507 084	8.4	64	98	9	-	-
NDPG507 085	8.5	64	98	9	M10x1.5	WH1~4
NDPG507 086	8.6	64	98	9	M10x1.5	WH5~6
NDPG507 087	8.7	64	98	9	-	-
NDPG507 08731	8.731	64	98	9	-	-
NDPG507 088	8.8	64	98	9	M10x1.25	WH1~4
NDPG507 089	8.9	64	98	9	M10x1.25	WH5~6
NDPG507 090	9	64	98	9	M10x1.0	WH1~4
NDPG507 091	9.1	64	98	10	M10x1.0	WH5~6
NDPG507 092	9.2	68	105	10	-	-
NDPG507 093	9.3	68	105	10	-	-
NDPG507 094	9.4	68	105	10	-	-
NDPG507 095	9.5	68	105	10	-	-
NDPG507 09525	9.525	68	105	10	-	-
NDPG507 096	9.6	68	105	10	-	-
NDPG507 097	9.7	68	105	10	-	-
NDPG507 098	9.8	68	105	10	-	-
NDPG507 099	9.9	68	105	10	-	-
NDPG507 100	10	68	105	10	-	-
NDPG507 101	10.1	68	105	11	-	-
NDPG507 102	10.2	73	110	11	-	-
NDPG507 103	10.3	73	110	11	M12x1.75	WH1~2
NDPG507 10319	10.319	73	110	11	M12x1.75	WH3~4
NDPG507 104	10.4	73	110	11	M12x1.75	WH5~6
NDPG507 105	10.5	73	110	11	M12x1.5	WH1~4

EDP No	SIZES (mm)				TAP	
	D	L1	L2	D2	Size	Limit
NDPG507 106	10.6	73	110	11	M12x1.5	WH5~6
NDPG507 107	10.7	73	110	11	-	-
NDPG507 10716	10.716	73	110	11	-	-
NDPG507 108	10.8	73	110	11	M12x1.25	WH1~4
NDPG507 109	10.9	73	110	11	M12x1.25	WH5~6
NDPG507 110	11	73	110	11	M12x1.0	WH1~4
NDPG507 111	11.1	73	110	12	M12x1.0	WH5~6
NDPG507 11113	11.113	80	120	12	-	-
NDPG507 112	11.2	80	120	12	-	-
NDPG507 113	11.3	80	120	12	-	-
NDPG507 114	11.4	80	120	12	-	-
NDPG507 115	11.5	80	120	12	-	-
NDPG507 116	11.6	80	120	12	-	-
NDPG507 117	11.7	80	120	12	-	-
NDPG507 118	11.8	80	120	12	-	-
NDPG507 119	11.9	80	120	12	-	-
NDPG507 120	12	80	120	12	M14x2.0	WH1~4
NDPG507 121	12.1	80	120	13	M14x2.0	WH5~6
NDPG507 122	12.2	90	137	13	-	-
NDPG507 123	12.3	90	137	13	-	-
NDPG507 124	12.4	90	137	13	-	-
NDPG507 125	12.5	90	137	13	M14x1.5	WH1~4
NDPG507 126	12.6	90	137	13	M14x1.5	WH5~6
NDPG507 127	12.7	90	137	13	-	-
NDPG507 128	12.8	90	137	13	-	-
NDPG507 129	12.9	90	137	13	-	-
NDPG507 130	13	90	137	13	-	-
NDPG507 131	13.1	90	137	14	-	-
NDPG507 133	13.3	96	147	14	-	-
NDPG507 134	13.4	96	147	14	-	-
NDPG507 13494	13.494	96	147	14	-	-
NDPG507 135	13.5	96	147	14	-	-
NDPG507 136	13.6	96	147	14	-	-
NDPG507 137	13.7	96	147	14	-	-
NDPG507 138	13.8	96	147	14	-	-
NDPG507 13891	13.891	96	147	14	-	-
NDPG507 139	13.9	96	147	14	-	-
NDPG507 140	14	96	147	14	M16x2.0	WH1~4
NDPG507 141	14.1	96	147	15	M16x2.0	WH5~6
NDPG507 142	14.2	100	153	15	-	-
NDPG507 14288	14.288	100	153	15	-	-

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○	○				○		◎

○ : GOOD ◎ : EXCELLENT

NDPG507 | NEW DOLPHIN GENERAL PURPOSE DRILL

EDP No	SIZES (mm)				TAP	
	D	L1	L2	D2	Size	Limit
NDPG507 143	14.3	100	153	15	-	-
NDPG507 145	14.5	100	153	15	M16x1.5	WH1~4
NDPG507 146	14.6	100	153	15	M16x1.5	WH5~6
NDPG507 147	14.7	100	153	15	-	-
NDPG507 148	14.8	100	153	15	-	-
NDPG507 149	14.9	100	153	15	-	-
NDPG507 150	15	100	153	15	-	-
NDPG507 151	15.1	100	153	16	-	-
NDPG507 154	15.4	112	160	16	-	-
NDPG507 155	15.5	112	160	16	M18x2.5	WH1~4
NDPG507 156	15.6	112	160	16	M18x2.5	WH5~6
NDPG507 157	15.7	112	160	16	-	-
NDPG507 158	15.8	112	160	16	-	-
NDPG507 15875	15.875	112	160	16	-	-
NDPG507 160	16	112	160	16	-	-
NDPG507 161	16.1	112	160	17	-	-
NDPG507 163	16.3	112	160	17	-	-

EDP No	SIZES (mm)				TAP	
	D	L1	L2	D2	Size	Limit
NDPG507 165	16.5	112	160	17	M18x1.5	WH1~6
NDPG507 16669	16.669	112	160	17	-	-
NDPG507 170	17	112	160	17	-	-
NDPG507 171	17.1	112	160	18	-	-
NDPG507 172	17.2	112	160	18	-	-
NDPG507 17463	17.463	112	160	18	-	-
NDPG507 175	17.5	112	160	18	M20x2.5	WH1~6
NDPG507 177	17.7	112	160	18	-	-
NDPG507 178	17.8	112	160	18	-	-
NDPG507 180	18	112	160	18	-	-
NDPG507 182	18.2	112	160	19	-	-
NDPG507 185	18.5	112	160	19	M20x1.5	WH1~6
NDPG507 190	19	112	160	19	-	-
NDPG507 195	19.5	112	160	20	M22x2.5	WH1~6
NDPG507 197	19.7	112	160	20	-	-
NDPG507 200	20	112	160	20	-	-

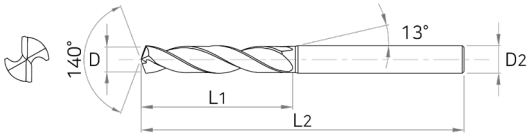
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
◎	◎	○	○				○		◎

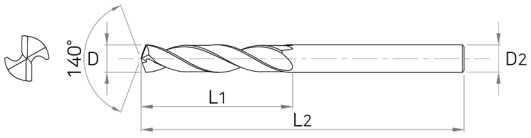
○ : GOOD ◎ : EXCELLENT

NDPK504(NDPR/L504) | NEW DOLPHIN CAST IRON DRILL









■ Tolerance

D		Shank Dia
~D3	0~-0.010	h6
D3.1~D6	0~-0.012	
D6.1~D10	0~-0.015	
D10.1~D18	0~-0.018	
D18.1~	0~-0.021	

CARBIDE | AlCrN | 4D | 30° HELIX | 140° | DATA P.708

EDP No	SIZES (mm)				TAP	
	D	L1	L2	D2	Size	Limit
NDPK504 010	1	8	38	3	-	-
NDPK504 011	1.1	9	42	3	-	-
NDPK504 012	1.2	10	42	3	-	-
NDPK504 013	1.3	10	42	3	-	-
NDPK504 014	1.4	11	42	3	-	-
NDPK504 015	1.5	11	42	3	-	-
NDPK504 016	1.6	12	42	3	-	-
NDPK504 017	1.7	12	42	3	-	-
NDPK504 018	1.8	13	42	3	-	-
NDPK504 019	1.9	13	42	3	-	-
NDPK504 020	2	18	50	3	-	-
NDPK504 021	2.1	18	50	3	-	-
NDPK504 022	2.2	18	50	3	-	-
NDPK504 023	2.3	18	50	3	-	-
NDPK504 024	2.4	18	50	3	-	-
NDPK504 025	2.5	18	50	3	M3x0.5	WH1~4
NDPK504 026	2.6	18	50	3	M3x0.5	WH5~6
NDPK504 027	2.7	18	50	3	-	-
NDPK504 028	2.8	18	50	3	-	-
NDPK504 029	2.9	18	50	3	-	-
NDPK504 030	3	20	55	3	-	-
NDPK504 031	3.1	20	55	4	-	-
NDPK504 03175	3.175	20	55	4	-	-
NDPK504 032	3.2	20	55	4	-	-

EDP No	SIZES (mm)				TAP	
	D	L1	L2	D2	Size	Limit
NDPK504 03264	3.264	20	55	4	-	-
NDPK504 033	3.3	20	55	4	M4x0.7	WH1~4
NDPK504 034	3.4	20	55	4	M4x0.7	WH 5~6
NDPK504 035	3.5	20	55	4	-	-
NDPK504 03572	3.572	25	55	4	-	-
NDPK504 036	3.6	25	55	4	-	-
NDPK504 037	3.7	25	55	4	-	-
NDPK504 038	3.8	25	55	4	-	-
NDPK504 039	3.9	25	55	4	-	-
NDPK504 040	4	25	55	4	-	-
NDPK504 04039	4.039	25	55	5	-	-
NDPK504 041	4.1	25	55	5	-	-
NDPK504 042	4.2	33	63	5	M5x0.8	WH1~4
NDPK504 043	4.3	33	63	5	M5x0.8	WH5~6
NDPK504 044	4.4	33	63	5	-	-
NDPK504 045	4.5	33	63	5	-	-
NDPK504 046	4.6	33	63	5	-	-
NDPK504 047	4.7	33	63	5	-	-
NDPK504 04763	4.763	33	63	5	-	-
NDPK504 048	4.8	33	63	5	-	-
NDPK504 049	4.9	33	63	5	-	-
NDPK504 050	5	33	63	5	M6x1.0	WH1~4
NDPK504 051	5.1	33	63	6	M6x1.0	WH5~6
NDPK504 05159	5.159	36	66	6	-	-

※ NDPR/L was renamed to NDPK from January 2023

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	○					◎		

○ : GOOD ◎ : EXCELLENT

NDPK504(NDPR/L504) | NEW DOLPHIN CAST IRON DRILL

EDP No	SIZES (mm)				TAP	
	D	L1	L2	D2	Size	Limit
NDPK504 052	5.2	36	66	6	-	-
NDPK504 053	5.3	36	66	6	-	-
NDPK504 054	5.4	36	66	6	-	-
NDPK504 055	5.5	36	66	6	-	-
NDPK504 05556	5.556	36	66	6	-	-
NDPK504 056	5.6	36	66	6	-	-
NDPK504 057	5.7	36	66	6	-	-
NDPK504 058	5.8	36	66	6	-	-
NDPK504 059	5.9	36	66	6	-	-
NDPK504 05953	5.953	36	66	6	-	-
NDPK504 060	6	36	66	6	-	-
NDPK504 061	6.1	36	66	7	-	-
NDPK504 062	6.2	42	75	7	-	-
NDPK504 063	6.3	42	75	7	-	-
NDPK504 0635	6.35	42	75	7	-	-
NDPK504 064	6.4	42	75	7	-	-
NDPK504 065	6.5	42	75	7	-	-
NDPK504 066	6.6	42	75	7	-	-
NDPK504 067	6.7	42	75	7	-	-
NDPK504 06747	6.747	42	75	7	-	-
NDPK504 068	6.8	42	75	7	M8x1.25	WH1~4
NDPK504 069	6.9	42	75	7	M8x1.25	WH5~6
NDPK504 070	7	42	75	7	M8x1.0	WH1~4
NDPK504 071	7.1	42	75	8	M8x1.0	WH5~6
NDPK504 07144	7.144	46	80	8	-	-
NDPK504 072	7.2	46	80	8	-	-
NDPK504 073	7.3	46	80	8	-	-
NDPK504 074	7.4	46	80	8	-	-
NDPK504 075	7.5	46	80	8	-	-
NDPK504 07541	7.541	46	80	8	-	-
NDPK504 076	7.6	46	80	8	-	-
NDPK504 077	7.7	46	80	8	-	-
NDPK504 078	7.8	46	80	8	-	-
NDPK504 079	7.9	46	80	8	-	-
NDPK504 07938	7.938	46	80	8	-	-
NDPK504 080	8	46	80	8	-	-
NDPK504 081	8.1	46	80	9	-	-
NDPK504 082	8.2	50	85	9	-	-
NDPK504 083	8.3	50	85	9	-	-
NDPK504 084	8.4	50	85	9	-	-
NDPK504 085	8.5	50	85	9	M10x1.5	WH1~4

EDP No	SIZES (mm)				TAP	
	D	L1	L2	D2	Size	Limit
NDPK504 086	8.6	50	85	9	M10x1.5	WH5~6
NDPK504 087	8.7	50	85	9	-	-
NDPK504 08731	8.731	50	85	9	-	-
NDPK504 088	8.8	50	85	9	M10x1.25	WH1~4
NDPK504 089	8.9	50	85	9	M10x1.25	WH5~6
NDPK504 090	9	50	85	9	M10x1.0	WH1~4
NDPK504 091	9.1	50	85	10	M10x1.0	WH5~6
NDPK504 092	9.2	55	90	10	-	-
NDPK504 093	9.3	55	90	10	-	-
NDPK504 094	9.4	55	90	10	-	-
NDPK504 095	9.5	55	90	10	-	-
NDPK504 09525	9.525	55	90	10	-	-
NDPK504 096	9.6	55	90	10	-	-
NDPK504 097	9.7	55	90	10	-	-
NDPK504 098	9.8	55	90	10	-	-
NDPK504 099	9.9	55	90	10	-	-
NDPK504 100	10	55	90	10	-	-
NDPK504 101	10.1	55	90	11	-	-
NDPK504 102	10.2	57	95	11	-	-
NDPK504 103	10.3	57	95	11	M12x1.75	WH1~2
NDPK504 10319	10.319	57	95	11	M12x1.75	WH3~4
NDPK504 104	10.4	57	95	11	M12x1.75	WH5~6
NDPK504 105	10.5	57	95	11	M12x1.5	WH1~4
NDPK504 106	10.6	57	95	11	M12x1.5	WH5~6
NDPK504 107	10.7	57	95	11	-	-
NDPK504 10716	10.716	57	95	11	-	-
NDPK504 108	10.8	57	95	11	M12x1.25	WH1~4
NDPK504 109	10.9	57	95	11	M12x1.25	WH5~6
NDPK504 110	11	57	95	11	M12x1.0	WH1~4
NDPK504 111	11.1	57	95	12	M12x1.0	WH5~6
NDPK504 11113	11.113	63	102	12	-	-
NDPK504 112	11.2	63	102	12	-	-
NDPK504 113	11.3	63	102	12	-	-
NDPK504 114	11.4	63	102	12	-	-
NDPK504 115	11.5	63	102	12	-	-
NDPK504 116	11.6	63	102	12	-	-
NDPK504 117	11.7	63	102	12	-	-
NDPK504 118	11.8	63	102	12	-	-
NDPK504 119	11.9	63	102	12	-	-
NDPK504 120	12	63	102	12	M14x2.0	WH1~4
NDPK504 121	12.1	63	102	13	M14x2.0	WH5~6

※ NDPR/L was renamed to NDPK from January 2023

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	○					◎		

○ : GOOD ◎ : EXCELLENT

NDPK504(NDPR/L504) | NEW DOLPHIN CAST IRON DRILL

EDP No	SIZES (mm)				TAP	
	D	L1	L2	D2	Size	Limit
NDPK504 122	12.2	63	102	13	-	-
NDPK504 123	12.3	63	102	13	-	-
NDPK504 124	12.4	63	102	13	-	-
NDPK504 125	12.5	63	102	13	M14x1.5	WH1~4
NDPK504 126	12.6	63	102	13	M14x1.5	WH5~6
NDPK504 127	12.7	63	102	13	-	-
NDPK504 128	12.8	63	102	13	-	-
NDPK504 129	12.9	63	102	13	-	-
NDPK504 130	13	63	102	13	-	-
NDPK504 131	13.1	63	102	14	-	-
NDPK504 132	13.2	65	107	14	-	-
NDPK504 133	13.3	65	107	14	-	-
NDPK504 134	13.4	65	107	14	-	-
NDPK504 13494	13.494	65	107	14	-	-
NDPK504 135	13.5	65	107	14	-	-
NDPK504 136	13.6	65	107	14	-	-
NDPK504 137	13.7	65	107	14	-	-
NDPK504 138	13.8	65	107	14	-	-
NDPK504 139	13.9	65	107	14	-	-
NDPK504 140	14	65	107	14	M16x2.0	WH1~4
NDPK504 141	14.1	65	107	15	M16x2.0	WH5~6
NDPK504 142	14.2	67	111	15	-	-
NDPK504 143	14.3	67	111	15	-	-
NDPK504 144	14.4	67	111	15	-	-
NDPK504 145	14.5	67	111	15	M16x1.5	WH1~4
NDPK504 146	14.6	67	111	15	M16x1.5	WH5~6
NDPK504 147	14.7	67	111	15	-	-
NDPK504 148	14.8	67	111	15	-	-
NDPK504 149	14.9	67	111	15	-	-

EDP No	SIZES (mm)				TAP	
	D	L1	L2	D2	Size	Limit
NDPK504 150	15	67	111	15	-	-
NDPK504 151	15.1	67	111	16	-	-
NDPK504 152	15.2	69	115	16	-	-
NDPK504 154	15.4	69	115	16	-	-
NDPK504 155	15.5	69	115	16	M18x2.5	WH1~4
NDPK504 156	15.6	69	115	16	M18x2.5	WH5~6
NDPK504 157	15.7	69	115	16	-	-
NDPK504 158	15.8	69	115	16	-	-
NDPK504 15875	15.875	69	115	16	-	-
NDPK504 160	16	69	115	16	-	-
NDPK504 161	16.1	69	115	17	-	-
NDPK504 163	16.3	71	119	17	-	-
NDPK504 165	16.5	71	119	17	M18x1.5	WH1~6
NDPK504 16669	16.669	71	119	17	-	-
NDPK504 170	17	71	119	17	-	-
NDPK504 171	17.1	71	119	18	-	-
NDPK504 172	17.2	74	123	18	-	-
NDPK504 175	17.5	74	123	18	M20x2.5	WH1~6
NDPK504 177	17.7	74	123	18	-	-
NDPK504 178	17.8	74	123	18	-	-
NDPK504 180	18	74	123	18	-	-
NDPK504 181	18.1	74	123	19	-	-
NDPK504 182	18.2	76	127	19	-	-
NDPK504 185	18.5	76	127	19	M20x1.5	WH1~6
NDPK504 190	19	76	127	19	-	-
NDPK504 191	19.1	76	127	20	-	-
NDPK504 195	19.5	80	131	20	M22x2.5	WH1~6
NDPK504 197	19.7	80	131	20	-	-
NDPK504 200	20	80	131	20	-	-

※ NDPR/L was renamed to NDPK from January 2023

■ Applicable Working Material

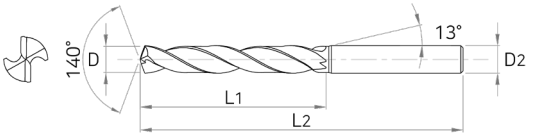
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	○					◎		

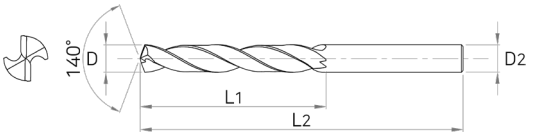
○ : GOOD ◎ : EXCELLENT

NDPK507(NDPR/L507) | NEW DOLPHIN CAST IRON DRILL









■ Tolerance

D		Shank Dia
~D3	0~-0.010	h6
D3.1~D6	0~-0.012	
D6.1~D10	0~-0.015	
D10.1~D18	0~-0.018	
D18.1~	0~-0.021	

CARBIDE | AlCrN | 7D | 30° HELIX | 140° | DATA P.708

EDP No	SIZES (mm)				TAP	
	D	L1	L2	D2	Size	Limit
NDPK507 030	3	45	80	3	-	-
NDPK507 031	3.1	45	80	4	-	-
NDPK507 03175	3.175	45	80	4	-	-
NDPK507 032	3.2	45	80	4	-	-
NDPK507 03264	3.264	45	80	4	-	-
NDPK507 033	3.3	45	80	4	M4x0.7	WH1~4
NDPK507 034	3.4	45	80	4	M4x0.7	WH5~6
NDPK507 035	3.5	45	80	4	-	-
NDPK507 03572	3.572	45	80	4	-	-
NDPK507 036	3.6	45	80	4	-	-
NDPK507 037	3.7	45	80	4	-	-
NDPK507 038	3.8	45	80	4	-	-
NDPK507 039	3.9	45	80	4	-	-
NDPK507 040	4	45	80	4	-	-
NDPK507 041	4.1	45	80	5	-	-
NDPK507 042	4.2	45	80	5	M5x0.8	WH1~4
NDPK507 043	4.3	45	80	5	M5x0.8	WH5~6
NDPK507 044	4.4	45	80	5	-	-
NDPK507 045	4.5	45	80	5	-	-
NDPK507 046	4.6	45	80	5	-	-
NDPK507 047	4.7	45	80	5	-	-
NDPK507 04763	4.763	45	80	5	-	-
NDPK507 048	4.8	45	80	5	-	-
NDPK507 049	4.9	45	80	5	-	-

EDP No	SIZES (mm)				TAP	
	D	L1	L2	D2	Size	Limit
NDPK507 050	5	45	80	5	M6x1.0	WH1~4
NDPK507 051	5.1	45	80	6	M6x1.0	WH5~6
NDPK507 05159	5.159	50	83	6	-	-
NDPK507 052	5.2	50	83	6	-	-
NDPK507 053	5.3	50	83	6	-	-
NDPK507 054	5.4	50	83	6	-	-
NDPK507 055	5.5	50	83	6	-	-
NDPK507 05556	5.556	50	83	6	-	-
NDPK507 056	5.6	50	83	6	-	-
NDPK507 057	5.7	50	83	6	-	-
NDPK507 058	5.8	50	83	6	-	-
NDPK507 059	5.9	50	83	6	-	-
NDPK507 060	6	50	83	6	-	-
NDPK507 061	6.1	50	83	7	-	-
NDPK507 062	6.2	53	85	7	-	-
NDPK507 063	6.3	53	85	7	-	-
NDPK507 0635	6.35	53	85	7	-	-
NDPK507 064	6.4	53	85	7	-	-
NDPK507 065	6.5	53	85	7	-	-
NDPK507 066	6.6	53	85	7	-	-
NDPK507 067	6.7	53	85	7	-	-
NDPK507 06747	6.747	53	85	7	-	-
NDPK507 068	6.8	53	85	7	M8x1.25	WH1~4
NDPK507 069	6.9	53	85	7	M8x1.25	WH5~6

※ NDPR/L was renamed to NDPK from January 2023

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	○					◎		

○ : GOOD ◎ : EXCELLENT

NDPK507(NDPR/L507)

NEW DOLPHIN CAST IRON DRILL

EDP No	SIZES (mm)				TAP	
	D	L1	L2	D2	Size	Limit
NDPK507 070	7	53	85	7	M8x1.0	WH1~4
NDPK507 071	7.1	53	85	8	M8x1.0	WH5~6
NDPK507 07144	7.144	58	90	8	-	-
NDPK507 072	7.2	58	90	8	-	-
NDPK507 073	7.3	58	90	8	-	-
NDPK507 074	7.4	58	90	8	-	-
NDPK507 075	7.5	58	90	8	-	-
NDPK507 076	7.6	58	90	8	-	-
NDPK507 077	7.7	58	90	8	-	-
NDPK507 078	7.8	58	90	8	-	-
NDPK507 079	7.9	58	90	8	-	-
NDPK507 07938	7.938	58	90	8	-	-
NDPK507 080	8	58	90	8	-	-
NDPK507 081	8.1	58	90	9	-	-
NDPK507 082	8.2	64	98	9	-	-
NDPK507 083	8.3	64	98	9	-	-
NDPK507 084	8.4	64	98	9	-	-
NDPK507 085	8.5	64	98	9	M10x1.5	WH1~4
NDPK507 086	8.6	64	98	9	M10x1.5	WH5~6
NDPK507 087	8.7	64	98	9	-	-
NDPK507 08731	8.731	64	98	9	-	-
NDPK507 088	8.8	64	98	9	M10x1.25	WH1~4
NDPK507 089	8.9	64	98	9	M10x1.25	WH5~6
NDPK507 090	9	64	98	9	M10x1.0	WH1~4
NDPK507 091	9.1	64	98	10	M10x1.0	WH5~6
NDPK507 092	9.2	68	105	10	-	-
NDPK507 093	9.3	68	105	10	-	-
NDPK507 094	9.4	68	105	10	-	-
NDPK507 095	9.5	68	105	10	-	-
NDPK507 09525	9.525	68	105	10	-	-
NDPK507 096	9.6	68	105	10	-	-
NDPK507 097	9.7	68	105	10	-	-
NDPK507 098	9.8	68	105	10	-	-
NDPK507 099	9.9	68	105	10	-	-
NDPK507 100	10	68	105	10	-	-
NDPK507 101	10.1	68	105	11	-	-
NDPK507 102	10.2	73	110	11	-	-
NDPK507 103	10.3	73	110	11	M12x1.75	WH1~2
NDPK507 10319	10.319	73	110	11	M12x1.75	WH3~4
NDPK507 104	10.4	73	110	11	M12x1.75	WH5~6
NDPK507 105	10.5	73	110	11	M12x1.5	WH1~4

EDP No	SIZES (mm)				TAP	
	D	L1	L2	D2	Size	Limit
NDPK507 106	10.6	73	110	11	M12x1.5	WH5~6
NDPK507 107	10.7	73	110	11	-	-
NDPK507 10716	10.716	73	110	11	-	-
NDPK507 108	10.8	73	110	11	M12x1.25	WH1~4
NDPK507 109	10.9	73	110	11	M12x1.25	WH5~6
NDPK507 110	11	73	110	11	M12x1.0	WH1~4
NDPK507 111	11.1	73	110	12	M12x1.0	WH5~6
NDPK507 11113	11.113	80	120	12	-	-
NDPK507 112	11.2	80	120	12	-	-
NDPK507 113	11.3	80	120	12	-	-
NDPK507 114	11.4	80	120	12	-	-
NDPK507 115	11.5	80	120	12	-	-
NDPK507 116	11.6	80	120	12	-	-
NDPK507 117	11.7	80	120	12	-	-
NDPK507 118	11.8	80	120	12	-	-
NDPK507 119	11.9	80	120	12	-	-
NDPK507 120	12	80	120	12	M14x2.0	WH1~4
NDPK507 121	12.1	80	120	13	M14x2.0	WH5~6
NDPK507 122	12.2	90	137	13	-	-
NDPK507 123	12.3	90	137	13	-	-
NDPK507 124	12.4	90	137	13	-	-
NDPK507 125	12.5	90	137	13	M14x1.5	WH1~4
NDPK507 126	12.6	90	137	13	M14x1.5	WH5~6
NDPK507 127	12.7	90	137	13	-	-
NDPK507 128	12.8	90	137	13	-	-
NDPK507 129	12.9	90	137	13	-	-
NDPK507 130	13	90	137	13	-	-
NDPK507 131	13.1	90	137	14	-	-
NDPK507 133	13.3	96	147	14	-	-
NDPK507 134	13.4	96	147	14	-	-
NDPK507 13494	13.494	96	147	14	-	-
NDPK507 135	13.5	96	147	14	-	-
NDPK507 136	13.6	96	147	14	-	-
NDPK507 137	13.7	96	147	14	-	-
NDPK507 138	13.8	96	147	14	-	-
NDPK507 13891	13.891	96	147	14	-	-
NDPK507 139	13.9	96	147	14	-	-
NDPK507 140	14	96	147	14	M16x2.0	WH1~4
NDPK507 141	14.1	96	147	15	M16x2.0	WH5~6
NDPK507 142	14.2	100	153	15	-	-
NDPK507 14288	14.288	100	153	15	-	-

※ NDPR/L was renamed to NDPK from January 2023

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	○					◎		

○ : GOOD ◎ : EXCELLENT

NDPK507(NDPR/L507) | NEW DOLPHIN CAST IRON DRILL

EDP No	SIZES (mm)				TAP	
	D	L1	L2	D2	Size	Limit
NDPK507 143	14.3	100	153	15	-	-
NDPK507 145	14.5	100	153	15	M16x1.5	WH1~4
NDPK507 146	14.6	100	153	15	M16x1.5	WH5~6
NDPK507 147	14.7	100	153	15	-	-
NDPK507 148	14.8	100	153	15	-	-
NDPK507 149	14.9	100	153	15	-	-
NDPK507 150	15	100	153	15	-	-
NDPK507 151	15.1	100	153	16	-	-
NDPK507 154	15.4	112	160	16	-	-
NDPK507 155	15.5	112	160	16	M18x2.5	WH1~4
NDPK507 156	15.6	112	160	16	M18x2.5	WH5~6
NDPK507 157	15.7	112	160	16	-	-
NDPK507 158	15.8	112	160	16	-	-
NDPK507 15875	15.875	112	160	16	-	-
NDPK507 160	16	112	160	16	-	-
NDPK507 161	16.1	112	160	17	-	-
NDPK507 163	16.3	112	160	17	-	-

EDP No	SIZES (mm)				TAP	
	D	L1	L2	D2	Size	Limit
NDPK507 165	16.5	112	160	17	M18x1.5	WH1~6
NDPK507 16669	16.669	112	160	17	-	-
NDPK507 170	17	112	160	17	-	-
NDPK507 171	17.1	112	160	18	-	-
NDPK507 172	17.2	112	160	18	-	-
NDPK507 17463	17.463	112	160	18	-	-
NDPK507 175	17.5	112	160	18	M20x2.5	WH1~6
NDPK507 177	17.7	112	160	18	-	-
NDPK507 178	17.8	112	160	18	-	-
NDPK507 180	18	112	160	18	-	-
NDPK507 182	18.2	112	160	19	-	-
NDPK507 185	18.5	112	160	19	M20x1.5	WH1~6
NDPK507 190	19	112	160	19	-	-
NDPK507 195	19.5	112	160	20	M22x2.5	WH1~6
NDPK507 197	19.7	112	160	20	-	-
NDPK507 200	20	112	160	20	-	-

※ NDPR/L was renamed to NDPK from January 2023

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	○					◎		

○ : GOOD ◎ : EXCELLENT

POWER MAX DRILL



Contents

(INCH : ◆ / METRIC : ◇)

EDP No / SPEC	Flutes	Geometry	Length 3D	Length 5D	Length 8D	Length 10D	Length 20D	Coolant	Margin	Tolerance	Diameter(Ø) Min	Diameter(Ø) Max	Page
PF503 ◆◇	2F		○					External	Single	h8	2	20	390
PF505 ◆◇				○				External	Single	h8	3	20	393
SF503 ◆◇			○					Internal	Single	h8	3	20	396
SF505 ◆◇				○				Internal	Single	h8	3.1	20	399
SF508 ◆◇					○			Internal	Single	h7	3	20	402
SF510 ◇						○		Internal	Double	h8	3	13	405
SF520 ◇							○	Internal	Double	h8	4.1	10	407
HP503 ◇			○					External	Double	m7	3	16	409
HPI503 ◇			○					Internal	Double	m7	3	20	411
HPI505 ◆◇				○				Internal	Double	m7	3	20	414
HPI508-N ◆◇					○			Internal	Double	m7	3	20	417
P503A(F) ◇			○					External	Single	m7	3	20	420
P505A(F) ◇				○				External	Single	m7	3	20	423
PI503A(F) ◇			○					Internal	Single	m7	3	20	426
PI505A(F) ◇				○				Internal	Single	m7	3	20	429
PI508 ◇					○			Internal	Single	m7	3	14	432

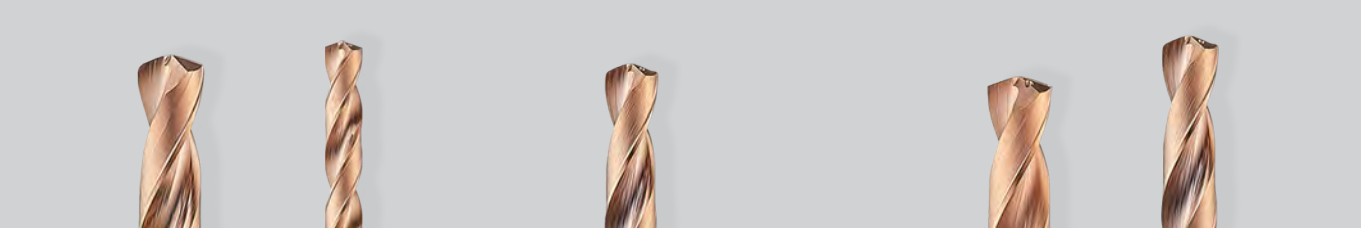
EDP No. System

*If expressed as an integer, the decimal point is omitted.

P	I	5	05	A	040

Section	Appearance	Grade	Drilling Depth	Shank Type	Cutting Dia
P : Power Max	F : Facet Point	5 : Grade	03 : 3D	A : Plane	Ø3
S : Spiral Coolant	I : Internal Coolant		05 : 5D	F : DIN 6535 HE	~
HP : High Precision			08 : 8D		Ø20
			10 : 10D		
			20 : 20D		

Ex) Internal Coolant / Drilling Depth 5D / Cutting Dia Ø4 / Weldon Shank Type / Power Max Drill

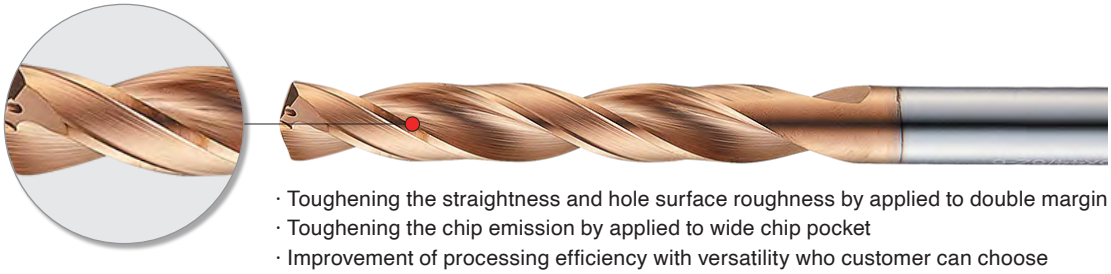


Characteristics

· Suitable to High speed work for Alloy steels,Cast iron, Stainelss steels,Preharden Steels
[Recommendation : ~HRc50]
· Extensive coverage of 3D ~ 20D Diameter

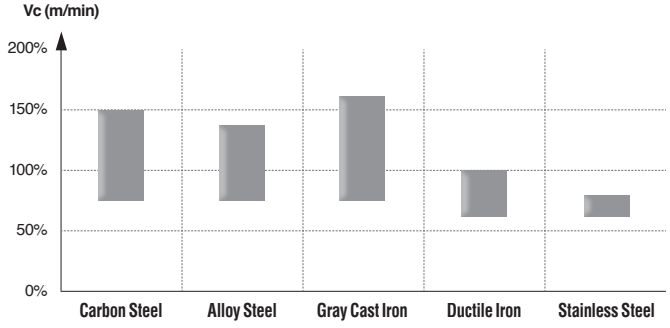
Features

· High chipping resistance with high feed by used the high toughness material
· Toughening the surface hardness with heat resistance by appelid to TiAlN coating
· Improvement of process-ability with decrease the frictional heat by possess the internal coolant series

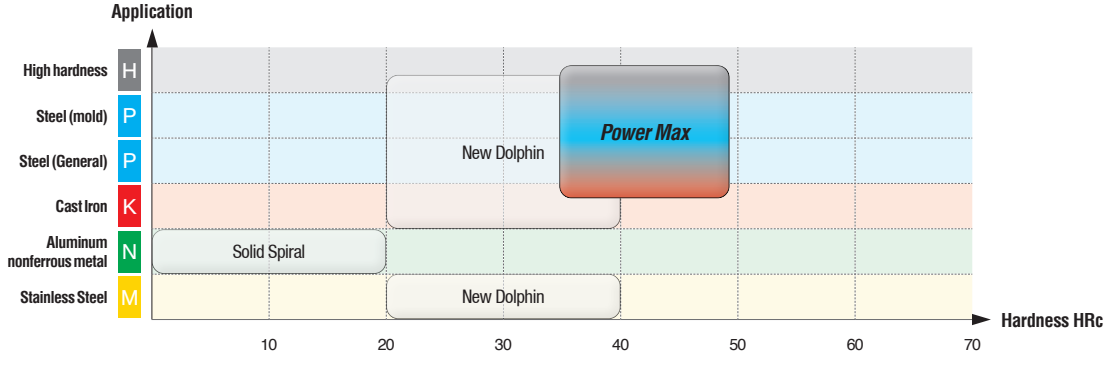


· Toughening the straightness and hole surface roughness by applied to double margin
· Toughening the chip emission by applied to wide chip pocket
· Improvement of processing efficiency with versatility who customer can choose between the external and internal coolant depends on the drilling depth

Vc by Application area

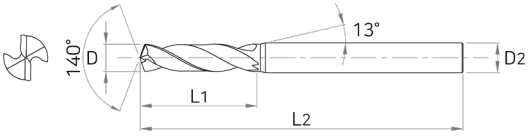


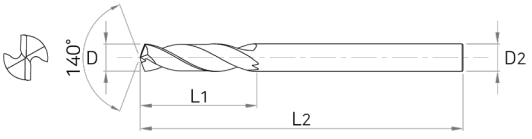
Applications



PF503 | HIGH SPEED DRILL - 3D







■ Tolerance

D		Shank Dia
~D3	0~-0.014	h6
D3.1~D6	0~-0.018	
D6.1~D10	0~-0.022	
D10.1~D18	0~-0.027	
D18.1~	0~-0.033	

CARBIDE | TiAlN | 3D | 30° HELIX | 140° | DATA P.709

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
PF503 020	2	-	.0787	14	50	3
PF503 021	2.1	-	.0827	14	50	3
PF503 022	2.2	-	.0866	14	50	3
PF503 023	2.3	-	.0906	14	50	3
PF503 024	2.4	-	.0945	14	50	3
PF503 025	2.5	-	.0984	14	50	3
PF503 026	2.6	-	.1024	14	50	3
PF503 027	2.7	-	.1063	14	50	3
PF503 028	2.8	-	.1102	14	50	3
PF503 029	2.9	-	.1142	14	50	3
PF503 030	3	-	.1181	18	60	3
PF503 031	3.1	-	.1220	20	60	4
PF503 03175	3.175	1/8	.1250	20	60	4
PF503 032	3.2	-	.1260	20	60	4
PF503 03264	3.264	-	.1285	20	60	4
PF503 033	3.3	-	.1299	20	60	4
PF503 034	3.4	-	.1339	22	60	4
PF503 035	3.5	-	.1378	22	60	4
PF503 03572	3.572	9/64	.1406	22	60	4
PF503 036	3.6	-	.1417	22	60	4
PF503 037	3.7	-	.1457	22	60	4
PF503 038	3.8	-	.1496	24	60	4
PF503 039	3.9	-	.1535	24	60	4
PF503 040	4	-	.1575	24	60	4

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
PF503 04039	4.039	-	.1590	24	60	4
PF503 041	4.1	-	.1614	24	60	4
PF503 042	4.2	-	.1654	26	62	5
PF503 043	4.3	-	.1693	26	62	5
PF503 044	4.4	-	.1732	26	62	5
PF503 045	4.5	-	.1772	26	62	5
PF503 046	4.6	-	.1811	26	62	5
PF503 047	4.7	-	.1850	26	62	5
PF503 04763	4.763	3/16	.1875	26	62	5
PF503 048	4.8	-	.1890	26	62	5
PF503 049	4.9	-	.1920	26	62	5
PF503 050	5	-	.1969	26	62	5
PF503 051	5.1	-	.2008	26	62	5
PF503 05159	5.159	13/64	.2031	28	66	6
PF503 052	5.2	-	.2047	28	66	6
PF503 053	5.3	-	.2087	28	66	6
PF503 054	5.4	-	.2126	28	66	6
PF503 055	5.5	-	.2165	28	66	6
PF503 05558	5.558	7/32	.2188	30	66	6
PF503 056	5.6	-	.2205	30	66	6
PF503 057	5.7	-	.2244	30	66	6
PF503 058	5.8	-	.2283	30	66	6
PF503 059	5.9	-	.2323	30	66	6
PF503 05953	5.953	15/64	.2344	30	66	6

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

PF503 | HIGH SPEED DRILL - 3D

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
PF503 060	6	-	.2362	30	66	6
PF503 061	6.1	-	.2402	30	66	6
PF503 062	6.2	-	.2441	34	74	7
PF503 063	6.3	-	.2480	34	74	7
PF503 0635	6.35	1/4	.2500	34	74	7
PF503 064	6.4	-	.2520	34	74	7
PF503 065	6.5	-	.2559	34	74	7
PF503 066	6.6	-	.2598	34	74	7
PF503 067	6.7	-	.2638	37	74	7
PF503 06747	6.747	17/64	.2656	37	74	7
PF503 068	6.8	-	.2677	37	74	7
PF503 069	6.9	-	.2717	37	74	7
PF503 070	7	-	.2756	37	74	7
PF503 071	7.1	-	.2795	37	74	7
PF503 07145	7.145	9/32	.2813	40	79	8
PF503 072	7.2	-	.2835	40	79	8
PF503 073	7.3	-	.2874	40	79	8
PF503 074	7.4	-	.2913	40	79	8
PF503 075	7.5	-	.2953	40	79	8
PF503 07541	7.541	19/64	.2969	40	79	8
PF503 076	7.6	-	.2992	40	79	8
PF503 077	7.7	-	.3031	40	79	8
PF503 078	7.8	-	.3071	40	79	8
PF503 079	7.9	-	.3110	40	79	8
PF503 07938	7.938	5/16	.3125	40	79	8
PF503 080	8	-	.3150	40	79	8
PF503 081	8.1	-	.3189	40	79	8
PF503 082	8.2	-	.3228	43	84	9
PF503 083	8.3	-	.3268	43	84	9
PF503 08334	8.334	21/64	.3281	43	84	9
PF503 084	8.4	-	.3307	43	84	9
PF503 085	8.5	-	.3320	43	84	9
PF503 086	8.6	-	.3346	43	84	9
PF503 087	8.7	-	.3386	43	84	9
PF503 08733	8.733	-	.3425	43	84	9
PF503 088	8.8	-	.3438	43	84	9
PF503 089	8.9	-	.3465	43	84	9
PF503 090	9	-	.3504	43	84	9
PF503 091	9.1	-	.3543	43	84	9
PF503 09129	9.129	23/64	.3594	47	89	10
PF503 092	9.2	-	.3622	47	89	10

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
PF503 093	9.3	-	.3661	47	89	10
PF503 09347	9.347	-	.3680	47	89	10
PF503 094	9.4	-	.3701	47	89	10
PF503 095	9.5	-	.3740	47	89	10
PF503 09525	9.525	3/8	.3750	47	89	10
PF503 096	9.6	-	.3780	47	89	10
PF503 097	9.7	-	.3819	47	89	10
PF503 098	9.8	-	.3858	47	89	10
PF503 099	9.9	-	.3898	47	89	10
PF503 09921	9.921	25/64	.3906	47	89	10
PF503 100	10	-	.3937	47	89	10
PF503 101	10.1	-	.3976	47	89	10
PF503 102	10.2	-	.4016	51	95	11
PF503 103	10.3	-	.4055	51	95	11
PF503 1032	10.32	13/32	.4063	51	95	11
PF503 104	10.4	-	.4094	51	95	11
PF503 105	10.5	-	.4134	51	95	11
PF503 106	10.6	-	.4173	51	95	11
PF503 107	10.7	-	.4213	51	95	11
PF503 10716	10.716	27/64	.4219	51	95	11
PF503 108	10.8	-	.4252	51	95	11
PF503 109	10.9	-	.4291	51	95	11
PF503 110	11	-	.4331	51	95	11
PF503 111	11.1	-	.4370	51	95	11
PF503 11113	11.113	7/16	.4375	54	102	12
PF503 112	11.2	-	.4409	54	102	12
PF503 113	11.3	-	.4449	54	102	12
PF503 114	11.4	-	.4488	54	102	12
PF503 115	11.5	-	.4528	54	102	12
PF503 116	11.6	-	.4531	54	102	12
PF503 117	11.7	-	.4567	54	102	12
PF503 118	11.8	-	.4606	54	102	12
PF503 119	11.9	15/32	.4646	54	102	12
PF503 11908	11.908	-	.4685	54	102	12
PF503 120	12	-	.4688	54	102	12
PF503 121	12.1	-	.4724	54	102	12
PF503 122	12.2	-	.4803	57	102	13
PF503 123	12.3	-	.4843	57	102	13
PF503 12304	12.304	31/64	.4844	57	102	13
PF503 124	12.4	-	.4882	57	102	13
PF503 125	12.5	-	.4921	57	102	13

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

PF503 | HIGH SPEED DRILL - 3D

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
PF503 126	12.6	-	.4961	57	102	13
PF503 127	12.7	-	.5000	57	102	13
PF503 128	12.8	-	.5039	57	102	13
PF503 129	12.9	-	.5079	57	102	13
PF503 130	13	-	.5118	57	102	13
PF503 13096	13.096	33/64	.5156	57	102	13
PF503 131	13.1	-	.5157	57	102	13
PF503 132	13.2	-	.5197	60	107	14
PF503 133	13.3	-	.5236	60	107	14
PF503 134	13.4	-	.5276	60	107	14
PF503 13494	13.494	17/32	.5313	60	107	14
PF503 135	13.5	-	.5315	60	107	14
PF503 136	13.6	-	.5354	60	107	14
PF503 137	13.7	-	.5394	60	107	14
PF503 138	13.8	-	.5433	60	107	14
PF503 13891	13.891	35/64	.5469	60	107	14
PF503 139	13.9	-	.5472	60	107	14
PF503 140	14	-	.5512	60	107	14
PF503 141	14.1	-	.5551	60	107	14
PF503 142	14.2	-	.5591	62	111	15
PF503 14288	14.288	9/16	.5625	62	111	15
PF503 143	14.3	-	.5630	62	111	15
PF503 144	14.4	-	.5669	62	111	15
PF503 145	14.5	-	.5709	62	111	15
PF503 146	14.6	-	.5748	62	111	15
PF503 147	14.7	-	.5787	62	111	15
PF503 148	14.8	-	.5827	62	111	15
PF503 149	14.9	-	.5866	62	111	15
PF503 150	15	-	.5906	62	111	15
PF503 15081	15.081	19/32	.5937	62	111	15

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
PF503 151	15.1	-	.5945	62	111	15
PF503 152	15.2	-	.5984	64	115	16
PF503 153	15.3	-	.6063	64	115	16
PF503 154	15.4	-	.6102	64	115	16
PF503 155	15.5	-	.6142	64	115	16
PF503 156	15.6	-	.6181	64	115	16
PF503 157	15.7	-	.6220	64	115	16
PF503 158	15.8	-	.6250	64	115	16
PF503 15875	15.875	5/8	.6299	64	115	16
PF503 160	16	-	.6339	64	115	16
PF503 161	16.1	-	.3071	64	115	16
PF503 163	16.3	-	.6417	66	119	17
PF503 165	16.5	-	.6496	66	119	17
PF503 16667	16.667	21/32	.6562	66	119	17
PF503 170	17	-	.6693	66	119	17
PF503 171	17.1	-	.6732	66	119	17
PF503 172	17.2	-	.6772	66	123	18
PF503 17463	17.463	11/16	.6772	66	123	18
PF503 175	17.5	-	.6875	66	123	18
PF503 177	17.7	-	.6890	66	123	18
PF503 178	17.8	-	.6969	66	123	18
PF503 180	18	-	.7008	66	123	18
PF503 181	18.1	-	.7087	66	123	18
PF503 182	18.2	-	.7165	70	127	19
PF503 185	18.5	-	.7283	70	127	19
PF503 190	19	-	.7480	70	127	19
PF503 191	19.1	-	.7520	70	127	19
PF503 195	19.5	-	.7677	70	131	20
PF503 197	19.7	-	.7756	70	131	20
PF503 200	20	-	.7874	70	131	20

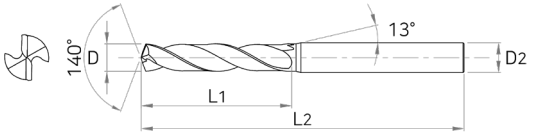
■ Applicable Working Material

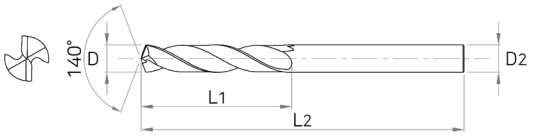
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

PF505 | HIGH SPEED DRILL - 5D







■ Tolerance

D		Shank Dia
~D3	0~-0.014	h6
D3.1~D6	0~-0.018	
D6.1~D10	0~-0.022	
D10.1~D18	0~-0.027	
D18.1~	0~-0.033	

CARBIDE | TiAlN | 5D | 30° HELIX | 140° | DATA P.709

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
PF505 030	3	-	.1181	25	60	3
PF505 031	3.1	-	.122	27	60	4
PF505 03175	3.175	1/8	.125	27	60	4
PF505 032	3.2	-	.126	27	60	4
PF505 03264	3.264	#30	.1285	27	60	4
PF505 033	3.3	-	.1299	27	60	4
PF505 034	3.4	-	.1339	30	65	4
PF505 035	3.5	-	.1378	30	65	4
PF505 03572	3.572	9/64	.1406	30	65	4
PF505 036	3.6	-	.1417	30	65	4
PF505 037	3.7	-	.1457	30	65	4
PF505 038	3.8	-	.1496	33	71	4
PF505 039	3.9	-	.1535	33	71	4
PF505 040	4	-	.1575	33	71	4
PF505 04039	4.039	#21	.1575	33	71	5
PF505 041	4.1	-	.159	33	71	5
PF505 042	4.2	-	.1614	33	71	5
PF505 043	4.3	-	.1654	36	71	5
PF505 044	4.4	-	.1693	36	71	5
PF505 045	4.5	-	.1732	36	71	5
PF505 046	4.6	-	.1772	36	71	5
PF505 047	4.7	-	.1811	36	71	5
PF505 04763	4.763	3/16	.185	39	71	5
PF505 048	4.8	-	.1875	39	71	5

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
PF505 049	4.9	-	.189	39	71	5
PF505 050	5	-	.192	39	71	5
PF505 051	5.1	-	.2008	39	83	6
PF505 05159	5.159	13/64	.2031	39	83	6
PF505 052	5.2	-	.2047	39	83	6
PF505 053	5.3	-	.2087	39	83	6
PF505 054	5.4	-	.2126	43	83	6
PF505 055	5.5	-	.2165	43	83	6
PF505 05558	5.558	7/32	.2188	43	83	6
PF505 056	5.6	-	.2205	43	83	6
PF505 057	5.7	-	.2244	43	83	6
PF505 058	5.8	-	.2283	43	83	6
PF505 059	5.9	-	.2323	43	83	6
PF505 05953	5.953	15/64	.2344	43	83	6
PF505 060	6	-	.2362	43	83	6
PF505 061	6.1	-	.2402	47	87	7
PF505 062	6.2	-	.2441	47	87	7
PF505 063	6.3	-	.248	47	87	7
PF505 065	6.35	1/4	.25	47	87	7
PF505 064	6.4	-	.252	47	87	7
PF505 065	6.5	-	.2559	47	87	7
PF505 066	6.6	-	.2598	47	87	7
PF505 067	6.7	-	.2638	47	87	7
PF505 06747	6.747	17/64	.2656	47	87	7

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

PF505 | HIGH SPEED DRILL - 5D

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
PF505 068	6.8	-	.2677	47	87	7
PF505 069	6.9	-	.2717	47	87	7
PF505 070	7		.2756	47	87	7
PF505 071	7.1	-	.2795	52	92	8
PF505 07145	7.145	9/32	.2813	52	92	8
PF505 072	7.2	-	.2835	52	92	8
PF505 073	7.3	-	.2874	52	92	8
PF505 074	7.4	-	.2913	52	92	8
PF505 075	7.5	-	.2953	52	92	8
PF505 07541	7.541	19/64	.2969	52	92	8
PF505 076	7.6	-	.2992	52	92	8
PF505 077	7.7	-	.3031	52	92	8
PF505 078	7.8	-	.3071	52	92	8
PF505 079	7.9		.311	52	92	8
PF505 07938	7.938	5/16	.3125	52	92	8
PF505 080	8	-	.315	52	92	8
PF505 081	8.1	-	.3189	56	96	9
PF505 082	8.2	-	.3228	56	96	9
PF505 083	8.3	-	.3268	56	96	9
PF505 08334	8.334	21/64	.3281	56	96	9
PF505 084	8.4	-	.3307	56	96	9
PF505 085	8.5	-	.3346	56	96	9
PF505 086	8.6	-	.3386	56	96	9
PF505 087	8.7	-	.3425	56	96	9
PF505 08733	8.733	11/32	.3438	56	96	9
PF505 088	8.8	-	.3465	56	96	9
PF505 089	8.9	-	.3504	56	96	9
PF505 090	9	-	.3543	56	96	9
PF505 091	9.1	-	.3583	62	105	10
PF505 09129	9.129	23/64	.3594	62	105	10
PF505 092	9.2	-	.3622	62	105	10
PF505 093	9.3	-	.3661	62	105	10
PF505 094	9.4	-	.3701	62	105	10
PF505 095	9.5	-	.374	62	105	10
PF505 09525	9.525	3/8	.375	62	105	10
PF505 096	9.6	-	.378	62	105	10
PF505 097	9.7	-	.3819	62	105	10
PF505 098	9.8	-	.3858	62	105	10
PF505 099	9.9	-	.3898	62	105	10
PF505 09921	9.921	25/64	.3906	62	105	10
PF505 100	10	-	.3937	62	105	10

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
PF505 101	10.1	-	.3976	68	115	11
PF505 102	10.2	-	.4016	68	115	11
PF505 103	10.3	-	.4055	68	115	11
PF505 1032	10.32	13/32	.4063	68	115	11
PF505 104	10.4	-	.4094	68	115	11
PF505 105	10.5	-	.4134	68	115	11
PF505 106	10.6	-	.4173	68	115	11
PF505 107	10.7	-	.4213	68	115	11
PF505 10716	10.716	27/64	.4219	68	115	11
PF505 108	10.8	-	.4252	68	115	11
PF505 109	10.9	-	.4291	68	115	11
PF505 110	11	-	.4331	68	115	11
PF505 111	11.1	-	.437	71	121	12
PF505 11113	11.113	7/16	.4375	71	121	12
PF505 112	11.2	-	.4409	71	121	12
PF505 113	11.3	-	.4449	71	121	12
PF505 114	11.4	-	.4488	71	121	12
PF505 115	11.5	-	.4528	71	121	12
PF505 116	11.6	-	.4567	71	121	12
PF505 117	11.7	-	.4606	71	121	12
PF505 118	11.8	-	.4646	71	121	12
PF505 119	11.9	-	.4685	71	121	12
PF505 11908	11.908	15/32	.4688	71	121	12
PF505 120	12	-	.4724	71	121	12
PF505 121	12.1	-	.4764	75	125	13
PF505 122	12.2	-	.4803	75	125	13
PF505 123	12.3	-	.4843	75	125	13
PF505 12304	12.304	31/64	.4844	75	125	13
PF505 124	12.4	-	.4882	75	125	13
PF505 125	12.5	-	.4921	75	125	13
PF505 126	12.6	-	.4961	75	125	13
PF505 127	12.7	-	.5	75	125	13
PF505 128	12.8	-	.5039	75	125	13
PF505 129	12.9	-	.5079	75	125	13
PF505 130	13	-	.5118	75	125	13
PF505 13096	13.096	33/64	.5156	80	134	14
PF505 131	13.1	-	.5157	80	134	14
PF505 132	13.2	-	.5197	80	134	14
PF505 133	13.3	-	.5236	80	134	14
PF505 134	13.4	-	.5276	80	134	14
PF505 13494	13.494	17/32	.5313	80	134	14

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

PF505 | HIGH SPEED DRILL - 5D

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
PF505 135	13.5	-	.5315	80	134	14
PF505 136	13.6	-	.5354	80	134	14
PF505 137	13.7	-	.5394	80	134	14
PF505 138	13.8	-	.5433	80	134	14
PF505 13891	13.891	35/64	.5469	80	134	14
PF505 139	13.9	-	.5472	80	134	14
PF505 140	14	-	.5512	80	134	14
PF505 141	14.1	-	.5551	83	143	15
PF505 142	14.2	-	.5591	83	143	15
PF505 14288	14.288	-	.5625	83	143	15
PF505 143	14.3	-	.563	83	143	15
PF505 144	14.4	-	.5669	83	143	15
PF505 145	14.5	-	.5709	83	143	15
PF505 146	14.6	-	.5748	83	143	15
PF505 147	14.7	-	.5787	83	143	15
PF505 148	14.8	-	.5827	83	143	15
PF505 149	14.9	-	.5866	83	143	15
PF505 150	15	-	.5906	83	143	15
PF505 15081	15.081	19/32	.5937	90	152	16
PF505 151	15.1	-	.5945	90	152	16
PF505 152	15.2	-	.5984	90	152	16
PF505 154	15.4	-	.6063	90	152	16
PF505 155	15.5	-	.6102	90	152	16
PF505 156	15.6	-	.6142	90	152	16

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
PF505 157	15.7	-	.6181	90	152	16
PF505 158	15.8	-	.622	90	152	16
PF505 15875	15.875	5/8	.625	90	152	16
PF505 160	16	-	.6299	90	152	16
PF505 161	16.1	-	.6339	95	155	17
PF505 163	16.3	-	.6417	95	155	17
PF505 165	16.5	-	.6496	95	155	17
PF505 166 67	16.667	21/32	.6562	95	155	17
PF505 170	17	-	.6693	95	155	17
PF505 171	17.1	-	.6732	100	157	18
PF505 172	17.2	-	.6772	100	157	18
PF505 17463	17.463	11/16	.6875	100	157	18
PF505 175	17.5	-	.689	100	157	18
PF505 177	17.7	-	.6969	100	157	18
PF505 178	17.8	-	.7008	100	157	18
PF505 180	18	-	.7087	100	157	18
PF505 181	18.1	-	.7126	105	160	19
PF505 182	18.2	-	.7165	105	160	19
PF505 185	18.5	-	.7283	105	160	19
PF505 190	19	-	.748	105	160	19
PF505 191	19.1	-	.752	110	163	20
PF505 195	19.5	-	.7677	110	163	20
PF505 197	19.7	-	.7756	110	163	20
PF505 200	20	-	.7874	110	163	20

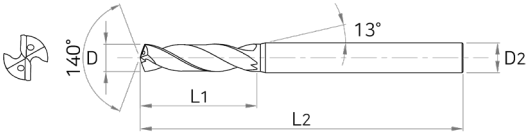
■ Applicable Working Material

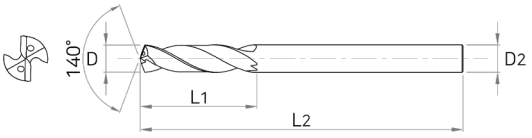
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

SF503 | HIGH SPEED INTERNAL COOLANT DRILL - 3D







■ Tolerance

D		Shank Dia
~D3	0~-0.014	h6
D3.1~D6	0~-0.018	
D6.1~D10	0~-0.022	
D10.1~D18	0~-0.027	
D18.1~	0~-0.033	

CARBIDE | TiAlN | 3D | 30° HELIX | 140° | DATA P.709

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
SF503 030	3	-	.1181	18	60	3
SF503 031	3.1	-	.1220	20	60	4
SF503 03175	3.175	1/8	.1250	20	60	4
SF503 032	3.2	-	.1260	20	60	4
SF503 032 64	3.264	-	.1285	20	60	4
SF503 033	3.3	-	.1299	20	60	4
SF503 034	3.4	-	.1339	22	60	4
SF503 035	3.5	-	.1378	22	60	4
SF503 03572	3.572	9/64	.1406	22	60	4
SF503 036	3.6	-	.1417	22	60	4
SF503 037	3.7	-	.1457	22	60	4
SF503 038	3.8	-	.1496	24	60	4
SF503 039	3.9	-	.1535	24	60	4
SF503 040	4	-	.1575	24	60	4
SF503 04039	4.039	-	.1590	24	62	5
SF503 041	4.1	-	.1614	24	62	5
SF503 042	4.2	-	.1654	26	62	5
SF503 043	4.3	-	.1693	26	62	5
SF503 044	4.4	-	.1732	26	62	5
SF503 045	4.5	-	.1772	26	62	5
SF503 046	4.6	-	.1811	26	62	5
SF503 047	4.7	-	.1850	26	62	5
SF503 04763	4.763	3/16	.1875	26	62	5
SF503 048	4.8	-	.1890	26	62	5

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
SF503 049	4.9	-	.1920	26	62	5
SF503 050	5	-	.1969	26	62	5
SF503 051	5.1	-	.2008	28	66	6
SF503 05159	5.159	13/64	.2031	28	66	6
SF503 052	5.2	-	.2047	28	66	6
SF503 053	5.3	-	.2087	28	66	6
SF503 054	5.4	-	.2126	28	66	6
SF503 055	5.5	-	.2165	28	66	6
SF503 05558	5.558	7/32	.2188	30	66	6
SF503 056	5.6	-	.2205	30	66	6
SF503 057	5.7	-	.2244	30	66	6
SF503 058	5.8	-	.2283	30	66	6
SF503 059	5.9	-	.2323	30	66	6
SF503 05953	5.953	15/64	.2344	30	66	6
SF503 060	6	-	.2362	30	66	6
SF503 061	6.1	-	.2402	34	74	7
SF503 062	6.2	-	.2441	34	74	7
SF503 063	6.3	-	.2480	34	74	7
SF503 063 5	6.350	1/4	.2500	34	74	7
SF503 064	6.4	-	.2520	34	74	7
SF503 065	6.5	-	.2559	34	74	7
SF503 066	6.6	-	.2598	34	74	7
SF503 067	6.7	-	.2638	37	74	7
SF503 06747	6.747	17/64	.2656	37	74	7

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

SF503 | HIGH SPEED INTERNAL COOLANT DRILL - 3D

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
SF503 068	6.8	-	.2677	37	74	7
SF503 069	6.9	-	.2717	37	74	7
SF503 070	7	-	.2756	37	74	7
SF503 071	7.1	-	.2795	40	79	8
SF503 07145	7.145	9/32	.2813	40	79	8
SF503 072	7.2	-	.2835	40	79	8
SF503 073	7.3	-	.2874	40	79	8
SF503 074	7.4	-	.2913	40	79	8
SF503 075	7.5	-	.2953	40	79	8
SF503 07541	7.541	19/64	.2969	40	79	8
SF503 076	7.6	-	.2992	40	79	8
SF503 077	7.7	-	.3031	40	79	8
SF503 078	7.8	-	.3071	40	79	8
SF503 079	7.9	-	.3110	40	79	8
SF503 07938	7.938	5/16	.3125	40	79	8
SF503 080	8	-	.3150	40	79	8
SF503 081	8.1	-	.3189	43	84	9
SF503 082	8.2	-	.3228	43	84	9
SF503 083	8.3	-	.3268	43	84	9
SF503 08334	8.334	21/64	.3281	43	84	9
SF503 084	8.4	-	.3307	43	84	9
SF503 085	8.5	-	.3346	43	84	9
SF503 086	8.6	-	.3386	43	84	9
SF503 087	8.7	-	.3425	43	84	9
SF503 08733	8.733	11/32	.3438	43	84	9
SF503 088	8.8	-	.3465	43	84	9
SF503 089	8.9	-	.3504	43	84	9
SF503 090	9	-	.3543	43	84	9
SF503 091	9.1	-	.3583	47	89	10
SF503 09129	9.129	23/64	.3594	47	89	10
SF503 092	9.2	-	.3622	47	89	10
SF503 093	9.3	-	.3661	47	89	10
SF503 094	9.4	-	.3701	47	89	10
SF503 095	9.5	-	.3740	47	89	10
SF503 09525	9.525	3/8	.3750	47	89	10
SF503 096	9.6	-	.3780	47	89	10
SF503 097	9.7	-	.3819	47	89	10
SF503 098	9.8	-	.3858	47	89	10
SF503 099	9.9	-	.3898	47	89	10
SF503 09921	9.921	25/64	.3906	47	89	10
SF503 100	10	-	.3937	47	89	10

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
SF503 101	10.1	-	.3976	51	95	11
SF503 102	10.2	-	.4016	51	95	11
SF503 103	10.3	-	.4055	51	95	11
SF503 1032	10.32	13/32	.4063	51	95	11
SF503 104	10.4	-	.4094	51	95	11
SF503 105	10.5	-	.4134	51	95	11
SF503 106	10.6	-	.4173	51	95	11
SF503 107	10.7	-	.4213	51	95	11
SF503 10716	10.716	27/64	.4219	51	95	11
SF503 108	10.8	-	.4252	51	95	11
SF503 109	10.9	-	.4291	51	95	11
SF503 110	11	-	.4331	51	95	11
SF503 111	11.1	-	.4370	54	102	12
SF503 11113	11.113	7/16	.4375	54	102	12
SF503 112	11.2	-	.4409	54	102	12
SF503 113	11.3	-	.4449	54	102	12
SF503 114	11.4	-	.4488	54	102	12
SF503 115	11.5	-	.4528	54	102	12
SF503 11509	11.509	29/64	.4531	54	102	12
SF503 116	11.6	-	.4567	54	102	12
SF503 117	11.7	-	.4606	54	102	12
SF503 118	11.8	-	.4646	54	102	12
SF503 119	11.9	-	.4685	54	102	12
SF503 11908	11.908	15/32	.4688	54	102	12
SF503 120	12	-	.4724	54	102	12
SF503 121	12.1	-	.4764	57	102	13
SF503 122	12.2	-	.4803	57	102	13
SF503 123	12.3	-	.4843	57	102	13
SF503 12304	12.304	31/64	.4844	57	102	13
SF503 124	12.4	-	.4882	57	102	13
SF503 125	12.5	-	.4921	57	102	13
SF503 126	12.6	-	.4961	57	102	13
SF503 127	12.7	1/2	.5000	57	102	13
SF503 128	12.8	-	.5039	57	102	13
SF503 129	12.9	-	.5079	57	102	13
SF503 130	13	-	.5118	57	102	13
SF503 13096	13.096	33/64	.5156	60	107	14
SF503 131	13.1	-	.5157	60	107	14
SF503 132	13.2	-	.5197	60	107	14
SF503 133	13.3	-	.5236	60	107	14
SF503 134	13.4	-	.5276	60	107	14

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

SF503 | HIGH SPEED INTERNAL COOLANT DRILL - 3D

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
SF503 13494	13.494	17/32	.5313	60	107	14
SF503 135	13.5	-	.5315	60	107	14
SF503 136	13.6	-	.5354	60	107	14
SF503 137	13.7	-	.5394	60	107	14
SF503 138	13.8	-	.5433	60	107	14
SF503 13891	13.891	35/64	.5469	60	107	14
SF503 139	13.9	-	.5472	60	107	14
SF503 140	14	-	.5512	60	107	14
SF503 141	14.1	-	.5551	62	111	15
SF503 142	14.2	-	.5591	62	111	15
SF503 14288	14.288	9/16	.5625	62	111	15
SF503 143	14.3	-	.5630	62	111	15
SF503 144	14.4	-	.5669	62	111	15
SF503 145	14.5	-	.5709	62	111	15
SF503 146	14.6	-	.5748	62	111	15
SF503 147	14.7	-	.5787	62	111	15
SF503 148	14.8	-	.5827	62	111	15
SF503 149	14.9	-	.5866	62	111	15
SF503 150	15	-	.5906	62	111	15
SF503 15081	15.081	19/32	.5937	64	115	16
SF503 151	15.1	-	.5945	64	115	16
SF503 152	15.2	-	.5984	64	115	16
SF503 154	15.4	-	.6063	64	115	16
SF503 155	15.5	-	.6102	64	115	16
SF503 156	15.6	-	.6142	64	115	16

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
SF503 157	15.7	-	.6181	64	115	16
SF503 158	15.8	-	.6220	64	115	16
SF503 15875	15.875	5/8	.6250	64	115	16
SF503 160	16	-	.6299	64	115	16
SF503 161	16.1	-	.6339	66	119	17
SF503 163	16.3	-	.6417	66	119	17
SF503 165	16.5	-	.6496	66	119	17
SF503 16667	16.667	21/32	.6562	66	119	17
SF503 170	17	-	.6693	66	119	17
SF503 171	17.1	-	.6732	66	123	18
SF503 172	17.2	-	.6772	66	123	18
SF503 17463	17.463	11/16	.6875	66	123	18
SF503 175	17.5	-	.6890	66	123	18
SF503 177	17.7	-	.6969	66	123	18
SF503 178	17.8	-	.7008	66	123	18
SF503 180	18	-	.7087	66	123	18
SF503 181	18.1	-	.7126	70	127	19
SF503 182	18.2	-	.7165	70	127	19
SF503 185	18.5	-	.7283	70	127	19
SF503 190	19	-	.7480	70	127	19
SF503 191	19.1	-	.7520	70	131	20
SF503 195	19.5	-	.7677	70	131	20
SF503 197	19.7	-	.7756	70	131	20
SF503 200	20	-	.7874	70	131	20

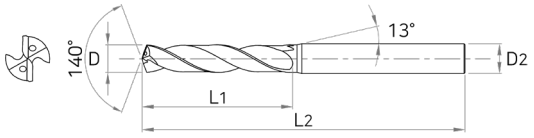
■ Applicable Working Material

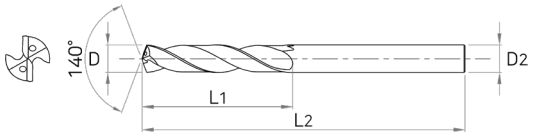
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

SF505 | HIGH SPEED INTERNAL COOLANT DRILL - 5D







■ Tolerance

D		Shank Dia
~D3	0~-0.014	h6
D3.1~D6	0~-0.018	
D6.1~D10	0~-0.022	
D10.1~D18	0~-0.027	
D18.1~	0~-0.033	

CARBIDE | TiAlN | 5D | 30° HELIX | 140° | DATA P.709

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
SF505 031	3.1	-	.1220	27	74	4
SF505 03175	3.175	1/8	.1250	27	74	4
SF505 032	3.2	-	.1260	27	74	4
SF505 03264	3.264	-	.1285	27	74	4
SF505 033	3.3	-	.1299	27	74	4
SF505 034	3.4	-	.1339	30	74	4
SF505 035	3.5	-	.1378	30	74	4
SF505 03572	3.572	9/64	.1406	30	74	4
SF505 036	3.6	-	.1417	30	74	4
SF505 037	3.7	-	.1457	30	74	4
SF505 038	3.8	-	.1496	33	74	4
SF505 039	3.9	-	.1535	33	74	4
SF505 040	4	-	.1575	33	74	4
SF505 04039	4.039	-	.1590	33	80	5
SF505 041	4.1	-	.1614	33	80	5
SF505 042	4.2	-	.1654	33	80	5
SF505 043	4.3	-	.1693	36	80	5
SF505 044	4.4	-	.1732	36	80	5
SF505 045	4.5	-	.1772	36	80	5
SF505 046	4.6	-	.1811	36	80	5
SF505 047	4.7	-	.1850	36	80	5
SF505 04763	4.763	3/16	.1875	39	80	5
SF505 048	4.8	-	.1890	39	80	5
SF505 049	4.9	-	.1920	39	80	5

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
SF505 050	5	-	.1969	39	80	5
SF505 051	5.1	-	.2008	39	87	6
SF505 05159	5.159	13/64	.2031	39	87	6
SF505 052	5.2	-	.2047	39	87	6
SF505 053	5.3	-	.2087	39	87	6
SF505 054	5.4	-	.2126	43	87	6
SF505 055	5.5	-	.2165	43	87	6
SF505 05558	5.558	7/32	.2188	43	87	6
SF505 056	5.6	-	.2205	43	87	6
SF505 057	5.7	-	.2244	43	87	6
SF505 058	5.8	-	.2283	43	87	6
SF505 059	5.9	-	.2323	43	87	6
SF505 05953	5.953	15/64	.2344	43	87	6
SF505 060	6	-	.2362	43	87	6
SF505 061	6.1	-	.2402	47	95	7
SF505 062	6.2	-	.2441	47	95	7
SF505 063	6.3	-	.2480	47	95	7
SF505 0635	6.350	1/4	.2500	47	95	7
SF505 064	6.4	-	.2520	47	95	7
SF505 065	6.5	-	.2559	47	95	7
SF505 066	6.6	-	.2598	47	95	7
SF505 067	6.7	-	.2638	47	95	7
SF505 06747	6.747	17/64	.2656	47	95	7
SF505 068	6.8	-	.2677	47	95	7

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

SF505 | HIGH SPEED INTERNAL COOLANT DRILL - 5D

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
SF505 069	6.9	-	.2717	47	95	7
SF505 070	7	-	.2756	47	95	7
SF505 071	7.1	-	.2795	52	103	8
SF505 07145	7.145	9/32	.2813	52	103	8
SF505 072	7.2	-	.2835	52	103	8
SF505 073	7.3	-	.2874	52	103	8
SF505 074	7.4	-	.2913	52	103	8
SF505 075	7.5	-	.2953	52	103	8
SF505 07541	7.541	19/64	.2969	52	103	8
SF505 076	7.6	-	.2992	52	103	8
SF505 077	7.7	-	.3031	52	103	8
SF505 078	7.8	-	.3071	52	103	8
SF505 079	7.9	-	.3110	52	103	8
SF505 07938	7.938	5/16	.3125	52	103	8
SF505 080	8	-	.3150	52	103	8
SF505 081	8.1	-	.3189	56	105	9
SF505 082	8.2	-	.3228	56	105	9
SF505 083	8.3	-	.3268	56	105	9
SF505 08334	8.334	21/64	.3281	56	105	9
SF505 084	8.4	-	.3307	56	105	9
SF505 085	8.5	-	.3346	56	105	9
SF505 086	8.6	-	.3386	56	105	9
SF505 087	8.7	-	.3425	56	105	9
SF505 08733	8.733	11/32	.3438	56	105	9
SF505 088	8.8	-	.3465	56	105	9
SF505 089	8.9	-	.3504	56	105	9
SF505 090	9	-	.3543	56	105	9
SF505 091	9.1	-	.3583	62	108	10
SF505 09129	9.129	23/64	.3594	62	108	10
SF505 092	9.2	-	.3622	62	108	10
SF505 093	9.3	-	.3661	62	108	10
SF505 094	9.4	-	.3701	62	108	10
SF505 095	9.5	-	.3740	62	108	10
SF505 09525	9.525	3/8	.3750	62	108	10
SF505 096	9.6	-	.3780	62	108	10
SF505 097	9.7	-	.3819	62	108	10
SF505 098	9.8	-	.3858	62	108	10
SF505 099	9.9	-	.3898	62	108	10
SF505 09921	9.921	25/64	.3906	62	108	10
SF505 100	10	-	.3937	62	108	10
SF505 101	10.1	-	.3976	68	125	11

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
SF505 102	10.2	-	.4016	68	125	11
SF505 103	10.3	-	.4055	68	125	11
SF505 1032	10.32	13/32	.4063	68	125	11
SF505 104	10.4	-	.4094	68	125	11
SF505 105	10.5	-	.4134	68	125	11
SF505 106	10.6	-	.4173	68	125	11
SF505 107	10.7	-	.4213	68	125	11
SF505 10716	10.716	27/64	.4219	68	125	11
SF505 108	10.8	-	.4252	68	125	11
SF505 109	10.9	-	.4291	68	125	11
SF505 110	11	-	.4331	68	125	11
SF505 111	11.1	-	.4370	71	133	12
SF505 11113	11.113	7/16	.4375	71	133	12
SF505 112	11.2	-	.4409	71	133	12
SF505 113	11.3	-	.4449	71	133	12
SF505 114	11.4	-	.4488	71	133	12
SF505 115	11.5	-	.4528	71	133	12
SF505 116	11.6	-	.4567	71	133	12
SF505 117	11.7	-	.4606	71	133	12
SF505 118	11.8	-	.4646	71	133	12
SF505 119	11.9	-	.4685	71	133	12
SF505 11908	11.908	15/32	.4688	71	133	12
SF505 120	12	-	.4724	71	133	12
SF505 121	12.1	-	.4764	75	137	13
SF505 122	12.2	-	.4803	75	137	13
SF505 123	12.3	-	.4843	75	137	13
SF505 12304	12.304	31/64	.4844	75	137	13
SF505 124	12.4	-	.4882	75	137	13
SF505 125	12.5	-	.4921	75	137	13
SF505 126	12.6	-	.4961	75	137	13
SF505 127	12.7	-	.5000	75	137	13
SF505 128	12.8	-	.5039	75	137	13
SF505 129	12.9	-	.5079	75	137	13
SF505 130	13	-	.5118	75	137	13
SF505 13096	13.096	33/64	.5156	80	142	14
SF505 131	13.1	-	.5157	80	142	14
SF505 132	13.2	-	.5197	80	142	14
SF505 133	13.3	-	.5236	80	142	14
SF505 134	13.4	0.5276	.80	142	14	14
SF505 13494	13.494	-	.5313	80	142	14
SF505 135	13.5	17/32	.5315	80	142	14

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

SF505 | HIGH SPEED INTERNAL COOLANT DRILL - 5D

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
SF505 136	13.6	-	.5354	80	142	14
SF505 137	13.7	-	.5394	80	142	14
SF505 138	13.8	-	.5433	80	142	14
SF505 13891	13.891	35/64	.5469	80	142	14
SF505 139	13.9	-	.5472	80	142	14
SF505 140	14	-	.5512	80	142	14
SF505 141	14.1	-	.5551	83	148	15
SF505 142	14.2	-	.5591	83	148	15
SF505 14288	14.288	9/16	.5625	83	148	15
SF505 143	14.3	-	.5630	83	148	15
SF505 144	14.4	-	.5669	83	148	15
SF505 145	14.5	-	.5709	83	148	15
SF505 146	14.6	-	.5748	83	148	15
SF505 147	14.7	-	.5787	83	148	15
SF505 148	14.8	-	.5827	83	148	15
SF505 149	14.9	-	.5866	83	148	15
SF505 150	15	-	.5906	83	148	15
SF505 15081	15.081	19/32	.5937	90	152	16
SF505 151	15.1	-	.5945	90	152	16
SF505 152	15.2	-	.5984	90	152	16
SF505 154	15.4	-	.6063	90	152	16
SF505 155	15.5	-	.6102	90	152	16
SF505 156	15.6	-	.6142	90	152	16
SF505 157	15.7	-	.6181	90	152	16

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
SF505 158	15.8	-	.6220	90	152	16
SF505 15875	15.875	5/8	.6250	90	152	16
SF505 160	16	-	.6299	90	152	16
SF505 161	16.1	-	.6339	95	155	17
SF505 163	16.3	-	.6417	95	155	17
SF505 165	16.5	-	.6496	95	155	17
SF505 16667	16.667	21/32	.6562	95	155	17
SF505 170	17	-	.6693	95	155	17
SF505 171	17.1	-	.6732	100	157	18
SF505 172	17.2	-	.6772	100	157	18
SF505 17463	17.463	11/16	.6875	100	157	18
SF505 175	17.5	-	.6890	100	157	18
SF505 177	17.7	-	.6969	100	157	18
SF505 178	17.8	-	.7008	100	157	18
SF505 180	18	-	.7087	100	157	18
SF505 181	18.1	-	.7126	105	160	19
SF505 182	18.2	-	.7165	105	160	19
SF505 185	18.5	-	.7283	105	160	19
SF505 190	19	-	.7480	105	160	19
SF505 191	19.1	-	.7520	110	163	20
SF505 195	19.5	-	.7677	110	163	20
SF505 197	19.7	-	.7756	110	163	20
SF505 200	20	-	.7874	110	163	20

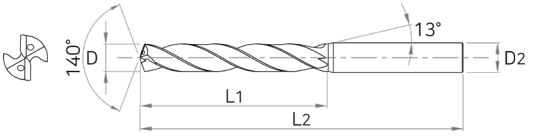
■ Applicable Working Material

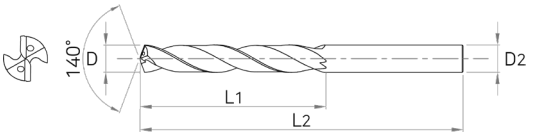
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

SF508 | HIGH SPEED INTERNAL COOLANT DRILL - 8D







■ Tolerance

D		Shank Dia
D3	0 ~ -0.014	h6
D3.1 ~ D6	0 ~ -0.018	
D6.1 ~ D10	0 ~ -0.022	
D10.1 ~ D13	0 ~ -0.027	

CARBIDE | TiAlN | 8D | 30° HELIX | 140° | DATA P.709

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
SF508 030	3	-	.1181	43	80	3
SF508 031	3.1	-	.1120	43	80	4
SF508 03175	3.175	1/8	.1250	43	80	4
SF508 032	3.2	-	.1260	43	80	4
SF508 033	3.3	-	.1299	43	80	4
SF508 034	3.4	-	.1339	43	80	4
SF508 035	3.5	-	.1378	43	80	4
SF508 03572	3.572	-	.1406	43	80	4
SF508 036	3.6	-	.1417	43	80	4
SF508 037	3.7	-	.1457	43	80	4
SF508 038	3.8	-	.1496	49	87	4
SF508 039	3.9	-	.1535	49	87	4
SF508 0397	3.97	9/64	.1563	49	87	4
SF508 040	4	-	.1575	49	87	4
SF508 04039	4.039	-	.1590	49	87	5
SF508 041	4.1	-	.1614	49	87	5
SF508 042	4.2	-	.1654	49	87	5
SF508 043	4.3	-	.1693	49	87	5
SF508 04366	4.366	-	.1719	49	87	5
SF508 044	4.4	-	.1732	49	87	5
SF508 045	4.5	-	.1772	49	87	5
SF508 046	4.6	-	.1811	49	87	5
SF508 047	4.7	-	.1850	49	87	5
SF508 04763	4.763	3/16	.1875	56	94	5

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
SF508 048	4.8	-	.1890	56	94	5
SF508 049	4.9	-	.1929	56	94	5
SF508 050	5	-	.1969	56	94	5
SF508 051	5.1	-	.2008	56	94	6
SF508 05159	5.159	13/64	.2031	56	94	6
SF508 052	5.2	-	.2047	56	94	6
SF508 053	5.3	-	.2087	56	94	6
SF508 054	5.4	-	.2126	56	94	6
SF508 0541	5.41	-	.2130	56	94	6
SF508 055	5.5	-	.2165	56	94	6
SF508 05558	5.558	7/32	.2188	56	94	6
SF508 056	5.6	-	.2205	56	94	6
SF508 057	5.7	-	.2244	56	94	6
SF508 058	5.8	-	.2283	56	94	6
SF508 059	5.9	-	.2323	56	94	6
SF508 05953	5.953	15/64	.2344	56	94	6
SF508 060	6	-	.2362	94	6	
SF508 061	6.1	-	.2402	67	105	7
SF508 062	6.2	-	.2441	67	105	7
SF508 063	6.3	-	.2480	67	105	7
SF508 0635	6.35	1/4	.2500	67	105	7
SF508 064	6.4	-	.2520	67	105	7
SF508 065	6.5	-	.2559	67	105	7
SF508 06528	6.528	-	.2570	67	105	7

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

SF508 | HIGH SPEED INTERNAL COOLANT DRILL - 8D

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
SF508 066	6.6	-	.2598	67	105	7
SF508 067	6.7	-	.2638	67	105	7
SF508 06747	6.747	17/64	.2656	67	105	7
SF508 068	6.8	-	.2677	67	105	7
SF508 069	6.9	-	.2717	67	105	7
SF508 070	7	-	.2756	76	116	7
SF508 071	7.1	-	.2795	76	116	8
SF508 07145	7.145	9/32	.2813	76	116	8
SF508 072	7.2	-	.2835	76	116	8
SF508 073	7.3	-	.2874	76	116	8
SF508 074	7.4	-	.2913	76	116	8
SF508 075	7.5	-	.2953	76	116	8
SF508 07541	7.541	19/64	.2969	76	116	8
SF508 076	7.6	-	.2992	76	116	8
SF508 077	7.7	-	.3031	76	116	8
SF508 078	7.8	-	.0371	76	116	8
SF508 079	7.9	-	.3110	76	116	8
SF508 07938	7.938	5/16	.3125	76	116	8
SF508 080	8	-	.3150	76	116	8
SF508 081	8.1	-	.3189	87	131	9
SF508 082	8.2	-	.3228	87	131	9
SF508 083	8.3	-	.3268	87	131	9
SF508 08334	8.334	21/64	.3281	87	131	9
SF508 084	8.4	-	3307	87	131	9
SF508 08433	8.433	-	3320	87	131	9
SF508 085	8.5	-	.3346	87	131	9
SF508 086	8.6	-	.3386	87	131	9
SF508 087	8.7	-	.3425	87	131	9
SF508 08733	8.733	11/32	.3438	87	131	9
SF508 088	8.8	-	.3465	87	131	9
SF508 089	8.9	-	.3504	87	131	9
SF508 090	9	-	.3543	87	131	9
SF508 091	9.1	-	.3583	95	139	10
SF508 09129	9.129	23/64	.3594	95	139	10
SF508 092	9.2	-	.3622	95	139	10
SF508 093	9.3	-	.3661	95	139	10
SF508 094	9.4	-	.3701	95	139	10
SF508 095	9.5	-	.3740	95	139	10
SF508 09525	9.525	3/8	.3750	95	139	10
SF508 096	9.6	-	.3780	95	139	10
SF508 097	9.7	-	.3819	95	139	10

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
SF508 098	9.8	-	.3858	95	139	10
SF508 099	9.9	-	.3898	95	139	10
SF508 09921	9.921	25/64	.3906	95	139	10
SF508 100	10	-	.3937	95	139	10
SF508 101	10.1	-	.3976	106	155	11
SF508 102	10.2	-	.4016	106	155	11
SF508 103	10.3	-	.4055	106	155	11
SF508 1032	10.32	13/32	.4063	106	155	11
SF508 104	10.4	-	.4094	106	155	11
SF508 105	10.5	-	.4134	106	155	11
SF508 106	10.6	-	.4173	106	155	11
SF508 107	10.7	-	.4213	106	155	11
SF508 10716	10.716	27/64	.4219	106	155	11
SF508 108	10.8	-	.4252	106	155	11
SF508 109	10.9	-	.4291	106	155	11
SF508 110	11	-	.4331	106	155	11
SF508 111	11.1	-	.4370	114	163	12
SF508 11113	11.113	7/16	.4375	114	163	12
SF508 112	11.2	-	.4409	114	163	12
SF508 113	11.3	-	.4449	114	163	12
SF508 114	11.4	-	.4488	114	163	12
SF508 115	11.5	-	.4528	114	163	12
SF508 11509	11.509	29/64	.4531	114	163	12
SF508 116	11.6	-	.4567	114	163	12
SF508 117	11.7	-	.4606	114	163	12
SF508 118	11.8	-	.4646	114	163	12
SF508 119	11.9	-	.4685	114	163	12
SF508 11908	11.908	15/32	.4688	114	163	12
SF508 120	12	-	.4724	114	163	12
SF508 121	12.1	-	.4764	133	182	13
SF508 122	12.2	-	.4803	133	182	13
SF508 123	12.3	-	.4843	133	182	13
SF508 12304	12.304	31/64	.4844	133	182	13
SF508 125	12.5	-	.4921	133	182	13
SF508 126	12.6	-	.4961	133	182	13
SF508 127	12.7	1/2	.5000	133	182	13
SF508 128	12.8	-	.5039	133	182	13
SF508 129	12.9	-	.5079	133	182	13
SF508 130	13	-	.5118	133	182	13
SF508 131	13.1	-	.5157	133	182	14
SF508 132	13.2	-	.5197	133	182	14

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

SF508 | HIGH SPEED INTERNAL COOLANT DRILL - 8D

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
SF508 133	13.3	-	.5236	133	182	14
SF508 134	13.4	-	.5276	133	182	14
SF508 13494	13.494	17/32	.5313	133	182	14
SF508 135	13.5	-	.5315	133	182	14
SF508 136	13.6	-	.5354	133	182	14
SF508 137	13.7	-	.5394	133	182	14
SF508 140	14	-	.5512	133	182	14
SF508 14288	14.288	9/16	.5625	152	204	15
SF508 143	14.3	-	.5630	152	204	15
SF508 144	14.4	-	.5669	152	204	15
SF508 145	14.5	-	.5709	152	204	15
SF508 14683	14.683	37/64	.5781	152	204	15
SF508 147	14.7	-	.5787	152	204	15
SF508 150	15	-	.5906	152	204	15
SF508 15081	15.081	19/32	.5937	152	204	16
SF508 155	15.5	-	.6102	152	204	16

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
SF508 157	15.7	-	.6181	152	204	16
SF508 15875	15.875	5/8	.6250	152	204	16
SF508 160	16	-	.6299	152	204	16
SF508 165	16.5	-	.6496	171	223	17
SF508 16667	16.667	21/32	.6562	171	223	17
SF508 170	17	-	.6693	171	223	17
SF508 17463	17.463	11/16	.6875	171	223	18
SF508 175	17.5	-	.6890	171	223	18
SF508 180	18	-	.7087	171	223	18
SF508 185	18.5	-	.7283	191	244	19
SF508 190	19	-	.7480	191	244	19
SF508 1905	19.05	3/4	.7500	191	244	20
SF508 19446	19.446	49/64	.7656	191	244	20
SF508 195	19.5	-	.7677	191	244	20
SF508 200	20	-	.7874	191	244	20

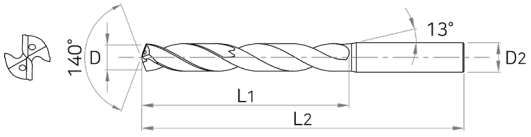
■ Applicable Working Material

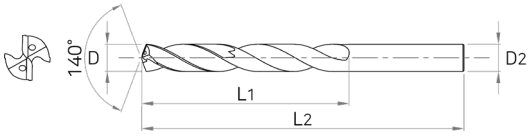
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

SF510 | HIGH SPEED INTERNAL COOLANT DRILL - 10D







■ Tolerance

D		Shank Dia
~D3	0~-0.014	h6
D3.1~D6	0~-0.018	
D6.1~D10	0~-0.022	
D10.1~D13	0~-0.027	

CARBIDE | TiAlN | 10D | 30° HELIX | 140° | DATA P.710

EDP No	SIZES (mm)			
	D	L1	L2	D2
SF510 030	3	39	87	3
SF510 031	3.1	46	94	4
SF510 032	3.2	46	94	4
SF510 033	3.3	46	94	4
SF510 034	3.4	46	94	4
SF510 035	3.5	46	94	4
SF510 036	3.6	52	101	4
SF510 037	3.7	52	101	4
SF510 038	3.8	52	101	4
SF510 039	3.9	52	101	4
SF510 040	4	52	101	4
SF510 041	4.1	59	108	5
SF510 042	4.2	59	108	5
SF510 043	4.3	59	108	5
SF510 044	4.4	59	108	5
SF510 045	4.5	59	108	5
SF510 046	4.6	66	117	5
SF510 047	4.7	66	117	5
SF510 048	4.8	66	117	5
SF510 049	4.9	66	117	5
SF510 050	5	66	117	5
SF510 051	5.1	72	123	6
SF510 052	5.2	72	123	6
SF510 053	5.3	72	123	6

EDP No	SIZES (mm)			
	D	L1	L2	D2
SF510 054	5.4	72	123	6
SF510 055	5.5	72	123	6
SF510 056	5.6	79	130	6
SF510 057	5.7	79	130	6
SF510 058	5.8	79	130	6
SF510 059	5.9	79	130	6
SF510 060	6	79	130	6
SF510 061	6.1	85	138	7
SF510 062	6.2	85	138	7
SF510 063	6.3	85	138	7
SF510 064	6.4	85	138	7
SF510 065	6.5	85	138	7
SF510 066	6.6	92	145	7
SF510 067	6.7	92	145	7
SF510 068	6.8	92	145	7
SF510 069	6.9	92	145	7
SF510 070	7	92	145	7
SF510 071	7.1	98	153	8
SF510 072	7.2	98	153	8
SF510 073	7.3	98	153	8
SF510 074	7.4	98	153	8
SF510 075	7.5	98	153	8
SF510 076	7.6	105	160	8
SF510 077	7.7	105	160	8

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

SF510 | HIGH SPEED INTERNAL COOLANT DRILL - 10D

EDP No	SIZES (mm)			
	D	L1	L2	D2
SF510 078	7.8	105	160	8
SF510 079	7.9	105	160	8
SF510 080	8	105	160	8
SF510 081	8.1	111	166	9
SF510 082	8.2	111	166	9
SF510 083	8.3	111	166	9
SF510 084	8.4	111	166	9
SF510 085	8.5	111	166	9
SF510 086	8.6	118	173	9
SF510 087	8.7	118	173	9
SF510 088	8.8	118	173	9
SF510 089	8.9	118	173	9
SF510 090	9	118	173	9
SF510 091	9.1	124	179	10
SF510 092	9.2	124	179	10
SF510 093	9.3	124	179	10
SF510 094	9.4	124	179	10
SF510 095	9.5	124	179	10
SF510 096	9.6	131	186	10
SF510 097	9.7	131	186	10
SF510 098	9.8	131	186	10
SF510 099	9.9	131	186	10
SF510 100	10	131	186	10
SF510 101	10.1	138	193	11
SF510 102	10.2	138	193	11
SF510 103	10.3	138	193	11
SF510 104	10.4	138	193	11

EDP No	SIZES (mm)			
	D	L1	L2	D2
SF510 105	10.5	138	193	11
SF510 106	10.6	144	205	11
SF510 107	10.7	144	205	11
SF510 108	10.8	144	205	11
SF510 109	10.9	144	205	11
SF510 110	11	144	205	11
SF510 111	11.1	151	212	12
SF510 112	11.2	151	212	12
SF510 113	11.3	151	212	12
SF510 114	11.4	151	212	12
SF510 115	11.5	151	212	12
SF510 116	11.6	157	218	12
SF510 117	11.7	157	218	12
SF510 118	11.8	157	218	12
SF510 119	11.9	157	218	12
SF510 120	12	157	218	12
SF510 121	12.1	164	225	13
SF510 122	12.2	164	225	13
SF510 123	12.3	164	225	13
SF510 124	12.4	164	225	13
SF510 125	12.5	164	225	13
SF510 126	12.6	170	236	13
SF510 127	12.7	170	236	13
SF510 128	12.8	170	236	13
SF510 129	12.9	170	236	13
SF510 130	13	170	236	13

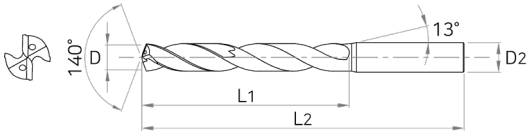
■ Applicable Working Material

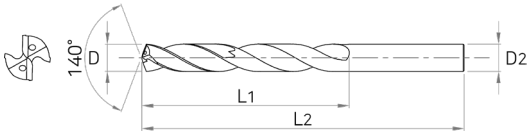
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

SF520 | HIGH SPEED INTERNAL COOLANT DRILL - 20D







■ Tolerance

D		Shank Dia
~D6	0~-0.018	h6
D6~10	0~-0.022	

CARBIDE | TiAlN | 20D | 30° HELIX | 140° | DATA P.710

EDP No	SIZES (mm)			
	D	L1	L2	D2
SF520 041	4.1	104	155	5
SF520 042	4.2	104	155	5
SF520 043	4.3	104	155	5
SF520 044	4.4	104	155	5
SF520 045	4.5	104	155	5
SF520 046	4.6	116	167	5
SF520 047	4.7	116	167	5
SF520 048	4.8	116	167	5
SF520 049	4.9	116	167	5
SF520 050	5	116	167	5
SF520 051	5.1	127	178	6
SF520 052	5.2	127	178	6
SF520 053	5.3	127	178	6
SF520 054	5.4	127	178	6
SF520 055	5.5	127	178	6
SF520 056	5.6	139	190	6
SF520 057	5.7	139	190	6
SF520 058	5.8	139	190	6
SF520 059	5.9	139	190	6
SF520 060	6	139	190	6
SF520 061	6.1	150	203	7
SF520 062	6.2	150	203	7
SF520 063	6.3	150	203	7
SF520 064	6.4	150	203	7

EDP No	SIZES (mm)			
	D	L1	L2	D2
SF520 065	6.5	150	203	7
SF520 066	6.6	162	215	7
SF520 067	6.7	162	215	7
SF520 068	6.8	162	215	7
SF520 069	6.9	162	215	7
SF520 070	7	162	215	7
SF520 071	7.1	173	228	8
SF520 072	7.2	173	228	8
SF520 073	7.3	173	228	8
SF520 074	7.4	173	228	8
SF520 075	7.5	173	228	8
SF520 076	7.6	185	240	8
SF520 077	7.7	185	240	8
SF520 078	7.8	185	240	8
SF520 079	7.9	185	240	8
SF520 080	8	185	240	8
SF520 081	8.1	196	251	9
SF520 082	8.2	196	251	9
SF520 083	8.3	196	251	9
SF520 084	8.4	196	251	9
SF520 085	8.5	196	251	9
SF520 086	8.6	208	263	9
SF520 087	8.7	208	263	9
SF520 088	8.8	208	263	9

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

SF520 | HIGH SPEED INTERNAL COOLANT DRILL - 20D

EDP No	SIZES (mm)			
	D	L1	L2	D2
SF520 089	8.9	208	263	9
SF520 090	9	208	263	9
SF520 091	9.1	219	274	10
SF520 092	9.2	219	274	10
SF520 093	9.3	219	274	10
SF520 094	9.4	219	274	10

EDP No	SIZES (mm)			
	D	L1	L2	D2
SF520 095	9.5	219	274	10
SF520 096	9.6	231	286	10
SF520 097	9.7	231	286	10
SF520 098	9.8	231	286	10
SF520 099	9.9	231	286	10
SF520 100	10	231	286	10

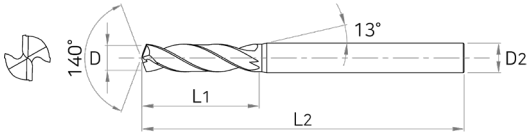
■ Applicable Working Material

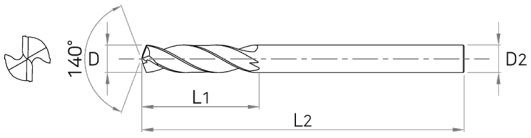
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

HP503 | DOUBLE MARGIN DRILL - DIN 6537K







■ Tolerance

D		Shank Dia
D3	+0.002 ~ +0.012	h6
D3.1 ~ D6	+0.004 ~ +0.016	
D6.1 ~ D10	+0.006 ~ +0.021	
D10.1 ~ D16	+0.007 ~ +0.025	

DIN 6537K | CARBIDE | TiAlN | 3D | 30° HELIX | 140° | DATA P.709

EDP No	SIZES (mm)				
	D		L1	L2	D2
	mm	inch			
HP503 030	3	.1181	20	62	6
HP503 031	3.1	.1220	20	62	6
HP503 032	3.2	.1260	20	62	6
HP503 033	3.3	.1299	20	62	6
HP503 034	3.4	.1339	20	62	6
HP503 035	3.5	.1378	20	62	6
HP503 036	3.6	.1417	20	62	6
HP503 037	3.7	.1457	20	62	6
HP503 038	3.8	.1496	24	66	6
HP503 039	3.9	.1535	24	66	6
HP503 040	4	.1575	24	66	6
HP503 041	4.1	.1614	24	66	6
HP503 042	4.2	.1654	24	66	6
HP503 043	4.3	.1693	24	66	6
HP503 044	4.4	.1732	24	66	6
HP503 045	4.5	.1772	24	66	6
HP503 046	4.6	.1811	24	66	6
HP503 047	4.7	.1850	24	66	6
HP503 048	4.8	.1890	28	66	6
HP503 049	4.9	.1929	28	66	6
HP503 050	5	.1969	28	66	6
HP503 051	5.1	.2008	28	66	6
HP503 052	5.2	.2047	28	66	6
HP503 053	5.3	.2087	28	66	6

EDP No	SIZES (mm)				
	D		L1	L2	D2
	mm	inch			
HP503 054	5.4	.2126	28	66	6
HP503 055	5.5	.2165	28	66	6
HP503 056	5.6	.2205	28	66	6
HP503 057	5.7	.2244	28	66	6
HP503 058	5.8	.2283	28	66	6
HP503 059	5.9	.2322	28	66	6
HP503 060	6	.2362	28	66	6
HP503 061	6.1	.2402	34	79	8
HP503 062	6.2	.2441	34	79	8
HP503 063	6.3	.2480	34	79	8
HP503 064	6.4	.2520	34	79	8
HP503 065	6.5	.2559	34	79	8
HP503 066	6.6	.2598	34	79	8
HP503 067	6.7	.2638	34	79	8
HP503 068	6.8	.2677	34	79	8
HP503 069	6.9	.2717	34	79	8
HP503 070	7	.2756	34	79	8
HP503 071	7.1	.2795	41	79	8
HP503 072	7.2	.2835	41	79	8
HP503 073	7.3	.2874	41	79	8
HP503 074	7.4	.2913	41	79	8
HP503 075	7.5	.2953	41	79	8
HP503 076	7.6	.2992	41	79	8
HP503 077	7.7	.3031	41	79	8

■ Applicable Working Material

Carbon Steel ~ HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

HP503 | DOUBLE MARGIN DRILL - DIN 6537K

EDP No	SIZES (mm)				
	D		L1	L2	D2
	mm	inch			
HP503 078	7.8	.3071	41	79	8
HP503 079	7.9	.3110	41	79	8
HP503 080	8	.3150	41	79	8
HP503 081	8.1	.3189	47	89	10
HP503 082	8.2	.3228	47	89	10
HP503 083	8.3	.3268	47	89	10
HP503 084	8.4	.3307	47	89	10
HP503 085	8.5	.3346	47	89	10
HP503 086	8.6	.3386	47	89	10
HP503 087	8.7	.3425	47	89	10
HP503 088	8.8	.3465	47	89	10
HP503 089	8.9	.3504	47	89	10
HP503 090	9	.3543	47	89	10
HP503 091	9.1	.3583	47	89	10
HP503 092	9.2	.3622	47	89	10
HP503 093	9.3	.3661	47	89	10
HP503 094	9.4	.3701	47	89	10
HP503 095	9.5	.3740	47	89	10
HP503 096	9.6	.3780	47	89	10
HP503 097	9.7	.3819	47	89	10
HP503 098	9.8	.3858	47	89	10
HP503 099	9.9	.3898	47	89	10
HP503 100	10	.3937	47	89	10
HP503 101	10.1	.3976	55	102	12
HP503 102	10.2	.4016	55	102	12
HP503 103	10.3	.4055	55	102	12
HP503 104	10.4	.4094	55	102	12
HP503 105	10.5	.4134	55	102	12
HP503 106	10.6	.4173	55	102	12
HP503 107	10.7	.4213	55	102	12
HP503 108	10.8	.4252	55	102	12
HP503 109	10.9	.4291	55	102	12
HP503 110	11	.4331	55	102	12
HP503 111	11.1	.4370	55	102	12

EDP No	SIZES (mm)				
	D		L1	L2	D2
	mm	inch			
HP503 112	11.2	.4409	55	102	12
HP503 113	11.3	.4449	55	102	12
HP503 114	11.4	.4488	55	102	12
HP503 115	11.5	.4528	55	102	12
HP503 116	11.6	.4567	55	102	12
HP503 117	11.7	.4606	55	102	12
HP503 118	11.8	.4646	55	102	12
HP503 119	11.9	.4685	55	102	12
HP503 120	12	.4724	55	102	12
HP503 121	12.1	.4764	60	107	14
HP503 122	12.2	.4803	60	107	14
HP503 123	12.3	.4843	60	107	14
HP503 124	12.4	.4882	60	107	14
HP503 125	12.5	.4921	60	107	14
HP503 126	12.6	.4961	60	107	14
HP503 127	12.7	.5000	60	107	14
HP503 128	12.8	.5039	60	107	14
HP503 129	12.9	.5079	60	107	14
HP503 130	13	.5118	60	107	14
HP503 131	13.1	.5157	60	107	14
HP503 132	13.2	.5157	60	107	14
HP503 133	13.3	.5236	60	107	14
HP503 135	13.5	.5315	60	107	14
HP503 137	13.7	.5394	60	107	14
HP503 140	14	.5512	60	107	14
HP503 142	14.2	.5591	65	115	16
HP503 143	14.3	.5630	65	115	16
HP503 145	14.5	.5709	65	115	16
HP503 146	14.6	.5787	65	115	16
HP503 148	14.8	.5827	65	115	16
HP503 150	15	.5906	65	115	16
HP503 155	15.5	.6102	65	115	16
HP503 157	15.7	.6181	65	115	16
HP503 160	16	.6299	65	115	16

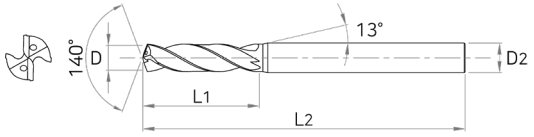
■ Applicable Working Material

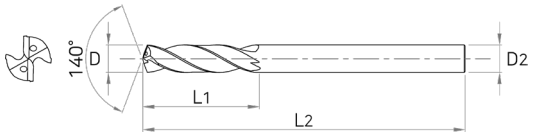
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

HPI503 | DOUBLE MARGIN INTERNAL COOLANT DRILL - DIN 6537K







■ Tolerance

D		Shank Dia
D3	+0.002 ~ +0.012	h6
D3.1 ~ 6	+0.004 ~ +0.016	
D6.1 ~ 10	+0.006 ~ +0.021	
D10.1 ~ 18	+0.007 ~ +0.025	
D18.1 ~	+0.008 ~ +0.029	

DIN 6537K | CARBIDE | TiAlN | 3D | 30° HELIX | 140° | DATA P.709

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
HPI503 030	3	-	.1181	20	62	6
HPI503 031	3.1	-	.112	20	62	6
HPI503 03175	3.175	1/8	.125	20	62	6
HPI503 032	3.2	-	.126	20	62	6
HPI503 03264	3.264	-	.1285	20	62	6
HPI503 033	3.3	-	.1299	20	62	6
HPI503 034	3.4	-	.1339	20	62	6
HPI503 035	3.5	-	.1378	20	62	6
HPI503 03572	3.572	9/64	.1406	20	62	6
HPI503 036	3.6	-	.1417	20	62	6
HPI503 037	3.7	-	.1457	20	62	6
HPI503 038	3.8	-	.1496	24	66	6
HPI503 039	3.9	-	.1535	24	66	6
HPI503 0397	3.97	5/32	.1563	24	66	6
HPI503 040	4	-	.1575	24	66	6
HPI503 04039	4.039	-	.159	24	66	6
HPI503 041	4.1	-	.1614	24	66	6
HPI503 042	4.2	-	.1654	24	66	6
HPI503 043	4.3	-	.1693	24	66	6
HPI503 04366	4.366	-	.1719	24	66	6
HPI503 044	4.4	-	.1732	24	66	6
HPI503 045	4.5	-	.1772	24	66	6
HPI503 046	4.6	-	.1811	24	66	6
HPI503 047	4.7	-	.185	24	66	6

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
HPI503 04763	4.763	3/16	.1875	28	66	6
HPI503 048	4.8	-	.189	28	66	6
HPI503 049	4.9	-	.1929	28	66	6
HPI503 050	5	-	.1969	28	66	6
HPI503 051	5.1	-	.2008	28	66	6
HPI503 05159	5.159	13/64	.2031	28	66	6
HPI503 052	5.2	-	.2047	28	66	6
HPI503 053	5.3	-	.2087	28	66	6
HPI503 054	5.4	-	.2126	28	66	6
HPI503 055	5.5	-	.2165	28	66	6
HPI503 05558	5.558	7/32	.2188	28	66	6
HPI503 056	5.6	-	.2205	28	66	6
HPI503 057	5.7	-	.2244	28	66	6
HPI503 058	5.8	-	.2283	28	66	6
HPI503 059	5.9	-	.2323	28	66	6
HPI503 05953	5.953	15/64	.2344	28	66	6
HPI503 060	6	-	.2362	28	66	6
HPI503 061	6.1	-	.2402	34	79	8
HPI503 062	6.2	-	.2441	34	79	8
HPI503 063	6.3	-	.248	34	79	8
HPI503 0635	6.35	1/4	.25	34	79	8
HPI503 064	6.4	-	.252	34	79	8
HPI503 065	6.5	-	.2559	34	79	8
HPI503 066	6.6	-	.2598	34	79	8

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

HPI503 | DOUBLE MARGIN INTERNAL COOLANT DRILL - DIN 6537K

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
HPI503 067	6.7	-	.2638	34	79	8
HPI503 06747	6.747	17/64	.2656	34	79	8
HPI503 068	6.8	-	.2677	34	79	8
HPI503 069	6.9	-	.2717	34	79	8
HPI503 070	7	-	.2756	34	79	8
HPI503 071	7.1	-	.2795	41	79	8
HPI503 07145	7.145	9/32	.2813	41	79	8
HPI503 072	7.2	-	.2835	41	79	8
HPI503 073	7.3	-	.2874	41	79	8
HPI503 074	7.4	-	.2913	41	79	8
HPI503 075	7.5	-	.2953	41	79	8
HPI503 07541	7.541	19/64	.2969	41	79	8
HPI503 076	7.6	-	.2992	41	79	8
HPI503 077	7.7	-	.3031	41	79	8
HPI503 078	7.8	-	.0371	41	79	8
HPI503 079	7.9	-	.311	41	79	8
HPI503 07938	7.938	5/16	.3125	41	79	8
HPI503 080	8	-	.315	41	79	8
HPI503 081	8.1	-	.3189	47	89	10
HPI503 082	8.2	-	.3228	47	89	10
HPI503 083	8.3	-	.3268	47	89	10
HPI503 08334	8.334	21/64	.3281	47	89	10
HPI503 0834	8.34	-	.3283	47	89	10
HPI503 084	8.4	-	.3307	47	89	10
HPI503 085	8.5	-	.3346	47	89	10
HPI503 086	8.6	-	.3386	47	89	10
HPI503 087	8.7	-	.3425	47	89	10
HPI503 08733	8.733	11/32	.3438	47	89	10
HPI503 088	8.8	-	.3465	47	89	10
HPI503 089	8.9	-	.6504	47	89	10
HPI503 090	9	-	.3543	47	89	10
HPI503 091	9.1	-	.3583	47	89	10
HPI503 09129	9.129	23/64	.3594	47	89	10
HPI503 092	9.2	-	.3622	47	89	10
HPI503 093	9.3	-	.3661	47	89	10
HPI503 094	9.4	-	.368	47	89	10
HPI503 095	9.5	-	.374	47	89	10
HPI503 09525	9.525	3/8	.375	47	89	10
HPI503 096	9.6	-	.378	47	89	10
HPI503 097	9.7	-	.3819	47	89	10
HPI503 098	9.8	-	.3858	47	89	10

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
HPI503 099	9.9	-	.3898	47	89	10
HPI503 09921	9.9921	25/64	.3906	47	89	10
HPI503 100	10	-	.3937	47	89	10
HPI503 101	10.1	-	.3976	55	105	12
HPI503 102	10.2	-	.4016	55	105	12
HPI503 103	10.3	-	.4055	55	105	12
HPI503 1032	10.32	13/32	.4063	55	105	12
HPI503 104	10.4	-	.4094	55	105	12
HPI503 105	10.5	-	.4134	55	105	12
HPI503 106	10.6	-	.4173	55	105	12
HPI503 107	10.7	-	.4213	55	105	12
HPI503 10716	10.716	27/64	.4219	55	105	12
HPI503 108	10.8	-	.4252	55	105	12
HPI503 109	10.9	-	.4291	55	105	12
HPI503 110	11	-	.4331	55	105	12
HPI503 111	11.1	-	.437	55	105	12
HPI503 11113	11.113	7/16	.4375	55	105	12
HPI503 112	11.2	-	.4409	55	105	12
HPI503 113	11.3	-	.4449	55	105	12
HPI503 114	11.4	-	.4488	55	105	12
HPI503 115	11.5	-	.4528	55	105	12
HPI503 11509	11.509	29/64	.4531	55	105	12
HPI503 116	11.6	-	.4567	55	105	12
HPI503 117	11.7	-	.4606	55	105	12
HPI503 118	11.8	-	.4646	55	105	12
HPI503 119	11.9	-	.4685	55	105	12
HPI503 11908	11.908	15/32	.4688	55	105	12
HPI503 120	12	-	.4724	55	105	12
HPI503 121	12.1	-	.4764	60	107	14
HPI503 122	12.2	-	.4803	60	107	14
HPI503 123	12.3	-	.4843	60	107	14
HPI503 12304	12.304	31/64	.4844	60	107	14
HPI503 124	12.4	-	.4882	60	107	14
HPI503 125	12.5	-	.4921	60	107	14
HPI503 126	12.6	-	.4961	60	107	14
HPI503 127	12.7	1/2	.5	60	107	14
HPI503 128	12.8	-	.5039	60	107	14
HPI503 129	12.9	-	.5079	60	107	14
HPI503 130	13	-	.5118	60	107	14
HPI503 132	13.2	-	.5197	60	107	14
HPI503 133	13.3	-	.5236	60	107	14

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

HPI503 | DOUBLE MARGIN INTERNAL COOLANT DRILL - DIN 6537K

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
HPI503 13494	13.494	17/32	.5313	60	107	14
HPI503 135	13.5	-	.5315	60	107	14
HPI503 137	13.7	-	.5394	60	107	14
HPI503 13891	13.891	35/64	.5469	60	107	14
HPI503 140	14	-	.5512	60	107	14
HPI503 141	14.1	-	.5551	65	115	16
HPI503 142	14.2	-	.5591	65	115	16
HPI503 14288	14.288	9/16	.5625	65	115	16
HPI503 145	14.5	-	.5709	65	115	16
HPI503 146	14.6	-	.5746	65	115	16
HPI503 147	14.7	-	.5787	65	115	16
HPI503 150	15	-	.5906	65	115	16
HPI503 15081	15.081	19/32	.5937	65	115	16
HPI503 155	15.5	-	.6102	65	115	16
HPI503 157	15.7	-	.6181	65	115	16
HPI503 158	15.8	-	.622	65	115	16
HPI503 15875	15.875	5/8	.625	65	115	16

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
HPI503 160	16	-	.6299	65	115	16
HPI503 162	16.2	-	.6378	73	123	18
HPI503 163	16.3	-	.6417	73	123	18
HPI503 165	16.5	-	.6496	73	123	18
HPI503 167	16.7	-	.6575	73	123	18
HPI503 168	16.8	-	.6614	73	123	18
HPI503 170	17	-	.6693	73	123	18
HPI503 171	17.1	-	.6732	73	123	18
HPI503 17463	17.463	11/16	.6875	73	123	18
HPI503 175	17.5	-	.689	73	123	18
HPI503 180	18	-	.7087	73	123	18
HPI503 185	18.5	-	.7883	79	131	20
HPI503 190	19	-	.748	79	131	20
HPI503 1905	19.05	3/4	.75	79	131	20
HPI503 197	19.7	-	.7756	79	131	20
HPI503 200	20	-	.7874	79	131	20

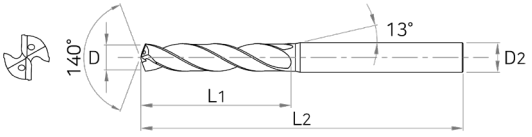
■ Applicable Working Material

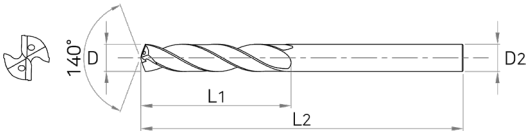
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

HPI505 | DOUBLE MARGIN INTERNAL COOLANT DRILL - DIN 6537L







■ Tolerance

D		Shank Dia
D3	+0.002 ~ +0.012	h6
D3.1 ~ 6	+0.004 ~ +0.016	
D6.1 ~ 10	+0.006 ~ +0.021	
D10.1 ~ 18	+0.007 ~ +0.025	
D18.1 ~	+0.008 ~ +0.029	

DIN 3537L | CARBIDE | TiAlN | 5D | 30° HELIX | 140° | DATA P.709

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
HPI505 030	3	-	.1181	30	66	6
HPI505 031	3.1	-	.1120	30	66	6
HPI505 03175	3.175	-	.1250	30	66	6
HPI505 032	3.2	-	.1260	30	66	6
HPI505 03264	3.264	1/8	.1285	30	66	6
HPI505 033	3.3	-	.1299	30	66	6
HPI505 034	3.4	-	.1339	30	66	6
HPI505 035	3.5	-	.1378	30	66	6
HPI505 03572	3.572	9/64	.1406	30	66	6
HPI505 036	3.6	-	.1417	30	66	6
HPI505 037	3.7	-	.1457	30	66	6
HPI505 038	3.8	-	.1496	36	74	6
HPI505 039	3.9	-	.1535	36	74	6
HPI505 0397	3.97	5/32	.1563	36	74	6
HPI505 040	4	-	.1575	36	74	6
HPI505 04039	4.039	-	.1590	36	74	6
HPI505 041	4.1	-	.1614	36	74	6
HPI505 042	4.2	-	.1654	36	74	6
HPI505 043	4.3	-	.1693	36	74	6
HPI505 04366	4.366	-	.1719	36	74	6
HPI505 044	4.4	-	.1732	36	74	6
HPI505 045	4.5	-	.1772	36	74	6
HPI505 0458	4.58	-	.1803	36	74	6
HPI505 046	4.6	-	.1811	36	74	6

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
HPI505 04623	4.623	-	.1820	36	74	6
HPI505 047	4.7	-	.1850	36	74	6
HPI505 04763	4.763	3/16	.1875	44	82	6
HPI505 048	4.8	-	.1890	44	82	6
HPI505 049	4.9	-	.1929	44	82	6
HPI505 050	5	-	.1969	44	82	6
HPI505 051	5.1	-	.2008	44	82	6
HPI505 05159	5.159	13/64	.2031	44	82	6
HPI505 052	5.2	-	.2047	44	82	6
HPI505 053	5.3	-	.2087	44	82	6
HPI505 054	5.4	-	.2126	44	82	6
HPI505 0541	5.41	-	.2130	44	82	6
HPI505 055	5.5	-	.2165	44	82	6
HPI505 05558	5.558	7/32	.2188	44	82	6
HPI505 056	5.6	-	.2205	44	82	6
HPI505 057	5.7	-	.2244	44	82	6
HPI505 058	5.8	-	.2283	44	82	6
HPI505 059	5.9	-	.2323	44	82	6
HPI505 05953	5.953	15/64	.2344	44	82	6
HPI505 060	6	-	.2362	44	82	6
HPI505 061	6.1	-	.2402	53	91	8
HPI505 062	6.2	-	.2441	53	91	8
HPI505 063	6.3	-	.2480	53	91	8
HPI505 0635	6.35	1/4	.2500	53	91	8

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

HPI505 | DOUBLE MARGIN INTERNAL COOLANT DRILL - DIN 6537L

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
HPI505 064	6.4	-	.2520	53	91	8
HPI505 065	6.5	-	.2559	53	91	8
HPI505 06528	6.528	-	.2570	53	91	8
HPI505 066	6.6	-	.2598	53	91	8
HPI505 067	6.7	-	.2638	53	91	8
HPI505 06747	6.747	17/64	.2656	53	91	8
HPI505 068	6.8	-	.2677	53	91	8
HPI505 069	6.9	-	.2717	53	91	8
HPI505 06909	6.909	-	.2720	53	91	8
HPI505 070	7	-	.2756	53	91	8
HPI505 071	7.1	-	.2795	53	91	8
HPI505 07145	7.145	9/32	.2813	53	91	8
HPI505 072	7.2	-	.2835	53	91	8
HPI505 073	7.3	-	.2874	53	91	8
HPI505 074	7.4	-	.2913	53	91	8
HPI505 075	7.5	-	.2953	53	91	8
HPI505 07541	7.541	19/64	.2969	53	91	8
HPI505 076	7.6	-	.2992	53	91	8
HPI505 077	7.7	-	.3031	53	91	8
HPI505 078	7.8	-	.3071	53	91	8
HPI505 079	7.9	-	.3110	53	91	8
HPI505 07938	7.938	5/16	.3125	53	91	8
HPI505 080	8	-	.3150	53	91	8
HPI505 081	8.1	-	.3189	61	103	10
HPI505 082	8.2	-	.3228	61	103	10
HPI505 083	8.3	-	.3268	61	103	10
HPI505 08334	8.334	21/64	.3281	61	103	10
HPI505 084	8.4	-	.3307	61	103	10
HPI505 08433	8.433	-	.3320	61	103	10
HPI505 085	8.5	-	.3346	61	103	10
HPI505 086	8.6	-	.3386	61	103	10
HPI505 087	8.7	-	.3425	61	103	10
HPI505 08733	8.733	11/32	.3438	61	103	10
HPI505 088	8.8	-	.3465	61	103	10
HPI505 089	8.9	-	.3504	61	103	10
HPI505 090	9	-	.3543	61	103	10
HPI505 091	9.1	-	.3583	61	103	10
HPI505 09129	9.129	23/64	.3594	61	103	10
HPI505 092	9.2	-	.3622	61	103	10
HPI505 093	9.3	-	.3661	61	103	10
HPI505 09347	9.347	-	.3680	61	103	10

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
HPI505 094	9.4	-	.3701	61	103	10
HPI505 095	9.5	-	.3740	61	103	10
HPI505 09525	9.525	3/8	.3750	61	103	10
HPI505 096	9.6	-	.3780	61	103	10
HPI505 097	9.7	-	.3819	61	103	10
HPI505 09703	9.703	-	.3820	61	103	10
HPI505 09746	9.746	-	.3837	61	103	10
HPI505 098	9.8	-	.3858	61	103	10
HPI505 099	9.9	-	.3898	61	103	10
HPI505 09921	9.921	25/64	.3906	61	103	10
HPI505 100	10	-	.3937	61	103	10
HPI505 101	10.1	-	.3976	71	118	12
HPI505 102	10.2	-	.4016	71	118	12
HPI505 103	10.3	-	.4055	71	118	12
HPI505 1032	10.32	13/32	.4063	71	118	12
HPI505 104	10.4	-	.4074	71	118	12
HPI505 105	10.5	-	.4134	71	118	12
HPI505 106	10.6	-	.4173	71	118	12
HPI505 107	10.7	-	.4213	71	118	12
HPI505 10716	10.716	27/64	.4219	71	118	12
HPI505 108	10.8	-	.4252	71	118	12
HPI505 109	10.9	-	.4291	71	118	12
HPI505 110	11	-	.4331	71	118	12
HPI505 111	11.1	-	.4370	71	118	12
HPI505 11113	11.113	7/16	.4375	71	118	12
HPI505 112	11.2	-	.4409	71	118	12
HPI505 113	11.3	-	.4449	71	118	12
HPI505 114	11.4	-	.4488	71	118	12
HPI505 115	11.5	-	.4528	71	118	12
HPI505 11509	11.509	29/64	.4531	71	118	12
HPI505 116	11.6	-	.4567	71	118	12
HPI505 117	11.7	-	.4606	71	118	12
HPI505 118	11.8	-	.4646	71	118	12
HPI505 119	11.9	-	.4685	71	118	12
HPI505 11908	11.908	15/32	.4688	71	118	12
HPI505 120	12	-	.4724	71	118	12
HPI505 121	12.1	-	.4764	77	124	14
HPI505 122	12.2	-	.4803	77	124	14
HPI505 123	12.3	-	.4843	77	124	14
HPI505 12304	12.304	31/64	.4844	77	124	14
HPI505 124	12.4	-	.4882	77	124	14

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

HPI505 | DOUBLE MARGIN INTERNAL COOLANT DRILL - DIN 6537L

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
HPI505 125	12.5	-	.4921	77	124	14
HPI505 126	12.6	-	.4961	77	124	14
HPI505 127	12.7	1/2	.5	77	124	14
HPI505 128	12.8	-	.5039	77	124	14
HPI505 129	12.9	-	.5079	77	124	14
HPI505 12903	12.903	-	.508	77	124	14
HPI505 130	13	-	.5118	77	124	14
HPI505 13096	13.096	33/64	.5156	77	124	14
HPI505 131	13.1	-	.5157	77	124	14
HPI505 132	13.2	-	.5197	77	124	14
HPI505 133	13.3	-	.5236	77	124	14
HPI505 134	13.4	-	.5276	77	124	14
HPI505 13494	13.494	17/32	.5313	77	124	14
HPI505 135	13.5	-	.5315	77	124	14
HPI505 137	13.7	-	.5394	77	124	14
HPI505 138	13.8	-	.5433	77	124	14
HPI505 13891	13.981	35/64	.5504	77	124	14
HPI505 140	14	-	.5512	77	124	14
HPI505 141	14.1	-	.5551	83	133	16
HPI505 142	14.2	-	.5591	83	133	16
HPI505 14288	14.288	9/16	.5625	83	133	16
HPI505 145	14.5	-	.5709	83	133	16
HPI505 146	14.6	-	.5748	83	133	16
HPI505 147	14.7	-	.5787	83	133	16
HPI505 148	14.8	-	.5827	83	133	16
HPI505 149	14.9	-	.5866	83	133	16
HPI505 150	15	-	.5906	83	133	16
HPI505 15081	15.081	19/32	.5937	83	133	16
HPI505 151	15.1	-	.5945	83	133	16
HPI505 152	15.2	-	.5984	83	133	16
HPI505 155	15.5	-	.6102	83	133	16
HPI505 156	15.6	-	.6142	83	133	16
HPI505 157	15.7	-	.6181	83	133	16
HPI505 158	15.8	-	.622	83	133	16
HPI505 15875	15.875	5/8	.625	83	133	16

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
HPI505 159	15.9	-	.626	83	133	16
HPI505 160	16	-	.6299	83	133	16
HPI505 16078	16.078	-	.633	93	143	18
HPI505 162	16.2	-	.6378	93	143	18
HPI505 164	16.4	-	.6457	93	143	18
HPI505 165	16.5	-	.6496	93	143	18
HPI505 166	16.6	-	.6535	93	143	18
HPI505 16667	16.667	21/32	.6562	93	143	18
HPI505 167	16.7	-	.6575	93	143	18
HPI505 170	17	-	.6693	93	143	18
HPI505 171	17.1	-	.6732	93	143	18
HPI505 172	17.2	-	.6772	93	143	18
HPI505 173	17.3	-	.6811	93	143	18
HPI505 17463	17.463	11/16	.6875	93	143	18
HPI505 175	17.5	-	.689	93	143	18
HPI505 176	17.6	-	.6929	93	143	18
HPI505 177	17.7	-	.6969	93	143	18
HPI505 178	17.8	-	.7008	93	143	18
HPI505 179	17.9	-	.7047	93	143	18
HPI505 180	18	-	.7087	93	143	18
HPI505 184	18.4	-	.7244	101	153	20
HPI505 185	18.5	-	.7283	101	153	20
HPI505 186	18.6	-	.7323	101	153	20
HPI505 188	18.8	-	.7402	101	153	20
HPI505 189	18.9	-	.7441	101	153	20
HPI505 190	19	-	.748	101	153	20
HPI505 1905	19.05	3/4	.75	101	153	20
HPI505 192	19.2	-	.7559	101	153	20
HPI505 19253	19.253	-	.758	101	153	20
HPI505 19446	19.446	49/64	.7656	101	153	20
HPI505 195	19.5	-	.7677	101	153	20
HPI505 197	19.7	-	.7756	101	153	20
HPI505 19844	19.844	25/32	.7813	101	153	20
HPI505 200	20	-	.7874	101	153	20

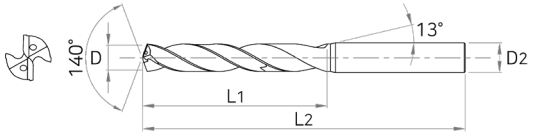
■ Applicable Working Material

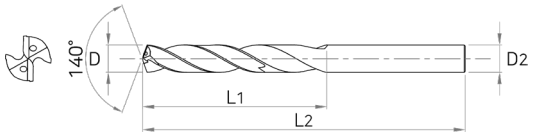
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

HPI508-N | DOUBLE MARGIN INTERNAL COOLANT DRILL - 8D







■ Tolerance

D		Shank Dia
D3	+0.002 ~ +0.012	h6
D3.1 ~ 6	+0.004 ~ +0.016	
D6.1 ~ 10	+0.006 ~ +0.021	
D10.1 ~ 18	+0.007 ~ +0.025	
D18.1 ~	+0.008 ~ +0.029	

CARBIDE | TiAlN | 8D | 30° HELIX | 140° | DATA P.709

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
HPI508 030N	3	-	.1181	43	80	6
HPI508 031N	3.1	-	.122	43	80	6
HPI508 03175N	3.175	1/8	.125	43	80	6
HPI508 032N	3.2	-	.126	43	80	6
HPI508 03264N	3.264	-	.1285	43	80	6
HPI508 033N	3.3	-	.1299	43	80	6
HPI508 034N	3.4	-	.1339	43	80	6
HPI508 035N	3.5	-	.1378	43	80	6
HPI508 03572N	3.572	9/64	.1406	43	80	6
HPI508 036N	3.6	-	.1417	43	80	6
HPI508 037N	3.7	-	.1457	43	80	6
HPI508 038N	3.8	-	.1496	49	87	6
HPI508 039N	3.9	-	.1535	49	87	6
HPI508 0397N	3.97	5/32	.1563	49	87	6
HPI508 040N	4	-	.1575	49	87	6
HPI508 04039N	4.039	-	.159	49	87	6
HPI508 041N	4.1	-	.1614	49	87	6
HPI508 042N	4.2	-	.1654	49	87	6
HPI508 043N	4.3	-	.1693	49	87	6
HPI508 04366N	4.366	-	.1719	49	87	6
HPI508 044N	4.4	-	.1732	49	87	6
HPI508 045N	4.5	-	.1772	49	87	6
HPI508 046N	4.6	-	.1811	49	87	6
HPI508 047N	4.7	-	.185	49	87	6

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
HPI508 04763N	4.763	3/16	.1875	56	94	6
HPI508 048N	4.8	-	.189	56	94	6
HPI508 049N	4.9	-	.1929	56	94	6
HPI508 050N	5	-	.1969	56	94	6
HPI508 051N	5.1	-	.2008	56	94	6
HPI508 05159N	5.159	13/64	.2031	56	94	6
HPI508 052N	5.2	-	.2047	56	94	6
HPI508 053N	5.3	-	.2087	56	94	6
HPI508 054N	5.4	-	.2126	56	94	6
HPI508 055N	5.5	-	.2165	56	94	6
HPI508 05558N	5.558	7/32	.2188	56	94	6
HPI508 056N	5.6	-	.2205	56	94	6
HPI508 057N	5.7	-	.2244	56	94	6
HPI508 058N	5.8	-	.2283	56	94	6
HPI508 059N	5.9	-	.2323	56	94	6
HPI508 05953N	5.953	15/64	.2344	56	94	6
HPI508 060N	6	-	.2362	65	94	6
HPI508 061N	6.1	-	.2402	67	105	8
HPI508 062N	6.2	-	.2441	67	105	8
HPI508 063N	6.3	-	.248	67	105	8
HPI508 0635N	6.35	1/4	.2500	67	105	8
HPI508 064N	6.4	-	.252	67	105	8
HPI508 065N	6.5	-	.2559	67	105	8
HPI508 066N	6.6	-	.2598	67	105	8

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

HPI508-N | DOUBLE MARGIN INTERNAL COOLANT DRILL - 8D

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
HPI508 067N	6.7	-	.2638	67	105	8
HPI508 06747N	6.747	17/64	.2656	67	105	8
HPI508 068N	6.8	-	.2677	67	105	8
HPI508 069N	6.9	-	.2717	67	105	8
HPI508 070N	7	-	.2756	76	116	8
HPI508 071N	7.1	-	.2795	76	116	8
HPI508 07145N	7.145	9/32	.2813	76	116	8
HPI508 072N	7.2	-	.2835	76	116	8
HPI508 073N	7.3	-	.2874	76	116	8
HPI508 074N	7.4	-	.2913	76	116	8
HPI508 075N	7.5	-	.2953	76	116	8
HPI508 07541N	7.541	19/64	.2969	76	116	8
HPI508 076N	7.6	-	.2992	76	116	8
HPI508 077N	7.7	-	.3031	76	116	8
HPI508 078N	7.8	-	.3071	76	116	8
HPI508 079N	7.9	-	.311	76	116	8
HPI508 07938N	7.938	5/16	.3125	76	116	8
HPI508 080N	8	-	.315	76	116	8
HPI508 081N	8.1	-	.3189	87	131	10
HPI508 082N	8.2	-	.3228	87	131	10
HPI508 083N	8.3	-	.3268	87	131	10
HPI508 08334N	8.334	21/64	.3281	87	131	10
HPI508 084N	8.4	-	.3307	87	131	10
HPI508 085N	8.5	-	.3346	87	131	10
HPI508 086N	8.6	-	.3386	87	131	10
HPI508 087N	8.7	-	.3425	87	131	10
HPI508 08733N	8.733	11/32	.3438	87	131	10
HPI508 088N	8.8	-	.3465	87	131	10
HPI508 089N	8.9	-	.3504	87	131	10
HPI508 090N	9	-	.3543	87	131	10
HPI508 091N	9.1	-	.3583	95	139	10
HPI508 09129N	9.129	23/64	.3594	95	139	10
HPI508 092N	9.2	-	.3622	95	139	10
HPI508 093N	9.3	-	.3661	95	139	10
HPI508 094N	9.4	-	.3701	95	139	10
HPI508 095N	9.5	-	.374	95	139	10
HPI508 09525N	9.525	3/8	.375	95	139	10
HPI508 096N	9.6	-	.378	95	139	10
HPI508 097N	9.7	-	.3819	95	139	10
HPI508 098N	9.8	-	.3858	95	139	10
HPI508 099N	9.9	-	.3898	95	139	10

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
HPI508 09921N	9.921	25/64	.3906	95	139	10
HPI508 100N	10	-	.3937	95	139	10
HPI508 101N	10.1	-	.3976	106	155	12
HPI508 102N	10.2	-	.4016	106	155	12
HPI508 103N	10.3	-	.4055	106	155	12
HPI508 1032N	10.32	13/32	.4063	106	155	12
HPI508 104N	10.4	-	.4094	106	155	12
HPI508 105N	10.5	-	.4134	106	155	12
HPI508 107N	10.7	-	.4213	106	155	12
HPI508 10716N	10.716	27/64	.4219	106	155	12
HPI508 108N	10.8	-	.4252	106	155	12
HPI508 109N	10.9	-	.4291	106	155	12
HPI508 110N	11	-	.4331	106	155	12
HPI508 111N	11.1	-	.437	114	163	12
HPI508 11113N	11.113	7/16	.4375	114	163	12
HPI508 112N	11.2	-	.4409	114	163	12
HPI508 113N	11.3	-	.4449	114	163	12
HPI508 114N	11.4	-	.4488	114	163	12
HPI508 115N	11.5	-	.4528	114	163	12
HPI508 11509N	11.509	29/64	.4531	114	163	12
HPI508 116N	11.6	-	.4567	114	163	12
HPI508 117N	11.7	-	.4606	114	163	12
HPI508 118N	11.8	-	.4646	114	163	12
HPI508 119N	11.9	-	.4685	114	163	12
HPI508 11908N	11.908	15/32	.4688	114	163	12
HPI508 120N	12	-	.4724	114	163	12
HPI508 12304N	12.304	31/64	.4844	133	182	14
HPI508 125N	12.5	-	.4921	133	182	14
HPI508 127N	12.7	1/2	.5	133	182	14
HPI508 128N	12.8	-	.5039	133	182	14
HPI508 130N	13	-	.5118	133	182	14
HPI508 13494N	13.494	-	.5313	133	182	14
HPI508 135N	13.5	-	.5315	133	182	14
HPI508 140N	14	-	.5512	133	182	14
HPI508 14288N	14.288	9/16	.5625	152	204	16
HPI508 145N	14.5	-	.5709	152	204	16
HPI508 150N	15	-	.5906	152	204	16
HPI508 151N	15.1	-	.5945	152	204	16
HPI508 152N	15.2	-	.5984	152	204	16
HPI508 153N	15.3	-	.6024	152	204	16
HPI508 155N	15.5	-	.6102	152	204	16

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

HPI508-N | DOUBLE MARGIN INTERNAL COOLANT DRILL - 8D

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
HPI508 158N	15.8	-	.622	152	204	16
HPI508 15875N	15.875	5/8	.625	152	204	16
HPI508 160N	16	-	.6299	152	204	16
HPI508 16078N	16.078	-	.633	171	223	18
HPI508 162N	16.2	-	.6378	171	223	18
HPI508 165N	16.5	-	.6496	171	223	18
HPI508 170N	17	-	.6693	171	223	18
HPI508 17463N	17.463	11/16	.6875	171	223	18

EDP No	SIZES (mm)					
	D			L1	L2	D2
	mm	fraction	inch			
HPI508 175N	17.5	-	.689	171	223	18
HPI508 180N	18	-	.7087	171	223	18
HPI508 185N	18.5	-	.7283	191	244	20
HPI508 190N	19	-	.748	191	244	20
HPI508 1905N	19.05	3/4	.75	191	244	20
HPI508 19253N	19.253	-	.758	191	244	20
HPI508 198N	19.8	-	.7795	191	244	20
HPI508 200N	20	-	.7874	191	244	20

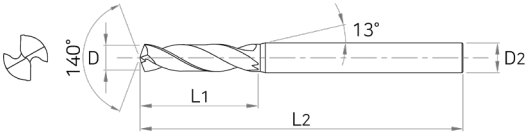
■ Applicable Working Material

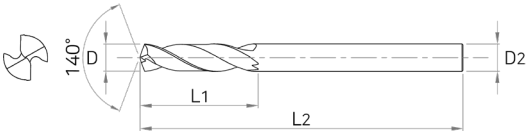
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

P503A(F) | HIGH SPEED DRILL - DIN6537K







■ Tolerance

D		Shank Dia
D3	+0.002 ~ +0.012	h6
D3.1 ~ D6	+0.004 ~ +0.016	
D6.1 ~ D10	+0.006 ~ +0.021	
D10.1 ~ D16	+0.007 ~ +0.025	

DIN 6537K | CARBIDE | TiAlN | 3D | 30° HELIX | 140° | DATA P.709

EDP No	EDP No Weldon shank	SIZES (mm) D	L1	L2	D2
P503A 030	P503F 030	3	20	62	6
P503A 031	P503F 031	3.1	20	62	6
P503A 032	P503F 032	3.2	20	62	6
P503A 033	P503F 033	3.3	20	62	6
P503A 034	P503F 034	3.4	20	62	6
P503A 035	P503F 035	3.5	20	62	6
P503A 036	P503F 036	3.6	20	62	6
P503A 037	P503F 037	3.7	20	62	6
P503A 038	P503F 038	3.8	24	66	6
P503A 039	P503F 039	3.9	24	66	6
P503A 040	P503F 040	4	24	66	6
P503A 041	P503F 041	4.1	24	66	6
P503A 042	P503F 042	4.2	24	66	6
P503A 043	P503F 043	4.3	24	66	6
P503A 044	P503F 044	4.4	24	66	6
P503A 045	P503F 045	4.5	24	66	6
P503A 046	P503F 046	4.6	24	66	6
P503A 047	P503F 047	4.7	24	66	6
P503A 048	P503F 048	4.8	28	66	6
P503A 049	P503F 049	4.9	28	66	6
P503A 050	P503F 050	5	28	66	6
P503A 051	P503F 051	5.1	28	66	6
P503A 052	P503F 052	5.2	28	66	6
P503A 053	P503F 053	5.3	28	66	6

EDP No	EDP No Weldon shank	SIZES (mm) D	L1	L2	D2
P503A 054	P503F 054	5.4	28	66	6
P503A 055	P503F 055	5.5	28	66	6
P503A 056	P503F 056	5.6	28	66	6
P503A 057	P503F 057	5.7	28	66	6
P503A 058	P503F 058	5.8	28	66	6
P503A 059	P503F 059	5.9	28	66	6
P503A 060	P503F 060	6	28	66	6
P503A 061	P503F 061	6.1	34	79	8
P503A 062	P503F 062	6.2	34	79	8
P503A 063	P503F 063	6.3	34	79	8
P503A 064	P503F 064	6.4	34	79	8
P503A 065	P503F 065	6.5	34	79	8
P503A 066	P503F 066	6.6	34	79	8
P503A 067	P503F 067	6.7	34	79	8
P503A 068	P503F 068	6.8	34	79	8
P503A 069	P503F 069	6.9	34	79	8
P503A 070	P503F 070	7	34	79	8
P503A 071	P503F 071	7.1	41	79	8
P503A 072	P503F 072	7.2	41	79	8
P503A 073	P503F 073	7.3	41	79	8
P503A 074	P503F 074	7.4	41	79	8
P503A 075	P503F 075	7.5	41	79	8
P503A 076	P503F 076	7.6	41	79	8
P503A 077	P503F 077	7.7	41	79	8

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel SKD61 ~HRc55	Hardened Steel SKD11 HRc55~	Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

P503A(F) | HIGH SPEED DRILL - DIN6537K

EDP No	EDP No Weldon shank	SIZES (mm) D	L1	L2	D2
P503A 078	P503F 078	7.8	41	79	8
P503A 079	P503F 079	7.9	41	79	8
P503A 080	P503F 080	8	41	79	8
P503A 081	P503F 081	8.1	47	89	10
P503A 082	P503F 082	8.2	47	89	10
P503A 083	P503F 083	8.3	47	89	10
P503A 084	P503F 084	8.4	47	89	10
P503A 085	P503F 085	8.5	47	89	10
P503A 086	P503F 086	8.6	47	89	10
P503A 087	P503F 087	8.7	47	89	10
P503A 088	P503F 088	8.8	47	89	10
P503A 089	P503F 089	8.9	47	89	10
P503A 090	P503F 090	9	47	89	10
P503A 091	P503F 091	9.1	47	89	10
P503A 092	P503F 092	9.2	47	89	10
P503A 093	P503F 093	9.3	47	89	10
P503A 094	P503F 094	9.4	47	89	10
P503A 095	P503F 095	9.5	47	89	10
P503A 096	P503F 096	9.6	47	89	10
P503A 097	P503F 097	9.7	47	89	10
P503A 098	P503F 098	9.8	47	89	10
P503A 099	P503F 099	9.9	47	89	10
P503A 100	P503F 100	10	47	89	10
P503A 101	P503F 101	10.1	55	102	12
P503A 102	P503F 102	10.2	55	102	12
P503A 103	P503F 103	10.3	55	102	12
P503A 104	P503F 104	10.4	55	102	12
P503A 105	P503F 105	10.5	55	102	12
P503A 106	P503F 106	10.6	55	102	12
P503A 107	P503F 107	10.7	55	102	12
P503A 108	P503F 108	10.8	55	102	12
P503A 109	P503F 109	10.9	55	102	12
P503A 110	P503F 110	11	55	102	12
P503A 111	P503F 111	11.1	55	102	12
P503A 112	P503F 112	11.2	55	102	12
P503A 113	P503F 113	11.3	55	102	12
P503A 114	P503F 114	11.4	55	102	12
P503A 115	P503F 115	11.5	55	102	12
P503A 116	P503F 116	11.6	55	102	12
P503A 117	P503F 117	11.7	55	102	12
P503A 118	P503F 118	11.8	55	102	12

EDP No	EDP No Weldon shank	SIZES (mm) D	L1	L2	D2
P503A 119	P503F 119	11.9	55	102	12
P503A 120	P503F 120	12	55	102	12
P503A 121	P503F 121	12.1	60	107	14
P503A 122	P503F 122	12.2	60	107	14
P503A 123	P503F 123	12.3	60	107	14
P503A 124	P503F 124	12.4	60	107	14
P503A 125	P503F 125	12.5	60	107	14
P503A 126	P503F 126	12.6	60	107	14
P503A 127	P503F 127	12.7	60	107	14
P503A 128	P503F 128	12.8	60	107	14
P503A 129	P503F 129	12.9	60	107	14
P503A 130	P503F 130	13	60	107	14
P503A 131	P503F 131	13.1	60	107	14
P503A 132	P503F 132	13.2	60	107	14
P503A 133	P503F 133	13.3	60	107	14
P503A 134	P503F 134	13.4	60	107	14
P503A 135	P503F 135	13.5	60	107	14
P503A 136	P503F 136	13.6	60	107	14
P503A 137	P503F 137	13.7	60	107	14
P503A 138	P503F 138	13.8	60	107	14
P503A 139	P503F 139	13.9	60	107	14
P503A 140	P503F 140	14	60	107	14
P503A 141	P503F 141	14.1	65	115	16
P503A 142	P503F 142	14.2	65	115	16
P503A 143	P503F 143	14.3	65	115	16
P503A 144	P503F 144	14.4	65	115	16
P503A 145	P503F 145	14.5	65	115	16
P503A 146	P503F 146	14.6	65	115	16
P503A 147	P503F 147	14.7	65	115	16
P503A 148	P503F 148	14.8	65	115	16
P503A 149	P503F 149	14.9	65	115	16
P503A 150	P503F 150	15	65	115	16
P503A 151	P503F 151	15.1	65	115	16
P503A 152	P503F 152	15.2	65	115	16
P503A 153	P503F 153	15.3	65	115	16
P503A 154	P503F 154	15.4	65	115	16
P503A 155	P503F 155	15.5	65	115	16
P503A 156	P503F 156	15.6	65	115	16
P503A 157	P503F 157	15.7	65	115	16
P503A 158	P503F 158	15.8	65	115	16
P503A 159	P503F 159	15.9	65	115	16

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel SKD61 ~HRc55	Hardened Steel SKD11 HRc55~	Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

P503A(F) | HIGH SPEED DRILL - DIN6537K

EDP No	EDP No Weldon shank	SIZES (mm) D	L1	L2	D2
P503A 160	P503F 160	16	65	115	16
P503A 161	P503F 161	16.1	73	123	18
P503A 163	P503F 163	16.3	73	123	18
P503A 165	P503F 165	16.5	73	123	18
P503A 170	P503F 170	17	73	123	18
P503A 171	P503F 171	17.1	73	123	18
P503A 172	P503F 172	17.2	73	123	18
P503A 175	P503F 175	17.5	73	123	18
P503A 177	P503F 177	17.7	73	123	18
P503A 178	P503F 178	17.8	73	123	18

EDP No	EDP No Weldon shank	SIZES (mm) D	L1	L2	D2
P503A 180	P503F 180	18	73	123	18
P503A 181	P503F 181	18.1	79	131	20
P503A 182	P503F 182	18.2	79	131	20
P503A 185	P503F 185	18.5	79	131	20
P503A 190	P503F 190	19	79	131	20
P503A 191	P503F 191	19.1	79	131	20
P503A 195	P503F 195	19.5	79	131	20
P503A 197	P503F 197	19.7	79	131	20
P503A 200	P503F 200	20	79	131	20

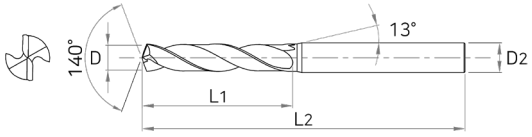
■ Applicable Working Material

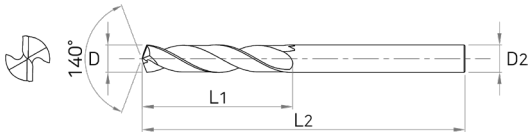
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel SKD61 ~HRc55	Hardened Steel SKD11 HRc55~	Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

P505A(F) | HIGH SPEED DRILL - DIN 6537L







■ Tolerance

D		Shank Dia
D3	+0.002 ~ +0.012	h6
D3.1 ~ 6	+0.004 ~ +0.016	
D6.1 ~ 10	+0.006 ~ +0.021	
D10.1 ~ 18	+0.007 ~ +0.025	
D18.1 ~	+0.008 ~ +0.029	

DIN 3537L | CARBIDE | TiAlN | 5D | 30° HELIX | 140° | DATA P.709

EDP No	EDP No Weldon shank	SIZES (mm) D	L1	L2	D2
P505A 030	P505F 030	3	28	66	6
P505A 031	P505F 031	3.1	28	66	6
P505A 032	P505F 032	3.2	28	66	6
P505A 033	P505F 033	3.3	28	66	6
P505A 034	P505F 034	3.4	28	66	6
P505A 035	P505F 035	3.5	28	66	6
P505A 036	P505F 036	3.6	28	66	6
P505A 037	P505F 037	3.7	28	66	6
P505A 038	P505F 038	3.8	36	74	6
P505A 039	P505F 039	3.9	36	74	6
P505A 040	P505F 040	4	36	74	6
P505A 041	P505F 041	4.1	36	74	6
P505A 042	P505F 042	4.2	36	74	6
P505A 043	P505F 043	4.3	36	74	6
P505A 044	P505F 044	4.4	36	74	6
P505A 045	P505F 045	4.5	36	74	6
P505A 046	P505F 046	4.6	36	74	6
P505A 047	P505F 047	4.7	36	74	6
P505A 048	P505F 048	4.8	44	82	6
P505A 049	P505F 049	4.9	44	82	6
P505A 050	P505F 050	5	44	82	6
P505A 051	P505F 051	5.1	44	82	6
P505A 052	P505F 052	5.2	44	82	6
P505A 053	P505F 053	5.3	44	82	6

EDP No	EDP No Weldon shank	SIZES (mm) D	L1	L2	D2
P505A 054	P505F 054	5.4	44	82	6
P505A 055	P505F 055	5.5	44	82	6
P505A 056	P505F 056	5.6	44	82	6
P505A 057	P505F 057	5.7	44	82	6
P505A 058	P505F 058	5.8	44	82	6
P505A 059	P505F 059	5.9	44	82	6
P505A 060	P505F 060	6	44	82	6
P505A 061	P505F 061	6.1	53	91	8
P505A 062	P505F 062	6.2	53	91	8
P505A 063	P505F 063	6.3	53	91	8
P505A 064	P505F 064	6.4	53	91	8
P505A 065	P505F 065	6.5	53	91	8
P505A 066	P505F 066	6.6	53	91	8
P505A 067	P505F 067	6.7	53	91	8
P505A 068	P505F 068	6.8	53	91	8
P505A 069	P505F 069	6.9	53	91	8
P505A 070	P505F 070	7	53	91	8
P505A 071	P505F 071	7.1	53	91	8
P505A 072	P505F 072	7.2	53	91	8
P505A 073	P505F 073	7.3	53	91	8
P505A 074	P505F 074	7.4	53	91	8
P505A 075	P505F 075	7.5	53	91	8
P505A 076	P505F 076	7.6	53	91	8
P505A 077	P505F 077	7.7	53	91	8

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel SKD61 ~HRc55	Hardened Steel SKD11 HRc55~	Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

P505A(F) | HIGH SPEED DRILL - DIN 6537L

EDP No	EDP No Weldon shank	SIZES (mm) D	L1	L2	D2
P505A 078	P505F 078	7.8	53	91	8
P505A 079	P505F 079	7.9	53	91	8
P505A 080	P505F 080	8	53	91	8
P505A 081	P505F 081	8.1	61	103	10
P505A 082	P505F 082	8.2	61	103	10
P505A 083	P505F 083	8.3	61	103	10
P505A 084	P505F 084	8.4	61	103	10
P505A 085	P505F 085	8.5	61	103	10
P505A 086	P505F 086	8.6	61	103	10
P505A 087	P505F 087	8.7	61	103	10
P505A 088	P505F 088	8.8	61	103	10
P505A 089	P505F 089	8.9	61	103	10
P505A 090	P505F 090	9	61	103	10
P505A 091	P505F 091	9.1	61	103	10
P505A 092	P505F 092	9.2	61	103	10
P505A 093	P505F 093	9.3	61	103	10
P505A 094	P505F 094	9.4	61	103	10
P505A 095	P505F 095	9.5	61	103	10
P505A 096	P505F 096	9.6	61	103	10
P505A 097	P505F 097	9.7	61	103	10
P505A 098	P505F 098	9.8	61	103	10
P505A 099	P505F 099	9.9	61	103	10
P505A 100	P505F 100	10	61	103	10
P505A 101	P505F 101	10.1	71	118	12
P505A 102	P505F 102	10.2	71	118	12
P505A 103	P505F 103	10.3	71	118	12
P505A 104	P505F 104	10.4	71	118	12
P505A 105	P505F 105	10.5	71	118	12
P505A 106	P505F 106	10.6	71	118	12
P505A 107	P505F 107	10.7	71	118	12
P505A 108	P505F 108	10.8	71	118	12
P505A 109	P505F 109	10.9	71	118	12
P505A 110	P505F 110	11	71	118	12
P505A 111	P505F 111	11.1	71	118	12
P505A 112	P505F 112	11.2	71	118	12
P505A 113	P505F 113	11.3	71	118	12
P505A 114	P505F 114	11.4	71	118	12
P505A 115	P505F 115	11.5	71	118	12
P505A 116	P505F 116	11.6	71	118	12
P505A 117	P505F 117	11.7	71	118	12
P505A 118	P505F 118	11.8	71	118	12

EDP No	EDP No Weldon shank	SIZES (mm) D	L1	L2	D2
P505A 119	P505F 119	11.9	71	118	12
P505A 120	P505F 120	12	71	118	12
P505A 121	P505F 121	12.1	77	124	14
P505A 122	P505F 122	12.2	77	124	14
P505A 123	P505F 123	12.3	77	124	14
P505A 124	P505F 124	12.4	77	124	14
P505A 125	P505F 125	12.5	77	124	14
P505A 126	P505F 126	12.6	77	124	14
P505A 127	P505F 127	12.7	77	124	14
P505A 128	P505F 128	12.8	77	124	14
P505A 129	P505F 129	12.9	77	124	14
P505A 130	P505F 130	13	77	124	14
P505A 131	P505F 131	13.1	77	124	14
P505A 132	P505F 132	13.2	77	124	14
P505A 133	P505F 133	13.3	77	124	14
P505A 134	P505F 134	13.4	77	124	14
P505A 135	P505F 135	13.5	77	124	14
P505A 136	P505F 136	13.6	77	124	14
P505A 137	P505F 137	13.7	77	124	14
P505A 138	P505F 138	13.8	77	124	14
P505A 139	P505F 139	13.9	77	124	14
P505A 140	P505F 140	14	77	124	14
P505A 141	P505F 141	14.1	83	133	16
P505A 142	P505F 142	14.2	83	133	16
P505A 143	P505F 143	14.3	83	133	16
P505A 144	P505F 144	14.4	83	133	16
P505A 145	P505F 145	14.5	83	133	16
P505A 146	P505F 146	14.6	83	133	16
P505A 147	P505F 147	14.7	83	133	16
P505A 148	P505F 148	14.8	83	133	16
P505A 149	P505F 149	14.9	83	133	16
P505A 150	P505F 150	15	83	133	16
P505A 151	P505F 151	15.1	83	133	16
P505A 152	P505F 152	15.2	83	133	16
P505A 153	P505F 153	15.3	83	133	16
P505A 154	P505F 154	15.4	83	133	16
P505A 155	P505F 155	15.5	83	133	16
P505A 156	P505F 156	15.6	83	133	16
P505A 157	P505F 157	15.7	83	133	16
P505A 158	P505F 158	15.8	83	133	16
P505A 159	P505F 159	15.9	83	133	16

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel SKD61 ~HRc55	Hardened Steel SKD11 HRc55~	Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

P505A(F) | HIGH SPEED DRILL - DIN 6537L

EDP No	EDP No	SIZES (mm)			
	Weldon shank	D	L1	L2	D2
P505A 160	P505F 160	16	83	133	16
P505A 161	P505F 161	16.1	93	143	18
P505A 162	P505F 162	16.2	93	143	18
P505A 163	P505F 163	16.3	93	143	18
P505A 164	P505F 164	16.4	93	143	18
P505A 165	P505F 165	16.5	93	143	18
P505A 166	P505F 166	16.6	93	143	18
P505A 167	P505F 167	16.7	93	143	18
P505A 168	P505F 168	16.8	93	143	18
P505A 169	P505F 169	16.9	93	143	18
P505A 170	P505F 170	17	93	143	18
P505A 171	P505F 171	17.1	93	143	18
P505A 172	P505F 172	17.2	93	143	18
P505A 173	P505F 173	17.3	93	143	18
P505A 174	P505F 174	17.4	93	143	18
P505A 175	P505F 175	17.5	93	143	18
P505A 176	P505F 176	17.6	93	143	18
P505A 177	P505F 177	17.7	93	143	18
P505A 178	P505F 178	17.8	93	143	18
P505A 179	P505F 179	17.9	93	143	18
P505A 180	P505F 180	18	93	143	18

EDP No	EDP No	SIZES (mm)			
	Weldon shank	D	L1	L2	D2
P505A 181	P505F 181	18.1	101	153	20
P505A 182	P505F 182	18.2	101	153	20
P505A 183	P505F 183	18.3	101	153	20
P505A 184	P505F 184	18.4	101	153	20
P505A 185	P505F 185	18.5	101	153	20
P505A 186	P505F 186	18.6	101	153	20
P505A 187	P505F 187	18.7	101	153	20
P505A 188	P505F 188	18.8	101	153	20
P505A 189	P505F 189	18.9	101	153	20
P505A 190	P505F 190	19	101	153	20
P505A 191	P505F 191	19.1	101	153	20
P505A 192	P505F 192	19.2	101	153	20
P505A 193	P505F 193	19.3	101	153	20
P505A 194	P505F 194	19.4	101	153	20
P505A 195	P505F 195	19.5	101	153	20
P505A 196	P505F 196	19.6	101	153	20
P505A 197	P505F 197	19.7	101	153	20
P505A 198	P505F 198	19.8	101	153	20
P505A 199	P505F 199	19.9	101	153	20
P505A 200	P505F 200	20	101	153	20

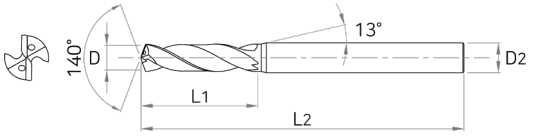
■ Applicable Working Material

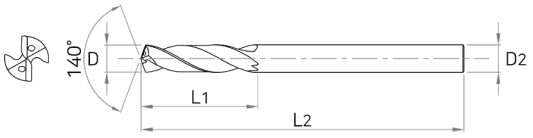
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

PI503A(F) | HIGH SPEED INTERNAL COOLANT DRILL - DIN 6537K







■ Tolerance

D		Shank Dia
D3	+0.002 ~ +0.012	h6
D3.1 ~ 6	+0.004 ~ +0.016	
D6.1 ~ 10	+0.006 ~ +0.021	
D10.1 ~ 18	+0.007 ~ +0.025	
D18.1 ~	+0.008 ~ +0.029	

DIN 6537K | CARBIDE | TiAlN | 3D | 30° HELIX | 140° | DATA P.709

EDP No	EDP No Weldon shank	SIZES (mm) D	L1	L2	D2
PI503A 030	PI503F 030	3	20	62	6
PI503A 031	PI503F 031	3.1	20	62	6
PI503A 032	PI503F 032	3.2	20	62	6
PI503A 033	PI503F 033	3.3	20	62	6
PI503A 034	PI503F 034	3.4	20	62	6
PI503A 035	PI503F 035	3.5	20	62	6
PI503A 036	PI503F 036	3.6	20	62	6
PI503A 037	PI503F 037	3.7	20	62	6
PI503A 038	PI503F 038	3.8	24	66	6
PI503A 039	PI503F 039	3.9	24	66	6
PI503A 040	PI503F 040	4	24	66	6
PI503A 041	PI503F 041	4.1	24	66	6
PI503A 042	PI503F 042	4.2	24	66	6
PI503A 043	PI503F 043	4.3	24	66	6
PI503A 044	PI503F 044	4.4	24	66	6
PI503A 045	PI503F 045	4.5	24	66	6
PI503A 046	PI503F 046	4.6	24	66	6
PI503A 047	PI503F 047	4.7	24	66	6
PI503A 048	PI503F 048	4.8	28	66	6
PI503A 049	PI503F 049	4.9	28	66	6
PI503A 050	PI503F 050	5	28	66	6
PI503A 051	PI503F 051	5.1	28	66	6
PI503A 052	PI503F 052	5.2	28	66	6
PI503A 053	PI503F 053	5.3	28	66	6

EDP No	EDP No Weldon shank	SIZES (mm) D	L1	L2	D2
PI503A 054	PI503F 054	5.4	28	66	6
PI503A 055	PI503F 055	5.5	28	66	6
PI503A 056	PI503F 056	5.6	28	66	6
PI503A 057	PI503F 057	5.7	28	66	6
PI503A 058	PI503F 058	5.8	28	66	6
PI503A 059	PI503F 059	5.9	28	66	6
PI503A 060	PI503F 060	6	28	66	6
PI503A 061	PI503F 061	6.1	34	79	8
PI503A 062	PI503F 062	6.2	34	79	8
PI503A 063	PI503F 063	6.3	34	79	8
PI503A 064	PI503F 064	6.4	34	79	8
PI503A 065	PI503F 065	6.5	34	79	8
PI503A066	PI503F 066	6.6	34	79	8
PI503A067	PI503F 067	6.7	34	79	8
PI503A068	PI503F 068	6.8	34	79	8
PI503A069	PI503F 069	6.9	34	79	8
PI503A070	PI503F 070	7	34	79	8
PI503A071	PI503F 071	7.1	41	79	8
PI503A072	PI503F 072	7.2	41	79	8
PI503A073	PI503F 073	7.3	41	79	8
PI503A074	PI503F 074	7.4	41	79	8
PI503A075	PI503F 075	7.5	41	79	8
PI503A076	PI503F 076	7.6	41	79	8
PI503A077	PI503F 077	7.7	41	79	8

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel SKD61 ~HRc55	Hardened Steel SKD11 HRc55~	Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

PI503A(F) | HIGH SPEED INTERNAL COOLANT DRILL - DIN 6537K

EDP No	EDP No	SIZES (mm)			
	Weldon shank	D	L1	L2	D2
PI503A 078	PI503F 078	7.8	41	79	8
PI503A 079	PI503F 079	7.9	41	79	8
PI503A 080	PI503F 080	8	41	79	8
PI503A 081	PI503F 081	8.1	47	89	10
PI503A 082	PI503F 082	8.2	47	89	10
PI503A 083	PI503F 083	8.3	47	89	10
PI503A 084	PI503F 084	8.4	47	89	10
PI503A 085	PI503F 085	8.5	47	89	10
PI503A 086	PI503F 086	8.6	47	89	10
PI503A 087	PI503F 087	8.7	47	89	10
PI503A 088	PI503F 088	8.8	47	89	10
PI503A 089	PI503F 089	8.9	47	89	10
PI503A 090	PI503F 090	9	47	89	10
PI503A 091	PI503F 091	9.1	47	89	10
PI503A 092	PI503F 092	9.2	47	89	10
PI503A 093	PI503F 093	9.3	47	89	10
PI503A 094	PI503F 094	9.4	47	89	10
PI503A 095	PI503F 095	9.5	47	89	10
PI503A 096	PI503F 096	9.6	47	89	10
PI503A 097	PI503F 097	9.7	47	89	10
PI503A 098	PI503F 098	9.8	47	89	10
PI503A 099	PI503F 099	9.9	47	89	10
PI503A 100	PI503F 100	10	47	89	10
PI503A 101	PI503F 101	10.1	55	102	12
PI503A 102	PI503F 102	10.2	55	102	12
PI503A 103	PI503F 103	10.3	55	102	12
PI503A 104	PI503F 104	10.4	55	102	12
PI503A 105	PI503F 105	10.5	55	102	12
PI503A 106	PI503F 106	10.6	55	102	12
PI503A 107	PI503F 107	10.7	55	102	12
PI503A 108	PI503F 108	10.8	55	102	12
PI503A 109	PI503F 109	10.9	55	102	12
PI503A 110	PI503F 110	11	55	102	12
PI503A 111	PI503F 111	11.1	55	102	12
PI503A 112	PI503F 112	11.2	55	102	12
PI503A 113	PI503F 113	11.3	55	102	12
PI503A 114	PI503F 114	11.4	55	102	12
PI503A 115	PI503F 115	11.5	55	102	12
PI503A 116	PI503F 116	11.6	55	102	12
PI503A 117	PI503F 117	11.7	55	102	12
PI503A 118	PI503F 118	11.8	55	102	12

EDP No	EDP No	SIZES (mm)			
	Weldon shank	D	L1	L2	D2
PI503A 119	PI503F 119	11.9	55	102	12
PI503A 120	PI503F 120	12	55	102	12
PI503A 121	PI503F 121	12.1	60	107	14
PI503A 122	PI503F 122	12.2	60	107	14
PI503A 123	PI503F 123	12.3	60	107	14
PI503A 124	PI503F 124	12.4	60	107	14
PI503A 125	PI503F 125	12.5	60	107	14
PI503A 126	PI503F 126	12.6	60	107	14
PI503A 127	PI503F 127	12.7	60	107	14
PI503A 128	PI503F 128	12.8	60	107	14
PI503A 129	PI503F 129	12.9	60	107	14
PI503A 130	PI503F 130	13	60	107	14
PI503A 131	PI503F 131	13.1	60	107	14
PI503A 132	PI503F 132	13.2	60	107	14
PI503A 133	PI503F 133	13.3	60	107	14
PI503A 134	PI503F 134	13.4	60	107	14
PI503A 135	PI503F 135	13.5	60	107	14
PI503A 136	PI503F 136	13.6	60	107	14
PI503A 137	PI503F 137	13.7	60	107	14
PI503A 138	PI503F 138	13.8	60	107	14
PI503A 139	PI503F 139	13.9	60	107	14
PI503A 140	PI503F 140	14	60	107	14
PI503A 141	PI503F 141	14.1	65	115	16
PI503A 142	PI503F 142	14.2	65	115	16
PI503A 143	PI503F 143	14.3	65	115	16
PI503A 144	PI503F 144	14.4	65	115	16
PI503A 145	PI503F 145	14.5	65	115	16
PI503A 146	PI503F 146	14.6	65	115	16
PI503A 147	PI503F 147	14.7	65	115	16
PI503A 148	PI503F 148	14.8	65	115	16
PI503A 149	PI503F 149	14.9	65	115	16
PI503A 150	PI503F 150	15	65	115	16
PI503A 151	PI503F 151	15.1	65	115	16
PI503A 152	PI503F 152	15.2	65	115	16
PI503A 153	PI503F 153	15.3	65	115	16
PI503A 154	PI503F 154	15.4	65	115	16
PI503A 155	PI503F 155	15.5	65	115	16
PI503A 156	PI503F 156	15.6	65	115	16
PI503A 157	PI503F 157	15.7	65	115	16
PI503A 158	PI503F 158	15.8	65	115	16
PI503A 159	PI503F 159	15.9	65	115	16

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

PI503A(F) | HIGH SPEED INTERNAL COOLANT DRILL - DIN 6537K

EDP No	EDP No	SIZES (mm)			
	Weldon shank	D	L1	L2	D2
PI503A 160	PI503F 160	16	65	115	16
PI503A 161	PI503F 161	16.1	73	123	18
PI503A 163	PI503F 163	16.3	73	123	18
PI503A 165	PI503F 165	16.5	73	123	18
PI503A 170	PI503F 170	17	73	123	18
PI503A 171	PI503F 171	17.1	73	123	18
PI503A 172	PI503F 172	17.2	73	123	18
PI503A 175	PI503F 175	17.5	73	123	18
PI503A 177	PI503F 177	17.7	73	123	18
PI503A 178	PI503F 178	17.8	73	123	18

EDP No	EDP No	SIZES (mm)			
	Weldon shank	D	L1	L2	D2
PI503A 180	PI503F 180	18	73	123	18
PI503A 181	PI503F 181	18.1	79	131	20
PI503A 182	PI503F 182	18.2	79	131	20
PI503A 185	PI503F 185	18.5	79	131	20
PI503A 190	PI503F 190	19	79	131	20
PI503A 191	PI503F 191	19.1	79	131	20
PI503A 195	PI503F 195	19.5	79	131	20
PI503A 197	PI503F 197	19.7	79	131	20
PI503A 200	PI503F 200	20	79	131	20

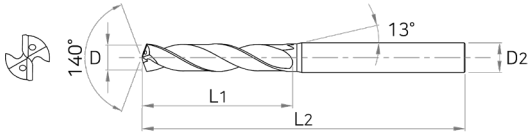
■ Applicable Working Material

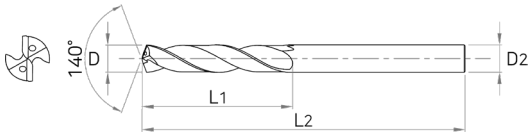
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

PI505A(F) | HIGH SPEED INTERNAL COOLANT DRILL - DIN 6537L







■ Tolerance

D		Shank Dia
D3	+0.002 ~ +0.012	h6
D6.1 ~ 10	+0.006 ~ +0.021	
D10.1 ~ 18	+0.007 ~ +0.025	
D18.1 ~	+0.008 ~ +0.029	

DIN 3537L | CARBIDE | TiAlN | 5D | 30° HELIX | 140° | DATA P.709

EDP No	EDP No Weldon shank	SIZES (mm) D	L1	L2	D2
PI505A 040	PI505F 040	4	36	74	6
PI505A 041	PI505F 041	4.1	36	74	6
PI505A 042	PI505F 042	4.2	36	74	6
PI505A 043	PI505F 043	4.3	36	74	6
PI505A 044	PI505F 044	4.4	36	74	6
PI505A 045	PI505F 045	4.5	36	74	6
PI505A 046	PI505F 046	4.6	36	74	6
PI505A 047	PI505F 047	4.7	36	74	6
PI505A 048	PI505F 048	4.8	44	82	6
PI505A 049	PI505F 049	4.9	44	82	6
PI505A 050	PI505F 050	5	44	82	6
PI505A 051	PI505F 051	5.1	44	82	6
PI505A 052	PI505F 052	5.2	44	82	6
PI505A 053	PI505F 053	5.3	44	82	6
PI505A 054	PI505F 054	5.4	44	82	6
PI505A 055	PI505F 055	5.5	44	82	6
PI505A 056	PI505F 056	5.6	44	82	6
PI505A 057	PI505F 057	5.7	44	82	6
PI505A 058	PI505F 058	5.8	44	82	6
PI505A 059	PI505F 059	5.9	44	82	6
PI505A 060	PI505F 060	6	44	82	6
PI505A 061	PI505F 061	6.1	53	91	8
PI505A 062	PI505F 062	6.2	53	91	8
PI505A 063	PI505F 063	6.3	53	91	8

EDP No	EDP No Weldon shank	SIZES (mm) D	L1	L2	D2
PI505A 064	PI505F 064	6.4	53	91	8
PI505A 065	PI505F 065	6.5	53	91	8
PI505A 066	PI505F 066	6.6	53	91	8
PI505A 067	PI505F 067	6.7	53	91	8
PI505A 068	PI505F 068	6.8	53	91	8
PI505A 069	PI505F 069	6.9	53	91	8
PI505A 070	PI505F 070	7	53	91	8
PI505A 071	PI505F 071	7.1	53	91	8
PI505A 072	PI505F 072	7.2	53	91	8
PI505A 073	PI505F 073	7.3	53	91	8
PI505A 074	PI505F 074	7.4	53	91	8
PI505A 075	PI505F 075	7.5	53	91	8
PI505A 076	PI505F 076	7.6	53	91	8
PI505A 077	PI505F 077	7.7	53	91	8
PI505A 078	PI505F 078	7.8	53	91	8
PI505A 079	PI505F 079	7.9	53	91	8
PI505A 080	PI505F 080	8	53	91	8
PI505A 081	PI505F 081	8.1	61	103	10
PI505A 082	PI505F 082	8.2	61	103	10
PI505A 083	PI505F 083	8.3	61	103	10
PI505A 084	PI505F 084	8.4	61	103	10
PI505A 085	PI505F 085	8.5	61	103	10
PI505A 086	PI505F 086	8.6	61	103	10
PI505A 087	PI505F 087	8.7	61	103	10

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel SKD61 ~HRc55	Hardened Steel SKD11 HRc55~	Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

PI505A(F) | HIGH SPEED INTERNAL COOLANT DRILL - DIN 6537L

EDP No	EDP No	SIZES (mm)			
	Weldon shank	D	L1	L2	D2
PI505A 088	PI505F 088	8.8	61	103	10
PI505A 089	PI505F 089	8.9	61	103	10
PI505A 090	PI505F 090	9	61	103	10
PI505A 091	PI505F 091	9.1	61	103	10
PI505A 092	PI505F 092	9.2	61	103	10
PI505A 093	PI505F 093	9.3	61	103	10
PI505A 094	PI505F 094	9.4	61	103	10
PI505A 095	PI505F 095	9.5	61	103	10
PI505A 096	PI505F 096	9.6	61	103	10
PI505A 097	PI505F 097	9.7	61	103	10
PI505A 098	PI505F 098	9.8	61	103	10
PI505A 099	PI505F 099	9.9	61	103	10
PI505A 100	PI505F 100	10	61	103	10
PI505A 101	PI505F 101	10.1	71	118	12
PI505A 102	PI505F 102	10.2	71	118	12
PI505A 103	PI505F 103	10.3	71	118	12
PI505A 104	PI505F 104	10.4	71	118	12
PI505A 105	PI505F 105	10.5	71	118	12
PI505A 106	PI505F 106	10.6	71	118	12
PI505A 107	PI505F 107	10.7	71	118	12
PI505A 108	PI505F 108	10.8	71	118	12
PI505A 109	PI505F 109	10.9	71	118	12
PI505A 110	PI505F 110	11	71	118	12
PI505A 111	PI505F 111	11.1	71	118	12
PI505A 112	PI505F 112	11.2	71	118	12
PI505A 113	PI505F 113	11.3	71	118	12
PI505A 114	PI505F 114	11.4	71	118	12
PI505A 115	PI505F 115	11.5	71	118	12
PI505A 116	PI505F 116	11.6	71	118	12
PI505A 117	PI505F 117	11.7	71	118	12
PI505A 118	PI505F 118	11.8	71	118	12
PI505A 119	PI505F 119	11.9	71	118	12
PI505A 120	PI505F 120	12	71	118	12
PI505A 121	PI505F 121	12.1	77	124	14
PI505A 122	PI505F 122	12.2	77	124	14
PI505A 123	PI505F 123	12.3	77	124	14
PI505A 124	PI505F 124	12.4	77	124	14
PI505A 125	PI505F 125	12.5	77	124	14
PI505A 126	PI505F 126	12.6	77	124	14
PI505A 127	PI505F 127	12.7	77	124	14
PI505A 128	PI505F 128	12.8	77	124	14

EDP No	EDP No	SIZES (mm)			
	Weldon shank	D	L1	L2	D2
PI505A 129	PI505F 129	12.9	77	124	14
PI505A 130	PI505F 130	13	77	124	14
PI505A 131	PI505F 131	13.1	77	124	14
PI505A 132	PI505F 132	13.2	77	124	14
PI505A 133	PI505F 133	13.3	77	124	14
PI505A 134	PI505F 134	13.4	77	124	14
PI505A 135	PI505F 135	13.5	77	124	14
PI505A 136	PI505F 136	13.6	77	124	14
PI505A 137	PI505F 137	13.7	77	124	14
PI505A 138	PI505F 138	13.8	77	124	14
PI505A 139	PI505F 139	13.9	77	124	14
PI505A 140	PI505F 140	14	77	124	14
PI505A 141	PI505F 141	14.1	83	133	16
PI505A 142	PI505F 142	14.2	83	133	16
PI505A 143	PI505F 143	14.3	83	133	16
PI505A 144	PI505F 144	14.4	83	133	16
PI505A 145	PI505F 145	14.5	83	133	16
PI505A 146	PI505F 146	14.6	83	133	16
PI505A 147	PI505F 147	14.7	83	133	16
PI505A 148	PI505F 148	14.8	83	133	16
PI505A 149	PI505F 149	14.9	83	133	16
PI505A 150	PI505F 150	15	83	133	16
PI505A 151	PI505F 151	15.1	83	133	16
PI505A 152	PI505F 152	15.2	83	133	16
PI505A 153	PI505F 153	15.3	83	133	16
PI505A 154	PI505F 154	15.4	83	133	16
PI505A 155	PI505F 155	15.5	83	133	16
PI505A 156	PI505F 156	15.6	83	133	16
PI505A 157	PI505F 157	15.7	83	133	16
PI505A 158	PI505F 158	15.8	83	133	16
PI505A 159	PI505F 159	15.9	83	133	16
PI505A 160	PI505F 160	16	83	133	16
PI505A 161	PI505F 161	16.1	93	143	18
PI505A 163	PI505F 163	16.3	93	143	18
PI505A 165	PI505F 165	16.5	93	143	18
PI505A 170	PI505F 170	17	93	143	18
PI505A 171	PI505F 171	17.1	93	143	18
PI505A 172	PI505F 172	17.2	93	143	18
PI505A 175	PI505F 175	17.5	93	143	18
PI505A 177	PI505F 177	17.7	93	143	18
PI505A 178	PI505F 178	17.8	93	143	18

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

PI505A(F) | HIGH SPEED INTERNAL COOLANT DRILL - DIN 6537L

EDP No	EDP No	SIZES (mm)			
	Weldon shank	D	L1	L2	D2
PI505A 180	PI505F 180	18	93	143	18
PI505A 181	PI505F 181	18.1	101	153	20
PI505A 182	PI505F 182	18.2	101	153	20
PI505A 185	PI505F 185	18.5	101	153	20
PI505A 190	PI505F 190	19	101	153	20

EDP No	EDP No	SIZES (mm)			
	Weldon shank	D	L1	L2	D2
PI505A 191	PI505F 191	19.1	101	153	20
PI505A 195	PI505F 195	19.5	101	153	20
PI505A 197	PI505F 197	19.7	101	153	20
PI505A 200	PI505F 200	20	101	153	20

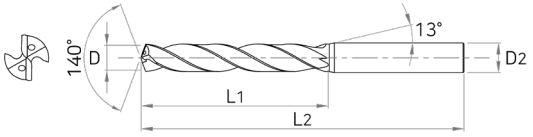
■ Applicable Working Material

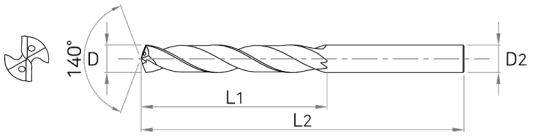
Carbon Steel ~ HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

PI508 | INTERNAL COOLANT HIGH SPEED DRILL - 8D







■ Tolerance

D		Shank Dia
D3	+0.002 ~ +0.012	h6
D3.1 ~ D6	+0.004 ~ +0.016	
D6.1 ~ D10	+0.006 ~ +0.021	
D10.1 ~ D14	+0.007 ~ +0.025	

CARBIDE | TiAlN | 8D | 30° HELIX | 140° | DATA P.709

EDP No	EDP No Weldon shank	SIZES (mm) D	L1	L2	D2
PI508A 030	PI508F 030	3	34	72	6
PI508A 031	PI508F 031	3.1	34	72	6
PI508A 032	PI508F 032	3.2	34	72	6
PI508A 033	PI508F 033	3.3	34	72	6
PI508A 034	PI508F 034	3.4	34	72	6
PI508A 035	PI508F 035	3.5	34	72	6
PI508A 036	PI508F 036	3.6	34	72	6
PI508A 037	PI508F 037	3.7	34	72	6
PI508A 038	PI508F 038	3.8	43	81	6
PI508A 039	PI508F 039	3.9	43	81	6
PI508A 040	PI508F 040	4	43	81	6
PI508A 041	PI508F 041	4.1	43	81	6
PI508A 042	PI508F 042	4.2	43	81	6
PI508A 043	PI508F 043	4.3	43	81	6
PI508A 044	PI508F 044	4.4	43	81	6
PI508A 045	PI508F 045	4.5	43	81	6
PI508A 046	PI508F 046	4.6	43	81	6
PI508A 047	PI508F 047	4.7	43	81	6
PI508A 048	PI508F 048	4.8	57	95	6
PI508A 049	PI508F 049	4.9	57	95	6
PI508A 050	PI508F 050	5	57	95	6
PI508A 051	PI508F 051	5.1	57	95	6
PI508A 052	PI508F 052	5.2	57	95	6
PI508A 053	PI508F 053	5.3	57	95	6

EDP No	EDP No Weldon shank	SIZES (mm) D	L1	L2	D2
PI508A 054	PI508F 054	5.4	57	95	6
PI508A 055	PI508F 055	5.5	57	95	6
PI508A 056	PI508F 056	5.6	57	95	6
PI508A 057	PI508F 057	5.7	57	95	6
PI508A 058	PI508F 058	5.8	57	95	6
PI508A 059	PI508F 059	5.9	57	95	6
PI508A 060	PI508F 060	6	57	95	6
PI508A 061	PI508F 061	6.1	76	114	8
PI508A 062	PI508F 062	6.2	76	114	8
PI508A 063	PI508F 063	6.3	76	114	8
PI508A 064	PI508F 064	6.4	76	114	8
PI508A 065	PI508F 065	6.5	76	114	8
PI508A 066	PI508F 066	6.6	76	114	8
PI508A 067	PI508F 067	6.7	76	114	8
PI508A 068	PI508F 068	6.8	76	114	8
PI508A 069	PI508F 069	6.9	76	114	8
PI508A 070	PI508F 070	7	76	114	8
PI508A 071	PI508F 071	7.1	76	114	8
PI508A 072	PI508F 072	7.2	76	114	8
PI508A 073	PI508F 073	7.3	76	114	8
PI508A 074	PI508F 074	7.4	76	114	8
PI508A 075	PI508F 075	7.5	76	114	8
PI508A 076	PI508F 076	7.6	76	114	8
PI508A 077	PI508F 077	7.7	76	114	8

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel SKD61 ~HRc55	Hardened Steel SKD11 HRc55~	Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

PI508 | INTERNAL COOLANT HIGH SPEED DRILL - 8D

EDP No	EDP No	SIZES (mm)			
	Weldon shank	D	L1	L2	D2
PI508A 078	PI508F 078	7.8	76	114	8
PI508A 079	PI508F 079	7.9	76	114	8
PI508A 080	PI508F 080	8	76	114	8
PI508A 081	PI508F 081	8.1	95	142	10
PI508A 082	PI508F 082	8.2	95	142	10
PI508A 083	PI508F 083	8.3	95	142	10
PI508A 084	PI508F 084	8.4	95	142	10
PI508A 085	PI508F 085	8.5	95	142	10
PI508A 086	PI508F 086	8.6	95	142	10
PI508A 087	PI508F 087	8.7	95	142	10
PI508A 088	PI508F 088	8.8	95	142	10
PI508A 089	PI508F 089	8.9	95	142	10
PI508A 090	PI508F 090	9	95	142	10
PI508A 091	PI508F 091	9.1	95	142	10
PI508A 092	PI508F 092	9.2	95	142	10
PI508A 093	PI508F 093	9.3	95	142	10
PI508A 094	PI508F 094	9.4	95	142	10
PI508A 095	PI508F 095	9.5	95	142	10
PI508A 096	PI508F 096	9.6	95	142	10
PI508A 097	PI508F 097	9.7	95	142	10
PI508A 098	PI508F 098	9.8	95	142	10
PI508A 099	PI508F 099	9.9	95	142	10
PI508A 100	PI508F 100	10	95	142	10
PI508A 101	PI508F 101	10.1	114	162	12
PI508A 102	PI508F 102	10.2	114	162	12
PI508A 103	PI508F 103	10.3	114	162	12
PI508A 104	PI508F 104	10.4	114	162	12
PI508A 105	PI508F 105	10.5	114	162	12
PI508A 106	PI508F 106	10.6	114	162	12
PI508A 107	PI508F 107	10.7	114	162	12
PI508A 108	PI508F 108	10.8	114	162	12
PI508A 109	PI508F 109	10.9	114	162	12

EDP No	EDP No	SIZES (mm)			
	Weldon shank	D	L1	L2	D2
PI508A 110	PI508F 110	11	114	162	12
PI508A 111	PI508F 111	11.1	114	162	12
PI508A 112	PI508F 112	11.2	114	162	12
PI508A 113	PI508F 113	11.3	114	162	12
PI508A 114	PI508F 114	11.4	114	162	12
PI508A 115	PI508F 115	11.5	114	162	12
PI508A 116	PI508F 116	11.6	114	162	12
PI508A 117	PI508F 117	11.7	114	162	12
PI508A 118	PI508F 118	11.8	114	162	12
PI508A 119	PI508F 119	11.9	114	162	12
PI508A 120	PI508F 120	12	114	162	12
PI508A 121	PI508F 121	12.1	133	178	14
PI508A 122	PI508F 122	12.2	133	178	14
PI508A 123	PI508F 123	12.3	133	178	14
PI508A 124	PI508F 124	12.4	133	178	14
PI508A 125	PI508F 125	12.5	133	178	14
PI508A 126	PI508F 126	12.6	133	178	14
PI508A 127	PI508F 127	12.7	133	178	14
PI508A 128	PI508F 128	12.8	133	178	14
PI508A 129	PI508F 129	12.9	133	178	14
PI508A 130	PI508F 130	13	133	178	14
PI508A 131	PI508F 131	13.1	133	178	14
PI508A 132	PI508F 132	13.2	133	178	14
PI508A 133	PI508F 133	13.3	133	178	14
PI508A 134	PI508F 134	13.4	133	178	14
PI508A 135	PI508F 135	13.5	133	178	14
PI508A 136	PI508F 136	13.6	133	178	14
PI508A 137	PI508F 137	13.7	133	178	14
PI508A 138	PI508F 138	13.8	133	178	14
PI508A 139	PI508F 139	13.9	133	178	14
PI508A 140	PI508F 140	14	133	178	14

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	◎	◎	○	○			◎		○

○ : GOOD ◎ : EXCELLENT

Solid Spiral Drill



Contents

(INCH : ◆ / METRIC : ◇)

EDP No / SPEC	Flutes	Appearance	Length 3D	5D	8D	10D	20D	Margin	Tolerance	Diameter(Ø) Min	Max	Page
SSD ◇	2F		○					Single	h8	1	13	436
SSDL ◇					○			Single	h8	2	10	439
SSTD ◇			○					Single	h8	0.5	13	441
SSTDL ◇					○			Single	h8	1	13	443
APF505 ◆ ◇				○				Single	0 ~ -0.012	3	16	445

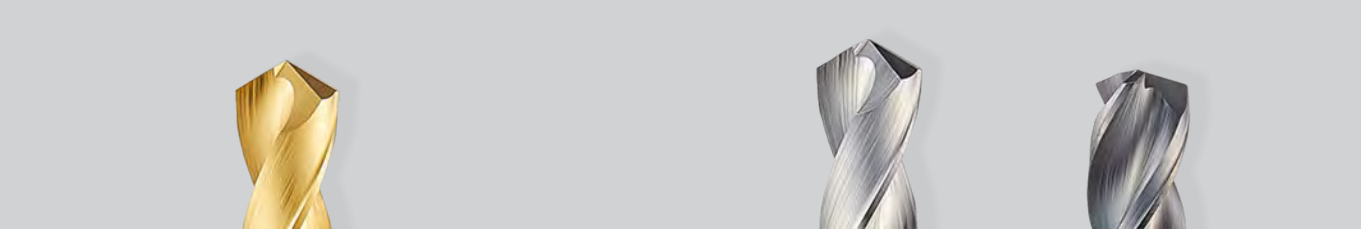
EDP No. System

*If expressed as an integer, the decimal point is omitted.

SS	D	L	051

Section	Appearance	Drilling Depth	Cutting Dia
SS : Solid Spiral	D : Drill	L : Long	Ø0.5
AP : Aluminium Power	TD : TiN Coated Drill	505 : 5D	~
	F : Facet Point		Ø16

Ex) Cutting Dia Ø5.1 / Long Type Solid Spiral Drill



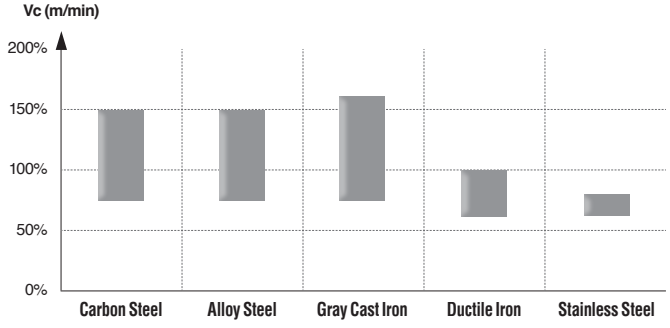
General Features

· Suitable to work for Copper,Aluminum, Alloy steels,Non-ferrous steels
· Reasonable price and extensive coverage

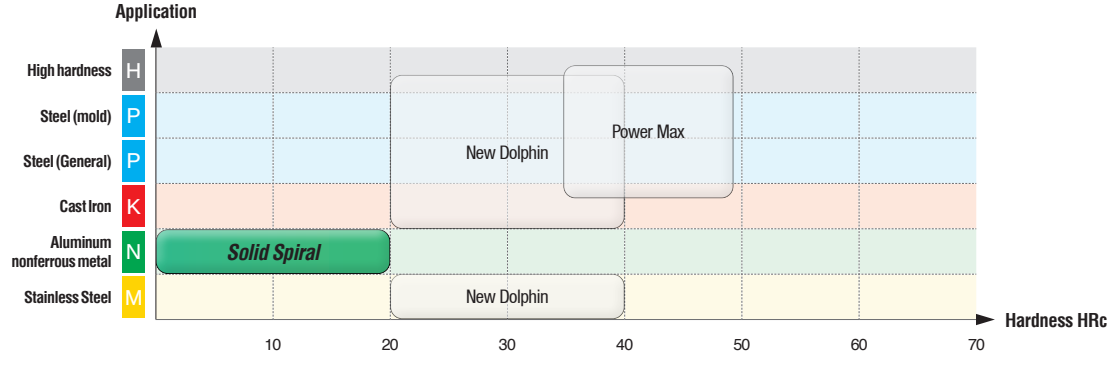
Characteristics

· High chipping resistance by applied to the high toughness material
· Improvement of Flute hardness and excellent chip mission by applied to TiN,DLC coating
· Improve to customer variety of choice by applied to equal to Diameter with Shank Diameter

Vc by Application area

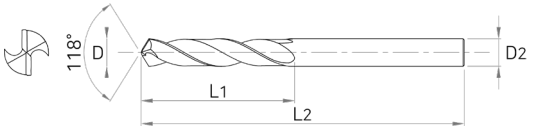


Applications



SSD | NONFERROUS DRILL - REGULAR





■ Tolerance

D		Shank Dia
~D3	0 ~ -0.014	h6
D3.1 ~ 6	0 ~ -0.018	
D6.1 ~ 10	0 ~ -0.022	
D10.1 ~ 13	0 ~ -0.027	

CARBIDE | Uncoated | 30° HELIX | 118° | DATA P.711

EDP No	SIZES (mm)			
	D	L1	L2	D2
SSD 010	1	10	38	1
SSD 0105	1.05	10	38	1.05
SSD 011	1.1	10	38	1.1
SSD 0115	1.15	10	38	1.15
SSD 012	1.2	10	38	1.2
SSD 0125	1.25	10	38	1.25
SSD 013	1.3	10	38	1.3
SSD 0135	1.35	10	38	1.35
SSD 014	1.4	10	38	1.4
SSD 0145	1.45	10	38	1.45
SSD 015	1.5	13	38	1.5
SSD 0155	1.55	13	38	1.55
SSD 016	1.6	13	38	1.6
SSD 0165	1.65	13	38	1.65
SSD 017	1.7	13	38	1.7
SSD 0175	1.75	13	38	1.75
SSD 018	1.8	13	38	1.8
SSD 0185	1.85	13	38	1.85
SSD 019	1.9	13	38	1.9
SSD 0195	1.95	13	38	1.95
SSD 020	2	16	45	2
SSD 0205	2.05	16	45	2.05
SSD 021	2.1	16	45	2.1
SSD 0215	2.15	16	45	2.15
SSD 022	2.2	16	45	2.2

EDP No	SIZES (mm)			
	D	L1	L2	D2
SSD 0225	2.25	16	45	2.25
SSD 023	2.3	16	45	2.3
SSD 0235	2.35	16	45	2.35
SSD 024	2.4	18	50	2.4
SSD 0245	2.45	18	50	2.45
SSD 025	2.5	20	50	2.5
SSD 0255	2.55	20	50	2.55
SSD 026	2.6	20	50	2.6
SSD 0265	2.65	20	50	2.65
SSD 027	2.7	22	50	2.7
SSD 0275	2.75	22	50	2.75
SSD 028	2.8	22	50	2.8
SSD 0285	2.85	22	50	2.85
SSD 029	2.9	22	50	2.9
SSD 0295	2.95	22	50	2.95
SSD 030	3	22	50	3
SSD 031	3.1	25	50	3.1
SSD 032	3.2	25	50	3.2
SSD 033	3.3	25	50	3.3
SSD 034	3.4	25	50	3.4
SSD 035	3.5	25	50	3.5
SSD 036	3.6	28	55	3.6
SSD 037	3.7	28	55	3.7
SSD 038	3.8	28	55	3.8
SSD 039	3.9	28	55	3.9

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○					○		○	◎	○

○ : GOOD ◎ : EXCELLENT

EDP No	SIZES (mm)			
	D	L1	L2	D2
SSD 040	4	28	55	4
SSD 041	4.1	30	60	4.1
SSD 042	4.2	30	60	4.2
SSD 043	4.3	30	60	4.3
SSD 044	4.4	30	60	4.4
SSD 045	4.5	30	60	4.5
SSD 046	4.6	33	65	4.6
SSD 047	4.7	33	65	4.7
SSD 048	4.8	35	65	4.8
SSD 049	4.9	35	65	4.9
SSD 050	5	35	65	5
SSD 051	5.1	35	65	5.1
SSD 052	5.2	35	65	5.2
SSD 053	5.3	35	65	5.3
SSD 054	5.4	35	65	5.4
SSD 055	5.5	35	65	5.5
SSD 056	5.6	38	75	5.6
SSD 057	5.7	38	75	5.7
SSD 058	5.8	38	75	5.8
SSD 059	5.9	38	75	5.9
SSD 060	6	38	75	6
SSD 061	6.1	38	75	6.1
SSD 062	6.2	38	75	6.2
SSD 063	6.3	38	75	6.3
SSD 064	6.4	38	75	6.4
SSD 065	6.5	38	75	6.5
SSD 066	6.6	45	80	6.6
SSD 067	6.7	45	80	6.7
SSD 068	6.8	45	80	6.8
SSD 069	6.9	45	80	6.9
SSD 070	7	45	80	7
SSD 071	7.1	45	80	7.1
SSD 072	7.2	45	80	7.2
SSD 073	7.3	45	80	7.3
SSD 074	7.4	45	80	7.4
SSD 075	7.5	45	80	7.5
SSD 076	7.6	50	85	7.6
SSD 077	7.7	50	85	7.7
SSD 078	7.8	50	85	7.8
SSD 079	7.9	50	85	7.9
SSD 080	8	50	85	8

EDP No	SIZES (mm)			
	D	L1	L2	D2
SSD 081	8.1	50	85	8.1
SSD 082	8.2	50	85	8.2
SSD 083	8.3	50	85	8.3
SSD 084	8.4	50	85	8.4
SSD 085	8.5	50	85	8.5
SSD 086	8.6	50	95	8.6
SSD 087	8.7	50	95	8.7
SSD 088	8.8	50	95	8.8
SSD 089	8.9	50	95	8.9
SSD 090	9	50	95	9
SSD 091	9.1	50	95	9.1
SSD 092	9.2	50	95	9.2
SSD 093	9.3	50	95	9.3
SSD 094	9.4	50	95	9.4
SSD 095	9.5	50	95	9.5
SSD 096	9.6	50	95	9.6
SSD 097	9.7	50	95	9.7
SSD 098	9.8	50	95	9.8
SSD 099	9.9	55	100	9.9
SSD 100	10	55	100	10
SSD 101	10.1	55	115	10.1
SSD 102	10.2	55	115	10.2
SSD 103	10.3	55	115	10.3
SSD 104	10.4	55	115	10.4
SSD 105	10.5	55	115	10.5
SSD 106	10.6	60	115	10.6
SSD 107	10.7	60	115	10.7
SSD 108	10.8	60	115	10.8
SSD 109	10.9	60	115	10.9
SSD 110	11	60	120	11
SSD 111	11.1	65	120	11.1
SSD 112	11.2	65	120	11.2
SSD 113	11.3	65	120	11.3
SSD 114	11.4	65	120	11.4
SSD 115	11.5	65	120	11.5
SSD 116	11.6	65	120	11.6
SSD 117	11.7	65	120	11.7
SSD 118	11.8	65	120	11.8
SSD 119	11.9	65	120	11.9
SSD 120	12	65	120	12
SSD 121	12.1	70	125	12.1

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○					○		○	◎	○

○ : GOOD ◎ : EXCELLENT

EDP No	SIZES (mm)			
	D	L1	L2	D2
SSD 122	12.2	70	125	12.2
SSD 123	12.3	70	125	12.3
SSD 124	12.4	70	125	12.4
SSD 125	12.5	70	125	12.5
SSD 126	12.6	70	125	12.6

EDP No	SIZES (mm)			
	D	L1	L2	D2
SSD 127	12.7	70	125	12.7
SSD 128	12.8	70	125	12.8
SSD 129	12.9	70	125	12.9
SSD 130	13	75	130	13

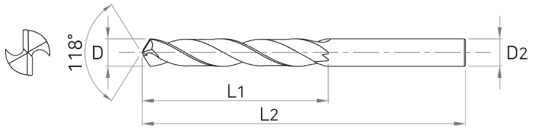
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○					○		○	◎	○

○ : GOOD ◎ : EXCELLENT

SSDL | NONFERROUS DRILL - LONG





■ Tolerance

D		Shank Dia
~D3	0~-0.014	h6
D3.1~6	0~-0.018	
D6.1~10	0~-0.022	

CARBIDE | Uncoated | 30° HELIX | 118° | DATA P.711

EDP No	SIZES (mm)			
	D	L1	L2	D2
SSDL 010	1	25	65	1
SSDL 011	1.1	25	65	1.1
SSDL 012	1.2	25	65	1.2
SSDL 013	1.3	25	65	1.3
SSDL 014	1.4	25	65	1.4
SSDL 015	1.5	25	65	1.5
SSDL 016	1.6	25	65	1.6
SSDL 017	1.7	25	65	1.7
SSDL 018	1.8	25	65	1.8
SSDL 019	1.9	25	65	1.9
SSDL 020	2	30	65	2
SSDL 021	2.1	30	65	2.1
SSDL 022	2.2	30	65	2.2
SSDL 023	2.3	30	65	2.3
SSDL 024	2.4	30	65	2.4
SSDL 025	2.5	35	70	2.5
SSDL 026	2.6	35	70	2.6
SSDL 027	2.7	35	70	2.7
SSDL 028	2.8	35	70	2.8
SSDL 029	2.9	35	70	2.9
SSDL 030	3	42	73	3
SSDL 031	3.1	42	73	3.1
SSDL 032	3.2	42	73	3.2
SSDL 033	3.3	42	73	3.3

EDP No	SIZES (mm)			
	D	L1	L2	D2
SSDL 034	3.4	42	73	3.4
SSDL 035	3.5	42	73	3.5
SSDL 036	3.6	45	80	3.6
SSDL 037	3.7	45	80	3.7
SSDL 038	3.8	48	80	3.8
SSDL 039	3.9	50	80	3.9
SSDL 040	4	54	85	4
SSDL 041	4.1	54	85	4.1
SSDL 042	4.2	54	85	4.2
SSDL 043	4.3	54	85	4.3
SSDL 044	4.4	54	85	4.4
SSDL 045	4.5	54	85	4.5
SSDL 046	4.6	59	90	4.6
SSDL 047	4.7	59	90	4.7
SSDL 048	4.8	59	90	4.8
SSDL 049	4.9	59	90	4.9
SSDL 050	5	59	90	5
SSDL 051	5.1	63	95	5.1
SSDL 052	5.2	63	95	5.2
SSDL 053	5.3	63	95	5.3
SSDL 054	5.4	63	95	5.4
SSDL 055	5.5	63	95	5.5
SSDL 056	5.6	66	100	5.6
SSDL 057	5.7	66	100	5.7

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○					○		○	◎	○

○ : GOOD ◎ : EXCELLENT

SSDL | NONFERROUS DRILL - LONG

EDP No	SIZES (mm)			
	D	L1	L2	D2
SSDL 058	5.8	66	100	5.8
SSDL 059	5.9	66	100	5.9
SSDL 060	6	66	100	6
SSDL 061	6.1	70	105	6.1
SSDL 062	6.2	70	105	6.2
SSDL 063	6.3	70	105	6.3
SSDL 064	6.4	70	105	6.4
SSDL 065	6.5	70	105	6.5
SSDL 066	6.6	73	105	6.6
SSDL 067	6.7	73	105	6.7
SSDL 068	6.8	73	105	6.8
SSDL 069	6.9	73	105	6.9
SSDL 070	7	73	105	7
SSDL 071	7.1	76	110	7.1
SSDL 072	7.2	76	110	7.2
SSDL 073	7.3	76	110	7.3
SSDL 074	7.4	76	110	7.4
SSDL 075	7.5	76	110	7.5
SSDL 076	7.6	80	115	7.6
SSDL 077	7.7	80	115	7.7
SSDL 078	7.8	80	115	7.8
SSDL 079	7.9	80	115	7.9

EDP No	SIZES (mm)			
	D	L1	L2	D2
SSDL 080	8	80	115	8
SSDL 081	8.1	85	125	8.1
SSDL 082	8.2	85	125	8.2
SSDL 083	8.3	85	125	8.3
SSDL 084	8.4	85	125	8.4
SSDL 085	8.5	85	125	8.5
SSDL 086	8.6	85	125	8.6
SSDL 087	8.7	85	125	8.7
SSDL 088	8.8	85	125	8.8
SSDL 089	8.9	85	125	8.9
SSDL 090	9	85	125	9
SSDL 091	9.1	88	130	9.1
SSDL 092	9.2	88	130	9.2
SSDL 093	9.3	88	130	9.3
SSDL 094	9.4	88	130	9.4
SSDL 095	9.5	88	130	9.5
SSDL 096	9.6	90	130	9.6
SSDL 097	9.7	90	130	9.7
SSDL 098	9.8	90	130	9.8
SSDL 099	9.9	90	130	9.9
SSDL 100	10	90	130	10

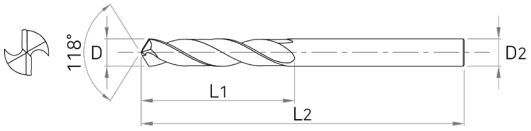
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○					○		○	◎	○

○ : GOOD ◎ : EXCELLENT

SSTD | NONFERROUS TiN COATED DRILL - REGULAR





■ Tolerance

D		Shank Dia
~D3	0~-0.014	h6
D3.1~6	0~-0.018	
D6.1~10	0~-0.022	
D10.1~13	0~-0.027	

CARBIDE | TiN | 30° HELIX | 118° | DATA P.711

EDP No	SIZES (mm)			
	D	L1	L2	D2
SSTD 005	0.5	6	22	0.5
SSTD 0055	0.55	7	24	0.55
SSTD 006	0.6	7	24	0.6
SSTD 0065	0.65	8	26	0.65
SSTD 007	0.7	9	28	0.7
SSTD 0075	0.75	9	28	0.75
SSTD 008	0.8	10	30	0.8
SSTD 0085	0.85	10	30	0.85
SSTD 009	0.9	11	32	0.9
SSTD 0095	0.95	11	32	0.95
SSTD 010	1	10	38	1
SSTD 011	1.1	10	38	1.1
SSTD 012	1.2	10	38	1.2
SSTD 013	1.3	10	38	1.3
SSTD 014	1.4	10	38	1.4
SSTD 015	1.5	13	38	1.5
SSTD 016	1.6	13	38	1.6
SSTD 017	1.7	13	38	1.7
SSTD 018	1.8	13	38	1.8
SSTD 019	1.9	13	38	1.9
SSTD 020	2	16	45	2
SSTD 021	2.1	16	45	2.1
SSTD 022	2.2	16	45	2.2
SSTD 023	2.3	16	45	2.3

EDP No	SIZES (mm)			
	D	L1	L2	D2
SSTD 024	2.4	18	50	2.4
SSTD 025	2.5	20	50	2.5
SSTD 026	2.6	20	50	2.6
SSTD 027	2.7	22	50	2.7
SSTD 028	2.8	22	50	2.8
SSTD 029	2.9	22	50	2.9
SSTD 030	3	22	50	3
SSTD 031	3.1	25	50	3.1
SSTD 032	3.2	25	50	3.2
SSTD 033	3.3	25	50	3.3
SSTD 034	3.4	25	50	3.4
SSTD 035	3.5	25	50	3.5
SSTD 036	3.6	28	55	3.6
SSTD 037	3.7	28	55	3.7
SSTD 038	3.8	28	55	3.8
SSTD 039	3.9	28	55	3.9
SSTD 040	4	28	55	4
SSTD 041	4.1	30	60	4.1
SSTD 042	4.2	30	60	4.2
SSTD 043	4.3	30	60	4.3
SSTD 044	4.4	30	60	4.4
SSTD 045	4.5	30	60	4.5
SSTD 046	4.6	33	65	4.6
SSTD 047	4.7	33	65	4.7

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○					○		○	◎	○

○ : GOOD ◎ : EXCELLENT

SSTD | NONFERROUS TiN COATED DRILL - REGULAR

EDP No	SIZES (mm)			
	D	L1	L2	D2
SSTD 048	4.8	35	65	4.8
SSTD 049	4.9	35	65	4.9
SSTD 050	5	35	65	5
SSTD 051	5.1	35	65	5.1
SSTD 052	5.2	35	65	5.2
SSTD 053	5.3	35	65	5.3
SSTD 054	5.4	35	65	5.4
SSTD 055	5.5	35	65	5.5
SSTD 056	5.6	38	75	5.6
SSTD 057	5.7	38	75	5.7
SSTD 058	5.8	38	75	5.8
SSTD 059	5.9	38	75	5.9
SSTD 060	6	38	75	6
SSTD 061	6.1	38	75	6.1
SSTD 062	6.2	38	75	6.2
SSTD 063	6.3	38	75	6.3
SSTD 064	6.4	38	75	6.4
SSTD 065	6.5	38	75	6.5
SSTD 066	6.6	45	80	6.6
SSTD 067	6.7	45	80	6.7
SSTD 068	6.8	45	80	6.8
SSTD 069	6.9	45	80	6.9
SSTD 070	7	45	80	7
SSTD 071	7.1	45	80	7.1
SSTD 072	7.2	45	80	7.2
SSTD 073	7.3	45	80	7.3
SSTD 074	7.4	45	80	7.4
SSTD 075	7.5	45	80	7.5
SSTD 076	7.6	50	85	7.6
SSTD 077	7.7	50	85	7.7
SSTD 078	7.8	50	85	7.8
SSTD 079	7.9	50	85	7.9
SSTD 080	8	50	85	8
SSTD 081	8.1	50	85	8.1
SSTD 082	8.2	50	85	8.2
SSTD 083	8.3	50	85	8.3
SSTD 084	8.4	50	85	8.4

EDP No	SIZES (mm)			
	D	L1	L2	D2
SSTD 085	8.5	50	85	8.5
SSTD 086	8.6	50	95	8.6
SSTD 087	8.7	50	95	8.7
SSTD 088	8.8	50	95	8.8
SSTD 089	8.9	50	95	8.9
SSTD 090	9	50	95	9
SSTD 091	9.1	50	95	9.1
SSTD 092	9.2	50	95	9.2
SSTD 093	9.3	50	95	9.3
SSTD 094	9.4	50	95	9.4
SSTD 095	9.5	50	95	9.5
SSTD 096	9.6	50	95	9.6
SSTD 097	9.7	50	95	9.7
SSTD 098	9.8	50	95	9.8
SSTD 099	9.9	55	100	9.9
SSTD 100	10	55	100	10
SSTD 101	10.1	55	115	10.1
SSTD 102	10.2	55	115	10.2
SSTD 103	10.3	55	115	10.3
SSTD 104	10.4	55	115	10.4
SSTD 105	10.5	55	115	10.5
SSTD 106	10.6	60	115	10.6
SSTD 107	10.7	60	115	10.7
SSTD 108	10.8	60	115	10.8
SSTD 109	10.9	60	115	10.9
SSTD 110	11	60	115	11
SSTD 111	11.1	65	120	11.1
SSTD 112	11.2	65	120	11.2
SSTD 113	11.3	65	120	11.3
SSTD 115	11.5	65	120	11.5
SSTD 118	11.8	65	120	11.8
SSTD 119	11.9	65	120	11.9
SSTD 120	12	65	120	12
SSTD 124	12.4	70	125	12.4
SSTD 125	12.5	70	125	12.5
SSTD 130	13	75	130	13

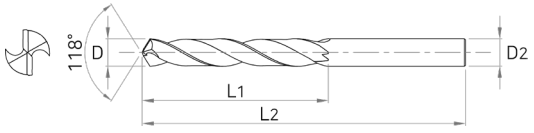
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○					○		○	◎	○

○ : GOOD ◎ : EXCELLENT

SSTDL | NON FERROUS TiN COATED DRILL - LONG





■ Tolerance

D		Shank Dia
~D3	0~-0.014	h6
D3.1~6	0~-0.018	
D6.1~10	0~-0.022	
D10.1~13	0~-0.027	

CARBIDE | TiN | 30° HELIX | 118° | DATA P.711

EDP No	SIZES (mm)			
	D	L1	L2	D2
SSTDL 010	1	25	65	1
SSTDL 011	1.1	25	65	1.1
SSTDL 012	1.2	25	65	1.2
SSTDL 013	1.3	25	65	1.3
SSTDL 014	1.4	25	65	1.4
SSTDL 015	1.5	25	65	1.5
SSTDL 016	1.6	25	65	1.6
SSTDL 017	1.7	25	65	1.7
SSTDL 018	1.8	25	65	1.8
SSTDL 019	1.9	25	65	1.9
SSTDL 020	2	30	65	2
SSTDL 021	2.1	30	65	2.1
SSTDL 022	2.2	30	65	2.2
SSTDL 023	2.3	30	65	2.3
SSTDL 024	2.4	30	65	2.4
SSTDL 025	2.5	35	70	2.5
SSTDL 026	2.6	35	70	2.6
SSTDL 027	2.7	35	70	2.7
SSTDL 028	2.8	35	70	2.8
SSTDL 029	2.9	35	70	2.9
SSTDL 030	3	42	73	3
SSTDL 031	3.1	42	73	3.1
SSTDL 032	3.2	42	73	3.2
SSTDL 033	3.3	42	73	3.3

EDP No	SIZES (mm)			
	D	L1	L2	D2
SSTDL 034	3.4	42	73	3.4
SSTDL 035	3.5	42	73	3.5
SSTDL 036	3.6	45	80	3.6
SSTDL 037	3.7	45	80	3.7
SSTDL 038	3.8	48	80	3.8
SSTDL 039	3.9	50	80	3.9
SSTDL 040	4	54	85	4
SSTDL 041	4.1	54	85	4.1
SSTDL 042	4.2	54	85	4.2
SSTDL 043	4.3	54	85	4.3
SSTDL 044	4.4	54	85	4.4
SSTDL 045	4.5	54	85	4.5
SSTDL 046	4.6	59	90	4.6
SSTDL 047	4.7	59	90	4.7
SSTDL 048	4.8	59	90	4.8
SSTDL 049	4.9	59	90	4.9
SSTDL 050	5	59	90	5
SSTDL 051	5.1	63	95	5.1
SSTDL 052	5.2	63	95	5.2
SSTDL 053	5.3	63	95	5.3
SSTDL 054	5.4	63	95	5.4
SSTDL 055	5.5	63	95	5.5
SSTDL 056	5.6	66	100	5.6
SSTDL 057	5.7	66	100	5.7

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○					○		○	◎	○

○ : GOOD ◎ : EXCELLENT

SSTDL | NON FERROUS TiN COATED DRILL - LONG

EDP No	SIZES (mm)			
	D	L1	L2	D2
SSTDL 058	5.8	66	100	5.8
SSTDL 059	5.9	66	100	5.9
SSTDL 060	6	66	100	6
SSTDL 061	6.1	70	105	6.1
SSTDL 062	6.2	70	105	6.2
SSTDL 063	6.3	70	105	6.3
SSTDL 064	6.4	70	105	6.4
SSTDL 065	6.5	70	105	6.5
SSTDL 066	6.6	73	105	6.6
SSTDL 067	6.7	73	105	6.7
SSTDL 068	6.8	73	105	6.8
SSTDL 069	6.9	73	105	6.9
SSTDL 070	7	73	105	7
SSTDL 071	7.1	76	110	7.1
SSTDL 072	7.2	76	110	7.2
SSTDL 073	7.3	76	110	7.3
SSTDL 074	7.4	76	110	7.4
SSTDL 075	7.5	76	110	7.5
SSTDL 076	7.6	80	115	7.6
SSTDL 077	7.7	80	115	7.7
SSTDL 078	7.8	80	115	7.8
SSTDL 079	7.9	80	115	7.9

EDP No	SIZES (mm)			
	D	L1	L2	D2
SSTDL 080	8	80	115	8
SSTDL 081	8.1	85	125	8.1
SSTDL 082	8.2	85	125	8.2
SSTDL 083	8.3	85	125	8.3
SSTDL 084	8.4	85	125	8.4
SSTDL 085	8.5	85	125	8.5
SSTDL 086	8.6	85	125	8.6
SSTDL 087	8.7	85	125	8.7
SSTDL 088	8.8	85	125	8.8
SSTDL 089	8.9	85	125	8.9
SSTDL 090	9	85	125	9
SSTDL 091	9.1	88	130	9.1
SSTDL 092	9.2	88	130	9.2
SSTDL 093	9.3	88	130	9.3
SSTDL 094	9.4	88	130	9.4
SSTDL 095	9.5	88	130	9.5
SSTDL 096	9.6	90	130	9.6
SSTDL 097	9.7	90	130	9.7
SSTDL 098	9.8	90	130	9.8
SSTDL 099	9.9	90	130	9.9
SSTDL 100	10	90	130	10

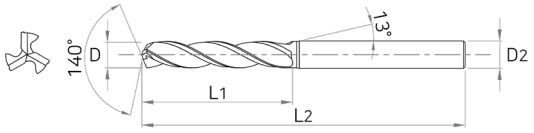
■ Applicable Working Material

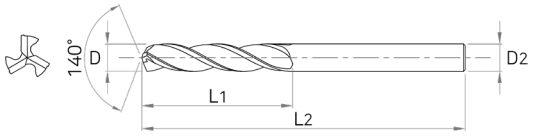
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○					○		○	◎	○

○ : GOOD ◎ : EXCELLENT

APF505 | 3F ALUMINUM DRILL - 5D







■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.012	h6

CARBIDE | D.L.C | 5D | 3 | 30° HELIX | 140° | DATA P.711

EDP No	SIZES (mm)			
	D	L1	L2	D2
APF505 030	3	20	60	3
APF505 03175	3.175	21.4	60.3	4
APF505 03263	3.263	21.5	60.3	4
APF505 035	3.5	22	63	4
APF505 03572	3.572	23.8	63.5	4
APF505 03967	3.967	23.8	63.5	4
APF505 040	4	24	65	4
APF505 045	4.5	24	65	5
APF505 04762	4.762	31.75	69.9	5
APF505 04800	4.8	31.8	69.9	5
APF505 04851	4.851	31.8	69.9	5
APF505 04914	4.914	31.75	69.9	5
APF505 050	5	32	75	5
APF505 05054	5.054	33.4	76.2	6
APF505 05105	5.105	33.4	76.2	6
APF505 05158	5.158	33.4	76.2	6
APF505 05181	5.181	34.9	76.2	6
APF505 05219	5.219	34.9	76.2	6
APF505 05308	5.308	34.9	76.2	6
APF505 05410	5.41	34.9	76.2	6
APF505 055	5.5	35	75	6
APF505 05556	5.556	34.9	76.2	6
APF505 05613	5.613	34.9	76.2	6
APF505 05791	5.791	34.9	76.2	6

EDP No	SIZES (mm)			
	D	L1	L2	D2
APF505 05953	5.953	38.1	82.6	6
APF505 060	6	38	82	6
APF505 06045	6.045	41.3	82.6	7
APF505 06146	6.146	41.3	82.6	7
APF505 06248	6.248	41.3	82.6	7
APF505 06350	6.35	41.3	82.6	7
APF505 065	6.5	38	82	7
APF505 06527	6.527	42.9	82.6	7
APF505 06629	6.629	42.9	88.9	7
APF505 06746	6.746	42.9	88.9	7
APF505 06756	6.756	42.9	88.9	7
APF505 06908	6.908	42.9	88.9	7
APF505 070	7	43	88	7
APF505 07035	7.035	42.9	88.9	8
APF505 07142	7.142	44.5	88.9	8
APF505 07366	7.366	44.5	88.9	8
APF505 075	7.5	44	95	8
APF505 07541	7.541	47.6	95.3	8
APF505 07670	7.67	47.6	95.3	8
APF505 07937	7.937	47.6	95.3	8
APF505 080	8	48	95	8
APF505 08026	8.026	47.6	95.3	9
APF505 08204	8.204	53.2	95.3	9
APF505 08333	8.333	53.2	101.6	9

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○					○		○	◎	○

○ : GOOD ◎ : EXCELLENT

APF505 | 3F ALUMINUM DRILL - 5D

EDP No	SIZES (mm)			
	D	L1	L2	D2
APF505 08432	8.432	53.2	101.6	9
APF505 085	8.5	53	100	9
APF505 08610	8.61	53.2	101.6	9
APF505 08732	8.732	55.6	101.6	9
APF505 08839	8.839	55.6	101.6	9
APF505 090	9	55	100	9
APF505 09093	9.093	57.9	108	10
APF505 09128	9.128	57.9	108	10
APF505 09347	9.347	57.9	108	10
APF505 095	9.5	58	108	10
APF505 09525	9.525	60.3	108	10
APF505 09575	9.575	60.3	108	10
APF505 09804	9.804	60.3	114.3	10
APF505 09921	9.921	60.3	114.3	10
APF505 100	10	60	114	10
APF505 10083	10.083	63.5	114.3	11
APF505 10261	10.261	65.1	114.3	11
APF505 10317	10.317	65.1	114.3	11
APF505 105	10.5	67	114	11
APF505 10716	10.716	68.3	114.3	11
APF505 110	11	68	114	11

EDP No	SIZES (mm)			
	D	L1	L2	D2
APF505 11112	11.112	71.4	120.7	12
APF505 115	11.5	70	120	12
APF505 11508	11.508	73	120.7	12
APF505 11907	11.907	73	120.7	12
APF505 120	12	73	120	12
APF505 12303	12.303	76.2	134.9	13
APF505 125	12.5	75	135	13
APF505 127	12.7	77.8	136.5	13
APF505 130	13	78	136	13
APF505 13096	13.096	79.4	136.5	14
APF505 13492	13.492	84.1	144.5	14
APF505 13891	13.891	85.7	147.6	14
APF505 140	14	86	148	14
APF505 14287	14.287	88.9	150.8	15
APF505 14683	14.683	88.9	152.4	15
APF505 150	15	90	152	15
APF505 15082	15.082	90.5	152.4	16
APF505 15478	15.478	93.7	157.2	16
APF505 15875	15.875	95.3	160.3	16
APF505 160	16	95	160	16

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○					○		○	◎	○

○ : GOOD ◎ : EXCELLENT

TAP SERIES



JIS CARBIDE TAP	450	
DIN CARBIDE TAP	460	
JIS HSSE TAP	470	
DIN HSSE TAP	502	

JIS CARBIDE TAP



Contents

Series	Type	EDP No	Geometry	Surface Treatment		Diameter(mm)		Page
				Coating	Uncoated	Min	Max	
JIS	SPIRAL	WPOM			○	M3	M12	452
		WPCM		TiCN		M3	M12	453
	STRAIGHT	WSOM			○	M3	M12	454
		WSCM		TiCN		M3	M12	455
	ROLL	WROM			○	M3	M12	456
		WRCM		TiCN		M3	M12	457
	SPIRAL ROLL	WFOM			○	M3	M6	458
		WFCM		TiCN		M3	M6	459

EDP No. System

*If expressed as an integer, the decimal point is omitted.

V R 0 M 06 100 40 S

Raw Material	Description	Surface Treatment	Thread	Size	Pitch	Chamfer Length	Oil Groove
V : HSSE	S(JIS) : Straight	O : NON	M : Meter Thread	M3	0.5	1.5	S : 1 Groove
W : CARBIDE	G(DIN) : Straight	T : TiN		~	~	2.0	M : 4 Groove
	P(JIS) : Spiral	C : TiCN		M24	3.0	2.5	
	Q(DIN) : Spiral	H : HOMO				4.0	
	N(JIS) : Point					5.0	
	D(DIN) : Point						
	R(JIS) : Roll						
	F(JIS) : Spiral Roll						
	M(DIN) : Roll						

Ex) Size M6 / Screw Pitch 1.0mm / Chamfer length 4 / Oil Groove 1 Uncoated HSSE Roll Tap

TAP SERIES



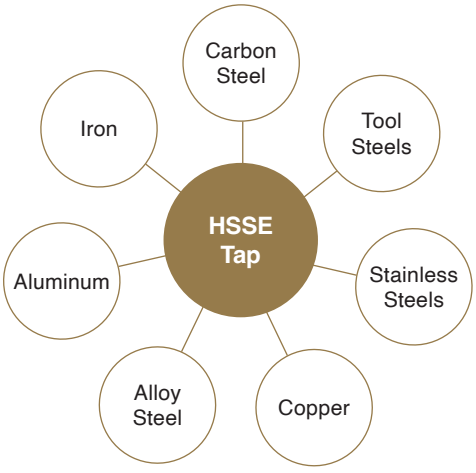
Characteristics

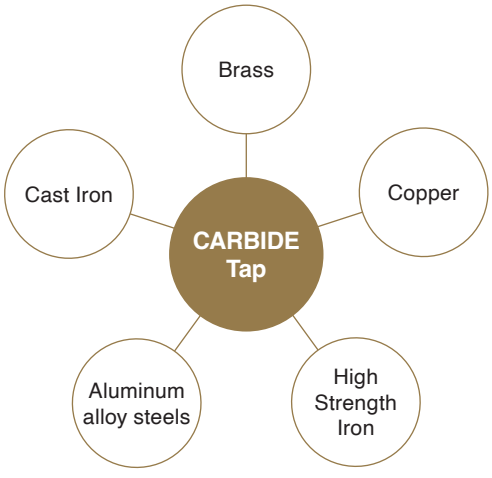
· Suitable for Alloy Steels, Carbon steels, Brass, Aluminum alloy steels
· Extend customer choice with variety of size and type

Features

· Improvement of wear resistance and chipping resistance by applied to high toughness material
· High processability and Minimized chip deposition by applied to TiN,TiCN coating
· Response to a wide range of processing conditions by adopting the stepwise accuracy method of WH or GH

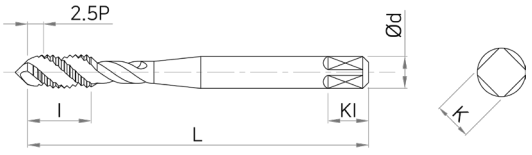
Applications

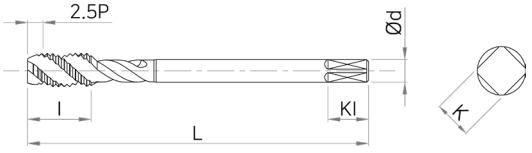




WPOM | JIS SPIRAL TAPS







CARBIDE | Uncoated | 15° HELIX

EDP No	SIZES (mm)							
2.5P	Thread Size	Limits	L	l	d	K	Kl	Z
WPOM 0305025	M3 X 0.5	WH3	46	11	4	3.2	6	3
WPOM 0407025	M4 X 0.7	WH3	52	13	5	4	7	3
WPOM 0508025	M5 X 0.8	WH3	60	16	5.5	4.5	7	3
WPOM 0610025	M6 X 1.0	WH3	62	19	6	4.5	7	3
WPOM 0810025	M8 X 1.0	WH3	70	22	6.2	5	8	3
WPOM 0812525	M8 X 1.25	WH4	70	22	6.2	5	8	3
WPOM 1010025	M10 X 1.0	WH3	75	24	7	5.5	8	3
WPOM 1012525	M10 X 1.25	WH4	75	24	7	5.5	8	3
WPOM 1015025	M10 X 1.5	WH4	75	24	7	5.5	8	3
WPOM 1210025	M12 X 1.0	WH3	82	29	8.5	6.5	9	3
WPOM 1212525	M12 X 1.25	WH4	82	29	8.5	6.5	9	3
WPOM 1215025	M12 X 1.5	WH4	82	29	8.5	6.5	9	3
WPOM 1217525	M12 X 1.75	WH5	82	29	8.5	6.5	9	3

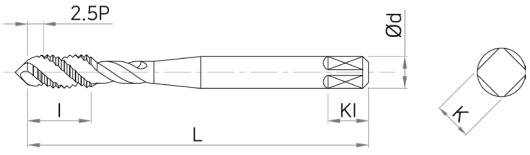
■ Applicable Working Material

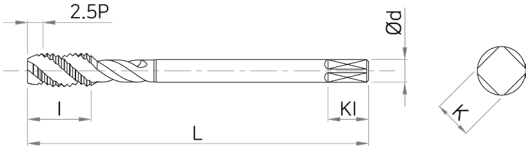
Copper	Brass	Casting Brass	Aluminum rolled material	Aluminum alloy castings	Zinc alloy castings
Cu	Bs	BsC	AL	AC, ADC	ZDC
◎	◎	◎	◎	◎	◎

○ : GOOD ◎ : EXCELLENT

WPCM | JIS SPIRAL TAPS







CARBIDE | TiCN | 15° HELIX

EDP No	SIZES (mm)							
2.5P	Thread Size	Limits	L	l	d	K	Kl	Z
WPCM 0305025	M3 X 0.5	WH3	46	11	4	3.2	6	3
WPCM 0407025	M4 X 0.7	WH3	52	13	5	4	7	3
WPCM 0508025	M5 X 0.8	WH3	60	16	5.5	4.5	7	3
WPCM 0610025	M6 X 1.0	WH3	62	19	6	4.5	7	3
WPCM 0810025	M8 X 1.0	WH3	70	22	6.2	5	8	3
WPCM 0812525	M8 X 1.25	WH4	70	22	6.2	5	8	3
WPCM 1010025	M10 X 1.0	WH3	75	24	7	5.5	8	3
WPCM 1012525	M10 X 1.25	WH4	75	24	7	5.5	8	3
WPCM 1015025	M10 X 1.5	WH4	75	24	7	5.5	8	3
WPCM 1210025	M12 X 1.0	WH3	82	29	8.5	6.5	9	3
WPCM 1212525	M12 X 1.25	WH4	82	29	8.5	6.5	9	3
WPCM 1215025	M12 X 1.5	WH4	82	29	8.5	6.5	9	3
WPCM 1217525	M12 X 1.75	WH5	82	29	8.5	6.5	9	3

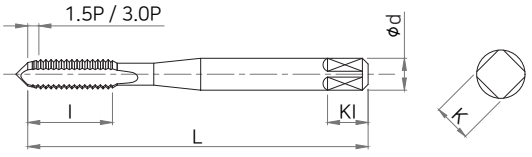
■ Applicable Working Material

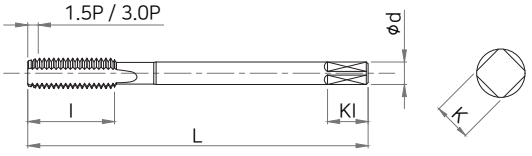
Copper	Brass	Casting Brass	Aluminum rolled material	Aluminum alloy castings	Zinc alloy castings
Cu	Bs	BsC	AL	AC, ADC	ZDC
◎	◎	◎	◎	◎	◎

○ : GOOD ◎ : EXCELLENT

WSOM | JIS STRAIGHT TAPS







CARBIDE | Uncoated

EDP No		SIZES (mm)							
1.5P	3P	Thread Size	Limits	L	l	d	K	Kl	Z
WSOM 0305015	WSOM 0305030	M3 X 0.5	WH3	46	11	4	3.2	6	3
WSOM 0407015	WSOM 0407030	M4 X 0.7	WH3	52	13	5	4	7	3
WSOM 0508015	WSOM 0508030	M5 X 0.8	WH3	60	16	5.5	4.5	7	3
WSOM 0610015	WSOM 0610030	M6 X 1.0	WH3	62	19	6	4.5	7	3
WSOM 0810015	WSOM 0810030	M8 X 1.0	WH3	70	22	6.2	5	8	4
WSOM 0812515	WSOM 0812530	M8 X 1.25	WH4	70	22	6.2	5	8	4
WSOM 1010015	WSOM 1010030	M10 X 1.0	WH3	75	24	7	5.5	8	4
WSOM 1012515	WSOM 1012530	M10 X 1.25	WH4	75	24	7	5.5	8	4
WSOM 1015015	WSOM 1015030	M10 X 1.5	WH4	75	24	7	5.5	8	4
WSOM 1210015	WSOM 1210030	M12 X 1.0	WH3	82	29	8.5	6.5	9	4
WSOM 1212515	WSOM 1212530	M12 X 1.25	WH4	82	29	8.5	6.5	9	4
WSOM 1215015	WSOM 1215030	M12 X 1.5	WH4	82	29	8.5	6.5	9	4
WSOM 1217515	WSOM 1217530	M12 X 1.75	WH5	82	29	8.5	6.5	9	4

※ 1.5P Tap is removed external center as bottoming type

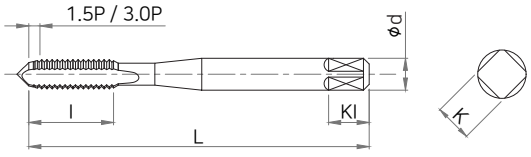
■ Applicable Working Material

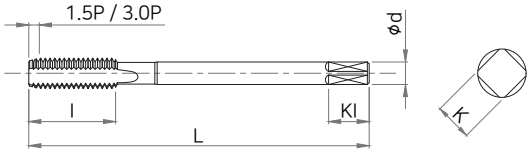
Copper	Brass	Casting Brass	Aluminum rolled material	Aluminum alloy castings	Zinc alloy castings
Cu	Bs	BsC	AL	AC, ADC	ZDC
◎	◎	◎	◎	◎	◎

○ : GOOD ◎ : EXCELLENT

WSCM | JIS STRAIGHT TAPS







CARBIDE | TiCN

EDP No		SIZES (mm)							
1.5P	3P	Thread Size	Limits	L	l	d	K	Kl	Z
WSCM 0305015	WSCM 0305030	M3 X 0.5	WH3	46	11	4	3.2	6	3
WSCM 0407015	WSCM 0407030	M4 X 0.7	WH3	52	13	5	4	7	3
WSCM 0508015	WSCM 0508030	M5 X 0.8	WH3	60	16	5.5	4.5	7	3
WSCM 0610015	WSCM 0610030	M6 X 1.0	WH3	62	19	6	4.5	7	3
WSCM 0810015	WSCM 0810030	M8 X 1.0	WH3	70	22	6.2	5	8	4
WSCM 0812515	WSCM 0812530	M8 X 1.25	WH4	70	22	6.2	5	8	4
WSCM 1010015	WSCM 1010030	M10 X 1.0	WH3	75	24	7	5.5	8	4
WSCM 1012515	WSCM 1012530	M10 X 1.25	WH4	75	24	7	5.5	8	4
WSCM 1015015	WSCM 1015030	M10 X 1.5	WH4	75	24	7	5.5	8	4
WSCM 1210015	WSCM 1210030	M12 X 1.0	WH3	82	29	8.5	6.5	9	4
WSCM 1212515	WSCM 1212530	M12 X 1.25	WH4	82	29	8.5	6.5	9	4
WSCM 1215015	WSCM 1215030	M12 X 1.5	WH4	82	29	8.5	6.5	9	4
WSCM 1217515	WSCM 1217530	M12 X 1.75	WH5	82	29	8.5	6.5	9	4

※ 1.5P Tap is removed external center as bottoming type

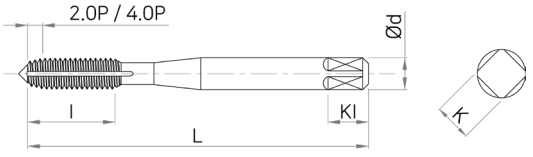
■ Applicable Working Material

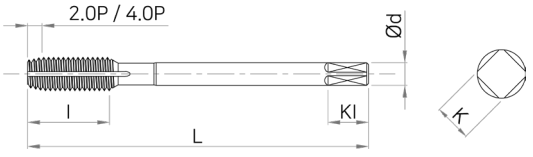
Copper	Brass	Casting Brass	Aluminum rolled material	Aluminum alloy castings	Zinc alloy castings
Cu	Bs	BsC	AL	AC, ADC	ZDC
◎	◎	◎	◎	◎	◎

○ : GOOD ◎ : EXCELLENT

WROM | JIS ROLL TAPS







CARBIDE | Uncoated

EDP No		SIZES (mm)							
2P	4P	Thread Size	Limits	L	l	d	K	Kl	Oil Groove
WROM 0305020S	-	M3 X 0.5	GH5	46	11	4	3.2	6	S
WROM 0305020M	WROM 0305040M	M3 X 0.5	GH5	46	11	4	3.2	6	M
WROM 0407020S	-	M4 X 0.7	GH6	52	13	5	4	7	S
WROM 0407020M	WROM 0407040M	M4 X 0.7	GH6	52	13	5	4	7	M
WROM 0508020S	-	M5 X 0.8	GH6	60	16	5.5	4.5	7	S
WROM 0508020M	WROM 0508040M	M5 X 0.8	GH6	60	16	5.5	4.5	7	M
WROM 0610020S	-	M6 X 1.0	GH7	62	19	6	4.5	7	S
WROM 0610020M	WROM 0610040M	M6 X 1.0	GH7	62	19	6	4.5	7	M
WROM 0812520S	-	M8 X 1.25	GH7	70	22	6.2	5	8	S
WROM 0812520M	WROM 0812540M	M8 X 1.25	GH7	70	22	6.2	5	8	M
WROM 1012520S	-	M10 X 1.25	GH7	75	24	7	5.5	8	S
WROM 1012520M	WROM 1012540M	M10 X 1.25	GH7	75	24	7	5.5	8	M
WROM 1015020S	-	M10 X 1.5	GH7	75	24	7	5.5	8	S
WROM 1015020M	WROM 1015040M	M10 X 1.5	GH7	75	24	7	5.5	8	M
WROM 1210020S	-	M12 X 1.0	GH7	82	29	8.5	6.5	9	S
WROM 1210020M	WROM 1210040M	M12 X 1.0	GH7	82	29	8.5	6.5	9	M
WROM 1212520S	-	M12 X 1.25	GH7	82	29	8.5	6.5	9	S
WROM 1212520M	WROM 1212540M	M12 X 1.25	GH7	82	29	8.5	6.5	9	M
WROM 1215020S	-	M12 X 1.5	GH7	82	29	8.5	6.5	9	S
WROM 1215020M	WROM 1215040M	M12 X 1.5	GH7	82	29	8.5	6.5	9	M
WROM 1217520S	-	M12 X 1.75	GH8	82	29	8.5	6.5	9	S
WROM 1217520M	WROM 1217540M	M12 X 1.75	GH8	82	29	8.5	6.5	9	M

※ 2.0P Tap is removed external center as bottoming type

Oil groove S : 1 Oil groove
Oil groove M : 4 Oil groove

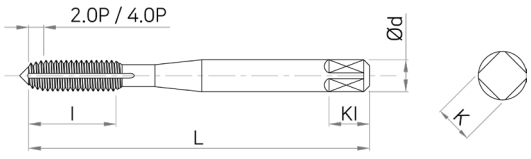
■ Applicable Working Material

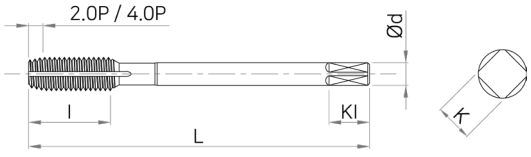
Copper	Brass	Casting Brass	Aluminum rolled material	Aluminum alloy castings	Zinc alloy castings
Cu	Bs	BsC	AL	AC, ADC	ZDC
◎	◎	◎	◎	◎	◎

○ : GOOD ◎ : EXCELLENT

WRCM | JIS ROLL TAPS







CARBIDE | TiCN

EDP No		SIZES (mm)							
2P	4P	Thread Size	Limits	L	l	d	K	Kl	Oil Groove
WRCM 0305020S	-	M3 X 0.5	GH5	46	11	4	3.2	6	S
WRCM 0305020M	WRCM 0305040M	M3 X 0.5	GH5	46	11	4	3.2	6	M
WRCM 0407020S	-	M4 X 0.7	GH6	52	13	5	4	7	S
WRCM 0407020M	WRCM 0407040M	M4 X 0.7	GH6	52	13	5	4	7	M
WRCM 0508020S	-	M5 X 0.8	GH6	60	16	5.5	4.5	7	S
WRCM 0508020M	WRCM 0508040M	M5 X 0.8	GH6	60	16	5.5	4.5	7	M
WRCM 0610020S	-	M6 X 1.0	GH7	62	19	6	4.5	7	S
WRCM 0610020M	WRCM 0610040M	M6 X 1.0	GH7	62	19	6	4.5	7	M
WRCM 0812520S	-	M8 X 1.25	GH7	70	22	6.2	5	8	S
WRCM 0812520M	WRCM 0812540M	M8 X 1.25	GH7	70	22	6.2	5	8	M
WRCM 1012520S	-	M10 X 1.25	GH7	75	24	7	5.5	8	S
WRCM 1012520M	WRCM 1012540M	M10 X 1.25	GH7	75	24	7	5.5	8	M
WRCM 1015020S	-	M10 X 1.5	GH7	75	24	7	5.5	8	S
WRCM 1015020M	WRCM 1015040M	M10 X 1.5	GH7	75	24	7	5.5	8	M
WRCM 1210020S	-	M12 X 1.0	GH7	82	29	8.5	6.5	9	S
WRCM 1210020M	WRCM 1210040M	M12 X 1.0	GH7	82	29	8.5	6.5	9	M
WRCM 1212520S	-	M12 X 1.25	GH7	82	29	8.5	6.5	9	S
WRCM 1212520M	WRCM 1212540M	M12 X 1.25	GH7	82	29	8.5	6.5	9	M
WRCM 1215020S	-	M12 X 1.5	GH7	82	29	8.5	6.5	9	S
WRCM 1215020M	WRCM 1215040M	M12 X 1.5	GH7	82	29	8.5	6.5	9	M
WRCM 1217520S	-	M12 X 1.75	GH8	82	29	8.5	6.5	9	S
WRCM 1217520M	WRCM 1217540M	M12 X 1.75	GH8	82	29	8.5	6.5	9	M

※ 2.0P Tap is removed external center as bottoming type

Oil groove S : 1 Oil groove
Oil groove M : 4 Oil groove

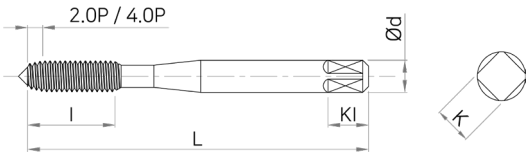
■ Applicable Working Material

Copper	Brass	Casting Brass	Aluminum rolled material	Aluminum alloy castings	Zinc alloy castings
Cu	Bs	BsC	AL	AC, ADC	ZDC
◎	◎	◎	◎	◎	◎

○ : GOOD ◎ : EXCELLENT

WFOM | JIS SPIRAL ROLL TAPS





CARBIDE | Uncoated

EDP No		SIZES (mm)						
2P	4P	Thread Size	Limits	L	l	d	K	Kl
WFOM 0305020	WFOM 0305040	M3 X 0.5	GH6	46	18	4	3.2	6
WFOM 03506020	WFOM 03506040	M3.5 X 0.6	GH6	46	18	4	3.2	6
WFOM 0407020	WFOM 0407040	M4 X 0.7	GH7	52	20	5	4	7
WFOM 0508020	WFOM 0508040	M5 X 0.8	GH7	60	22	5.5	4.5	7
WFOM 0610020	WFOM 0610040	M6 X 1.0	GH7	62	24	6	4.5	7

※ 2.0P Tap is removed external center as bottoming type

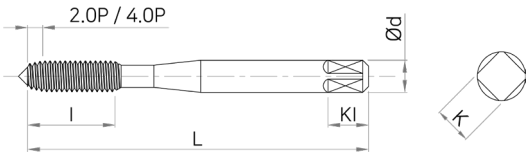
■ Applicable Working Material

Copper	Brass	Casting Brass	Aluminum rolled material	Aluminum alloy castings	Zinc alloy castings
Cu	Bs	BsC	AL	AC, ADC	ZDC
◎	◎	◎	◎	◎	◎

○ : GOOD ◎ : EXCELLENT

WFCM | JIS SPIRAL ROLL TAPS





CARBIDE | TiCN

EDP No		SIZES (mm)						
2P	4P	Thread Size	Limits	L	l	d	K	Kl
WFCM 0305020	WFCM 0305040	M3 X 0.5	GH6	46	18	4	3.2	6
WFCM 03506020	WFCM 03506040	M3.5 X 0.6	GH6	46	18	4	3.2	6
WFCM 0407020	WFCM 0407040	M4 X 0.7	GH7	52	20	5	4	7
WFCM 0508020	WFCM 0508040	M5 X 0.8	GH7	60	22	5.5	4.5	7
WFCM 0610020	WFCM 0610040	M6 X 1.0	GH7	62	24	6	4.5	7

※ 2.0P Tap is removed external center as bottoming type

■ Applicable Working Material

Copper	Brass	Casting Brass	Aluminum rolled material	Aluminum alloy castings	Zinc alloy castings
Cu	Bs	BsC	AL	AC, ADC	ZDC
◎	◎	◎	◎	◎	◎

○ : GOOD ◎ : EXCELLENT

DIN CARBIDE TAP

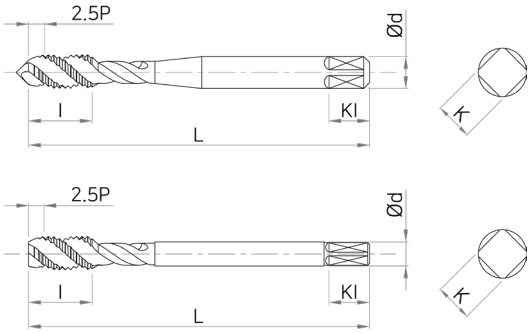


Contents

Series	Type	EDP No	Geometry	Surface Treatment		Diameter(mm)		Page
				Coating	Uncoated	Min	Max	
DIN	SPIRAL	WQOM			○	M3	M12	461
		WQCM		TiCN		M3	M12	462
	STRAIGHT	WGOM			○	M3	M12	463
		WGCM		TiCN		M3	M12	464
	ROLL	WMOM			○	M3	M12	465
		WMCM		TiCN		M3	M12	467

WQOM | DIN SPIRAL TAPS





DIN 371-374 376 | CARBIDE | Uncoated | 15° HELIX

EDP No	SIZES (mm)								
2.5P	Thread Size	Limits	L	l	d	K	Kl	Z	DIN Type
WQOM 0305025	M3X0.5	6H	56	11	3.5	2.7	6	3	371
WQOM 0407025	M4X0.7	6H	63	13	4.5	3.4	6	3	371
WQOM 0508025	M5X0.8	6H	70	15	6	4.9	8	3	371
WQOM 0610025	M6X1.0	6H	80	17	6	4.9	8	3	371
WQOM 0810025	M8X1.0	6H	90	17	6	4.9	8	3	374
WQOM 0812525	M8X1.25	6H	90	20	8	6.2	9	3	371
WQOM 1010025	M10X1.0	6H	90	18	7	5.5	8	3	374
WQOM 1012525	M10X1.25	6H	100	22	7	5.5	8	3	374
WQOM 1015025	M10X1.5	6H	100	22	10	8	11	3	371
WQOM 1210025	M12X1.0	6H	100	18	9	7	10	3	374
WQOM 1212525	M12X1.25	6H	100	22	9	7	10	3	374
WQOM 1215025	M12X1.5	6H	100	22	9	7	10	3	374
WQOM 1217525	M12X1.75	6H	110	24	9	7	10	3	376

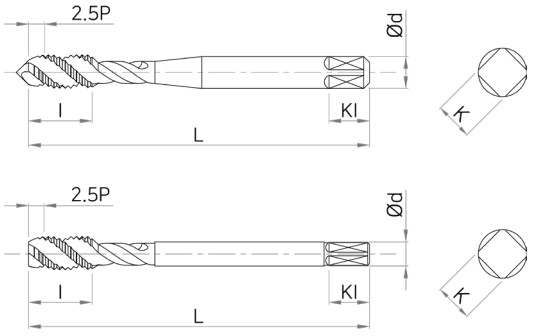
■ Applicable Working Material

Cast Iron	High Strength Steels	Copper	Brass	Casting Brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Thermoplastic
FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC	-
○	◎	◎	◎	◎	○	○	○	○	○	◎

○ : GOOD ◎ : EXCELLENT

WQCM | DIN SPIRAL TAPS





DIN 371-374 376 | CARBIDE | TiCN | 15° HELIX

EDP No	SIZES (mm)								
2.5P	Thread Size	Limits	L	l	d	K	Kl	Z	DIN Type
WQCM 0305025	M3X0.5	6H	56	11	3.5	2.7	6	3	371
WQCM 0407025	M4X0.7	6H	63	13	4.5	3.4	6	3	371
WQCM 0508025	M5X0.8	6H	70	15	6	4.9	8	3	371
WQCM 0610025	M6X1.0	6H	80	17	6	4.9	8	3	371
WQCM 0810025	M8X1.0	6H	90	17	6	4.9	8	3	374
WQCM 0812525	M8X1.25	6H	90	20	8	6.2	9	3	371
WQCM 1010025	M10X1.0	6H	90	18	7	5.5	8	3	374
WQCM 1012525	M10X1.25	6H	100	22	7	5.5	8	3	374
WQCM 1015025	M10X1.5	6H	100	22	10	8	11	3	371
WQCM 1210025	M12X1.0	6H	100	18	9	7	10	3	374
WQCM 1212525	M12X1.25	6H	100	22	9	7	10	3	374
WQCM 1215025	M12X1.5	6H	100	22	9	7	10	3	374
WQCM 1217525	M12X1.75	6H	110	24	9	7	10	3	376

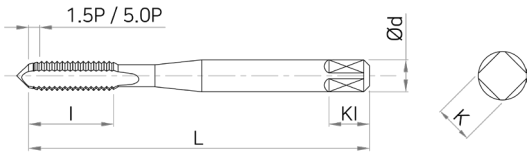
■ Applicable Working Material

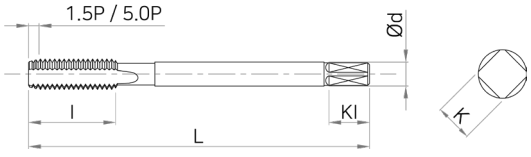
Cast Iron	High Strength Steels	Copper	Brass	Casting Brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Thermoplastic
FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC	-
○	◎	◎	◎	◎	○	○	○	○	○	◎

○ : GOOD ◎ : EXCELLENT

WGOM | DIN STRAIGHT TAPS







DIN 371-374 376 | CARBIDE | Uncoated

EDP No		SIZES (mm)								
1.5P	5P	Thread Size	Limits	L	l	d	K	Kl	Z	DIN Type
WGOM 0305015	WGOM 0305050	M3X0.5	6H	56	11	3.5	2.7	6	3	371
WGOM 0407015	WGOM 0407050	M4X0.7	6H	63	13	4.5	3.4	6	3	371
WGOM 0508015	WGOM 0508050	M5X0.8	6H	70	15	6	4.9	8	3	371
WGOM 0610015	WGOM 0610050	M6X1.0	6H	80	17	6	4.9	8	3	371
WGOM 0810015	WGOM 0810050	M8X1.0	6H	90	17	6	4.9	8	4	374
WGOM 0812515	WGOM 0812550	M8X1.25	6H	90	20	8	6.2	9	4	371
WGOM 1010015	WGOM 1010050	M10X1.0	6H	90	18	7	5.5	8	4	374
WGOM 1012515	WGOM 1012550	M10X1.25	6H	100	22	7	5.5	8	4	374
WGOM 1015015	WGOM 1015050	M10X1.5	6H	100	22	10	8	11	4	371
WGOM 1210015	WGOM 1210050	M12X1.0	6H	100	18	9	7	10	4	374
WGOM 1212515	WGOM 1212550	M12X1.25	6H	100	22	9	7	10	4	374
WGOM 1215015	WGOM 1215050	M12X1.5	6H	100	22	9	7	10	4	374
WGOM 1217515	WGOM 1217550	M12X1.75	6H	110	24	9	7	10	4	376

※ 1.5P Tap is removed external center as bottoming type

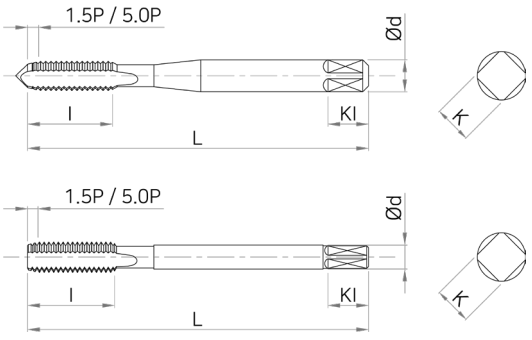
■ Applicable Working Material

Cast Iron	High Strength Steels	Copper	Brass	Casting Brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Thermoplastic
FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC	-
○	◎	◎	◎	◎	○	○	○	○	○	◎

○ : GOOD ◎ : EXCELLENT

WGCM | DIN STRAIGHT TAPS





DIN 371-374 376 | CARBIDE | TiCN

EDP No		SIZES (mm)								
1.5P	5P	Thread Size	Limits	L	l	d	K	Kl	Z	DIN Type
WGCM 0305015	WGCM 0305050	M3X0.5	6H	56	11	3.5	2.7	6	3	371
WGCM 0407015	WGCM 0407050	M4X0.7	6H	63	13	4.5	3.4	6	3	371
WGCM 0508015	WGCM 0508050	M5X0.8	6H	70	15	6	4.9	8	3	371
WGCM 0610015	WGCM 0610050	M6X1.0	6H	80	17	6	4.9	8	3	371
WGCM 0810015	WGCM 0810050	M8X1.0	6H	90	17	6	4.9	8	4	374
WGCM 0812515	WGCM 0812550	M8X1.25	6H	90	20	8	6.2	9	4	371
WGCM 1010015	WGCM 1010050	M10X1.0	6H	90	18	7	5.5	8	4	374
WGCM 1012515	WGCM 1012550	M10X1.25	6H	100	22	7	5.5	8	4	374
WGCM 1015015	WGCM 1015050	M10X1.5	6H	100	22	10	8	11	4	371
WGCM 1210015	WGCM 1210050	M12X1.0	6H	100	18	9	7	10	4	374
WGCM 1212515	WGCM 1212550	M12X1.25	6H	100	22	9	7	10	4	374
WGCM 1215015	WGCM 1215050	M12X1.5	6H	100	22	9	7	10	4	374
WGCM 1217515	WGCM 1217550	M12X1.75	6H	110	24	9	7	10	4	376

※ 1.5P Tap is removed external center as bottoming type

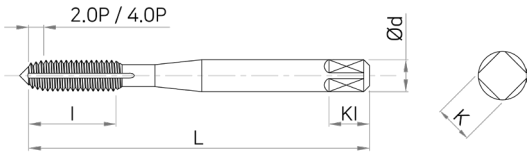
■ Applicable Working Material

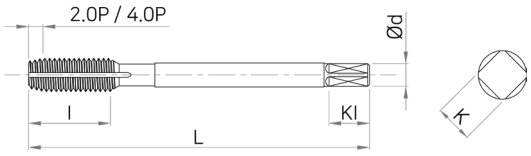
Cast Iron	High Strength Steels	Copper	Brass	Casting Brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Thermoplastic
FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC	-
○	◎	◎	◎	◎	○	○	○	○	○	◎

○ : GOOD ◎ : EXCELLENT

WMOM | DIN ROLL TAPS







DIN 371-374 376 | CARBIDE | Uncoated

EDP No		SIZES (mm)							
2P	4P	Thread Size	Limits	L	l	d	K	Kl	DIN Type
WMOM 0305020S	-	M3x0.5	6HX	56	11	3.5	2.7	6	S
WMOM 0305020M	WMOM 0305040M	M3x0.5	6HX	56	11	3.5	2.7	6	M
WMOM 0407020S	-	M4x0.7	6HX	63	13	4.5	3.4	6	S
WMOM 0407020M	WMOM 0407040M	M4x0.7	6HX	63	13	4.5	3.4	6	M
WMOM 0508020S	-	M5x0.8	6HX	70	15	6	4.9	8	S
WMOM 0508020M	WMOM 0508040M	M5x0.8	6HX	70	15	6	4.9	8	M
WMOM 0610020S	-	M6x1.0	6HX	80	17	6	4.9	8	S
WMOM 0610020M	WMOM 0610040M	M6x1.0	6HX	80	17	6	4.9	8	M
WMOM 0810020S	-	M8x1.0	6HX	90	17	6	4.9	8	S
WMOM 0810020M	WMOM 0810040M	M8x1.0	6HX	90	17	6	4.9	8	M
WMOM 0812520S	-	M8x1.25	6HX	90	20	8	6.2	9	S
WMOM 0812520M	WMOM 0812540M	M8x1.25	6HX	90	20	8	6.2	9	M
WMOM 1010020S	-	M10x1.0	6HX	90	18	7	5.5	8	S
WMOM 1010020M	WMOM 1010040M	M10x1.0	6HX	90	18	7	5.5	8	M
WMOM 1012520S	-	M10x1.25	6HX	100	22	7	5.5	8	S
WMOM 1012520M	WMOM 1012540M	M10x1.25	6HX	100	22	7	5.5	8	M
WMOM 1015020S	-	M10x1.5	6HX	100	22	10	8	11	S
WMOM 1015020M	WMOM 1015040M	M10x1.5	6HX	100	22	10	8	11	M
WMOM 1210020S	-	M12x1.0	6HX	100	18	9	7	10	S
WMOM 1210020M	WMOM 1210040M	M12x1.0	6HX	100	18	9	7	10	M
WMOM 1212520S	-	M12x1.25	6HX	100	22	9	7	10	S
WMOM 1212520M	WMOM 1212540M	M12x1.25	6HX	100	22	9	7	10	M
WMOM 1215020S	-	M12x1.5	6HX	100	22	9	7	10	S
WMOM 1215020M	WMOM 1215040M	M12x1.5	6HX	100	22	9	7	10	M

※ 2.0P Tap is removed external center as bottoming type

Oil groove S : 1 Oil groove
Oil groove M : 4 Oil groove

■ Applicable Working Material

Cast Iron	High Strength Steels	Copper	Brass	Casting Brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Thermoplastic
FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC	-
○	◎	◎	◎	◎	○	○	○	○	○	◎

○ : GOOD ◎ : EXCELLENT

WMOM | DIN ROLL TAPS

EDP No		SIZES (mm)							
2P	4P	Thread Size	Limits	L	l	d	K	Kl	DIN Type
WMOM 1217520S	-	M12x1.75	6HX	110	24	9	7	10	S
WMOM 1217520M	WMOM 1217540M	M12x1.75	6HX	110	24	9	7	10	M

※ 2.0P Tap is removed external center as bottoming type

Oil groove S : 1 Oil groove
Oil groove M : 4 Oil groove

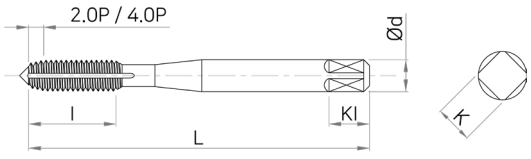
■ Applicable Working Material

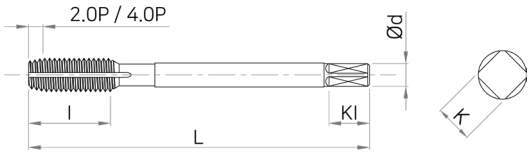
Cast Iron	High Strength Steels	Copper	Brass	Casting Brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Thermoplastic
FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC	-
○	◎	◎	◎	◎	○	○	○	○	○	◎

○ : GOOD ◎ : EXCELLENT

WMCM | DIN ROLL TAPS







DIN 371-374 376 | CARBIDE | TiCN

EDP No		SIZES (mm)							
2P	4P	Thread Size	Limits	L	l	d	K	Kl	DIN Type
WMCM 0305020S	-	M3x0.5	6HX	56	11	3.5	2.7	6	S
WMCM 0305020M	WMCM 0305040M	M3x0.5	6HX	56	11	3.5	2.7	6	M
WMCM 0407020S	-	M4x0.7	6HX	63	13	4.5	3.4	6	S
WMCM 0407020M	WMCM 0407040M	M4x0.7	6HX	63	13	4.5	3.4	6	M
WMCM 0508020S	-	M5x0.8	6HX	70	15	6	4.9	8	S
WMCM 0508020M	WMCM 0508040M	M5x0.8	6HX	70	15	6	4.9	8	M
WMCM 0610020S	-	M6x1.0	6HX	80	17	6	4.9	8	S
WMCM 0610020M	WMCM 0610040M	M6x1.0	6HX	80	17	6	4.9	8	M
WMCM 0810020S	-	M8x1.0	6HX	90	17	8	6.2	9	S
WMCM 0810020M	WMCM 0810040M	M8x1.0	6HX	90	17	8	6.2	9	M
WMCM 0812520S	-	M8x1.25	6HX	90	20	8	6.2	9	S
WMCM 0812520M	WMCM 0812540M	M8x1.25	6HX	90	20	8	6.2	9	M
WMCM 1010020S	-	M10x1.0	6HX	90	18	10	8	11	S
WMCM 1010020M	WMCM 1010040M	M10x1.0	6HX	90	18	10	8	11	M
WMCM 1012520S	-	M10x1.25	6HX	100	22	10	8	11	S
WMCM 1012520M	WMCM 1012540M	M10x1.25	6HX	100	22	10	8	11	M
WMCM 1015020S	-	M10x1.5	6HX	100	22	10	8	11	S
WMCM 1015020M	WMCM 1015040M	M10x1.5	6HX	100	22	10	8	11	M
WMCM 1210020S	-	M12x1.0	6HX	100	18	9	7	10	S
WMCM 1210020M	WMCM 1210040M	M12x1.0	6HX	100	18	9	7	10	M
WMCM 1212520S	-	M12x1.25	6HX	100	22	9	7	10	S
WMCM 1212520M	WMCM 1212540M	M12x1.25	6HX	100	22	9	7	10	M
WMCM 1215020S	-	M12x1.5	6HX	100	22	9	7	10	S
WMCM 1215020M	WMCM 1215040M	M12x1.5	6HX	100	22	9	7	10	M

※ 2.0P Tap is removed external center as bottoming type

Oil groove S : 1 Oil groove
Oil groove M : 4 Oil groove

■ Applicable Working Material

Cast Iron	High Strength Steels	Copper	Brass	Casting Brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Thermoplastic
FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC	-
○	◎	◎	◎	◎	○	○	○	○	○	◎

○ : GOOD ◎ : EXCELLENT

WMCM | DIN ROLL TAPS

EDP No		SIZES (mm)							
2P	4P	Thread Size	Limits	L	l	d	K	Kl	DIN Type
WMCM 1217520S	-	M12x1.75	6HX	110	24	9	7	10	S
WMCM 1217520M	WMCM 1217540M	M12x1.75	6HX	110	24	9	7	10	M

※ 2.0P Tap is removed external center as bottoming type

Oil groove S : 1 oil groove
Oil groove M : 4 oil groove

■ Applicable Working Material

Cast Iron	High Strength Steels	Copper	Brass	Casting Brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Thermoplastic
FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC	-
○	◎	◎	◎	◎	○	○	○	○	○	◎

○ : GOOD ◎ : EXCELLENT

JIS HSSE TAP

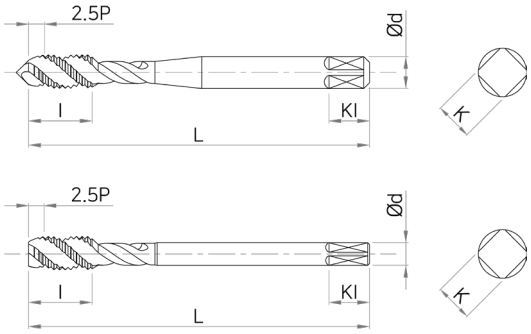


Contents

Series	Type	EDP No	Geometry	Surface Treatment		Diameter(mm)		Page
				Coating	Uncoated	Min	Max	
JIS	SPIRAL	VPOM			○	M3	M24	471
		VPTM		TiN		M3	M24	473
		VPCM		TiCN		M3	M24	475
		VPHM		HOMO		M3	M24	477
	POINT	VNOM			○	M3	M24	479
		VNTM		TiN		M3	M24	481
		VNCM		TiCN		M3	M24	483
		VNHM		HOMO		M3	M24	485
	STRAIGHT	VSOM			○	M3	M24	487
		VSTM		TiN		M3	M24	489
		VSCM		TiCN		M3	M24	491
		VSHM		HOMO		M3	M24	493
	ROLL	VROM			○	M3	M12	495
		VRTM		TiN		M3	M12	496
		VRCM		TiCN		M3	M12	497
	SPIRAL ROLL	VFOM			○	M3	M6	498
		VFTM		TiN		M3	M6	499
		VFCM		TiCN		M3	M6	500

VPOM | JIS SPIRAL TAPS





HSSE | Uncoated | 35° HELIX

EDP No	SIZES (mm)							
2.5P	Thread Size	Limits	L	l	d	K	Kl	Z
VPOM 0305025	M3 X 0.5	WH2	46	11	4	3.2	6	3
VPOM 0407025	M4 X 0.7	WH2	52	13	5	4	7	3
VPOM 04507525	M4.5 X 0.75	WH2	55	13	5	4	7	3
VPOM 0508025	M5 X 0.8	WH2	60	16	5.5	4.5	7	3
VPOM 0610025	M6 X 1.0	WH2	62	19	6	4.5	7	3
VPOM 0810025	M8 X 1.0	WH2	70	22	6.2	5	8	3
VPOM 0812525	M8 X 1.25	WH2	70	22	6.2	5	8	3
VPOM 1012525	M10 X 1.25	WH2	75	24	7	5.5	8	3
VPOM 1015025	M10 X 1.5	WH2	75	24	7	5.5	8	3
VPOM 1210025	M12 X 1.0	WH2	82	29	8.5	6.5	9	3
VPOM 1212525	M12 X 1.25	WH2	82	29	8.5	6.5	9	3
VPOM 1215025	M12 X 1.5	WH2	82	29	8.5	6.5	9	3
VPOM 1217525	M12 X 1.75	WH2	82	29	8.5	6.5	9	3
VPOM 1415025	M14 X 1.5	WH2	88	30	10.5	8	11	3
VPOM 1420025	M14 X 2.0	WH2	88	30	10.5	8	11	3
VPOM 1615025	M16 X 1.5	WH2	95	32	12.5	10	13	3
VPOM 1620025	M16 X 2.0	WH2	95	32	12.5	10	13	3
VPOM 1815025	M18 X 1.5	WH2	100	37	14	11	14	4
VPOM 1825025	M18 X 2.5	WH3	100	37	14	11	14	4
VPOM 2015025	M20 X 1.5	WH3	105	37	15	12	15	4
VPOM 2025025	M20 X 2.5	WH3	105	37	15	12	15	4
VPOM 2215025	M22 X 1.5	WH3	115	38	17	13	16	4
VPOM 2225025	M22 X 2.5	WH3	115	38	17	13	16	4
VPOM 2415025	M24 X 1.5	WH3	120	45	19	15	18	4

■ Applicable Working Material

Copper	Brass	Casting Brass	Aluminum rolled material	Aluminum alloy castings	Zinc alloy castings
Cu	Bs	BsC	AL	AC, ADC	ZDC
○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VPOM | JIS SPIRAL TAPS

EDP No	SIZES (mm)							
2.5P	Thread Size	Limits	L	l	d	K	Kl	Z
VPOM 2420025	M24 X 2.0	WH3	120	45	19	15	18	4
VPOM 2430025	M24 X 3.0	WH4	120	45	19	15	18	4

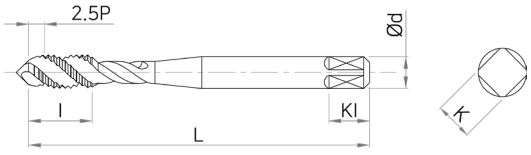
■ Applicable Working Material

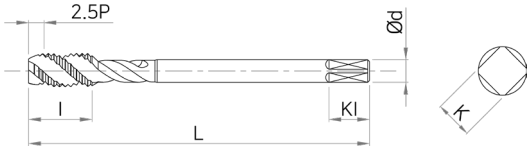
Copper	Brass	Casting Brass	Aluminum rolled material	Aluminum alloy castings	Zinc alloy castings
Cu	Bs	BsC	AL	AC, ADC	ZDC
○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VPTM | JIS SPIRAL TAPS







HSSE | TiN | 35° HELIX

EDP No	SIZES (mm)							
2.5P	Thread Size	Limits	L	l	d	K	Kl	Z
VPTM 0305025	M3 X 0.5	WH2	46	11	4	3.2	6	3
VPTM 0407025	M4 X 0.7	WH2	52	13	5	4	7	3
VPTM 04507525	M4.5 X 0.75	WH2	55	13	5	4	7	3
VPTM 0508025	M5 X 0.8	WH2	60	16	5.5	4.5	7	3
VPTM 0610025	M6 X 1.0	WH2	62	19	6	4.5	7	3
VPTM 0810025	M8 X 1.0	WH2	70	22	6.2	5	8	3
VPTM 0812525	M8 X 1.25	WH2	70	22	6.2	5	8	3
VPTM 1012525	M10 X 1.25	WH2	75	24	7	5.5	8	3
VPTM 1015025	M10 X 1.5	WH2	75	24	7	5.5	8	3
VPTM 1210025	M12 X 1.0	WH2	82	29	8.5	6.5	9	3
VPTM 1212525	M12 X 1.25	WH2	82	29	8.5	6.5	9	3
VPTM 1215025	M12 X 1.5	WH2	82	29	8.5	6.5	9	3
VPTM 1217525	M12 X 1.75	WH2	82	29	8.5	6.5	9	3
VPTM 1415025	M14 X 1.5	WH2	88	30	10.5	8	11	3
VPTM 1420025	M14 X 2.0	WH2	88	30	10.5	8	11	3
VPTM 1615025	M16 X 1.5	WH2	95	32	12.5	10	13	3
VPTM 1620025	M16 X 2.0	WH2	95	32	12.5	10	13	3
VPTM 1815025	M18 X 1.5	WH2	100	37	14	11	14	4
VPTM 1825025	M18 X 2.5	WH3	100	37	14	11	14	4
VPTM 2015025	M20 X 1.5	WH3	105	37	15	12	15	4
VPTM 2025025	M20 X 2.5	WH3	105	37	15	12	15	4
VPTM 2215025	M22 X 1.5	WH3	115	38	17	13	16	4
VPTM 2225025	M22 X 2.5	WH3	115	38	17	13	16	4
VPTM 2415025	M24 X 1.5	WH3	120	45	19	15	18	4

■ Applicable Working Material

Copper	Brass	Casting Brass	Aluminum rolled material	Aluminum alloy castings	Zinc alloy castings
Cu	Bs	BsC	AL	AC, ADC	ZDC
○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VPTM | JIS SPIRAL TAPS

EDP No	SIZES (mm)							
2.5P	Thread Size	Limits	L	l	d	K	Kl	Z
VPTM 2420025	M24 X 2.0	WH3	120	45	19	15	18	4
VPTM 2430025	M24 X 3.0	WH4	120	45	19	15	18	4

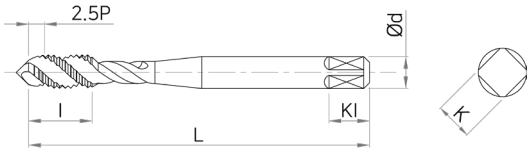
■ Applicable Working Material

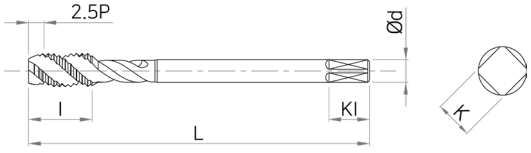
Copper	Brass	Casting Brass	Aluminum rolled material	Aluminum alloy castings	Zinc alloy castings
Cu	Bs	BsC	AL	AC, ADC	ZDC
○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VPCM | JIS SPIRAL TAPS







HSSE | TiCN | 35° HELIX

EDP No	SIZES (mm)							
2.5P	Thread Size	Limits	L	l	d	K	Kl	Z
VPCM 0305025	M3 X 0.5	WH2	46	11	4	3.2	6	3
VPCM 0407025	M4 X 0.7	WH2	52	13	5	4	7	3
VPCM 04507525	M4.5 X 0.75	WH2	55	13	5	4	7	3
VPCM 0508025	M5 X 0.8	WH2	60	16	5.5	4.5	7	3
VPCM 0610025	M6 X 1.0	WH2	62	19	6	4.5	7	3
VPCM 0810025	M8 X 1.0	WH2	70	22	6.2	5	8	3
VPCM 0812525	M8 X 1.25	WH2	70	22	6.2	5	8	3
VPCM 1012525	M10 X 1.25	WH2	75	24	7	5.5	8	3
VPCM 1015025	M10 X 1.5	WH2	75	24	7	5.5	8	3
VPCM 1210025	M12 X 1.0	WH2	82	29	8.5	6.5	9	3
VPCM 1212525	M12 X 1.25	WH2	82	29	8.5	6.5	9	3
VPCM 1215025	M12 X 1.5	WH2	82	29	8.5	6.5	9	3
VPCM 1217525	M12 X 1.75	WH2	82	29	8.5	6.5	9	3
VPCM 1415025	M14 X 1.5	WH2	88	30	10.5	8	11	3
VPCM 1420025	M14 X 2.0	WH2	88	30	10.5	8	11	3
VPCM 1615025	M16 X 1.5	WH2	95	32	12.5	10	13	3
VPCM 1620025	M16 X 2.0	WH2	95	32	12.5	10	13	3
VPCM 1815025	M18 X 1.5	WH2	100	37	14	11	14	4
VPCM 1825025	M18 X 2.5	WH3	100	37	14	11	14	4
VPCM 2015025	M20 X 1.5	WH3	105	37	15	12	15	4
VPCM 2025025	M20 X 2.5	WH3	105	37	15	12	15	4
VPCM 2215025	M22 X 1.5	WH3	115	38	17	13	16	4
VPCM 2225025	M22 X 2.5	WH3	115	38	17	13	16	4
VPCM 2415025	M24 X 1.5	WH3	120	45	19	15	18	4

■ Applicable Working Material

Copper	Brass	Casting Brass	Aluminum rolled material	Aluminum alloy castings	Zinc alloy castings
Cu	Bs	BsC	AL	AC, ADC	ZDC
○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

EDP No	SIZES (mm)							
2.5P	Thread Size	Limits	L	l	d	K	Kl	Z
VPCM 2420025	M24 X 2.0	WH3	120	45	19	15	18	4
VPCM 2430025	M24 X 3.0	WH4	120	45	19	15	18	4

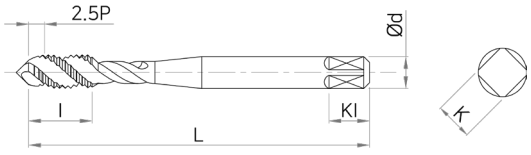
■ Applicable Working Material

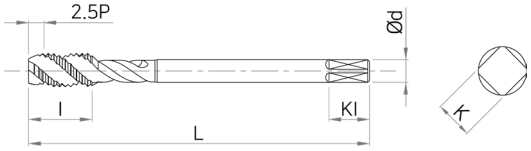
Copper	Brass	Casting Brass	Aluminum rolled material	Aluminum alloy castings	Zinc alloy castings
Cu	Bs	BsC	AL	AC, ADC	ZDC
○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VPHM | JIS SPIRAL TAPS







HSSE | HOMO | 35° HELIX

EDP No	SIZES (mm)							
2.5P	Thread Size	Limits	L	l	d	K	Kl	Z
VPHM 0305025	M3 X 0.5	WH2	46	11	4	3.2	6	3
VPHM 0407025	M4 X 0.7	WH2	52	13	5	4	7	3
VPHM 04507525	M4.5 X 0.75	WH2	55	13	5	4	7	3
VPHM 0508025	M5 X 0.8	WH2	60	16	5.5	4.5	7	3
VPHM 0610025	M6 X 1.0	WH2	62	19	6	4.5	7	3
VPHM 0810025	M8 X 1.0	WH2	70	22	6.2	5	8	3
VPHM 0812525	M8 X 1.25	WH2	70	22	6.2	5	8	3
VPHM 1012525	M10 X 1.25	WH2	75	24	7	5.5	8	3
VPHM 1015025	M10 X 1.5	WH2	75	24	7	5.5	8	3
VPHM 1210025	M12 X 1.0	WH2	82	29	8.5	6.5	9	3
VPHM 1212525	M12 X 1.25	WH2	82	29	8.5	6.5	9	3
VPHM 1215025	M12 X 1.5	WH2	82	29	8.5	6.5	9	3
VPHM 1217525	M12 X 1.75	WH2	82	29	8.5	6.5	9	3
VPHM 1415025	M14 X 1.5	WH2	88	30	10.5	8	11	3
VPHM 1420025	M14 X 2.0	WH2	88	30	10.5	8	11	3
VPHM 1615025	M16 X 1.5	WH2	95	32	12.5	10	13	3
VPHM 1620025	M16 X 2.0	WH2	95	32	12.5	10	13	3
VPHM 1815025	M18 X 1.5	WH2	100	37	14	11	14	4
VPHM 1825025	M18 X 2.5	WH3	100	37	14	11	14	4
VPHM 2015025	M20 X 1.5	WH3	105	37	15	12	15	4
VPHM 2025025	M20 X 2.5	WH3	105	37	15	12	15	4
VPHM 2215025	M22 X 1.5	WH3	115	38	17	13	16	4
VPHM 2225025	M22 X 2.5	WH3	115	38	17	13	16	4
VPHM 2415025	M24 X 1.5	WH3	120	45	19	15	18	4

■ Applicable Working Material

Copper	Brass	Casting Brass	Aluminum rolled material	Aluminum alloy castings	Zinc alloy castings
Cu	Bs	BsC	AL	AC, ADC	ZDC
○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

EDP No	SIZES (mm)							
2.5P	Thread Size	Limits	L	l	d	K	Kl	Z
VPHM 2420025	M24 X 2.0	WH3	120	45	19	15	18	4
VPHM 2430025	M24 X 3.0	WH4	120	45	19	15	18	4

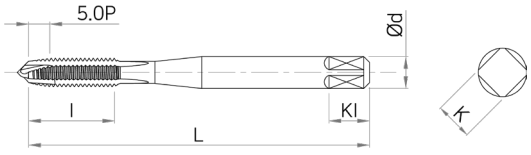
■ Applicable Working Material

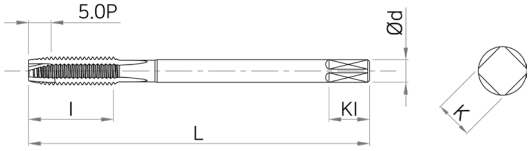
Copper	Brass	Casting Brass	Aluminum rolled material	Aluminum alloy castings	Zinc alloy castings
Cu	Bs	BsC	AL	AC, ADC	ZDC
○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VNOM | JIS POINT TAPS







HSSE | Uncoated

EDP No	SIZES (mm)							
5P	Thread Size	Limits	L	l	d	K	Kl	Z
VNOM 0305050	M3 X 0.5	WH2	46	11	4	3.2	6	3
VNOM 0407050	M4 X 0.7	WH2	52	13	5	4	7	3
VNOM 04507550	M4.5 X 0.75	WH2	55	13	5	4	7	3
VNOM 0508050	M5 X 0.8	WH2	60	16	5.5	4.5	7	3
VNOM 0610050	M6 X 1.0	WH2	62	19	6	4.5	7	3
VNOM 0810050	M8 X 1.0	WH3	70	22	6.2	5	8	3
VNOM 0812550	M8 X 1.25	WH3	70	22	6.2	5	8	3
VNOM 1012550	M10 X 1.25	WH3	75	24	7	5.5	8	3
VNOM 1015050	M10 X 1.5	WH3	75	24	7	5.5	8	3
VNOM 1210050	M12 X 1.0	WH3	82	29	8.5	6.5	9	3
VNOM 1212550	M12 X 1.25	WH3	82	29	8.5	6.5	9	3
VNOM 1215050	M12 X 1.5	WH3	82	29	8.5	6.5	9	3
VNOM 1217550	M12 X 1.75	WH4	82	29	8.5	6.5	9	3
VNOM 1415050	M14 X 1.5	WH3	88	30	10.5	8	11	3
VNOM 1420050	M14 X 2.0	WH4	88	30	10.5	8	11	3
VNOM 1615050	M16 X 1.5	WH3	95	32	12.5	10	13	3
VNOM 1620050	M16 X 2.0	WH4	95	32	12.5	10	13	3
VNOM 1815050	M18 X 1.5	WH4	100	37	14	11	14	3
VNOM 1825050	M18 X 2.5	WH4	100	37	14	11	14	3
VNOM 2015050	M20 X 1.5	WH4	105	37	15	12	15	3
VNOM 2025050	M20 X 2.5	WH4	105	37	15	12	15	3
VNOM 2215050	M22 X 1.5	WH4	115	38	17	13	16	3
VNOM 2225050	M22 X 2.5	WH4	115	38	17	13	16	3
VNOM 2415050	M24 X 1.5	WH4	120	45	19	15	18	3

■ Applicable Working Material

Copper	Brass	Casting Brass	Aluminum rolled material	Aluminum alloy castings	Zinc alloy castings
Cu	Bs	BsC	AL	AC, ADC	ZDC
○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

EDP No	SIZES (mm)							
5P	Thread Size	Limits	L	l	d	K	Kl	Z
VNOM 2420050	M24 X 2.0	WH4	120	45	19	15	18	3
VNOM 2430050	M24 X 3.0	WH4	120	45	19	15	18	3

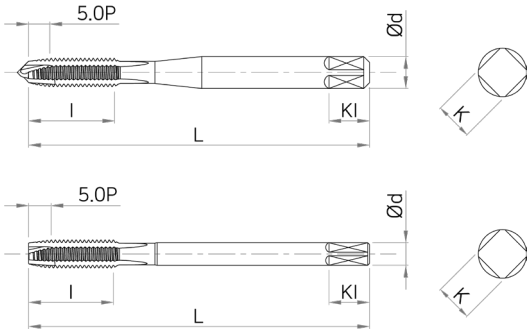
■ Applicable Working Material

Copper	Brass	Casting Brass	Aluminum rolled material	Aluminum alloy castings	Zinc alloy castings
Cu	Bs	BsC	AL	AC, ADC	ZDC
○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VNTM | JIS POINT TAPS





HSSE | TiN

EDP No	SIZES (mm)							
5P	Thread Size	Limits	L	l	d	K	Kl	Z
VNTM 0305050	M3 X 0.5	WH2	46	11	4	3.2	6	3
VNTM 0407050	M4 X 0.7	WH2	52	13	5	4	7	3
VNTM 04507550	M4.5 X 0.75	WH2	55	13	5	4	7	3
VNTM 0508050	M5 X 0.8	WH2	60	16	5.5	4.5	7	3
VNTM 0610050	M6 X 1.0	WH2	62	19	6	4.5	7	3
VNTM 0810050	M8 X 1.0	WH3	70	22	6.2	5	8	3
VNTM 0812550	M8 X 1.25	WH3	70	22	6.2	5	8	3
VNTM 1012550	M10 X 1.25	WH3	75	24	7	5.5	8	3
VNTM 1015050	M10 X 1.5	WH3	75	24	7	5.5	8	3
VNTM 1210050	M12 X 1.0	WH3	82	29	8.5	6.5	9	3
VNTM 1212550	M12 X 1.25	WH3	82	29	8.5	6.5	9	3
VNTM 1215050	M12 X 1.5	WH3	82	29	8.5	6.5	9	3
VNTM 1217550	M12 X 1.75	WH4	82	29	8.5	6.5	9	3
VNTM 1415050	M14 X 1.5	WH3	88	30	10.5	8	11	3
VNTM 1420050	M14 X 2.0	WH4	88	30	10.5	8	11	3
VNTM 1615050	M16 X 1.5	WH3	95	32	12.5	10	13	3
VNTM 1620050	M16 X 2.0	WH4	95	32	12.5	10	13	3
VNTM 1815050	M18 X 1.5	WH4	100	37	14	11	14	3
VNTM 1825050	M18 X 2.5	WH4	100	37	14	11	14	3
VNTM 2015050	M20 X 1.5	WH4	105	37	15	12	15	3
VNTM 2025050	M20 X 2.5	WH4	105	37	15	12	15	3
VNTM 2215050	M22 X 1.5	WH4	115	38	17	13	16	3
VNTM 2225050	M22 X 2.5	WH4	115	38	17	13	16	3
VNTM 2415050	M24 X 1.5	WH4	120	45	19	15	18	3

■ Applicable Working Material

Copper	Brass	Casting Brass	Aluminum rolled material	Aluminum alloy castings	Zinc alloy castings
Cu	Bs	BsC	AL	AC, ADC	ZDC
○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VNTM | JIS POINT TAPS

EDP No	SIZES (mm)							
5P	Thread Size	Limits	L	l	d	K	Kl	Z
VNTM 2420050	M24 X 2.0	WH4	120	45	19	15	18	3
VNTM 2430050	M24 X 3.0	WH4	120	45	19	15	18	3

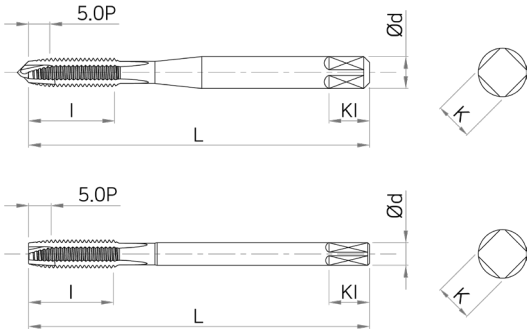
■ Applicable Working Material

Copper	Brass	Casting Brass	Aluminum rolled material	Aluminum alloy castings	Zinc alloy castings
Cu	Bs	BsC	AL	AC, ADC	ZDC
○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VNCM | JIS POINT TAPS





HSSE | TiCN

EDP No	SIZES (mm)							
5P	Thread Size	Limits	L	l	d	K	Kl	Z
VNCM 0305050	M3 X 0.5	WH2	46	11	4	3.2	6	3
VNCM 0407050	M4 X 0.7	WH2	52	13	5	4	7	3
VNCM 04507550	M4.5 X 0.75	WH2	55	13	5	4	7	3
VNCM 0508050	M5 X 0.8	WH2	60	16	5.5	4.5	7	3
VNCM 0610050	M6 X 1.0	WH2	62	19	6	4.5	7	3
VNCM 0810050	M8 X 1.0	WH3	70	22	6.2	5	8	3
VNCM 0812550	M8 X 1.25	WH3	70	22	6.2	5	8	3
VNCM 1012550	M10 X 1.25	WH3	75	24	7	5.5	8	3
VNCM 1015050	M10 X 1.5	WH3	75	24	7	5.5	8	3
VNCM 1210050	M12 X 1.0	WH3	82	29	8.5	6.5	9	3
VNCM 1212550	M12 X 1.25	WH3	82	29	8.5	6.5	9	3
VNCM 1215050	M12 X 1.5	WH3	82	29	8.5	6.5	9	3
VNCM 1217550	M12 X 1.75	WH4	82	29	8.5	6.5	9	3
VNCM 1415050	M14 X 1.5	WH3	88	30	10.5	8	11	3
VNCM 1420050	M14 X 2.0	WH4	88	30	10.5	8	11	3
VNCM 1615050	M16 X 1.5	WH3	95	32	12.5	10	13	3
VNCM 1620050	M16 X 2.0	WH4	95	32	12.5	10	13	3
VNCM 1815050	M18 X 1.5	WH4	100	37	14	11	14	3
VNCM 1825050	M18 X 2.5	WH4	100	37	14	11	14	3
VNCM 2015050	M20 X 1.5	WH4	105	37	15	12	15	3
VNCM 2025050	M20 X 2.5	WH4	105	37	15	12	15	3
VNCM 2215050	M22 X 1.5	WH4	115	38	17	13	16	3
VNCM 2225050	M22 X 2.5	WH4	115	38	17	13	16	3
VNCM 2415050	M24 X 1.5	WH4	120	45	19	15	18	3

■ Applicable Working Material

Copper	Brass	Casting Brass	Aluminum rolled material	Aluminum alloy castings	Zinc alloy castings
Cu	Bs	BsC	AL	AC, ADC	ZDC
○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

EDP No	SIZES (mm)							
5P	Thread Size	Limits	L	l	d	K	Kl	Z
VNCM 2420050	M24 X 2.0	WH4	120	45	19	15	18	3
VNCM 2430050	M24 X 3.0	WH4	120	45	19	15	18	3

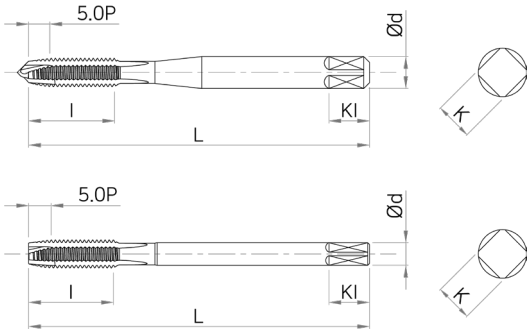
■ Applicable Working Material

Copper	Brass	Casting Brass	Aluminum rolled material	Aluminum alloy castings	Zinc alloy castings
Cu	Bs	BsC	AL	AC, ADC	ZDC
○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VNHM | JIS POINT TAPS





HSSE HOMO

EDP No	SIZES (mm)							
5P	Thread Size	Limits	L	l	d	K	Kl	Z
VNHM 0305050	M3 X 0.5	WH2	46	11	4	3.2	6	3
VNHM 0407050	M4 X 0.7	WH2	52	13	5	4	7	3
VNHM 04507550	M4.5 X 0.75	WH2	55	13	5	4	7	3
VNHM 0508050	M5 X 0.8	WH2	60	16	5.5	4.5	7	3
VNHM 0610050	M6 X 1.0	WH2	62	19	6	4.5	7	3
VNHM 0810050	M8 X 1.0	WH3	70	22	6.2	5	8	3
VNHM 0812550	M8 X 1.25	WH3	70	22	6.2	5	8	3
VNHM 1012550	M10 X 1.25	WH3	75	24	7	5.5	8	3
VNHM 1015050	M10 X 1.5	WH3	75	24	7	5.5	8	3
VNHM 1210050	M12 X 1.0	WH3	82	29	8.5	6.5	9	3
VNHM 1212550	M12 X 1.25	WH3	82	29	8.5	6.5	9	3
VNHM 1215050	M12 X 1.5	WH3	82	29	8.5	6.5	9	3
VNHM 1217550	M12 X 1.75	WH4	82	29	8.5	6.5	9	3
VNHM 1415050	M14 X 1.5	WH3	88	30	10.5	8	11	3
VNHM 1420050	M14 X 2.0	WH4	88	30	10.5	8	11	3
VNHM 1615050	M16 X 1.5	WH3	95	32	12.5	10	13	3
VNHM 1620050	M16 X 2.0	WH4	95	32	12.5	10	13	3
VNHM 1815050	M18 X 1.5	WH4	100	37	14	11	14	3
VNHM 1825050	M18 X 2.5	WH4	100	37	14	11	14	3
VNHM 2015050	M20 X 1.5	WH4	105	37	15	12	15	3
VNHM 2025050	M20 X 2.5	WH4	105	37	15	12	15	3
VNHM 2215050	M22 X 1.5	WH4	115	38	17	13	16	3
VNHM 2225050	M22 X 2.5	WH4	115	38	17	13	16	3
VNHM 2415050	M24 X 1.5	WH4	120	45	19	15	18	3

■ Applicable Working Material

Copper	Brass	Casting Brass	Aluminum rolled material	Aluminum alloy castings	Zinc alloy castings
Cu	Bs	BsC	AL	AC, ADC	ZDC
○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VNHM | JIS POINT TAPS

EDP No	SIZES (mm)							
5P	Thread Size	Limits	L	l	d	K	Kl	Z
VNHM 2420050	M24 X 2.0	WH4	120	45	19	15	18	3
VNHM 2430050	M24 X 3.0	WH4	120	45	19	15	18	3

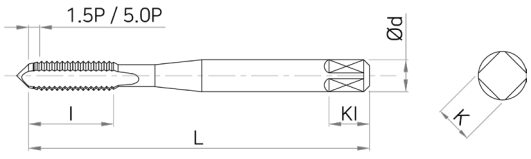
■ Applicable Working Material

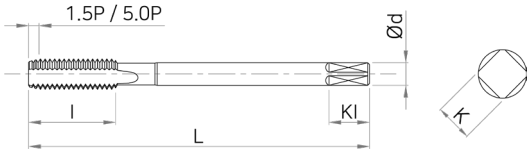
Copper	Brass	Casting Brass	Aluminum rolled material	Aluminum alloy castings	Zinc alloy castings
Cu	Bs	BsC	AL	AC, ADC	ZDC
○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VSOM | JIS STRAIGHT TAPS







HSSE | Uncoated

EDP No		SIZES (mm)							
1.5P	5P	Thread Size	Limits	L	l	d	K	Kl	Z
VSOM 0305015	VSOM 0305050	M3 X 0.5	WH2	46	11	4	3.2	6	3
VSOM 0407015	VSOM 0407050	M4 X 0.7	WH2	52	13	5	4	7	3
VSOM 04507515	VSOM 04507550	M4.5 X 0.75	WH2	55	13	5	4	7	3
VSOM 0508015	VSOM 0508050	M5 X 0.8	WH2	60	16	5.5	4.5	7	3
VSOM 0610015	VSOM 0610050	M6 X 1.0	WH2	62	19	6	4.5	7	3
VSOM 0810015	VSOM 0810050	M8 X 1.0	WH2	70	22	6.2	5	8	4
VSOM 0812515	VSOM 0812550	M8 X 1.25	WH2	70	22	6.2	5	8	4
VSOM 1012515	VSOM 1012550	M10 X 1.25	WH2	75	24	7	5.5	8	4
VSOM 1015015	VSOM 1015050	M10 X 1.5	WH3	75	24	7	5.5	8	4
VSOM 1210015	VSOM 1210050	M12 X 1.0	WH2	82	29	8.5	6.5	9	4
VSOM 1212515	VSOM 1212550	M12 X 1.25	WH2	82	29	8.5	6.5	9	4
VSOM 1215015	VSOM 1215050	M12 X 1.5	WH3	82	29	8.5	6.5	9	4
VSOM 1217515	VSOM 1217550	M12 X 1.75	WH3	82	29	8.5	6.5	9	4
VSOM 1415015	VSOM 1415050	M14 X 1.5	WH3	88	30	10.5	8	11	4
VSOM 1420015	VSOM 1420050	M14 X 2.0	WH3	88	30	10.5	8	11	4
VSOM 1615015	VSOM 1615050	M16 X 1.5	WH3	95	32	12.5	10	13	4
VSOM 1620015	VSOM 1620050	M16 X 2.0	WH3	95	32	12.5	10	13	4
VSOM 1815015	VSOM 1815050	M18 X 1.5	WH3	100	37	14	11	14	4
VSOM 1825015	VSOM 1825050	M18 X 2.5	WH3	100	37	14	11	14	4
VSOM 2015015	VSOM 2015050	M20 X 1.5	WH3	105	37	15	12	15	4
VSOM 2025015	VSOM 2025050	M20 X 2.5	WH3	105	37	15	12	15	4
VSOM 2215015	VSOM 2215050	M22 X 1.5	WH3	115	38	17	13	16	4
VSOM 2225015	VSOM 2225050	M22 X 2.5	WH3	115	38	17	13	16	4
VSOM 2415015	VSOM 2415050	M24 X 1.5	WH3	120	45	19	15	18	4

※ 1.5P Tap is removed external center as bottoming type

■ Applicable Working Material

Copper	Brass	Casting Brass	Aluminum rolled material	Aluminum alloy castings	Zinc alloy castings
Cu	Bs	BsC	AL	AC, ADC	ZDC
○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VSOM | JIS STRAIGHT TAPS

EDP No		SIZES (mm)							
1.5P	5P	Thread Size	Limits	L	l	d	K	Kl	Z
VSOM 2420015	VSOM 2420050	M24 X 2.0	WH3	120	45	19	15	18	4
VSOM 2430015	VSOM 2430050	M24 X 3.0	WH3	120	45	19	15	18	4

※ 1.5P Tap is removed external center as bottoming type

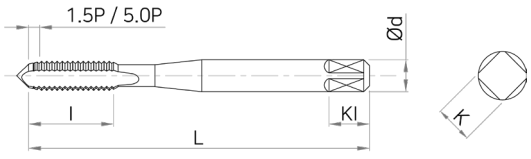
■ Applicable Working Material

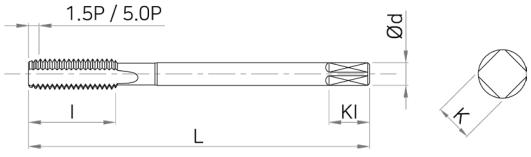
Copper	Brass	Casting Brass	Aluminum rolled material	Aluminum alloy castings	Zinc alloy castings
Cu	Bs	BsC	AL	AC, ADC	ZDC
○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VSTM | JIS STRAIGHT TAPS







HSSE | TiN

EDP No		SIZES (mm)							
1.5P	5P	Thread Size	Limits	L	l	d	K	Kl	Z
VSTM 0305015	VSTM 0305050	M3 X 0.5	WH2	46	11	4	3.2	6	3
VSTM 0407015	VSTM 0407050	M4 X 0.7	WH2	52	13	5	4	7	3
VSTM 04507515	VSTM 04507550	M4.5 X 0.75	WH2	55	13	5	4	7	3
VSTM 0508015	VSTM 0508050	M5 X 0.8	WH2	60	16	5.5	4.5	7	3
VSTM 0610015	VSTM 0610050	M6 X 1.0	WH2	62	19	6	4.5	7	3
VSTM 0810015	VSTM 0810050	M8 X 1.0	WH2	70	22	6.2	5	8	4
VSTM 0812515	VSTM 0812550	M8 X 1.25	WH2	70	22	6.2	5	8	4
VSTM 1012515	VSTM 1012550	M10 X 1.25	WH2	75	24	7	5.5	8	4
VSTM 1015015	VSTM 1015050	M10 X 1.5	WH3	75	24	7	5.5	8	4
VSTM 1210015	VSTM 1210050	M12 X 1.0	WH2	82	29	8.5	6.5	9	4
VSTM 1212515	VSTM 1212550	M12 X 1.25	WH2	82	29	8.5	6.5	9	4
VSTM 1215015	VSTM 1215050	M12 X 1.5	WH3	82	29	8.5	6.5	9	4
VSTM 1217515	VSTM 1217550	M12 X 1.75	WH3	82	29	8.5	6.5	9	4
VSTM 1415015	VSTM 1415050	M14 X 1.5	WH3	88	30	10.5	8	11	4
VSTM 1420015	VSTM 1420050	M14 X 2.0	WH3	88	30	10.5	8	11	4
VSTM 1615015	VSTM 1615050	M16 X 1.5	WH3	95	32	12.5	10	13	4
VSTM 1620015	VSTM 1620050	M16 X 2.0	WH3	95	32	12.5	10	13	4
VSTM 1815015	VSTM 1815050	M18 X 1.5	WH3	100	37	14	11	14	4
VSTM 1825015	VSTM 1825050	M18 X 2.5	WH3	100	37	14	11	14	4
VSTM 2015015	VSTM 2015050	M20 X 1.5	WH3	105	37	15	12	15	4
VSTM 2025015	VSTM 2025050	M20 X 2.5	WH3	105	37	15	12	15	4
VSTM 2215015	VSTM 2215050	M22 X 1.5	WH3	115	38	17	13	16	4
VSTM 2225015	VSTM 2225050	M22 X 2.5	WH3	115	38	17	13	16	4
VSTM 2415015	VSTM 2415050	M24 X 1.5	WH3	120	45	19	15	18	4

※ 1.5P Tap is removed external center as bottoming type

■ Applicable Working Material

Copper	Brass	Casting Brass	Aluminum rolled material	Aluminum alloy castings	Zinc alloy castings
Cu	Bs	BsC	AL	AC, ADC	ZDC
○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VSTM | JIS STRAIGHT TAPS

EDP No		SIZES (mm)							
1.5P	5P	Thread Size	Limits	L	l	d	K	Kl	Z
VSTM 2420015	VSTM 2420050	M24 X 2.0	WH3	120	45	19	15	18	4
VSTM 2430015	VSTM 2430050	M24 X 3.0	WH3	120	45	19	15	18	4

※ 1.5P Tap is removed external center as bottoming type

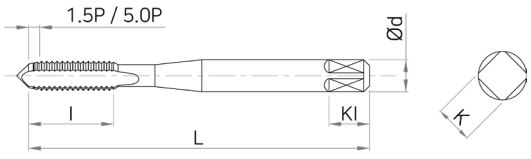
■ Applicable Working Material

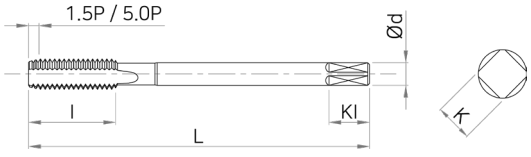
Copper	Brass	Casting Brass	Aluminum rolled material	Aluminum alloy castings	Zinc alloy castings
Cu	Bs	BsC	AL	AC, ADC	ZDC
○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VSCM | JIS STRAIGHT TAPS







HSSE | TiCN

EDP No		SIZES (mm)							
1.5P	5P	Thread Size	Limits	L	l	d	K	Kl	Z
VSCM 0305015	VSCM 0305050	M3 X 0.5	WH2	46	11	4	3.2	6	3
VSCM 0407015	VSCM 0407050	M4 X 0.7	WH2	52	13	5	4	7	3
VSCM 04507515	VSCM 04507550	M4.5 X 0.75	WH2	55	13	5	4	7	3
VSCM 0508015	VSCM 0508050	M5 X 0.8	WH2	60	16	5.5	4.5	7	3
VSCM 0610015	VSCM 0610050	M6 X 1.0	WH2	62	19	6	4.5	7	3
VSCM 0810015	VSCM 0810050	M8 X 1.0	WH2	70	22	6.2	5	8	4
VSCM 0812515	VSCM 0812550	M8 X 1.25	WH2	70	22	6.2	5	8	4
VSCM 1012515	VSCM 1012550	M10 X 1.25	WH2	75	24	7	5.5	8	4
VSCM 1015015	VSCM 1015050	M10 X 1.5	WH3	75	24	7	5.5	8	4
VSCM 1210015	VSCM 1210050	M12 X 1.0	WH2	82	29	8.5	6.5	9	4
VSCM 1212515	VSCM 1212550	M12 X 1.25	WH2	82	29	8.5	6.5	9	4
VSCM 1215015	VSCM 1215050	M12 X 1.5	WH3	82	29	8.5	6.5	9	4
VSCM 1217515	VSCM 1217550	M12 X 1.75	WH3	82	29	8.5	6.5	9	4
VSCM 1415015	VSCM 1415050	M14 X 1.5	WH3	88	30	10.5	8	11	4
VSCM 1420015	VSCM 1420050	M14 X 2.0	WH3	88	30	10.5	8	11	4
VSCM 1615015	VSCM 1615050	M16 X 1.5	WH3	95	32	12.5	10	13	4
VSCM 1620015	VSCM 1620050	M16 X 2.0	WH3	95	32	12.5	10	13	4
VSCM 1815015	VSCM 1815050	M18 X 1.5	WH3	100	37	14	11	14	4
VSCM 1825015	VSCM 1825050	M18 X 2.5	WH3	100	37	14	11	14	4
VSCM 2015015	VSCM 2015050	M20 X 1.5	WH3	105	37	15	12	15	4
VSCM 2025015	VSCM 2025050	M20 X 2.5	WH3	105	37	15	12	15	4
VSCM 2215015	VSCM 2215050	M22 X 1.5	WH3	115	38	17	13	16	4
VSCM 2225015	VSCM 2225050	M22 X 2.5	WH3	115	38	17	13	16	4
VSCM 2415015	VSCM 2415050	M24 X 1.5	WH3	120	45	19	15	18	4

※ 1.5P Tap is removed external center as bottoming type

■ Applicable Working Material

Copper	Brass	Casting Brass	Aluminum rolled material	Aluminum alloy castings	Zinc alloy castings
Cu	Bs	BsC	AL	AC, ADC	ZDC
○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

EDP No		SIZES (mm)							
1.5P	5P	Thread Size	Limits	L	l	d	K	Kl	Z
VSCM 2420015	VSCM 2420050	M24 X 2.0	WH3	120	45	19	15	18	4
VSCM 2430015	VSCM 2430050	M24 X 3.0	WH3	120	45	19	15	18	4

※ 1.5P Tap is removed external center as bottoming type

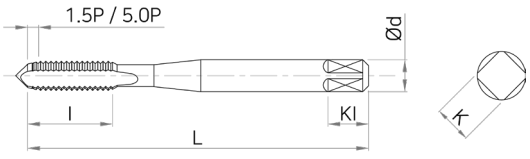
■ Applicable Working Material

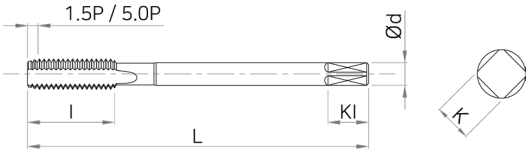
Copper	Brass	Casting Brass	Aluminum rolled material	Aluminum alloy castings	Zinc alloy castings
Cu	Bs	BsC	AL	AC, ADC	ZDC
○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VSHM | JIS STRAIGHT TAPS







HSSE | HOMO

EDP No		SIZES (mm)							
1.5P	5P	Thread Size	Limits	L	l	d	K	Kl	Z
VSHM 0305015	VSHM 0305050	M3 X 0.5	WH2	46	11	4	3.2	6	3
VSHM 0407015	VSHM 0407050	M4 X 0.7	WH2	52	13	5	4	7	3
VSHM 04507515	VSHM 04507550	M4.5 X 0.75	WH2	55	13	5	4	7	3
VSHM 0508015	VSHM 0508050	M5 X 0.8	WH2	60	16	5.5	4.5	7	3
VSHM 0610015	VSHM 0610050	M6 X 1.0	WH2	62	19	6	4.5	7	3
VSHM 0810015	VSHM 0810050	M8 X 1.0	WH2	70	22	6.2	5	8	4
VSHM 0812515	VSHM 0812550	M8 X 1.25	WH2	70	22	6.2	5	8	4
VSHM 1012515	VSHM 1012550	M10 X 1.25	WH2	75	24	7	5.5	8	4
VSHM 1015015	VSHM 1015050	M10 X 1.5	WH3	75	24	7	5.5	8	4
VSHM 1210015	VSHM 1210050	M12 X 1.0	WH2	82	29	8.5	6.5	9	4
VSHM 1212515	VSHM 1212550	M12 X 1.25	WH2	82	29	8.5	6.5	9	4
VSHM 1215015	VSHM 1215050	M12 X 1.5	WH3	82	29	8.5	6.5	9	4
VSHM 1217515	VSHM 1217550	M12 X 1.75	WH3	82	29	8.5	6.5	9	4
VSHM 1415015	VSHM 1415050	M14 X 1.5	WH3	88	30	10.5	8	11	4
VSHM 1420015	VSHM 1420050	M14 X 2.0	WH3	88	30	10.5	8	11	4
VSHM 1615015	VSHM 1615050	M16 X 1.5	WH3	95	32	12.5	10	13	4
VSHM 1620015	VSHM 1620050	M16 X 2.0	WH3	95	32	12.5	10	13	4
VSHM 1815015	VSHM 1815050	M18 X 1.5	WH3	100	37	14	11	14	4
VSHM 1825015	VSHM 1825050	M18 X 2.5	WH3	100	37	14	11	14	4
VSHM 2015015	VSHM 2015050	M20 X 1.5	WH3	105	37	15	12	15	4
VSHM 2025015	VSHM 2025050	M20 X 2.5	WH3	105	37	15	12	15	4
VSHM 2215015	VSHM 2215050	M22 X 1.5	WH3	115	38	17	13	16	4
VSHM 2225015	VSHM 2225050	M22 X 2.5	WH3	115	38	17	13	16	4
VSHM 2415015	VSHM 2415050	M24 X 1.5	WH3	120	45	19	15	18	4

※ 1.5P Tap is removed external center as bottoming type

■ Applicable Working Material

Copper	Brass	Casting Brass	Aluminum rolled material	Aluminum alloy castings	Zinc alloy castings
Cu	Bs	BsC	AL	AC, ADC	ZDC
○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

EDP No		SIZES (mm)							
1.5P	5P	Thread Size	Limits	L	l	d	K	Kl	Z
VSHM 2420015	VSHM 2420050	M24 X 2.0	WH3	120	45	19	15	18	4
VSHM 2430015	VSHM 2430050	M24 X 3.0	WH3	120	45	19	15	18	4

※ 1.5P Tap is removed external center as bottoming type

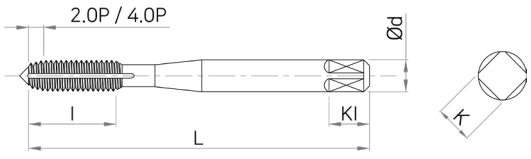
■ Applicable Working Material

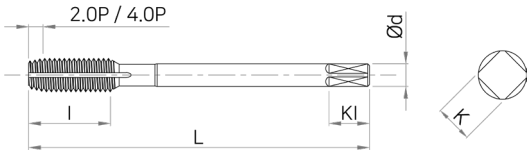
Copper	Brass	Casting Brass	Aluminum rolled material	Aluminum alloy castings	Zinc alloy castings
Cu	Bs	BsC	AL	AC, ADC	ZDC
○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VROM | JIS ROLL TAPS







HSSE | Uncoated

EDP No		SIZES (mm)							
2P	4P	Thread Size	Limits	L	l	d	K	Kl	Oil Groove
VROM 0305020S	-	M3 X 0.5	GH5	46	11	4	3.2	6	S
VROM 0305020M	VROM 0305040M	M3 X 0.5	GH5	46	11	4	3.2	6	M
VROM 0407020S	-	M4 X 0.7	GH6	52	13	5	4	7	S
VROM 0407020M	VROM 0407040M	M4 X 0.7	GH6	52	13	5	4	7	M
VROM 0508020S	-	M5 X 0.8	GH6	60	16	5.5	4.5	7	S
VROM 0508020M	VROM 0508040M	M5 X 0.8	GH6	60	16	5.5	4.5	7	M
VROM 0610020S	-	M6 X 1.0	GH7	62	19	6	4.5	7	S
VROM 0610020M	VROM 0610040M	M6 X 1.0	GH7	62	19	6	4.5	7	M
VROM 0810020S	-	M8 X 1.0	GH7	70	22	6.2	5	8	S
VROM 0810040M	VROM 0810040M	M8 X 1.0	GH7	70	22	6.2	5	8	M
VROM 0812520S	-	M8 X 1.25	GH7	70	22	6.2	5	8	S
VROM 0812520M	VROM 0812540M	M8 X 1.25	GH7	70	22	6.2	5	8	M
VROM 1012520S	-	M10 X 1.25	GH7	75	24	7	5.5	8	S
VROM 1012520M	VROM 1012540M	M10 X 1.25	GH7	75	24	7	5.5	8	M
VROM 1015020S	-	M10 X 1.5	GH7	75	24	7	5.5	8	S
VROM 1015020M	VROM 1015040M	M10 X 1.5	GH7	75	24	7	5.5	8	M
VROM 1210020S	-	M12 X 1.0	GH7	82	29	8.5	6.5	9	S
VROM 1210020M	VROM 1210040M	M12 X 1.0	GH7	82	29	8.5	6.5	9	M
VROM 1212520S	-	M12 X 1.25	GH7	82	29	8.5	6.5	9	S
VROM 1212520M	VROM 1212540M	M12 X 1.25	GH7	82	29	8.5	6.5	9	M
VROM 1215020S	-	M12 X 1.5	GH7	82	29	8.5	6.5	9	S
VROM 1215020M	VROM 1215040M	M12 X 1.5	GH7	82	29	8.5	6.5	9	M
VROM 1217520S	-	M12 X 1.75	GH8	82	29	8.5	6.5	9	S
VROM 1217520M	VROM 1217540M	M12 X 1.75	GH8	82	29	8.5	6.5	9	M

※ 1.5P Tap is removed external center as bottoming type

Oil groove S : 1 Oil groove
Oil groove M : 4 Oil groove

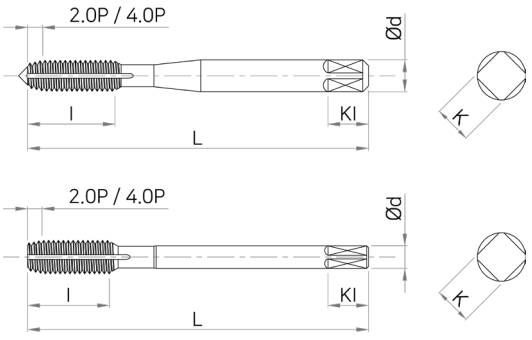
■ Applicable Working Material

Copper	Brass	Casting Brass	Aluminum rolled material	Aluminum alloy castings	Zinc alloy castings
Cu	Bs	BsC	AL	AC, ADC	ZDC
○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VRTM | JIS ROLL TAPS





HSSE | TiN

EDP No		SIZES (mm)							
2P	4P	Thread Size	Limits	L	l	d	K	Kl	Oil Groove
VRTM 0305020S	-	M3 X 0.5	GH5	46	11	4	3.2	6	S
VRTM 0305020M	VRTM 0305040M	M3 X 0.5	GH6	46	11	4	3.2	6	M
VRTM 0407020S	-	M4 X 0.7	GH6	52	13	5	4	7	S
VRTM 0407020M	VRTM 0407040M	M4 X 0.7	GH6	52	13	5	4	7	M
VRTM 0508020S	-	M5 X 0.8	GH6	60	16	5.5	4.5	7	S
VRTM 0508020M	VRTM 0508040M	M5 X 0.8	GH6	60	16	5.5	4.5	7	M
VRTM 0610020S	-	M6 X 1.0	GH7	62	19	6	4.5	7	S
VRTM 0610020M	VRTM 0610040M	M6 X 1.0	GH7	62	19	6	4.5	7	M
VRTM 0810020S	-	M8 X 1.0	GH7	70	22	6.2	5	8	S
VRTM 0810020M	VRTM 0810040M	M8 X 1.0	GH7	70	22	6.2	5	8	M
VRTM 0812520S	-	M8 X 1.25	GH7	70	22	6.2	5	8	S
VRTM 0812520M	VRTM 0812540M	M8 X 1.25	GH7	70	22	6.2	5	8	M
VRTM 1012520S	-	M10 X 1.25	GH7	75	24	7	5.5	8	S
VRTM 1012520M	VRTM 1012540M	M10 X 1.25	GH7	75	24	7	5.5	8	M
VRTM 1015020S	-	M10 X 1.5	GH7	75	24	7	5.5	8	S
VRTM 1015020M	VRTM 1015040M	M10 X 1.5	GH7	75	24	7	5.5	8	M
VRTM 1210020S	-	M12 X 1.0	GH7	82	29	8.5	6.5	9	S
VRTM 1210020M	VRTM 1210040M	M12 X 1.0	GH7	82	29	8.5	6.5	9	M
VRTM 1212520S	-	M12 X 1.25	GH7	82	29	8.5	6.5	9	S
VRTM 1212520M	VRTM 1212540M	M12 X 1.25	GH7	82	29	8.5	6.5	9	M
VRTM 1215020S	-	M12 X 1.5	GH7	82	29	8.5	6.5	9	S
VRTM 1215020M	VRTM 1215040M	M12 X 1.5	GH7	82	29	8.5	6.5	9	M
VRTM 1217520S	-	M12 X 1.75	GH8	82	29	8.5	6.5	9	S
VRTM 1217520M	VRTM 1217540M	M12 X 1.75	GH8	82	29	8.5	6.5	9	M

※ 1.5P Tap is removed external center as bottoming type

Oil groove S : 1 Oil groove
Oil groove M : 4 Oil groove

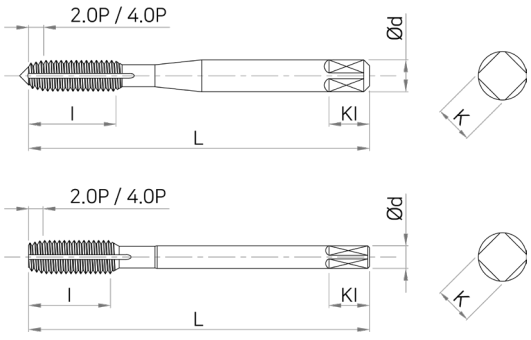
■ Applicable Working Material

Copper	Brass	Casting Brass	Aluminum rolled material	Aluminum alloy castings	Zinc alloy castings
Cu	Bs	BsC	AL	AC, ADC	ZDC
○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VRCM | JIS ROLL TAPS





HSSE | TiCN

EDP No		SIZES (mm)							
2P	4P	Thread Size	Limits	L	l	d	K	Kl	Oil Groove
VRCM 0305020S	-	M3 X 0.5	GH5	46	11	4	3.2	6	S
VRCM 0305020M	VRCM 0305040M	M3 X 0.5	GH5	46	11	4	3.2	6	M
VRCM 0407020S	-	M4 X 0.7	GH6	52	13	5	4	7	S
VRCM 0407020M	VRCM 0407040M	M4 X 0.7	GH6	52	13	5	4	7	M
VRCM 0508020S	-	M5 X 0.8	GH6	60	16	5.5	4.5	7	S
VRCM 0508020M	VRCM 0508040M	M5 X 0.8	GH6	60	16	5.5	4.5	7	M
VRCM 0610020S	-	M6 X 1.0	GH7	62	19	6	4.5	7	S
VRCM 0610020M	VRCM 0610040M	M6 X 1.0	GH7	62	19	6	4.5	7	M
VRCM 0810020S	-	M8 X 1.0	GH7	70	22	6.2	5	8	S
VRCM 0810040S	VRCM 0810040M	M8 X 1.0	GH7	70	22	6.2	5	8	M
VRCM 0812520S	-	M8 X 1.25	GH7	70	22	6.2	5	8	S
VRCM 0812520M	VRCM 0812540M	M8 X 1.25	GH7	70	22	6.2	5	8	M
VRCM 1012520S	-	M10 X 1.25	GH7	75	24	7	5.5	8	S
VRCM 1012520M	VRCM 1012540M	M10 X 1.25	GH7	75	24	7	5.5	8	M
VRCM 1015020S	-	M10 X 1.50	GH7	75	24	7	5.5	8	S
VRCM 1015020M	VRCM 1015040M	M10 X 1.50	GH7	75	24	7	5.5	8	M
VRCM 1210020S	-	M12 X 1.0	GH7	82	29	8.5	6.5	9	S
VRCM 1210020M	VRCM 1210040M	M12 X 1.0	GH7	82	29	8.5	6.5	9	M
VRCM 1212520S	-	M12 X 1.25	GH7	82	29	8.5	6.5	9	S
VRCM 1212520M	VRCM 1212540M	M12 X 1.25	GH7	82	29	8.5	6.5	9	M
VRCM 1215020S	-	M12 X 1.5	GH7	82	29	8.5	6.5	9	S
VRCM 1215020M	VRCM 1215040M	M12 X 1.5	GH7	82	29	8.5	6.5	9	M
VRCM 1217520S	-	M12 X 1.75	GH8	82	29	8.5	6.5	9	S
VRCM 1217520M	VRCM 1217540M	M12 X 1.75	GH8	82	29	8.5	6.5	9	M

※ 1.5P Tap is removed external center as bottoming type

Oil groove S : 1 Oil groove
Oil groove M : 4 Oil groove

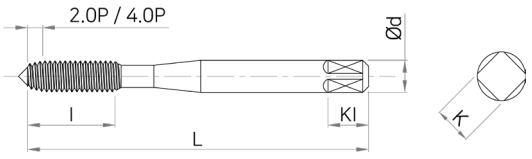
■ Applicable Working Material

Copper	Brass	Casting Brass	Aluminum rolled material	Aluminum alloy castings	Zinc alloy castings
Cu	Bs	BsC	AL	AC, ADC	ZDC
○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VFOM | JIS SPIRAL ROLL TAPS





HSSE | Uncoated

EDP No		SIZES (mm)						
2P	4P	Thread Size	Limits	L	l	d	K	Kl
VFOM 0305020	VFOM 0305040	M3 X 0.5	GH6	46	18	4	3.2	6
VFOM 03506020	VFOM 03506040	M3.5 X 0.6	GH6	46	18	4	3.2	6
VFOM 0407020	VFOM 0407040	M4 X 0.7	GH7	52	20	5	4	7
VFOM 0508020	VFOM 0508040	M5 X 0.8	GH7	60	22	5.5	4.5	7
VFOM 0610020	VFOM 0610040	M6 X 1.0	GH7	62	24	6	4.5	7

※ 2.0P Tap is removed external center as bottoming type

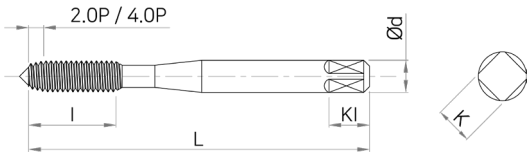
■ Applicable Working Material

Copper	Brass	Casting Brass	Aluminum rolled material	Aluminum alloy castings	Zinc alloy castings
Cu	Bs	BsC	AL	AC, ADC	ZDC
○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VFTM | JIS SPIRAL ROLL TAPS





HSSE | TiN

EDP No		SIZES (mm)						
2P	4P	Thread Size	Limits	L	l	d	K	Kl
VFTM 0305020	VFTM 0305040	M3 X 0.5	GH6	46	18	4	3.2	6
VFTM 03506020	VFTM 03506040	M3.5 X 0.6	GH6	46	18	4	3.2	6
VFTM 0407020	VFTM 0407040	M4 X 0.7	GH7	52	20	5	4	7
VFTM 0508020	VFTM 0508040	M5 X 0.8	GH7	60	22	5.5	4.5	7
VFTM 0610020	VFTM 0610040	M6 X 1.0	GH7	62	24	6	4.5	7

※ 2.0P Tap is removed external center as bottoming type

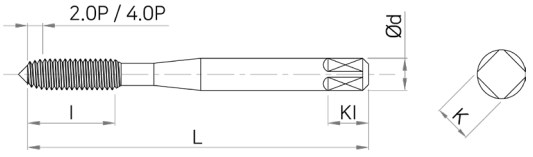
■ Applicable Working Material

Copper	Brass	Casting Brass	Aluminum rolled material	Aluminum alloy castings	Zinc alloy castings
Cu	Bs	BsC	AL	AC, ADC	ZDC
○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VFCM | JIS SPIRAL ROLL TAPS





HSSE | TiCN

EDP No		SIZES (mm)						
2P	4P	Thread Size	Limits	L	l	d	K	Kl
VFCM 0305020	VFCM 0305040	M3 X 0.5	GH6	46	18	4	3.2	6
VFCM 03506020	VFCM 03506040	M3.5 X 0.6	GH6	46	18	4	3.2	6
VFCM 0407020	VFCM 0407040	M4 X 0.7	GH7	52	20	5	4	7
VFCM 0508020	VFCM 0508040	M5 X 0.8	GH7	60	22	5.5	4.5	7
VFCM 0610020	VFCM 0610040	M6 X 1.0	GH7	62	24	6	4.5	7

※ 2.0P Tap is removed external center as bottoming type

■ Applicable Working Material

Copper	Brass	Casting Brass	Aluminum rolled material	Aluminum alloy castings	Zinc alloy castings
Cu	Bs	BsC	AL	AC, ADC	ZDC
○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

DIN HSSE TAP

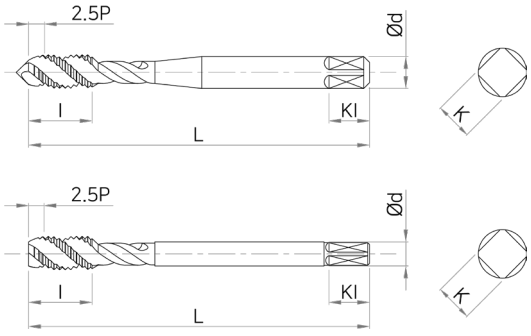


Contents

Series	Type	EDP No	Geometry	Surface Treatment		Diameter(mm)		Page
				Coating	Uncoated	Min	Max	
DIN	SPIRAL	VQOM			○	M3	M24	503
		VQTM		TiN		M3	M24	505
		VQCM		TiCN		M3	M24	507
		VQHM		HOMO		M3	M24	509
	POINT	VDOM			○	M3	M24	511
		VDTM		TiN		M3	M24	513
		VDCM		TiCN		M3	M24	515
		VDHM		HOMO		M3	M24	517
	STRAIGHT	VGOM			○	M3	M24	519
		VGTM		TiN		M3	M24	521
		VGCM		TiCN		M3	M24	523
		VGHM		HOMO		M3	M24	525
	ROLL	VMOM			○	M3	M12	527
		VMTM		TiN		M3	M12	529
		VMCM		TiCN		M3	M12	531

VQOM | DIN SPIRAL TAPS





DIN 371-374 376 | HSSE | Uncoated | 35° HELIX

EDP No	SIZES (mm)								
2.5P	Thread Size	Limits	L	l	d	K	Kl	Z	DIN Type
VQOM 0305025	M3X0.5	6H	56	11	3.5	2.7	6	3	371
VQOM 0407025	M4X0.7	6H	63	13	4.5	3.4	6	3	371
VQOM 0508025	M5X0.8	6H	70	15	6	4.9	8	3	371
VQOM 0610025	M6X1.0	6H	80	17	6	4.9	8	3	371
VQOM 0810025	M8X1.0	6H	90	17	6	4.9	8	3	374
VQOM 0812525	M8X1.25	6H	90	20	8	6.2	9	3	371
VQOM 1010025	M10X1.0	6H	90	18	7	5.5	8	3	374
VQOM 1012525	M10X1.25	6H	100	22	7	5.5	8	3	374
VQOM 1015025	M10X1.5	6H	100	22	10	8	11	3	371
VQOM 1210025	M12X1.0	6H	100	18	9	7	10	3	374
VQOM 1212525	M12X1.25	6H	100	22	9	7	10	3	374
VQOM 1215025	M12X1.5	6H	100	22	9	7	10	3	374
VQOM 1217525	M12X1.75	6H	110	24	9	7	10	3	376
VQOM 1415025	M14X1.5	6H	100	22	11	9	12	3	374
VQOM 1420025	M14X2.0	6H	110	26	11	9	12	3	376
VQOM 1615025	M16X1.5	6H	100	22	12	9	12	3	374
VQOM 1620025	M16X2.0	6H	110	27	12	9	12	3	376
VQOM 1815025	M18X1.5	6H	110	25	14	11	14	4	374
VQOM 1825025	M18X2.5	6H	125	30	14	11	14	4	376
VQOM 2015025	M20X1.5	6H	125	25	16	12	15	4	374
VQOM 2025025	M20X2.5	6H	140	32	16	12	15	4	376
VQOM 2215025	M22X1.5	6H	125	25	18	14.5	17	4	374
VQOM 2225025	M22X2.5	6H	140	32	18	14.5	17	4	376
VQOM 2415025	M24X1.5	6H	140	27	18	14.5	17	4	374

■ Applicable Working Material

Medium Carbon Steels	Alloy Steel	High Strength Steels	Copper	Brass	Casting Brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Thermoplastic
C0.25% ~0.45%	SCM	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC	-
◎	◎	○	○	○	○	○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

EDP No	SIZES (mm)								
2.5P	Thread Size	Limits	L	l	d	K	Kl	Z	DIN Type
VQOM 2420025	M24X2.0	6H	140	27	18	14.5	17	4	374
VQOM 2430025	M24X3.0	6H	160	34	18	14.5	17	4	376

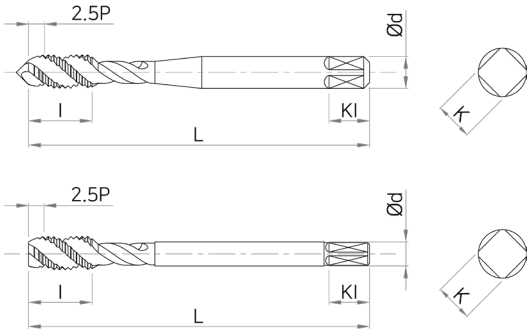
■ Applicable Working Material

Medium Carbon Steels	Alloy Steel	High Strength Steels	Copper	Brass	Casting Brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Thermoplastic
C0.25% ~0.45%	SCM	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC	-
◎	◎	○	○	○	○	○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VQTM | DIN SPIRAL TAPS





DIN 371-374 376 | HSSE | TiN | 35° HELIX

EDP No	SIZES (mm)								
2.5P	Thread Size	Limits	L	l	d	K	Kl	Z	DIN Type
VQTM 0305025	M3X0.5	6H	56	11	3.5	2.7	6	3	371
VQTM 0407025	M4X0.7	6H	63	13	4.5	3.4	6	3	371
VQTM 0508025	M5X0.8	6H	70	15	6	4.9	8	3	371
VQTM 0610025	M6X1.0	6H	80	17	6	4.9	8	3	371
VQTM 0810025	M8X1.0	6H	90	17	6	4.9	8	3	374
VQTM 0812525	M8X1.25	6H	90	20	8	6.2	9	3	371
VQTM 1010025	M10X1.0	6H	90	18	7	5.5	8	3	374
VQTM 1012525	M10X1.25	6H	100	22	7	5.5	8	3	374
VQTM 1015025	M10X1.5	6H	100	22	10	8	11	3	371
VQTM 1210025	M12X1.0	6H	100	18	9	7	10	3	374
VQTM 1212525	M12X1.25	6H	100	22	9	7	10	3	374
VQTM 1215025	M12X1.5	6H	100	22	9	7	10	3	374
VQTM 1217525	M12X1.75	6H	110	24	9	7	10	3	376
VQTM 1415025	M14X1.5	6H	100	22	11	9	12	3	374
VQTM 1420025	M14X2.0	6H	110	26	11	9	12	3	376
VQTM 1615025	M16X1.5	6H	100	22	12	9	12	3	374
VQTM 1620025	M16X2.0	6H	110	27	12	9	12	3	376
VQTM 1815025	M18X1.5	6H	110	25	14	11	14	4	374
VQTM 1825025	M18X2.5	6H	125	30	14	11	14	4	376
VQTM 2015025	M20X1.5	6H	125	25	16	12	15	4	374
VQTM 2025025	M20X2.5	6H	140	32	16	12	15	4	376
VQTM 2215025	M22X1.5	6H	125	25	18	14.5	17	4	374
VQTM 2225025	M22X2.5	6H	140	32	18	14.5	17	4	376
VQTM 2415025	M24X1.5	6H	140	27	18	14.5	17	4	374

■ Applicable Working Material

Medium Carbon Steels	Alloy Steel	High Strength Steels	Copper	Brass	Casting Brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Thermoplastic
C0.25% ~0.45%	SCM	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC	-
◎	◎	○	○	○	○	○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

EDP No	SIZES (mm)								
2.5P	Thread Size	Limits	L	l	d	K	Kl	Z	DIN Type
VQTM 2420025	M24X2.0	6H	140	27	18	14.5	17	4	374
VQTM 2430025	M24X3.0	6H	160	34	18	14.5	17	4	376

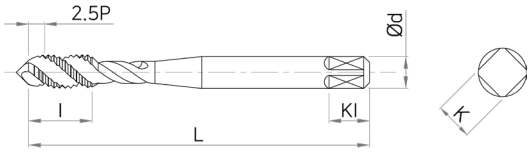
■ Applicable Working Material

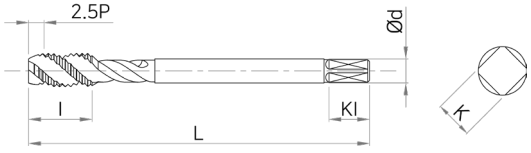
Medium Carbon Steels	Alloy Steel	High Strength Steels	Copper	Brass	Casting Brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Thermoplastic
C0.25% ~0.45%	SCM	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC	-
◎	◎	○	○	○	○	○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VQCM | DIN SPIRAL TAPS







DIN 371-374 376 | HSSE | TiCN | 35° HELIX

EDP No	SIZES (mm)								
2.5P	Thread Size	Limits	L	l	d	K	Kl	Z	DIN Type
VQCM 0305025	M3X0.5	6H	56	11	3.5	2.7	6	3	371
VQCM 0407025	M4X0.7	6H	63	13	4.5	3.4	6	3	371
VQCM 0508025	M5X0.8	6H	70	15	6	4.9	8	3	371
VQCM 0610025	M6X1.0	6H	80	17	6	4.9	8	3	371
VQCM 0810025	M8X1.0	6H	90	17	6	4.9	8	3	374
VQCM 0812525	M8X1.25	6H	90	20	8	6.2	9	3	371
VQCM 1010025	M10X1.0	6H	90	18	7	5.5	8	3	374
VQCM 1012525	M10X1.25	6H	100	22	7	5.5	8	3	374
VQCM 1015025	M10X1.5	6H	100	22	10	8	11	3	371
VQCM 1210025	M12X1.0	6H	100	18	9	7	10	3	374
VQCM 1212525	M12X1.25	6H	100	22	9	7	10	3	374
VQCM 1215025	M12X1.5	6H	100	22	9	7	10	3	374
VQCM 1217525	M12X1.75	6H	110	24	9	7	10	3	376
VQCM 1415025	M14X1.5	6H	100	22	11	9	12	3	374
VQCM 1420025	M14X2.0	6H	110	26	11	9	12	3	376
VQCM 1615025	M16X1.5	6H	100	22	12	9	12	3	374
VQCM 1620025	M16X2.0	6H	110	27	12	9	12	3	376
VQCM 1815025	M18X1.5	6H	110	25	14	11	14	4	374
VQCM 1825025	M18X2.5	6H	125	30	14	11	14	4	376
VQCM 2015025	M20X1.5	6H	125	25	16	12	15	4	374
VQCM 2025025	M20X2.5	6H	140	32	16	12	15	4	376
VQCM 2215025	M22X1.5	6H	125	25	18	14.5	17	4	374
VQCM 2225025	M22X2.5	6H	140	32	18	14.5	17	4	376
VQCM 2415025	M24X1.5	6H	140	27	18	14.5	17	4	374

■ Applicable Working Material

Medium Carbon Steels	Alloy Steel	High Strength Steels	Copper	Brass	Casting Brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Thermoplastic
C0.25% ~0.45%	SCM	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC	-
◎	◎	○	○	○	○	○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

EDP No	SIZES (mm)								
2.5P	Thread Size	Limits	L	l	d	K	Kl	Z	DIN Type
VQCM 2420025	M24X2.0	6H	140	27	18	14.5	17	4	374
VQCM 2430025	M24X3.0	6H	160	34	18	14.5	17	4	376

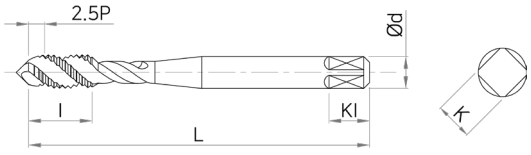
■ Applicable Working Material

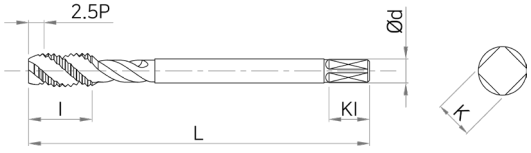
Medium Carbon Steels	Alloy Steel	High Strength Steels	Copper	Brass	Casting Brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Thermoplastic
C0.25% ~0.45%	SCM	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC	-
◎	◎	○	○	○	○	○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VQHM | DIN SPIRAL TAPS







DIN 371-374 376 | HSSE | HOMO | 35° HELIX

EDP No	SIZES (mm)								
2.5P	Thread Size	Limits	L	l	d	K	Kl	Z	DIN Type
VQHM 0305025	M3X0.5	6H	56	11	3.5	2.7	6	3	371
VQHM 0407025	M4X0.7	6H	63	13	4.5	3.4	6	3	371
VQHM 0508025	M5X0.8	6H	70	15	6	4.9	8	3	371
VQHM 0610025	M6X1.0	6H	80	17	6	4.9	8	3	371
VQHM 0810025	M8X1.0	6H	90	17	6	4.9	8	3	374
VQHM 0812525	M8X1.25	6H	90	20	8	6.2	9	3	371
VQHM 1010025	M10X1.0	6H	90	18	7	5.5	8	3	374
VQHM 1012525	M10X1.25	6H	100	22	7	5.5	8	3	374
VQHM 1015025	M10X1.5	6H	100	22	10	8	11	3	371
VQHM 1210025	M12X1.0	6H	100	18	9	7	10	3	374
VQHM 1212525	M12X1.25	6H	100	22	9	7	10	3	374
VQHM 1215025	M12X1.5	6H	100	22	9	7	10	3	374
VQHM 1217525	M12X1.75	6H	110	24	9	7	10	3	376
VQHM 1415025	M14X1.5	6H	100	22	11	9	12	3	374
VQHM 1420025	M14X2.0	6H	110	26	11	9	12	3	376
VQHM 1615025	M16X1.5	6H	100	22	12	9	12	3	374
VQHM 1620025	M16X2.0	6H	110	27	12	9	12	3	376
VQHM 1815025	M18X1.5	6H	110	25	14	11	14	4	374
VQHM 1825025	M18X2.5	6H	125	30	14	11	14	4	376
VQHM 2015025	M20X1.5	6H	125	25	16	12	15	4	374
VQHM 2025025	M20X2.5	6H	140	32	16	12	15	4	376
VQHM 2215025	M22X1.5	6H	125	25	18	14.5	17	4	374
VQHM 2225025	M22X2.5	6H	140	32	18	14.5	17	4	376
VQHM 2415025	M24X1.5	6H	140	27	18	14.5	17	4	374

■ Applicable Working Material

Medium Carbon Steels	Alloy Steel	High Strength Steels	Copper	Brass	Casting Brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Thermoplastic
C0.25% ~0.45%	SCM	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC	-
◎	◎	○	○	○	○	○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

EDP No	SIZES (mm)								
2.5P	Thread Size	Limits	L	l	d	K	Kl	Z	DIN Type
VQHM 2420025	M24X2.0	6H	140	27	18	14.5	17	4	374
VQHM 2430025	M24X3.0	6H	160	34	18	14.5	17	4	376

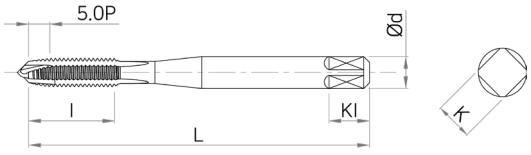
■ Applicable Working Material

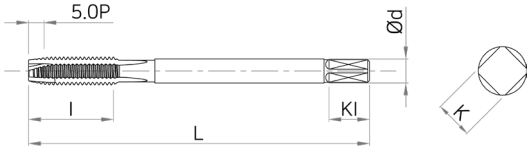
Medium Carbon Steels	Alloy Steel	High Strength Steels	Copper	Brass	Casting Brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Thermoplastic
C0.25% ~0.45%	SCM	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC	-
◎	◎	○	○	○	○	○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VDOM | DIN SPIRAL TAPS







DIN 371-374 376 | HSSE | Uncoated

EDP No	SIZES (mm)								
5P	Thread Size	Limits	L	l	d	K	Kl	Z	DIN Type
VDOM 0305050	M3X0.5	6H	56	11	3.5	2.7	6	3	371
VDOM 0407050	M4X0.7	6H	63	13	4.5	3.4	6	3	371
VDOM 0508050	M5X0.8	6H	70	15	6	4.9	8	3	371
VDOM 0610050	M6X1.0	6H	80	17	6	4.9	8	3	371
VDOM 0810050	M8X1.0	6H	90	17	6	4.9	8	3	374
VDOM 0812550	M8X1.25	6H	90	20	8	6.2	9	3	371
VDOM 1010050	M10X1.0	6H	90	18	7	5.5	8	3	374
VDOM 1012550	M10X1.25	6H	100	22	7	5.5	8	3	374
VDOM 1015050	M10X1.5	6H	100	22	10	8	11	3	371
VDOM 1210050	M12X1.0	6H	100	18	9	7	10	3	374
VDOM 1212550	M12X1.25	6H	100	22	9	7	10	3	374
VDOM 1215050	M12X1.5	6H	100	22	9	7	10	3	374
VDOM 1217550	M12X1.75	6H	110	24	9	7	10	3	376
VDOM 1415050	M14X1.5	6H	100	22	11	9	12	3	374
VDOM 1420050	M14X2.0	6H	110	26	11	9	12	3	376
VDOM 1615050	M16X1.5	6H	100	22	12	9	12	3	374
VDOM 1620050	M16X2.0	6H	110	27	12	9	12	3	376
VDOM 1815050	M18X1.5	6H	110	25	14	11	14	3	374
VDOM 1825050	M18X2.5	6H	125	30	14	11	14	3	376
VDOM 2015050	M20X1.5	6H	125	25	16	12	15	3	374
VDOM 2025050	M20X2.5	6H	140	32	16	12	15	3	376
VDOM 2215050	M22X1.5	6H	125	25	18	14.5	17	3	374
VDOM 2225050	M22X2.5	6H	140	32	18	14.5	17	3	376
VDOM 2415050	M24X1.5	6H	140	27	18	14.5	17	3	374

■ Applicable Working Material

Medium Carbon Steels	Alloy Steel	High Strength Steels	Copper	Brass	Casting Brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Thermoplastic
C0.25% ~0.45%	SCM	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC	-
◎	◎	○	○	○	○	○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

EDP No	SIZES (mm)								
5P	Thread Size	Limits	L	l	d	K	Kl	Z	DIN Type
VDOM 2420050	M24X2.0	6H	140	27	18	14.5	17	3	374
VDOM 2430050	M24X3.0	6H	160	34	18	14.5	17	3	376

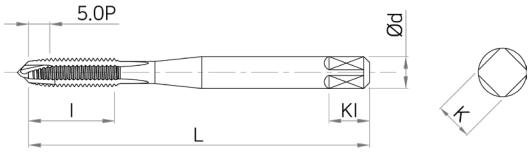
■ Applicable Working Material

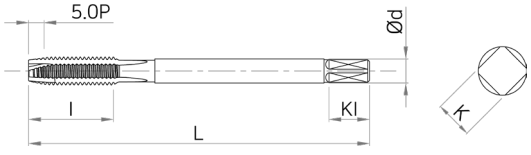
Medium Carbon Steels	Alloy Steel	High Strength Steels	Copper	Brass	Casting Brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Thermoplastic
C0.25% ~0.45%	SCM	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC	-
◎	◎	○	○	○	○	○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VDTM | DIN POINT TAPS







DIN 371-374 376 | HSSE | TiN

EDP No	SIZES (mm)								
5P	Thread Size	Limits	L	l	d	K	Kl	Z	DIN Type
VDTM 0305050	M3X0.5	6H	56	11	3.5	2.7	6	3	371
VDTM 0407050	M4X0.7	6H	63	13	4.5	3.4	6	3	371
VDTM 0508050	M5X0.8	6H	70	15	6	4.9	8	3	371
VDTM 0610050	M6X1.0	6H	80	17	6	4.9	8	3	371
VDTM 0810050	M8X1.0	6H	90	17	6	4.9	8	3	374
VDTM 0812550	M8X1.25	6H	90	20	8	6.2	9	3	371
VDTM 1010050	M10X1.0	6H	90	18	7	5.5	8	3	374
VDTM 1012550	M10X1.25	6H	100	22	7	5.5	8	3	374
VDTM 1015050	M10X1.5	6H	100	22	10	8	11	3	371
VDTM 1210050	M12X1.0	6H	100	18	9	7	10	3	374
VDTM 1212550	M12X1.25	6H	100	22	9	7	10	3	374
VDTM 1215050	M12X1.5	6H	100	22	9	7	10	3	374
VDTM 1217550	M12X1.75	6H	110	24	9	7	10	3	376
VDTM 1415050	M14X1.5	6H	100	22	11	9	12	3	374
VDTM 1420050	M14X2.0	6H	110	26	11	9	12	3	376
VDTM 1615050	M16X1.5	6H	100	22	12	9	12	3	374
VDTM 1620050	M16X2.0	6H	110	27	12	9	12	3	376
VDTM 1815050	M18X1.5	6H	110	25	14	11	14	3	374
VDTM 1825050	M18X2.5	6H	125	30	14	11	14	3	376
VDTM 2015050	M20X1.5	6H	125	25	16	12	15	3	374
VDTM 2025050	M20X2.5	6H	140	32	16	12	15	3	376
VDTM 2215050	M22X1.5	6H	125	25	18	14.5	17	3	374
VDTM 2225050	M22X2.5	6H	140	32	18	14.5	17	3	376
VDTM 2415050	M24X1.5	6H	140	27	18	14.5	17	3	374

■ Applicable Working Material

Medium Carbon Steels	Alloy Steel	High Strength Steels	Copper	Brass	Casting Brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Thermoplastic
C0.25% ~0.45%	SCM	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC	-
◎	◎	○	○	○	○	○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VDTM | DIN POINT TAPS

EDP No	SIZES (mm)								
5P	Thread Size	Limits	L	l	d	K	Kl	Z	DIN Type
VDTM 2420050	M24X2.0	6H	140	27	18	14.5	17	3	374
VDTM 2430050	M24X3.0	6H	160	34	18	14.5	17	3	376

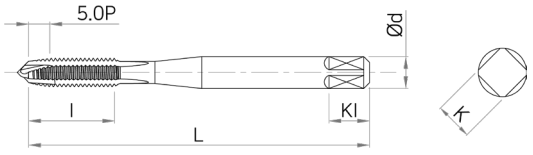
■ Applicable Working Material

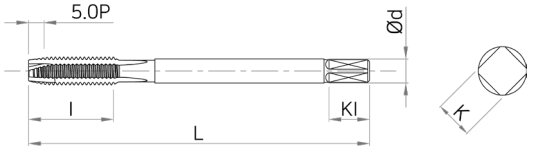
Medium Carbon Steels	Alloy Steel	High Strength Steels	Copper	Brass	Casting Brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Thermoplastic
C0.25% ~0.45%	SCM	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC	-
◎	◎	○	○	○	○	○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VDCM | DIN POINT TAPS







DIN 371-374 376 | HSSE | TiCN

EDP No	SIZES (mm)								
5P	Thread Size	Limits	L	l	d	K	Kl	Z	DIN Type
VDCM 0305050	M3X0.5	6H	56	11	3.5	2.7	6	3	371
VDCM 0407050	M4X0.7	6H	63	13	4.5	3.4	6	3	371
VDCM 0508050	M5X0.8	6H	70	15	6	4.9	8	3	371
VDCM 0610050	M6X1.0	6H	80	17	6	4.9	8	3	371
VDCM 0810050	M8X1.0	6H	90	17	6	4.9	8	3	374
VDCM 0812550	M8X1.25	6H	90	20	8	6.2	9	3	371
VDCM 1010050	M10X1.0	6H	90	18	7	5.5	8	3	374
VDCM 1012550	M10X1.25	6H	100	22	7	5.5	8	3	374
VDCM 1015050	M10X1.5	6H	100	22	10	8	11	3	371
VDCM 1210050	M12X1.0	6H	100	18	9	7	10	3	374
VDCM 1212550	M12X1.25	6H	100	22	9	7	10	3	374
VDCM 1215050	M12X1.5	6H	100	22	9	7	10	3	374
VDCM 1217550	M12X1.75	6H	110	24	9	7	10	3	376
VDCM 1415050	M14X1.5	6H	100	22	11	9	12	3	374
VDCM 1420050	M14X2.0	6H	110	26	11	9	12	3	376
VDCM 1615050	M16X1.5	6H	100	22	12	9	12	3	374
VDCM 1620050	M16X2.0	6H	110	27	12	9	12	3	376
VDCM 1815050	M18X1.5	6H	110	25	14	11	14	3	374
VDCM 1825050	M18X2.5	6H	125	30	14	11	14	3	376
VDCM 2015050	M20X1.5	6H	125	25	16	12	15	3	374
VDCM 2025050	M20X2.5	6H	140	32	16	12	15	3	376
VDCM 2215050	M22X1.5	6H	125	25	18	14.5	17	3	374
VDCM 2225050	M22X2.5	6H	140	32	18	14.5	17	3	376
VDCM 2415050	M24X1.5	6H	140	27	18	14.5	17	3	374

■ Applicable Working Material

Medium Carbon Steels	Alloy Steel	High Strength Steels	Copper	Brass	Casting Brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Thermoplastic
C0.25% ~0.45%	SCM	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC	-
◎	◎	○	○	○	○	○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

EDP No	SIZES (mm)								
5P	Thread Size	Limits	L	l	d	K	Kl	Z	DIN Type
VDCM 2420050	M24X2.0	6H	140	27	18	14.5	17	3	374
VDCM 2430050	M24X3.0	6H	160	34	18	14.5	17	3	376

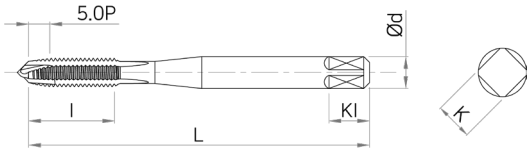
■ Applicable Working Material

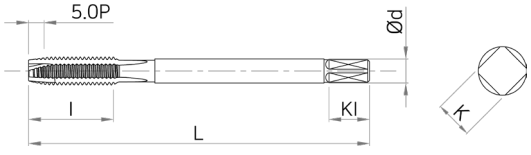
Medium Carbon Steels	Alloy Steel	High Strength Steels	Copper	Brass	Casting Brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Thermoplastic
C0.25% ~0.45%	SCM	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC	-
◎	◎	○	○	○	○	○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VDHM | DIN POINT TAPS







DIN 371-374 376 | HSSE | HOMO

EDP No	SIZES (mm)								
5P	Thread Size	Limits	L	l	d	K	Kl	Z	DIN Type
VDHM 0305050	M3X0.5	6H	56	11	3.5	2.7	6	3	371
VDHM 0407050	M4X0.7	6H	63	13	4.5	3.4	6	3	371
VDHM 0508050	M5X0.8	6H	70	15	6	4.9	8	3	371
VDHM 0610050	M6X1.0	6H	80	17	6	4.9	8	3	371
VDHM 0810050	M8X1.0	6H	90	17	6	4.9	8	3	374
VDHM 0812550	M8X1.25	6H	90	20	8	6.2	9	3	371
VDHM 1010050	M10X1.0	6H	90	18	7	5.5	8	3	374
VDHM 1012550	M10X1.25	6H	100	22	7	5.5	8	3	374
VDHM 1015050	M10X1.5	6H	100	22	10	8	11	3	371
VDHM 1210050	M12X1.0	6H	100	18	9	7	10	3	374
VDHM 1212550	M12X1.25	6H	100	22	9	7	10	3	374
VDHM 1215050	M12X1.5	6H	100	22	9	7	10	3	374
VDHM 1217550	M12X1.75	6H	110	24	9	7	10	3	376
VDHM 1415050	M14X1.5	6H	100	22	11	9	12	3	374
VDHM 1420050	M14X2.0	6H	110	26	11	9	12	3	376
VDHM 1615050	M16X1.5	6H	100	22	12	9	12	3	374
VDHM 1620050	M16X2.0	6H	110	27	12	9	12	3	376
VDHM 1815050	M18X1.5	6H	110	25	14	11	14	3	374
VDHM 1825050	M18X2.5	6H	125	30	14	11	14	3	376
VDHM 2015050	M20X1.5	6H	125	25	16	12	15	3	374
VDHM 2025050	M20X2.5	6H	140	32	16	12	15	3	376
VDHM 2215050	M22X1.5	6H	125	25	18	14.5	17	3	374
VDHM 2225050	M22X2.5	6H	140	32	18	14.5	17	3	376
VDHM 2415050	M24X1.5	6H	140	27	18	14.5	17	3	374

■ Applicable Working Material

Medium Carbon Steels	Alloy Steel	High Strength Steels	Copper	Brass	Casting Brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Thermoplastic
C0.25% ~0.45%	SCM	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC	-
◎	◎	○	○	○	○	○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VDHM | DIN POINT TAPS

EDP No	SIZES (mm)								
5P	Thread Size	Limits	L	l	d	K	Kl	Z	DIN Type
VDHM 2420050	M24X2.0	6H	140	27	18	14.5	17	3	374
VDHM 2430050	M24X3.0	6H	160	34	18	14.5	17	3	376

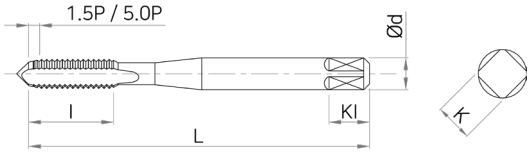
■ Applicable Working Material

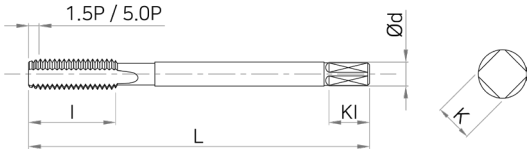
Medium Carbon Steels	Alloy Steel	High Strength Steels	Copper	Brass	Casting Brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Thermoplastic
C0.25% ~0.45%	SCM	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC	-
◎	◎	○	○	○	○	○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VGOM | DIN STRAIGHT TAPS







DIN 371-374 376 | HSSE | Uncoated

EDP No		SIZES (mm)								
1.5P	5P	Thread Size	Limits	L	l	d	K	Kl	Z	Oil Groove
VGOM 0305015	VGOM 0305050	M3X0.5	6H	56	11	3.5	2.7	6	3	371
VGOM 0407015	VGOM 0407050	M4X0.7	6H	63	13	4.5	3.4	6	3	371
VGOM 0508015	VGOM 0508050	M5X0.8	6H	70	15	6	4.9	8	3	371
VGOM 0610015	VGOM 0610050	M6X1.0	6H	80	17	6	4.9	8	3	371
VGOM 0810015	VGOM 0810050	M8X1.0	6H	90	17	6	4.9	8	4	374
VGOM 0812515	VGOM 0812550	M8X1.25	6H	90	20	8	6.2	9	4	371
VGOM 1010015	VGOM 1010050	M10X1.0	6H	90	18	7	5.5	8	4	374
VGOM 1012515	VGOM 1012550	M10X1.25	6H	100	22	7	5.5	8	4	374
VGOM 1015015	VGOM 1015050	M10X1.5	6H	100	22	10	8	11	4	371
VGOM 1210015	VGOM 1210050	M12X1.0	6H	100	18	9	7	10	4	374
VGOM 1212515	VGOM 1212550	M12X1.25	6H	100	22	9	7	10	4	374
VGOM 1215015	VGOM 1215050	M12X1.5	6H	100	22	9	7	10	4	374
VGOM 1217515	VGOM 1217550	M12X1.75	6H	110	24	9	7	10	4	376
VGOM 1415015	VGOM 1415050	M14X1.5	6H	100	22	11	9	12	4	374
VGOM 1420015	VGOM 1420050	M14X2.0	6H	110	26	11	9	12	4	376
VGOM 1615015	VGOM 1615050	M16X1.5	6H	100	22	12	9	12	4	374
VGOM 1620015	VGOM 1620050	M16X2.0	6H	110	27	12	9	12	4	376
VGOM 1815015	VGOM 1815050	M18X1.5	6H	110	25	14	11	14	4	374
VGOM 1825015	VGOM 1825050	M18X2.5	6H	125	30	14	11	14	4	376
VGOM 2015015	VGOM 2015050	M20X1.5	6H	125	25	16	12	15	4	374
VGOM 2025015	VGOM 2025050	M20X2.5	6H	140	32	16	12	15	4	376
VGOM 2215015	VGOM 2215050	M22X1.5	6H	125	25	18	14.5	17	4	374
VGOM 2225015	VGOM 2225050	M22X2.5	6H	140	32	18	14.5	17	4	376
VGOM 2415015	VGOM 2415050	M24X1.5	6H	140	27	18	14.5	17	4	374

※ 1.5P Tap is removed external center as bottoming type

■ Applicable Working Material

Medium Carbon Steels	Alloy Steel	High Strength Steels	Copper	Brass	Casting Brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Thermoplastic
C0.25% ~0.45%	SCM	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC	-
◎	◎	○	○	○	○	○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VGOM | DIN STRAIGHT TAPS

EDP No		SIZES (mm)								
1.5P	5P	Thread Size	Limits	L	l	d	K	Kl	Z	Oil Groove
VGOM 2420015	VGOM 2420050	M24X2.0	6H	140	27	18	14.5	17	4	374
VGOM 2430015	VGOM 2430050	M24X3.0	6H	160	34	18	14.5	17	4	376

※ 1.5P Tap is removed external center as bottoming type

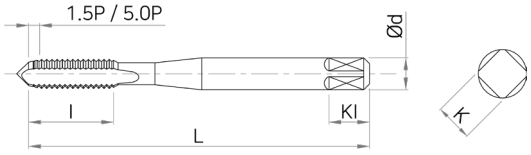
■ Applicable Working Material

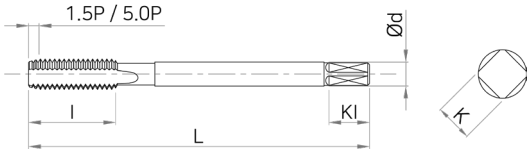
Medium Carbon Steels	Alloy Steel	High Strength Steels	Copper	Brass	Casting Brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Thermoplastic
C0.25% ~0.45%	SCM	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC	-
◎	◎	○	○	○	○	○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VGTM | DIN STRAIGHT TAPS







DIN 371-374 376 | HSSE | TiN

EDP No		SIZES (mm)								
1.5P	5P	Thread Size	Limits	L	l	d	K	Kl	Z	DIN Type
VGTM 0305015	VGTM 0305050	M3X0.5	6H	56	11	3.5	2.7	6	3	371
VGTM 0407015	VGTM 0407050	M4X0.7	6H	63	13	4.5	3.4	6	3	371
VGTM 0508015	VGTM 0508050	M5X0.8	6H	70	15	6	4.9	8	3	371
VGTM 0610015	VGTM 0610050	M6X1.0	6H	80	17	6	4.9	8	3	371
VGTM 0810015	VGTM 0810050	M8X1.0	6H	90	17	6	4.9	8	4	374
VGTM 0812515	VGTM 0812550	M8X1.25	6H	90	20	8	6.2	9	4	371
VGTM 1010015	VGTM 1010050	M10X1.0	6H	90	18	7	5.5	8	4	374
VGTM 1012515	VGTM 1012550	M10X1.25	6H	100	22	7	5.5	8	4	374
VGTM 1015015	VGTM 1015050	M10X1.5	6H	100	22	10	8	11	4	371
VGTM 1210015	VGTM 1210050	M12X1.0	6H	100	18	9	7	10	4	374
VGTM 1212515	VGTM 1212550	M12X1.25	6H	100	22	9	7	10	4	374
VGTM 1215015	VGTM 1215050	M12X1.5	6H	100	22	9	7	10	4	374
VGTM 1217515	VGTM 1217550	M12X1.75	6H	110	24	9	7	10	4	376
VGTM 1415015	VGTM 1415050	M14X1.5	6H	100	22	11	9	12	4	374
VGTM 1420015	VGTM 1420050	M14X2.0	6H	110	26	11	9	12	4	376
VGTM 1615015	VGTM 1615050	M16X1.5	6H	100	22	12	9	12	4	374
VGTM 1620015	VGTM 1620050	M16X2.0	6H	110	27	12	9	12	4	376
VGTM 1815015	VGTM 1815050	M18X1.5	6H	110	25	14	11	14	4	374
VGTM 1825015	VGTM 1825050	M18X2.5	6H	125	30	14	11	14	4	376
VGTM 2015015	VGTM 2015050	M20X1.5	6H	125	25	16	12	15	4	374
VGTM 2025015	VGTM 2025050	M20X2.5	6H	140	32	16	12	15	4	376
VGTM 2215015	VGTM 2215050	M22X1.5	6H	125	25	18	14.5	17	4	374
VGTM 2225015	VGTM 2225050	M22X2.5	6H	140	32	18	14.5	17	4	376
VGTM 2415015	VGTM 2415050	M24X1.5	6H	140	27	18	14.5	17	4	374

※ 1.5P Tap is removed external center as bottoming type

■ Applicable Working Material

Medium Carbon Steels	Alloy Steel	High Strength Steels	Copper	Brass	Casting Brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Thermoplastic
C0.25% ~0.45%	SCM	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC	-
◎	◎	○	○	○	○	○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VGTM | DIN STRAIGHT TAPS

EDP No		SIZES (mm)								
1.5P	5P	Thread Size	Limits	L	l	d	K	Kl	Z	DIN Type
VGTM 2420015	VGTM 2420050	M24X2.0	6H	140	27	18	14.5	17	4	374
VGTM 2430015	VGTM 2430050	M24X3.0	6H	160	34	18	14.5	17	4	376

※ 1.5P Tap is removed external center as bottoming type

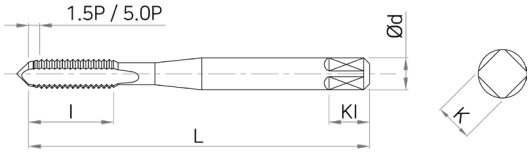
■ Applicable Working Material

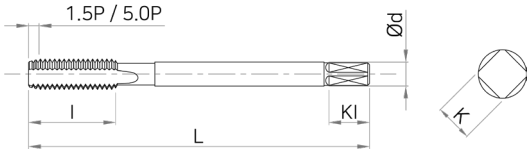
Medium Carbon Steels	Alloy Steel	High Strength Steels	Copper	Brass	Casting Brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Thermoplastic
C0.25% ~0.45%	SCM	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC	-
◎	◎	○	○	○	○	○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VGCM | DIN STRAIGHT TAPS







DIN 371-374 376 | HSSE | TiCN

EDP No		SIZES (mm)								
1.5P	5P	Thread Size	Limits	L	l	d	K	Kl	Z	DIN Type
VGCM 0305015	VGCM 0305050	M3X0.5	6H	56	11	3.5	2.7	6	3	371
VGCM 0407015	VGCM 0407050	M4X0.7	6H	63	13	4.5	3.4	6	3	371
VGCM 0508015	VGCM 0508050	M5X0.8	6H	70	15	6	4.9	8	3	371
VGCM 0610015	VGCM 0610050	M6X1.0	6H	80	17	6	4.9	8	3	371
VGCM 0810015	VGCM 0810050	M8X1.0	6H	90	17	6	4.9	8	4	374
VGCM 0812515	VGCM 0812550	M8X1.25	6H	90	20	8	6.2	9	4	371
VGCM 1010015	VGCM 1010050	M10X1.0	6H	90	18	7	5.5	8	4	374
VGCM 1012515	VGCM 1012550	M10X1.25	6H	100	22	7	5.5	8	4	374
VGCM 1015015	VGCM 1015050	M10X1.5	6H	100	22	10	8	11	4	371
VGCM 1210015	VGCM 1210050	M12X1.0	6H	100	18	9	7	10	4	374
VGCM 1212515	VGCM 1212550	M12X1.25	6H	100	22	9	7	10	4	374
VGCM 1215015	VGCM 1215050	M12X1.5	6H	100	22	9	7	10	4	374
VGCM 1217515	VGCM 1217550	M12X1.75	6H	110	24	9	7	10	4	376
VGCM 1415015	VGCM 1415050	M14X1.5	6H	100	22	11	9	12	4	374
VGCM 1420015	VGCM 1420050	M14X2.0	6H	110	26	11	9	12	4	376
VGCM 1615015	VGCM 1615050	M16X1.5	6H	100	22	12	9	12	4	374
VGCM 1620015	VGCM 1620050	M16X2.0	6H	110	27	12	9	12	4	376
VGCM 1815015	VGCM 1815050	M18X1.5	6H	110	25	14	11	14	4	374
VGCM 1825015	VGCM 1825050	M18X2.5	6H	125	30	14	11	14	4	376
VGCM 2015015	VGCM 2015050	M20X1.5	6H	125	25	16	12	15	4	374
VGCM 2025015	VGCM 2025050	M20X2.5	6H	140	32	16	12	15	4	376
VGCM 2215015	VGCM 2215050	M22X1.5	6H	125	25	18	14.5	17	4	374
VGCM 2225015	VGCM 2225050	M22X2.5	6H	140	32	18	14.5	17	4	376
VGCM 2415015	VGCM 2415050	M24X1.5	6H	140	27	18	14.5	17	4	374

※ 1.5P Tap is removed external center as bottoming type

■ Applicable Working Material

Medium Carbon Steels	Alloy Steel	High Strength Steels	Copper	Brass	Casting Brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Thermoplastic
C0.25% ~0.45%	SCM	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC	-
◎	◎	○	○	○	○	○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

EDP No		SIZES (mm)								
1.5P	5P	Thread Size	Limits	L	l	d	K	Kl	Z	DIN Type
VGCM 2420015	VGCM 2420050	M24X2.0	6H	140	27	18	14.5	17	4	374
VGCM 2430015	VGCM 2430050	M24X3.0	6H	160	34	18	14.5	17	4	376

※ 1.5P Tap is removed external center as bottoming type

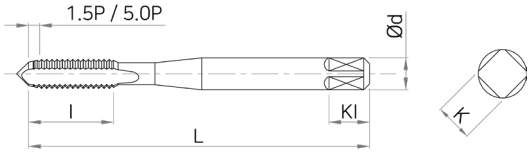
■ Applicable Working Material

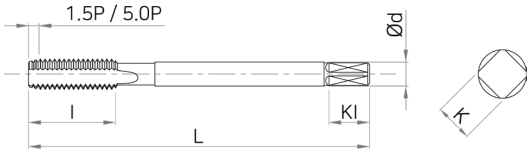
Medium Carbon Steels	Alloy Steel	High Strength Steels	Copper	Brass	Casting Brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Thermoplastic
C0.25% ~0.45%	SCM	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC	-
◎	◎	○	○	○	○	○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VGHM | DIN STRAIGHT TAPS







DIN 371-374 376 | HSSE | HOMO

EDP No		SIZES (mm)								
1.5P	5P	Thread Size	Limits	L	l	d	K	Kl	Z	DIN Type
VGHM 0305015	VGHM 0305050	M3X0.5	6H	56	11	3.5	2.7	6	3	371
VGHM 0407015	VGHM 0407050	M4X0.7	6H	63	13	4.5	3.4	6	3	371
VGHM 0508015	VGHM 0508050	M5X0.8	6H	70	15	6	4.9	8	3	371
VGHM 0610015	VGHM 0610050	M6X1.0	6H	80	17	6	4.9	8	3	371
VGHM 0810015	VGHM 0810050	M8X1.0	6H	90	17	6	4.9	8	4	374
VGHM 0812515	VGHM 0812550	M8X1.25	6H	90	20	8	6.2	9	4	371
VGHM 1010015	VGHM 1010050	M10X1.0	6H	90	18	7	5.5	8	4	374
VGHM 1012515	VGHM 1012550	M10X1.25	6H	100	22	7	5.5	8	4	374
VGHM 1015015	VGHM 1015050	M10X1.5	6H	100	22	10	8	11	4	371
VGHM 1210015	VGHM 1210050	M12X1.0	6H	100	18	9	7	10	4	374
VGHM 1212515	VGHM 1212550	M12X1.25	6H	100	22	9	7	10	4	374
VGHM 1215015	VGHM 1215050	M12X1.5	6H	100	22	9	7	10	4	374
VGHM 1217515	VGHM 1217550	M12X1.75	6H	110	24	9	7	10	4	376
VGHM 1415015	VGHM 1415050	M14X1.5	6H	100	22	11	9	12	4	374
VGHM 1420015	VGHM 1420050	M14X2.0	6H	110	26	11	9	12	4	376
VGHM 1615015	VGHM 1615050	M16X1.5	6H	100	22	12	9	12	4	374
VGHM 1620015	VGHM 1620050	M16X2.0	6H	110	27	12	9	12	4	376
VGHM 1815015	VGHM 1815050	M18X1.5	6H	110	25	14	11	14	4	374
VGHM 1825015	VGHM 1825050	M18X2.5	6H	125	30	14	11	14	4	376
VGHM 2015015	VGHM 2015050	M20X1.5	6H	125	25	16	12	15	4	374
VGHM 2025015	VGHM 2025050	M20X2.5	6H	140	32	16	12	15	4	376
VGHM 2215015	VGHM 2215050	M22X1.5	6H	125	25	18	14.5	17	4	374
VGHM 2225015	VGHM 2225050	M22X2.5	6H	140	32	18	14.5	17	4	376
VGHM 2415015	VGHM 2415050	M24X1.5	6H	140	27	18	14.5	17	4	374

※ 1.5P Tap is removed external center as bottoming type

■ Applicable Working Material

Medium Carbon Steels	Alloy Steel	High Strength Steels	Copper	Brass	Casting Brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Thermoplastic
C0.25% ~0.45%	SCM	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC	-
◎	◎	○	○	○	○	○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

EDP No		SIZES (mm)								
1.5P	5P	Thread Size	Limits	L	l	d	K	Kl	Z	DIN Type
VGHM 2420015	VGHM 2420050	M24X2.0	6H	140	27	18	14.5	17	4	374
VGHM 2430015	VGHM 2430050	M24X3.0	6H	160	34	18	14.5	17	4	376

※ 1.5P Tap is removed external center as bottoming type

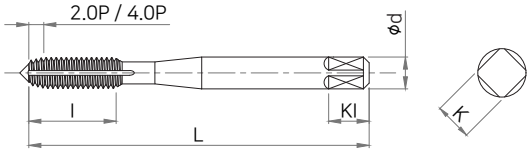
■ Applicable Working Material

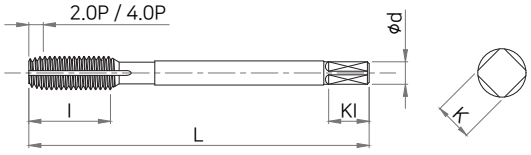
Medium Carbon Steels	Alloy Steel	High Strength Steels	Copper	Brass	Casting Brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Thermoplastic
C0.25% ~0.45%	SCM	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC	-
◎	◎	○	○	○	○	○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VMOM | DIN ROLL TAPS







DIN 371-374 376 | HSSE | Uncoated

EDP No		SIZES (mm)							
2P	4P	Thread Size	Limits	L	l	d	K	Kl	Oil Groove
VMOM 0305020S	-	M3x0.5	6HX	56	11	3.5	2.7	6	S
VMOM 0305020M	VMOM 0305040M	M3x0.5	6HX	56	11	3.5	2.7	6	M
VMOM 0407020S	-	M4x0.7	6HX	63	13	4.5	3.4	6	S
VMOM 0407020M	VMOM 0407040M	M4x0.7	6HX	63	13	4.5	3.4	6	M
VMOM 0508020S	-	M5x0.8	6HX	70	15	6	4.9	8	S
VMOM 0508020M	VMOM 0508040M	M5x0.8	6HX	70	15	6	4.9	8	M
VMOM 0610020S	-	M6x1.0	6HX	80	17	6	4.9	8	S
VMOM 0610020M	VMOM 0610040M	M6x1.0	6HX	80	17	6	4.9	8	M
VMOM 0810020S	-	M8x1.0	6HX	90	17	6	4.9	8	S
VMOM 0810020M	VMOM 0810040M	M8x1.0	6HX	90	17	6	4.9	8	M
VMOM 0812520S	-	M8x1.25	6HX	90	20	8	6.2	9	S
VMOM 0812520M	VMOM 0812540M	M8x1.25	6HX	90	20	8	6.2	9	M
VMOM 1010020S	-	M10x1.0	6HX	90	18	7	5.5	8	S
VMOM 1010020M	VMOM 1010040M	M10x1.0	6HX	90	18	7	5.5	8	M
VMOM 1012520S	-	M10x1.25	6HX	100	22	7	5.5	8	S
VMOM 1012520M	VMOM 1012540M	M10x1.25	6HX	100	22	7	5.5	8	M
VMOM 1015020S	-	M10x1.5	6HX	100	22	10	8	11	S
VMOM 1015020M	VMOM 1015040M	M10x1.5	6HX	100	22	10	8	11	M
VMOM 1210020S	-	M12x1.0	6HX	100	18	9	7	10	S
VMOM 1210020M	VMOM 1210040M	M12x1.0	6HX	100	18	9	7	10	M
VMOM 1212520S	-	M12x1.25	6HX	100	22	9	7	10	S
VMOM 1212520M	VMOM 1212540M	M12x1.25	6HX	100	22	9	7	10	M
VMOM 1215020S	-	M12x1.5	6HX	100	22	9	7	10	S
VMOM 1215020M	VMOM 1215040M	M12x1.5	6HX	100	22	9	7	10	M

※ 2.0P Tap is removed external center as bottoming type

Oil groove S : 1 Oil groove
Oil groove M : 4 Oil groove

■ Applicable Working Material

Medium Carbon Steels	Alloy Steel	High Strength Steels	Copper	Brass	Casting Brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Thermoplastic
C0.25% ~0.45%	SCM	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC	-
◎	◎	○	○	○	○	○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VMOM | DIN ROLL TAPS

EDP No		SIZES (mm)							
2P	4P	Thread Size	Limits	L	l	d	K	Kl	Oil Groove
VMOM 1217520S	-	M12x1.75	6HX	110	24	9	7	10	S
VMOM 1217520M	VMOM 1217540M	M12x1.75	6HX	100	24	9	7	10	M

※ 2.0P Tap is removed external center as bottoming type

Oil groove S : 1 Oil groove
Oil groove M : 4 Oil groove

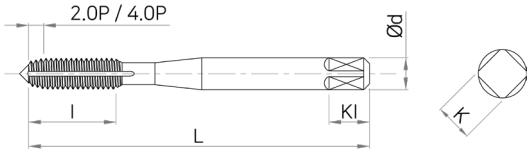
■ Applicable Working Material

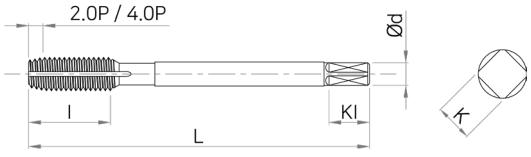
Medium Carbon Steels	Alloy Steel	High Strength Steels	Copper	Brass	Casting Brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Thermoplastic
C0.25% ~0.45%	SCM	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC	-
◎	◎	○	○	○	○	○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VMTM | DIN ROLL TAPS







DIN 371-374 376 | HSSE | TiN

EDP No		SIZES (mm)							
1.5P	5P	Thread Size	Limits	L	l	d	K	Kl	Oil Groove
VMTM 0305020S	-	M3x0.5	6HX	56	11	3.5	2.7	6	S
VMTM 0305020M	VMTM 0305040M	M3x0.5	6HX	56	11	3.5	2.7	6	M
VMTM 0407020S	-	M4x0.7	6HX	63	13	4.5	3.4	6	S
VMTM 0407020M	VMTM 0407040M	M4x0.7	6HX	63	13	4.5	3.4	6	M
VMTM 0508020S	-	M5x0.8	6HX	70	15	6	4.9	8	S
VMTM 0508020M	VMTM 0508040M	M5x0.8	6HX	70	15	6	4.9	8	M
VMTM 0610020S	-	M6x1.0	6HX	80	17	6	4.9	8	S
VMTM 0610020M	VMTM 0610040M	M6x1.0	6HX	80	17	6	4.9	8	M
VMTM 0810020S	-	M8x1.0	6HX	90	17	8	6.2	9	S
VMTM 0810020M	VMTM 0810040M	M8x1.0	6HX	90	17	8	6.2	9	M
VMTM 0812520S	-	M8x1.25	6HX	90	20	8	6.2	9	S
VMTM 0812520M	VMTM 0812540M	M8x1.25	6HX	90	20	8	6.2	9	M
VMTM 1010020S	-	M10x1.0	6HX	90	18	10	8	11	S
VMTM 1010020M	VMTM 1010040M	M10x1.0	6HX	90	18	10	8	11	M
VMTM 1012520S	-	M10x1.25	6HX	100	22	10	8	11	S
VMTM 1012520M	VMTM 1012540M	M10x1.25	6HX	100	22	10	8	11	M
VMTM 1015020S	-	M10x1.5	6HX	100	22	10	8	11	S
VMTM 1015020M	VMTM 1015040M	M10x1.5	6HX	100	22	10	8	11	M
VMTM 1210020S	-	M12x1.0	6HX	100	18	9	7	10	S
VMTM 1210020M	VMTM 1210040M	M12x1.0	6HX	100	18	9	7	10	M
VMTM 1212520S	-	M12x1.25	6HX	100	22	9	7	10	S
VMTM 1212520M	VMTM 1212540M	M12x1.25	6HX	100	22	9	7	10	M
VMTM 1215020S	-	M12x1.5	6HX	100	22	9	7	10	S
VMTM 1215020M	VMTM 1215040M	M12x1.5	6HX	100	22	9	7	10	M

※ 2.0P Tap is removed external center as bottoming type

Oil groove S : 1 Oil groove
Oil groove M : 4 Oil groove

■ Applicable Working Material

Medium Carbon Steels	Alloy Steel	High Strength Steels	Copper	Brass	Casting Brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Thermoplastic
C0.25% ~0.45%	SCM	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC	-
◎	◎	○	○	○	○	○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VMTM | DIN ROLL TAPS

EDP No		SIZES (mm)							
1.5P	5P	Thread Size	Limits	L	l	d	K	Kl	Oil Groove
VMTM 1217520S	-	M12x1.75	6HX	110	24	9	7	10	S
VMTM 1217520M	VMTM 1217540M	M12x1.75	6HX	110	24	9	7	10	M

※ 2.0P Tap is removed external center as bottoming type

Oil groove S : 1 Oil groove
Oil groove M : 4 Oil groove

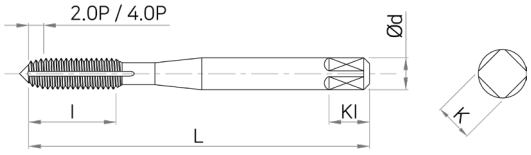
■ Applicable Working Material

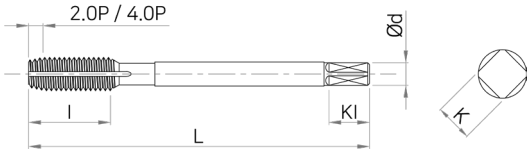
Medium Carbon Steels	Alloy Steel	High Strength Steels	Copper	Brass	Casting Brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Thermoplastic
C0.25% ~0.45%	SCM	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC	-
◎	◎	○	○	○	○	○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

VMCM | DIN ROLL TAPS







DIN 371-374 376 | HSSE | TiCN

EDP No		SIZES (mm)							
1.5P	5P	Thread Size	Limits	L	l	d	K	Kl	Oil Groove
VMTM 0305020S	-	M3x0.5	6HX	56	11	3.5	2.7	6	S
VMTM 0305020M	VMTM 0305040M	M3x0.5	6HX	56	11	3.5	2.7	6	M
VMTM 0407020S	-	M4x0.7	6HX	63	13	4.5	3.4	6	S
VMTM 0407020M	VMTM 0407040M	M4x0.7	6HX	63	13	4.5	3.4	6	M
VMTM 0508020S	-	M5x0.8	6HX	70	15	6	4.9	8	S
VMTM 0508020M	VMTM 0508040M	M5x0.8	6HX	70	15	6	4.9	8	M
VMTM 0610020S	-	M6x1.0	6HX	80	17	6	4.9	8	S
VMTM 0610020M	VMTM 0610040M	M6x1.0	6HX	80	17	6	4.9	8	M
VMTM 0810020S	-	M8x1.0	6HX	90	17	8	6.2	9	S
VMTM 0810020M	VMTM 0810040M	M8x1.0	6HX	90	17	8	6.2	9	M
VMTM 0812520S	-	M8x1.25	6HX	90	20	8	6.2	9	S
VMTM 0812520M	VMTM 0812540M	M8x1.25	6HX	90	20	8	6.2	9	M
VMTM 1010020S	-	M10x1.0	6HX	90	18	10	8	11	S
VMTM 1010020M	VMTM 1010040M	M10x1.0	6HX	90	18	10	8	11	M
VMTM 1012520S	-	M10x1.25	6HX	100	22	10	8	11	S
VMTM 1012520M	VMTM 1012540M	M10x1.25	6HX	100	22	10	8	11	M
VMTM 1015020S	-	M10x1.5	6HX	100	22	10	8	11	S
VMTM 1015020M	VMTM 1015040M	M10x1.5	6HX	100	22	10	8	11	M
VMTM 1210020S	-	M12x1.0	6HX	100	18	9	7	10	S
VMTM 1210020M	VMTM 1210040M	M12x1.0	6HX	100	18	9	7	10	M
VMTM 1212520S	-	M12x1.25	6HX	100	22	9	7	10	S
VMTM 1212520M	VMTM 1212540M	M12x1.25	6HX	100	22	9	7	10	M
VMTM 1215020S	-	M12x1.5	6HX	100	22	9	7	10	S
VMTM 1215020M	VMTM 1215040M	M12x1.5	6HX	100	22	9	7	10	M

※ 2.0P Tap is removed external center as bottoming type

Oil groove S : 1 Oil groove
Oil groove M : 4 Oil groove

■ Applicable Working Material

Medium Carbon Steels	Alloy Steel	High Strength Steels	Copper	Brass	Casting Brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Thermoplastic
C0.25% ~0.45%	SCM	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC	-
◎	◎	○	○	○	○	○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

EDP No		SIZES (mm)							
1.5P	5P	Thread Size	Limits	L	l	d	K	Kl	Oil Groove
VMCM 1217520S	-	M12x1.75	6HX	110	24	9	7	10	S
VMCM 1217520M	VMCM 1217540M	M12x1.75	6HX	110	24	9	7	10	M

※ 2.0P Tap is removed external center as bottoming type

Oil groove S : 1 Oil groove
Oil groove M : 4 Oil groove

■ Applicable Working Material

Medium Carbon Steels	Alloy Steel	High Strength Steels	Copper	Brass	Casting Brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Thermoplastic
C0.25% ~0.45%	SCM	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC	-
◎	◎	○	○	○	○	○	○	○	○	○	○

○ : GOOD ◎ : EXCELLENT

CENTERING TOOL SERIES



CENTERING TOOL

536



CENTERING TOOL



Contents

EDP No	Geometry	Type	Page
CDS		Solid center drill	538
LDS		NC Spotting drill	539
LDF---W		NC Spotting drill - Multi type	540
CES302(60°)		Centering endmill - Solid type(60°)	541
CES302(90°)		Centering endmill - Solid type(90°)	542
CEM---W		Centering endmill - brazed type	543
CRC		Corner Rounding cutter	544
CFT---W		Chamfer Tool	545
CCT		Chamfer Cutter	546
CCF		Chamfer Cutter Face	547

EDP No. System

*If expressed as an integer, the decimal point is omitted.

C DS 030

Appearance	Type	Diameter
C : Center	DS : Drill Spotting(Metric)	30
L : Leading	DA : Drill Spotting(Inch) (Variable Point Angle)	35
CE : Centering Endmill	DF : Drill Spotting Multy Type	40
CR : Corner Rounding	S : End Mill Solid Type	
CF : Chamfer	M : End Mill Brazed Type	
CC : Chamfer Cutter	C : Cutter	
	T : Tool	
	F : Face	

Ex) Cutting Dia Ø3.0 / Center Drill



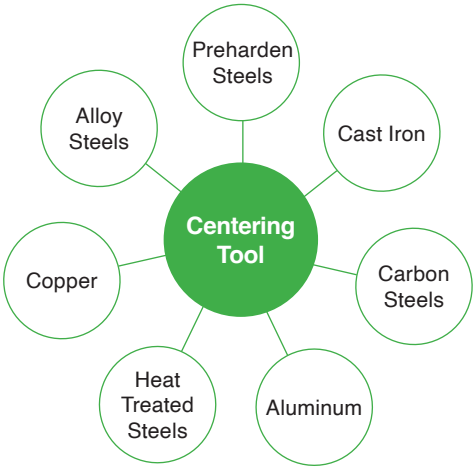
Characteristics

· Suitable to work for Die Steels,Alloy Steels, Cast Iron, Stainless Steels, Graphite
· Processing the corners chamfering and R shape processing

Features

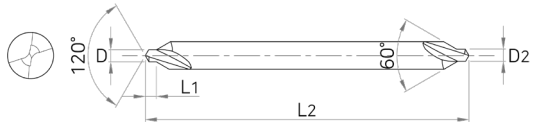
· Enough to customized work on corner chamfering and R shape processing
· Excellent retentivity for Flute hardness and High temperature harness by applied to TiAlN, AlTiN coating

Applications



CDS | SOLID CENTER DRILL





■ Tolerance

D		Shank Dia
All Sizes	0 ~ +0.1	h6

CARBIDE | Uncoated | 15° HELIX

EDP No	SIZES (mm)			
	D	L1	L2	D2
CDS 010	1	1	40	3
CDS 015	1.5	1.5	40	4
CDS 020	2	2	45	5
CDS 025	2.5	2.5	45	6
CDS 030	3	3	55	8
CDS 040	4	4.5	60	10
CDS 050	5	5.5	65	12

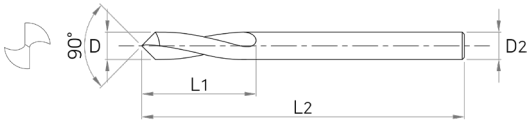
■ Applicable Working Material

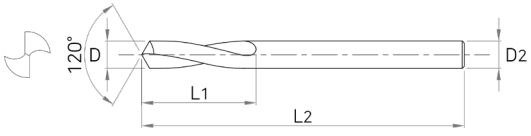
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	○			○			○	○	○

○ : GOOD ◎ : EXCELLENT

LDS | NC SPOTTING DRILL







■ Tolerance

D		Shank Dia
All Sizes	0 ~ +0.1	h6



EDP No	SIZES (mm)				
	D	L1	L2	D2	θ
LDS 030	3	9	50	3	90°
LDS 030L	3	10	100	3	90°
LDS 030A	3	9	50	3	120°
LDS 040	4	10	50	4	90°
LDS 040L	4	12	100	4	90°
LDS 040A	4	10	50	4	120°
LDS 050	5	12	50	5	90°
LDS 050A	5	12	50	5	120°
LDS 060	6	13	60	6	90°
LDS 060L	6	18	110	6	90°
LDS 060A	6	13	60	6	120°
LDS 080	8	23	70	8	90°
LDS 080L	8	23	150	8	90°
LDS 080A	8	23	70	8	120°
LDS 100	10	24	80	10	90°
LDS 100L	10	24	150	10	90°
LDS 100A	10	24	80	10	120°
LDS 120	12	28	80	12	90°
LDS 120L	12	24	150	12	90°
LDS 120A	12	28	80	12	120°
LDS 160	16	32	90	16	90°
LDS 160A	16	32	90	16	120°
LDS 200	20	35	100	20	90°
LDS 200A	20	35	100	20	120°

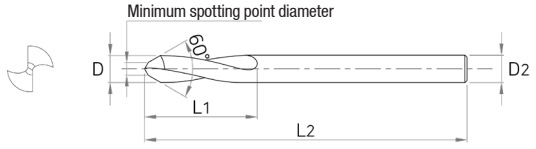
■ Applicable Working Material

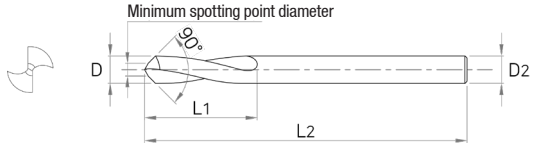
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	○			○			○	○	○

○ : GOOD ◎ : EXCELLENT

LDF-W | NC SPOTTING DRILL - MULTY TYPE







■ Tolerance

D		Shank Dia
All Sizes	0 ~ +0.1	h6

CARBIDE | TiAlN | 20° HELIX | 60° | 90°

EDP No	SIZES (mm)					
	D	L1	L2	D2	θ	Minimum spotting point diameter
LDF 0360W	3	9	50	3	60°	1.5
LDF 0390W	3	9	50	3	90°	1.2
LDF 0460W	4	10	50	4	60°	1.7
LDF 0490W	4	10	50	4	90°	1.3
LDF 0560W	5	12	50	5	60°	1.9
LDF 0590W	5	12	50	5	90°	1.5
LDF 0660W	6	13	60	6	60°	1.9
LDF 0690W	6	13	60	6	90°	1.5
LDF 0860W	8	23	70	8	60°	1.9
LDF 0890W	8	23	70	8	90°	1.6
LDF 1060W	10	24	80	10	60°	2.1
LDF 1090W	10	24	80	10	90°	2.1
LDF 1260W	12	28	80	12	60°	2.1
LDF 1290W	12	28	80	12	90°	2.1

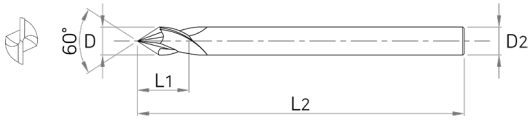
■ Applicable Working Material

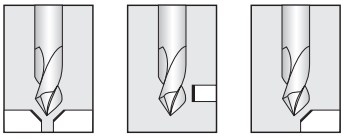
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	○			○			○	○	○

○ : GOOD ◎ : EXCELLENT

CES302(60°) | CENTERING ENDMILL - SOLID







■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.05	h6



EDP No		SIZES (mm)			
non coating	coating	D	L1	L2	D2
CES302 030-60S3	CES302 030-60S3-C	3	6	50	3
CES302 040-60S4	CES302 040-60S4-C	4	8	50	4
CES302 050-60S5	CES302 050-60S5-C	5	10	50	5
CES302 060-60	CES302 060-60-C	6	12	60	6
CES302 080-60	CES302 080-60-C	8	16	70	8
CES302 100-60	CES302 100-60-C	10	18	70	10
CES302 120-60	CES302 120-60-C	12	20	75	12

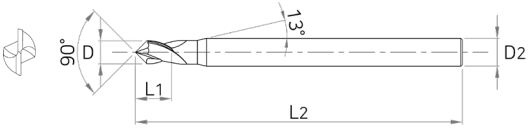
■ Applicable Working Material

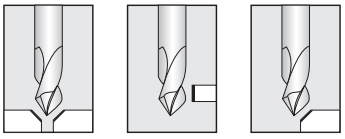
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	○			○			○	○	○

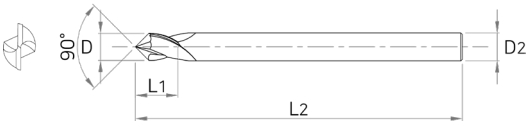
○ : GOOD ◎ : EXCELLENT

CES302(90°) | CENTERING ENDMILL - SOLID









■ Tolerance

D		Shank Dia
All Sizes	0 ~ -0.05	h6



EDP No		SIZES (mm)			
non coating	coating	D	L1	L2	D2
CES302 020S2	CES302 020S2-C	2	5	50	3
CES302 030	CES302 030-C	3	6	50	6
CES302 030S3	CES302 030S3-C	3	6	50	3
CES302 040	CES302 040-C	4	8	50	6
CES302 040S4	CES302 040S4-C	4	8	50	4
CES302 050	CES302 050-C	5	10	50	6
CES302 050S5	CES302 050S5-C	5	10	50	5
CES302 060	CES302 060-C	6	12	60	6
CES302 080	CES302 080-C	8	16	70	8
CES302 100	CES302 100-C	10	18	70	10
CES302 120	CES302 120-C	12	20	75	12
CES302 140	CES302 140-C	14	24	80	14
CES302 160	CES302 160-C	16	26	80	16
CES302 200	CES302 200-C	20	32	100	20

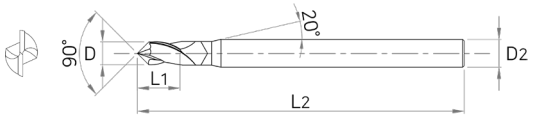
■ Applicable Working Material

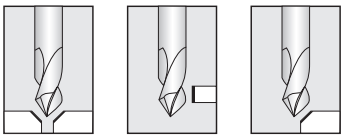
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	○			○			○	○	○

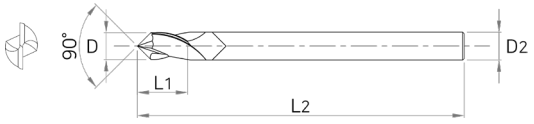
○ : GOOD ◎ : EXCELLENT

CEM-W | CENTERING ENDMILL - BRAZED TYPE









■ Tolerance

D		Shank Dia
All Sizes	0 ~ +0.1	h7



EDP No	SIZES (mm)			
	D	L1	L2	D2
CEM 1016W	10	15	115	16
CEM 1216W	12	20	145	16
CEM 1620W	16	23	150	20
CEM 2025W	20	25	155	25

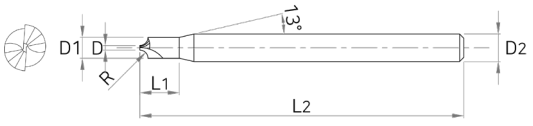
■ Applicable Working Material

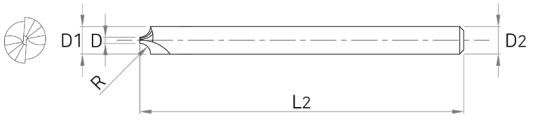
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	○			○			○	○	○

○ : GOOD ◎ : EXCELLENT

CRC | CORNER ROUNDING CUTTER







■ Tolerance

D		Shank Dia
All Sizes	±0.05	h6



EDP No	SIZES (mm)					
	D	R	D1	L1	L2	D2
CRC 209 050	0.9	0.5	2	3	45	4
CRC 209 075	0.9	0.75	2.5	4	45	4
CRC 209 100	0.9	1	3	5	50	6
CRC 259 100	5.9	1	8	-	60	8
CRC 214 150	1.4	1.5	4.5	8	50	6
CRC 249 150	4.9	1.5	8	-	60	8
CRC 214 200	1.4	2	5.5	10	50	6
CRC 239 200	3.9	2	8	-	60	8
CRC 219 250	1.9	2.5	7	13	60	8
CRC 219 300	1.9	3	8	-	60	8
CRC 219 350	1.9	3.5	9	13	70	10
CRC 219 400	1.9	4	10	-	70	10
CRC 219 450	1.9	4.5	11	13	80	12
CRC 219 500	1.9	5	12	-	80	12
CRC 239 600	3.9	6	16	-	85	16
CRC 259 700	5.9	7	20	-	85	20
CRC 239 800	3.9	8	20	-	85	20

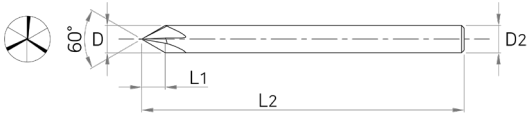
■ Applicable Working Material

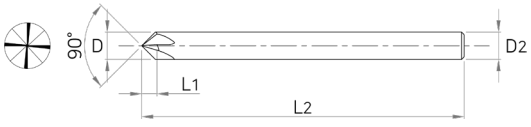
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	○			○			○	○	○

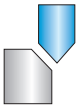
○ : GOOD ◎ : EXCELLENT

CFT-W | CHAMFER TOOL

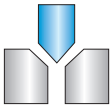








Available work (O)



Available work (O)

■ Tolerance

D		Shank Dia
All Sizes	0 ~ +0.1	h6

CARBIDE | TiAlN | 3~4 | 0° HELIX | 60° | 90° | DATA P.716

EDP No	SIZES (mm)					
	D	θ	L1	L2	D2	Z
CFT 0660W	6	60°	5.1	50	6	3
CFT 0690W	6	90°	3	50	6	3
CFT 0860W	8	60°	6.9	60	8	3
CFT 0890W	8	90°	4	60	8	3
CFT 1060W	10	60°	8.6	70	10	4
CFT 1090W	10	90°	5	70	10	4
CFT 1260W	12	60°	10.3	75	12	4
CFT 1290W	12	90°	6	75	12	4

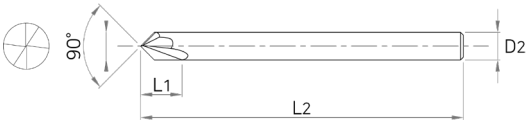
■ Applicable Working Material

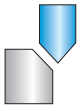
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	○			○			○	○	○

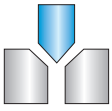
○ : GOOD ◎ : EXCELLENT

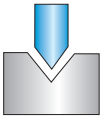
CCT | CHAMFER CUTTER






Available work (O)


Available work (O)


Available work (△)

■ Tolerance

D		Shank Dia
All Sizes	0 ~ +0.1	h6

CARBIDE | AlTiN | 2 | 0° HELIX | DATA P.716

EDP No	SIZES (mm)				
	D	θ	L1	L2	D2
CCT 502 030 S3	3	90 °	1.5	60	3
CCT 502 040 S4	4		2	60	4
CCT 502 060	6		3	60	6
CCT 502 080	8		4	65	8
CCT 502 100	10		5	70	10
CCT 502 120	12		6	75	12

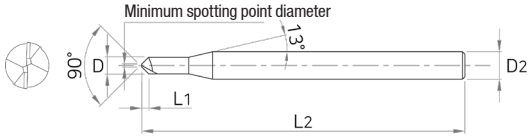
■ Applicable Working Material

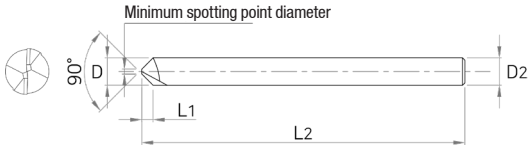
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
O	O			O			O	O	O

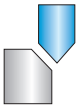
O : GOOD ◎ : EXCELLENT

CCF | CHAMFER CUTTER FACE

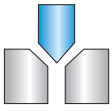








Available work (O)



Available work (O)

■ Tolerance

D		Shank Dia
All Sizes	±0.01	h6

CARBIDE | TiAlN | 2 | 5° HELIX | DATA P.716

EDP No	SIZES (mm)					
	D	θ	L1	L2	D2	Minimum spotting point diameter
CCF 502 020 S4	2	90 °	0.85	50	4	0.3
CCF 502 020	2		0.85	50	6	0.3
CCF 502 040 S4	4		1.85	50	4	0.3
CCF 502 040	4		1.85	50	6	0.3
CCF 502 060	6		2.85	50	6	0.3
CCF 502 080	8		3.8	60	8	0.4
CCF 502 100	10		4.75	70	10	0.5
CCF 502 120	12		5.75	75	12	0.5

■ Applicable Working Material

Carbon Steel ~ HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	○			○			○	○	○

○ : GOOD ◎ : EXCELLENT

REAMER SERIES



REAMER

550



REAMER



Contents

EDP No	Geometry	Type	Page
SSR		Straight Flute Reamer	551
SHR		Helical Flute Reamer	552
HRS-W		Helical Neck Type Reamer	553
SBR		High-Helix Broach Reamer	555

EDP No. System

*If expressed as an integer, the decimal point is omitted.

SS R 060

Appearance	Type	Diameter
SS : Solid Straight	R : Reamer	30
SH : Solid Helix	S : Separate Diameter	35
HR : Neck Type Helix		40
SB : Solid Broach		

Ex) Cutting Dia Ø6.0 / Solid Straight Reamer

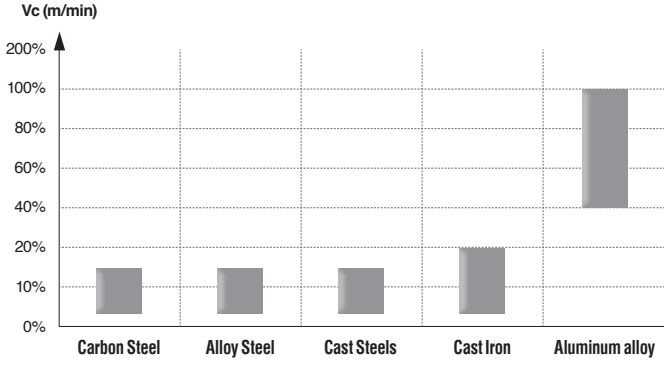
Characteristics

· Suitable to work for Carbon Steels, Alloy Steels, Preharden Steels, Copper, Cast Iron, Aluminum
· Extend customer choice with variety of size and type

Features

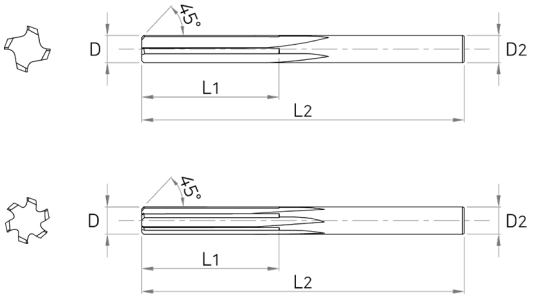
· Excellent Chip emission by applied to Helical cutting edge
· Reduced friction by applied to clearance angle of the chamfer

Vc by Application area



SSR | STRAIGHT FLUTE REAMER





■ Tolerance

D		Shank Dia
~ D3	+0.006 ~ +0.002	h6
D3.1 ~ D6	+0.009 ~ +0.004	
D6.1 ~ D10	+0.012 ~ +0.006	
D10.1 ~ D12	+0.015 ~ +0.007	

CARBIDE | Uncoated | 4 | 6 | 0° HELIX

EDP No	SIZES (mm)				
	D	L1	L2	D2	Z
SSR 020	2	25	60	4	4
SSR 025	2.5	25	60	4	4
SSR 030	3	28	70	4	6
SSR 035	3.5	30	75	4	6
SSR 040	4	30	75	4	6
SSR 045	4.5	35	80	6	6
SSR 050	5	35	80	6	6
SSR 055	5.5	35	80	6	6
SSR 060	6	35	80	6	6
SSR 065	6.5	45	100	8	6
SSR 070	7	45	100	8	6
SSR 080	8	45	100	8	6
SSR 090	9	50	110	10	6
SSR 100	10	50	110	10	6
SSR 110	11	50	120	12	6
SSR 120	12	50	120	12	6

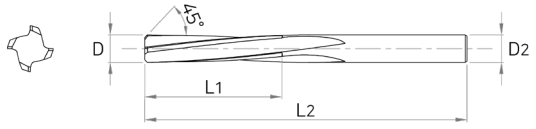
■ Applicable Working Material

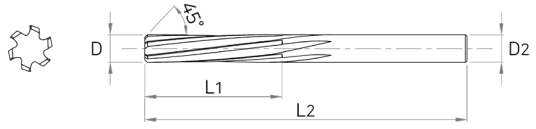
Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD400, 500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	○	○			○		○	○	○

○ : GOOD ◎ : EXCELLENT

SHR | HELICAL FLUTE REAMER







■ Tolerance

D		Shank Dia
~D3	+0.006 ~ +0.002	h6
D3.1 ~ D6	+0.009 ~ +0.004	
D6.1 ~ D10	+0.012 ~ +0.006	
D10.1 ~ D12	+0.015 ~ +0.007	



EDP No	SIZES (mm)				
	D	L1	L2	D2	Z
SHR 020	2	25	60	4	4
SHR 025	2.5	25	60	4	4
SHR 030	3	28	70	4	6
SHR 035	3.5	30	75	4	6
SHR 040	4	30	75	4	6
SHR 045	4.5	35	80	6	6
SHR 050	5	35	80	6	6
SHR 055	5.5	35	80	6	6
SHR 060	6	35	80	6	6
SHR 065	6.5	45	100	8	6
SHR 070	7	45	100	8	6
SHR 080	8	45	100	8	6
SHR 090	9	50	110	10	6
SHR 100	10	50	110	10	6
SHR 110	11	50	120	12	6
SHR 120	12	50	120	12	6

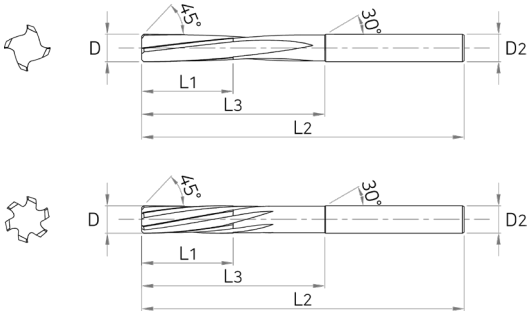
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD400, 500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	○	○			○		○	○	○

○ : GOOD ◎ : EXCELLENT

HRS-W | HELICAL FLUTE NECK REAMER





■ Tolerance

D		Shank Dia
~D5.03	0~+0.004	h6
D5.5~12.05	0~+0.005	

CARBIDE | Uncoated | 4 | 6 | 7° HELIX

EDP No	SIZES (mm)					
	D	L1	L3	L2	D2	Z
HRS 0198W	1.98	12	22	50	4	4
HRS 0199W	1.99	12	22	50	4	4
HRS 0200W	2	12	22	50	4	4
HRS 0201W	2.01	12	22	50	4	4
HRS 0202W	2.02	12	22	50	4	4
HRS 0203W	2.03	12	22	50	4	4
HRS 0248W	2.48	16	26	60	4	4
HRS 0249W	2.49	16	26	60	4	4
HRS 0250W	2.5	16	26	60	4	4
HRS 0251W	2.51	16	26	60	4	4
HRS 0252W	2.52	16	26	60	4	4
HRS 0253W	2.53	16	26	60	4	4
HRS 0297W	2.97	18	30	65	4	6
HRS 0298W	2.98	18	30	65	4	6
HRS 0299W	2.99	18	30	65	4	6
HRS 0300W	3	18	30	65	4	6
HRS 0301W	3.01	18	30	65	4	6
HRS 0302W	3.02	18	30	65	4	6
HRS 0303W	3.03	18	30	65	4	6
HRS 0350W	3.5	20	35	75	4	6
HRS 0397W	3.97	20	35	75	4	6
HRS 0398W	3.98	20	35	75	4	6
HRS 0399W	3.99	20	35	75	4	6
HRS 0400W	4	20	35	75	4	6

EDP No	SIZES (mm)					
	D	L1	L3	L2	D2	Z
HRS 0401W	4.01	20	35	75	4	6
HRS 0402W	4.02	20	35	75	4	6
HRS 0403W	4.03	20	35	75	4	6
HRS 0450W	4.5	25	40	80	6	6
HRS 0497W	4.97	25	40	80	6	6
HRS 0498W	4.98	25	40	80	6	6
HRS 0499W	4.99	25	40	80	6	6
HRS 0500W	5	25	40	80	6	6
HRS 0501W	5.01	25	40	80	6	6
HRS 0502W	5.02	25	40	80	6	6
HRS 0503W	5.03	25	40	80	6	6
HRS 0550W	5.5	25	45	80	6	6
HRS 0597W	5.97	25	45	80	6	6
HRS 0598W	5.98	25	45	80	6	6
HRS 0599W	5.99	25	45	80	6	6
HRS 0600W	6	25	45	80	6	6
HRS 0601W	6.01	25	45	80	6	6
HRS 0602W	6.02	25	45	80	6	6
HRS 0603W	6.03	25	45	80	6	6
HRS 0650W	6.5	30	60	100	8	6
HRS 0700W	7	30	60	100	8	6
HRS 0750W	7.5	33	65	100	8	6
HRS 0797W	7.97	33	65	100	8	6
HRS 0798W	7.98	33	65	100	8	6

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD400, 500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	○	○			○		○	○	○

○ : GOOD ◎ : EXCELLENT

HRS-W | HELICAL FLUTE NECK REAMER

EDP No	SIZES (mm)					
	D	L1	L3	L2	D2	Z
HRS 0799W	7.99	33	65	100	8	6
HRS 0800W	8	33	65	100	8	6
HRS 0801W	8.01	33	65	100	8	6
HRS 0802W	8.02	33	65	100	8	6
HRS 0803W	8.03	33	65	100	8	6
HRS 0850W	8.5	35	70	110	10	6
HRS 0900W	9	35	70	110	10	6
HRS 0997W	9.97	35	70	110	10	6
HRS 0998W	9.98	35	70	110	10	6
HRS 0999W	9.99	35	70	110	10	6
HRS 1000W	10	35	70	110	10	6
HRS 1001W	10.01	35	70	110	10	6
HRS 1002W	10.02	35	70	110	10	6

EDP No	SIZES (mm)					
	D	L1	L3	L2	D2	Z
HRS 1003W	10.03	35	70	110	10	6
HRS 1004W	10.04	35	70	110	10	6
HRS 1005W	10.05	35	70	110	10	6
HRS 1100W	11	40	80	120	12	6
HRS 1197W	11.97	40	80	120	12	6
HRS 1198W	11.98	40	80	120	12	6
HRS 1199W	11.99	40	80	120	12	6
HRS 1200W	12	40	80	120	12	6
HRS 1201W	12.01	40	80	120	12	6
HRS 1202W	12.02	40	80	120	12	6
HRS 1203W	12.03	40	80	120	12	6
HRS 1204W	12.04	40	80	120	12	6
HRS 1205W	12.05	40	80	120	12	6

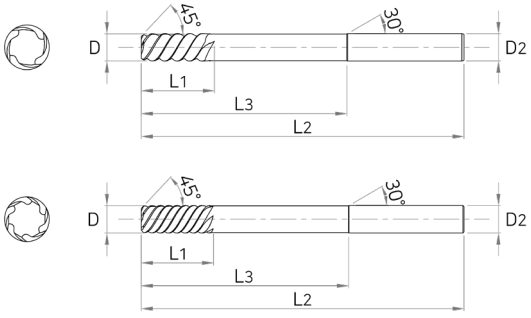
■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD400, 500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	○	○			○		○	○	○

○ : GOOD ◎ : EXCELLENT

SBR | BROACH REAMER





■ Tolerance

D		Shank Dia
~D3	+0.006 ~ +0.002	h6
D4 ~ 6	+0.009 ~ +0.004	
D8 ~ 10	+0.012 ~ +0.006	
D12 ~ 16	+0.015 ~ +0.007	
D20 ~	+0.017 ~ +0.007	



EDP No	SIZES (mm)					
	D	L1	L2	L3	D2	Z
SBR 030	3	12	70	40	4	4
SBR 040	4	12	75	45	4	4
SBR 050	5	16	80	45	6	4
SBR 060	6	16	80	45	6	4
SBR 080	8	20	100	60	8	4
SBR 100	10	25	110	65	10	4
SBR 120	12	28	120	70	12	4
SBR 140	14	30	145	90	14	4
SBR 160	16	35	155	100	16	6
SBR 180	18	38	170	110	18	6
SBR 200	20	40	180	120	20	6

■ Applicable Working Material

Carbon Steel ~HB225	Alloy Steel HB225~325	Prehardened Steel HRc30~50	Hardened Steel		Copper	Graphite	Cast Iron ~FCD400, 500	Aluminum	Stainless Steel
			SKD61 ~HRc55	SKD11 HRc55~					
○	○	○			○		○	○	○

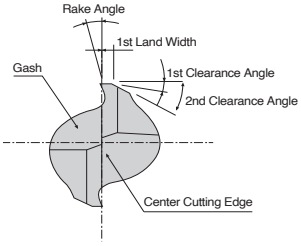
○ : GOOD ◎ : EXCELLENT

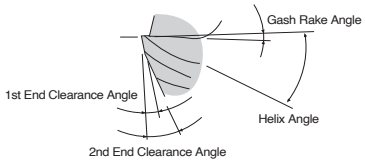


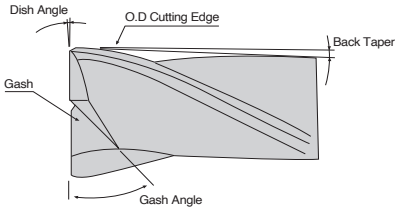
TECHNICAL DATA

Recommended Cutting Condition

Nomenclature of Endmill







Application range of Grade

Workpiece	Grade
Carbon Steel, Alloy Steels, Tool Steel, Metal Mold Steel	• Micro Grain Carbide • P30
Cast Iron, Ductile	• Micro Grain Carbide • K10~K20
Heat Treatment Steel(HRc 40~60)	• Ultrafinest Carbide
Aluminium, Nonferrous Meterial	• Micro Grain Carbide • K10

Formula of End Milling

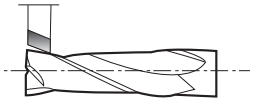
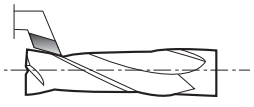
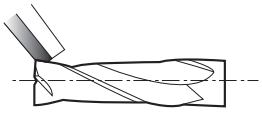
(1) Cutting Speed	$V = \frac{\pi \times D \times N}{1000}$ (m/min)	V : Cutting Speed D : Diameter of End Mill N : End Mill revolution	(m/min) (mm) (RPM)
(2) Feed per tooth	$fz = \frac{F}{Z \times N}$ (mm/tooth)	fz : Feed per tooth F : Table feed rate Z : No. of teeth N : End Mill revolution	(mm/tooth) (tooth) (RPM)
(3) Table Feed rate	$F = fz \times Z \times N$	F : Feed rate fz : Feed per tooth Z : No. of teeth N : End Mill revolution	(mm/min) (mm/tooth) (tooth) (RPM)
(4) Cutting Time	$Tc = \frac{L}{F}$	Tc: Cutting Time F : Table feed rate L : Length of cut (Workpiece Length+Diameter of Endmill+α)	(min) (mm/ min) (mm)

For Regrinding

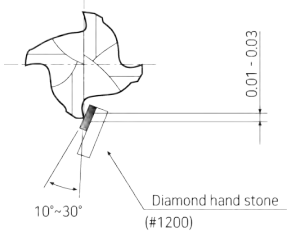
1. Regrinding range

Application Range	Cutter Dia	Amount Of Flank Wear
Finish Machining	~ ø10 ø 11 ~ ø30 ø 31 ~ ø50	0.05 ~ 0.1 0.1 ~ 0.25 0.2 ~ 0.35
Rough Machining	~ ø10 ø 11 ~ ø30 ø 31 ~ ø50	0.08 ~ 0.15 0.15 ~ 0.35 0.3 ~ 0.45

2. Regrinding Method of Relief

		**(1) Concave method** • In case when precise outer Diameter dimension is required. • In case of aluminium machining.
		**(2) Flat method** • Excellent machinability - Applicable to ball end mill and taper end mill. • Secondary clearance angle work is required. - When Diameter is large.
		**(3) Eccentric method** • Excellent toughness and surface roughness. • Secondary clearance angle work is not required.

3. Honing



1) Recommend honing for machining mold metal and high Hardness Workpiece.
   -The amount of honing shall be less than that of feed per blade.
2) When using end mill without honing, machine for 10 to 30 seconds at feed rate of less than 0.01 mm/blade and then machine at normal feed rate.
3) Honing is not required for machining aluminium and non-ferrous metal.

Recommended Cutting Condition

Trouble Shooting for End Milling

Problem	Cause	Solution
(1) Rupture	• High feed • High slotting volume • High protrusion volume • Worn out of flute • Longer cutting length	• Reduce feed • Reduce slotting volume • Reduce protrusion volume • Regrind at the beginning • Reduce cutting length
(2) Wear / Burning	• High speed • Small rake angle • High Hardness of material	• Reduce speed, Supply enough oil • Correct to proper rake angle • Supply Dry > soluble > Non-water soluble oil and do surface treatment"
(3) Chattering	• Improper cutting condition • Lack of Strength in machinery and chuck • Poorly fixed material • High protrusion volume • Large clearance of rake angle	• Adjust cutting and feed speed • Replace machinery and chuck • Contain a material firmly • Reduce protrusion volume • Reduce clearance of rake angle
(4) Defective of cutting edge	• Hige feed • Small rake angle • Chattering occurs • Poorly sealed material • High slotting volume • High protrusion volume • Lack of Strength in machinery	• Reduce feed • Adjust angle properly • Reduce Chattering by lowing the number of turning • Contain a material firmly • Reduce slotting volume • Reduce protrusion volume • Replace machinery
(5) Bad Cutability	• Worn out of cutting edge • Improper endmill • Small rake angle	• Regrind at the beginning • Replace proper endmill • Correct to proper rake angle
(6) Poor chip emission	• Low injection pressure of the oil • Small chip pocket • Worn out of cutting edge • High slotting volume	• Increase oil volume and pressure • Use fewer flute endmill or Reduce feed • Regrind at the beginning • Reduce slotting volume
(7) Burr on surface	• High feed • Low speed • Worn out of cutting edge • High slotting volume	• Reduce feed • Speed up • Regrind at the beginning • Reduce slotting volume
(8) Incorrect dimension	• Incorrect machinery or chuck • Incorrect rigidity of machinery or chuck • longer cutting length • Fewer number of flutes	• Correct machinery or chuck • Replace machinery or chuck • Reduce cutting length • Replace to larger number of flutes endmill
(9) Fusion	• Lack of oil or affination between tool and material	• Supply Dry > soluble > Non-water soluble oil • For Alloy Steels, use active type non-water soluble oil

ZE702, ZE712 SERIES ▶ Slotting

Workpiece	Herdened Steels Heat Resistant Steels		Herdened Steels									
Hardness	HRc30 ~ HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65		HRc 65 ~ HRc70	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
0.2	50,000	130	45,000	115	40,000	95	33,000	60	33,000	45	26,400	30
0.3	50,000	190	45,000	140	40,000	115	33,000	70	25,000	50	20,000	35
0.4	50,000	235	45,000	180	40,000	140	33,000	90	25,000	55	20,000	40
0.5	50,000	370	45,000	280	40,000	220	33,000	140	25,000	85	20,000	60
0.6	50,000	470	45,000	360	40,000	285	30,000	160	25,000	105	20,000	75
0.8	50,000	600	40,000	440	30,000	295	25,000	185	19,000	110	15,200	80
0.9	49,000	655	39,000	520	27,800	330	22,700	205	17,500	125	14,000	90
1	48,000	750	38,000	570	25,500	360	20,500	215	16,000	135	12,500	85
2	33,300	850	26,000	680	17,500	420	14,500	260	11,000	160	9,500	115
3	21,800	850	17,300	680	11,500	420	9,500	260	7,500	160	6,400	115
4	16,700	880	13,200	700	8,800	440	7,200	270	5,600	170	4,750	118
5	15,700	1,000	12,500	805	8,300	500	6,400	285	5,100	180	4,450	132
6	13,100	950	10,350	770	6,900	480	5,300	280	4,200	180	3,700	130
8	9,880	930	7,800	720	5,200	445	4,000	255	3,200	165	2,800	120
10	7,800	850	6,150	680	4,100	415	3,200	240	2,550	155	2,200	112
12	6,650	850	5,250	680	3,500	415	2,650	240	2,100	155	1,860	112
16	4,900	730	3,900	580	2,600	365	2,000	210	1,600	135	1,400	95
20	3,900	660	3,100	525	2,050	335	1,600	195	1,300	125	1,100	85

RPM = rev / min
FEED = mm / min



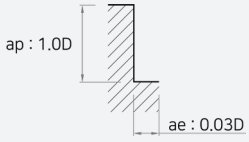


Recommended Cutting Condition

ZE702, ZE712 SERIES ▶ Side Cutting

Workpiece	Herdened Steels Heat Resistant Steels		Herdened Steels									
Hardness	HRc30 ~ HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65		HRc 65 ~ HRc70	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1	48,000	1,050	38,000	820	25,500	510	20,500	310	16,000	190	12,500	125
2	33,300	1,200	26,000	970	17,500	600	14,500	370	11,000	230	9,500	165
3	21,800	1,200	17,300	970	11,500	600	9,500	370	7,500	230	6,400	165
4	16,700	1,250	13,200	1,000	8,800	625	7,200	385	5,600	240	4,750	170
5	15,700	1,450	12,500	1,150	8,300	710	6,400	410	5,100	260	4,450	190
6	13,100	1,350	10,350	1,100	6,900	690	5,300	400	4,200	255	3,700	185
8	9,880	1,320	7,800	1,030	5,200	635	4,000	365	3,200	235	2,800	170
10	7,800	1,200	6,150	970	4,100	590	3,200	340	2,550	220	2,200	160
12	6,650	1,200	5,250	970	3,500	590	2,650	340	2,100	220	1,860	160
16	4,900	1,050	3,900	840	2,600	520	2,000	300	1,600	190	1,400	140
20	3,900	950	3,100	750	2,050	475	1,600	275	1,300	175	1,100	125

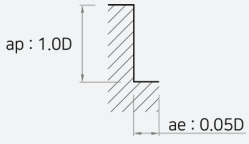
RPM = rev / min
FEED = mm / min

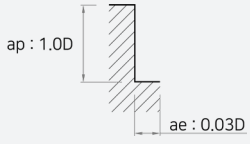


ZE704, ZE714, ZE724 SERIES ▶ Side Cutting

Workpiece	Herdened Steels Heat Resistant Steels		Herdened Steels									
Hardness	HRc30 ~ HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65		HRc 65 ~ HRc70	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1	48,000	1,480	38,000	1,050	25,500	710	20,500	430	16,000	270	12,500	175
2	33,300	1,750	26,000	1,250	17,500	840	14,500	520	11,000	320	9,500	230
3	21,800	1,750	17,300	1,250	11,500	840	9,500	520	7,500	320	6,400	230
4	16,700	1,800	13,200	1,300	8,800	880	7,200	540	5,600	335	4,750	240
5	15,700	2,000	12,500	1,500	8,300	1,000	6,400	580	5,100	370	4,450	270
6	13,100	1,950	10,350	1,400	6,900	950	5,300	560	4,200	350	3,700	260
8	9,880	1,880	7,800	1,350	5,200	900	4,000	520	3,200	330	2,800	240
10	7,800	1,750	6,150	1,260	4,100	840	3,200	480	2,550	310	2,200	220
12	6,650	1,750	5,250	1,260	3,500	840	2,650	480	2,100	300	1,860	220
16	4,900	1,500	3,900	1,100	2,600	730	2,000	420	1,600	270	1,400	200
20	3,900	1,300	3,100	970	2,050	650	1,600	380	1,300	250	1,100	180

RPM = rev / min
FEED = mm / min

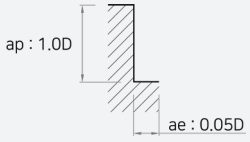


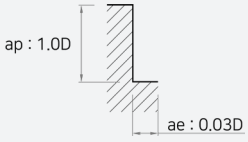


ZE716, ZR706, ZR736 SERIES

Workpiece	Herdened Steels Heat Resistant Steels		Herdened Steels									
Hardness	HRc30 ~ HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65		HRc 65 ~ HRc70	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6	24,800	5,350	23,500	4,900	16,000	4,900	13,500	3,300	10,500	2,100	8,000	1,450
8	20,000	5,500	19,000	5,000	12,000	4,600	10,000	3,100	8,000	2,000	6,000	1,400
10	16,000	4,900	15,500	4,500	9,500	4,100	8,000	2,900	6,400	1,800	4,800	1,300
12	13,000	4,500	12,500	4,100	8,000	3,800	6,600	2,500	5,300	1,600	4,000	1,150
16	10,000	4,000	9,700	3,700	6,000	3,400	5,000	2,300	4,000	1,250	3,000	870
20	8,000	3,350	7,800	3,400	4,800	3,200	4,000	2,100	3,200	1,020	2,400	690

RPM = rev / min
FEED = mm / min





ZSLNS20, ZSLNS40 SERIES

Work-piece	Alloy Steels, Heat Resistant Steels			Herdened Steels			Herdened Steels			Copper, Copper alloy		
Hardness	HRc30 ~ HRc45			HRc45 ~ HRc55			HRc55 ~ HRc65			-		
Diameter (mm)	RPM	FEED	Ae(mm)	RPM	FEED	Ae(mm)	RPM	FEED	Ae(mm)	RPM	FEED	Ae(mm)
0.4	34,100~50,000	350~590	0.005~0.028	30,500~35,200	295~340	0.003~0.020	18,300~24,600	120~200	0.002~0.012	48,000~50,000	790~920	0.008~0.048
0.5	25,650~33,000	370~470	0.006~0.035	23,750~26,000	285~315	0.004~0.025	14,200~18,000	115~130	0.003~0.015	44,000~50,000	800~1,150	0.010~0.060
0.6	20,900~35,200	330~560	0.007~0.030	19,900~22,000	260~290	0.005~0.021	11,900~15,500	100~120	0.003~0.013	37,500~50,000	770~1,250	0.011~0.051
0.8	16,150~26,400	360~590	0.009~0.040	15,200~16,700	280~310	0.006~0.028	9,000~11,700	110~125	0.004~0.017	28,500~47,000	770~1,300	0.015~0.068
1.0	12,300~18,700	350~540	0.011~0.028	10,500~11,500	250~280	0.008~0.020	6,300~8,050	100~115	0.005~0.012	22,500~34,000	810~1,300	0.018~0.048
1.2	10,450~17,600	350~590	0.025~0.070	9,100~10,000	250~280	0.015~0.042	5,400~7,000	100~115	0.009~0.026	22,500~31,500	950~1,350	0.036~0.101
1.5	9,100~17,600	430~830	0.017~0.077	7,000~8,000	250~280	0.012~0.055	4,300~5,500	100~115	0.007~0.033	14,500~25,000	770~1,320	0.028~0.132
2.0	6,350~10,550	340~570	0.021~0.140	6,100~6,700	270~300	0.015~0.100	3,600~4,700	100~120	0.009~0.060	11,500~18,500	770~1,250	0.036~0.240
3.0	4,300~7,050	550~900	0.056~0.210	3,990~4,600	445~515	0.040~0.150	2,400~3,200	105~310	0.024~0.090	9,000~13,000	1,400~2,110	0.096~0.360
4.0	3,200~5,300	400~675	0.074~0.280	3,000~3,400	335~380	0.053~0.200	1,800~2,400	75~230	0.032~0.120	6,750~9,750	1,050~1,575	0.128~0.480

RPM = rev / min
FEED = mm / min

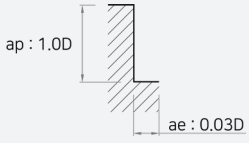


Recommended Cutting Condition

ZR702, ZR732 SERIES ▶ Side Cutting

Workpiece	Herdened Steels Heat Resistant Steels		Herdened Steels									
Hardness	HRc30 ~ HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65		HRc 65 ~ HRc70	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	33,300	960	26,000	776	17,500	480	14,500	296	11,000	184	9,500	132
3	21,800	960	17,300	776	11,500	480	9,500	296	7,500	184	6,400	132
4	16,700	1,000	13,200	800	8,800	500	7,200	308	5,600	192	4,750	136
5	15,700	1,160	12,500	920	8,300	568	6,400	328	5,100	208	4,450	152
6	13,100	1,080	10,350	880	6,900	552	5,300	320	4,200	204	3,700	148
8	9,880	1,056	7,800	824	5,200	508	4,000	292	3,200	188	2,800	136
10	7,800	960	6,150	776	4,100	472	3,200	272	2,550	176	2,200	128
12	6,650	960	5,250	776	3,500	472	2,650	272	2,100	176	1,860	128
16	4,900	840	3,900	672	2,600	416	2,000	240	1,600	152	1,400	112
20	3,900	760	3,100	600	2,050	380	1,600	220	1,300	140	1,100	100

RPM = rev / min
FEED = mm / min



ZR702, ZR732 SERIES ▶ Slotting

Workpiece	Herdened Steels Heat Resistant Steels		Herdened Steels									
Hardness	HRc30 ~ HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65		HRc 65 ~ HRc70	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	33,300	680	26,000	544	17,500	336	14,500	208	11,000	128	9,500	92
3	21,800	680	17,300	544	11,500	336	9,500	208	7,500	128	6,400	92
4	16,700	704	13,200	560	8,800	352	7,200	216	5,600	136	4,750	94
5	15,700	800	12,500	644	8,300	400	6,400	228	5,100	144	4,450	106
6	13,100	760	10,350	616	6,900	384	5,300	224	4,200	144	3,700	104
8	9,880	744	7,800	576	5,200	356	4,000	204	3,200	132	2,800	96
10	7,800	680	6,150	544	4,100	332	3,200	192	2,550	124	2,200	90
12	6,650	680	5,250	544	3,500	332	2,650	192	2,100	124	1,860	90
16	4,900	584	3,900	464	2,600	292	2,000	168	1,600	108	1,400	78
20	3,900	528	3,100	420	2,050	268	1,600	168	1,300	100	1,100	70

RPM = rev / min
FEED = mm / min

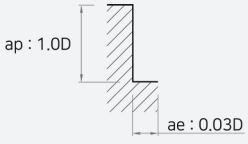




ZR704, ZR714, ZR724, ZR734 SERIES ▶ Side Cutting

Workpiece	Herdened Steels Heat Resistant Steels		Herdened Steels									
Hardness	HRc30 ~ HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65		HRc 65 ~ HRc70	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1	48,000	1,480	38,000	1,050	25,500	710	20,500	430	16,000	270	12,500	175
2	33,300	1,750	26,000	1,250	17,500	840	14,500	520	11,000	320	9,500	230
3	21,800	1,750	17,300	1,250	11,500	840	9,500	520	7,500	320	6,400	230
4	16,700	1,800	13,200	1,300	8,800	880	7,200	540	5,600	335	4,750	240
5	15,700	2,000	12,500	1,500	8,300	1,000	6,400	580	5,100	370	4,450	270
6	13,100	1,950	10,350	1,400	6,900	950	5,300	560	4,200	350	3,700	260
8	9,880	1,880	7,800	1,350	5,200	900	4,000	520	3,200	330	2,800	240
10	7,800	1,750	6,150	1,260	4,100	840	3,200	480	2,550	310	2,200	220
12	6,650	1,750	5,250	1,260	3,500	840	2,650	480	2,100	300	1,860	220
16	4,900	1,500	3,900	1,100	2,600	730	2,000	420	1,600	270	1,400	200
20	3,900	1,300	3,100	970	2,050	650	1,600	380	1,300	250	1,100	180

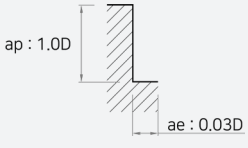
RPM = rev / min
FEED = mm / min



ZS124, ZS1(2)04, ZS204 SERIES ▶ Side Cutting

Workpiece	Herdened Steels Heat Resistant Steels		Herdened Steels							
Hardness	HRc30 ~ HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc 65 ~ HRc70	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
4	17,200	1,690	11,440	1,140	9,360	700	7,280	430	6,170	310
6	13,450	1,820	8,970	1,230	6,890	720	5,460	450	4,810	330
8	9,100	1,750	6,760	1,170	5,200	670	4,160	420	3,640	310
10	8,000	1,630	5,330	1,090	4,160	620	3,320	400	2,860	280
12	6,830	1,630	4,550	1,010	3,450	580	2,730	370	2,420	260

RPM = rev / min
FEED = mm / min



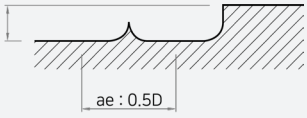
Recommended Cutting Condition

ZSPM4 SERIES

Workpiece	Herdened Steels									
Hardness	~HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65	
D X R (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
3 X R0.5	9,550	6,500	6,900	4,150	4,550	2,750	2,850	1,150	1,900	610
4 X R0.5	7,950	7,000	5,750	4,600	4,000	3,200	2,550	1,350	1,750	700
6 X R0.5	5,800	7,650	4,100	4,900	2,900	3,500	1,850	1,850	1,350	795
6 X R1.0	5,800	7,650	4,100	4,900	2,900	3,500	1,850	1,850	1,350	795
8 X R1.0	4,350	7,650	3,050	4,900	2,200	3,500	1,400	1,850	995	795
8 X R2.0	4,350	7,650	3,050	4,900	2,200	3,500	1,400	1,850	995	795
10 X R1.0	3,500	7,650	2,450	4,900	1,750	3,500	1,100	1,850	795	795
10 X R2.0	3,500	7,650	2,450	4,900	1,750	3,500	1,100	1,850	795	795
12 X R2.0	2,900	7,650	2,050	4,900	1,450	3,500	925	1,850	665	795
12 X R3.0	2,900	7,650	2,050	4,900	1,450	3,500	925	1,850	665	795

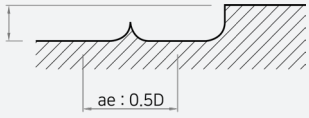
RPM = rev / min
FEED = mm / min

ap : 0.2R



*ae shouldn't be over max. 0.5D

ap : 0.1R



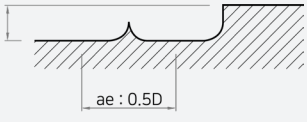
*ae shouldn't be over max. 0.5D

ZSPM4 SERIES ▶ High Speed Cutting

Workpiece	Herdened Steels									
Hardness	~HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65	
D X R (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
3 X R0.5	22,000	16,000	17,000	10,000	12,500	8,000	9,500	4,600	6,900	2,500
4 X R0.5	17,000	17,500	13,000	12,000	11,000	9,200	8,000	5,500	5,600	2,900
6 X R0.5	13,500	18,500	10,500	13,800	9,000	11,000	6,400	6,400	4,500	3,600
6 X R1.0	13,500	18,500	10,500	13,800	9,000	11,000	6,400	6,400	4,500	3,600
8 X R1.0	10,000	18,500	8,000	14,000	6,800	11,000	4,800	6,700	3,400	4,100
8 X R2.0	10,000	18,500	8,000	14,000	6,800	11,000	4,800	6,700	3,400	4,100
10 X R1.0	8,000	18,500	6,400	14,000	5,400	11,000	3,800	6,800	2,700	3,800
10 X R2.0	8,000	18,500	6,400	14,000	5,400	11,000	3,800	6,800	2,700	3,800
12 X R2.0	6,600	18,500	5,300	14,000	4,500	11,000	3,200	7,000	2,250	3,600
12 X R3.0	6,600	18,500	5,300	14,000	4,500	11,000	3,200	7,000	2,250	3,600

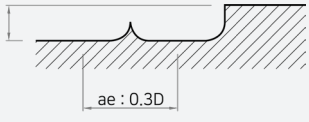
RPM = rev / min
FEED = mm / min

ap : 0.1R



*ae shouldn't be over max. 0.3D

ap : 0.05R



*ae shouldn't be over max. 0.3D

ZSLNR20 SERIES

Workpiece				Carbon Steels, Alloy Steels (180~250HB)		Prehardened Steels (HRc35~45)		Herdened Steels (HRc45~55)		Herdened Steels (HRc55~65)	
Ratio to standard depth of cut				Depth of Cut X 100%		Depth of Cut X 100%		Depth of Cut X 100%		Depth of Cut X 100%	
Mill Dia (mm)	Diameter (mm)	Neck Length (mm)	Depth of Cut (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
1	0.1	8	0.024	23,328	880	19,829	748	17,496	587	16,330	479
		10	0.009	24,000	451	18,000	276	17,800	221	15,000	193
0.8	0.1	4	0.032	48,000	1,102	28,000	518	20,000	320	20,000	288
		6	0.019	38,700	800	25,000	461	18,000	288	18,000	256
		8	0.015	29,025	600	20,000	369	16,200	259	16,200	230
		12	0.012	29,025	570	20,000	350	16,200	246	16,200	219
	0.2	4	0.056	48,000	1,102	28,000	518	20,000	320	20,000	288
		6	0.032	38,700	800	25,000	461	18,000	288	18,000	256
1	0.1	4	0.038	32,400	1,359	27,540	1,039	24,300	815	22,680	666
		6	0.024	26,244	990	22,307	842	19,683	660	18,371	539
		8	0.024	23,328	880	19,829	748	17,496	587	16,330	479
		10	0.015	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.015	18,144	609	15,422	453	13,608	399	12,701	320
		16	0.009	18,144	533	15,422	420	13,608	342	12,701	266
		20	0.006	13,608	399	11,567	315	10,206	257	9,526	200
	0.2	4	0.07	32,400	1,359	27,540	1,039	24,300	815	22,680	666
		6	0.04	26,244	990	22,307	842	19,683	660	18,371	539
		8	0.04	23,328	880	19,829	748	17,496	587	16,330	479
		10	0.025	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.025	18,144	609	15,422	453	13,608	399	12,701	320
		16	0.015	18,144	533	15,422	420	13,608	342	12,701	266
		20	0.01	13,608	399	11,567	315	10,206	257	9,526	200
	0.3	6	0.04	26,244	990	22,307	842	19,683	660	18,371	539
		10	0.025	20,412	770	17,350	655	15,309	514	14,288	419
		16	0.015	18,144	533	15,422	420	13,608	342	12,701	266
		20	0.01	13,608	399	11,567	315	10,206	257	9,526	200
1.5	0.1	4	0.042	24,930	1,130	20,956	868	18,711	678	17,364	556
		8	0.036	22,680	1,027	19,278	873	17,010	685	15,876	559
		12	0.036	18,144	822	15,422	698	13,608	548	12,701	447
		15	0.023	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.018	14,112	568	11,995	423	10,584	373	9,878	298
	0.2	4	0.07	24,930	1,130	20,956	868	18,711	678	17,364	556
		8	0.06	22,680	1,027	19,278	873	17,010	685	15,876	559
		12	0.06	18,144	822	15,422	698	13,608	548	12,701	447
		15	0.038	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.03	14,112	568	11,995	423	10,584	373	9,878	298
	0.3	8	0.06	22,680	1,027	19,278	873	17,010	685	15,876	559
		15	0.038	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.03	14,112	568	11,995	423	10,584	373	9,878	298
2	0.2	6	0.08	20,790	1,635	17,672	1,389	15,593	981	14,553	801
		8	0.07	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		12	0.04	15,309	1,083	13,013	921	11,482	722	10,716	590
		16	0.04	13,608	963	11,567	818	10,206	642	9,526	524
		20	0.035	11,907	843	10,121	716	8,930	562	8,335	459

Recommended Cutting Condition

ZSLNR20 SERIES

Workpiece				Carbon Steels, Alloy Steels (180~250HB)		Prehardened Steels (HRc35~45)		Herdened Steels (HRc45~55)		Herdened Steels (HRc55~65)	
Ratio to standard depth of cut				Depth of Cut X 100%		Depth of Cut X 100%		Depth of Cut X 100%		Depth of Cut X 100%	
Mill Dia (mm)	Diameter (mm)	Neck Length (mm)	Depth of Cut (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
2	0.2	25	0.025	11,907	843	10,121	716	8,930	562	8,335	459
		30	0.017	11,312	800	9,615	680	8,484	534	7,918	436
	0.3	8	0.09	18,900	1,651	16,065	1,403	14,175	991	13,230	809
		16	0.06	13,608	1,070	11,567	909	10,206	713	9,526	583
		20	0.037	11,907	936	10,121	796	8,930	624	8,335	510
	0.5	6	0.017	20,709	1,635	17,672	1,389	15,593	981	14,553	801
		8	0.014	18,900	1,651	16,065	1,403	14,175	991	13,230	809
		12	0.08	15,309	1,204	13,013	1,023	11,482	802	10,716	655
		16	0.08	13,608	1,070	11,567	909	10,206	713	9,526	583
		20	0.05	11,907	936	10,121	796	8,930	624	8,335	510
		25	0.05	11,907	936	10,121	796	8,930	624	8,335	510
		30	0.03	11,312	889	9,615	756	8,484	593	7,918	484
	0.8	8	0.2	18,900	1,651	16,065	1,403	14,175	991	13,230	809
		16	0.1	13,608	1,070	11,567	909	10,206	713	9,526	583
		20	0.06	11,907	936	10,121	796	8,930	624	8,335	510
3	0.2	8	0.09	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		12	0.07	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		16	0.05	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		20	0.05	11,664	1,146	9,914	974	8,748	764	8,165	624
		30	0.04	9,072	1,146	7,711	974	6,804	764	6,350	624
		35	0.035	9,072	1,146	7,711	974	6,804	764	6,350	624
	0.3	8	0.13	14,400	1,572	12,240	1,337	10,800	943	10,080	771
		16	0.075	14,400	1,572	12,240	1,337	10,800	943	10,080	771
		20	0.075	11,664	1,274	9,914	1,083	8,748	849	8,165	693
		30	0.06	9,072	1,274	7,711	1,083	6,804	849	6,350	693
	0.5	8	0.18	14,400	1,572	12,240	1,337	10,800	943	10,080	771
		12	0.13	14,400	1,572	12,240	1,337	10,800	943	10,080	771
		16	0.1	14,400	1,572	12,240	1,337	10,800	943	10,080	771
		20	0.1	11,664	1,274	9,914	1,083	8,748	849	8,165	693
		30	0.08	9,072	1,274	7,711	1,083	6,804	849	6,350	693
		35	0.065	9,072	1,274	7,711	1,083	6,804	849	6,350	693

· Please adjust the cutting depth index according to the cutting depth factors of above table.
· In actual machining, the condition should be adjusted according to the machining shape, purpose and machine type.
· If RPM of the machine is low, the feed rate should be low in the same ratio as RPM.

ZSTNR20 SERIES

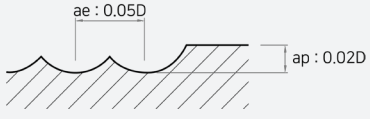
Workpiece				Carbon Steels, Alloy Steels (180~250HB)		Prehardened Steels (HRc35~45)		Herdened Steels (HRc45~55)		Herdened Steels (HRc55~65)	
Ratio to standard depth of cut				Depth of Cut X 100%		Depth of Cut X 100%		Depth of Cut X 100%		Depth of Cut X 100%	
Mill Dia (mm)	Diameter (mm)	Neck Length (mm)	Depth of Cut (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
0.2	0.05	0.5	0.02	50,000	258	50,000	205	50,000	180	50,000	160
		1	0.014	50,000	258	50,000	205	50,000	180	50,000	160
		1.5	0.008	50,000	240	45,900	202	45,900	170	45,900	153
		2	0.008	42,000	202	36,700	176	36,700	162	36,700	147
0.3	0.05	1	0.021	50,000	585	50,000	456	50,000	336	50,000	320
		1.5	0.016	50,000	585	45,000	456	45,000	336	45,000	320
		2	0.012	45,000	530	45,000	420	45,000	300	45,000	290
		2.5	0.01	40,000	471	40,000	373	40,000	267	40,000	258
		3	0.008	35,000	412	35,000	326	30,000	200	30,000	194
0.4	0.05	1	0.025	50,000	580	50,000	461	40,000	320	36,000	270
		1.5	0.02	50,000	580	50,000	461	40,000	320	36,000	270
		2	0.016	45,000	520	45,000	410	36,000	290	34,000	240
		2.5	0.015	40,500	480	40,500	370	33,400	270	30,600	220
		3	0.014	40,000	410	40,000	330	32,800	240	25,600	200
		3.5	0.012	36,000	380	36,000	300	29,400	200	22,920	180
		4	0.008	30,000	320	30,000	250	21,600	160	19,200	150
	0.1	2	0.028	45,000	520	45,000	410	36,000	290	34,000	240
		3	0.016	40,000	410	40,000	330	32,800	240	25,600	200
		4	0.01	30,000	320	30,000	250	21,600	160	19,200	150
0.5	0.05	1	0.03	50,000	898	40,000	464	30,000	378	28,000	315
		2	0.023	50,000	898	40,000	464	30,000	378	28,000	315
		3	0.017	45,000	810	36,000	414	27,000	315	24,500	261
		4	0.017	40,000	820	32,000	378	24,000	279	20,000	234
		5	0.011	28,800	540	19,400	280	18,000	250	15,000	200
		6	0.008	28,800	480	19,400	260	18,000	250	15,000	200
	0.1	1	0.035	50,000	898	40,000	464	30,000	378	28,000	315
		2	0.03	50,000	898	40,000	464	30,000	378	28,000	315
		3	0.02	45,000	810	36,000	414	27,000	315	24,500	261
		4	0.02	40,000	720	32,000	378	24,000	279	20,000	234
		5	0.013	28,800	540	19,400	280	18,000	250	15,000	200
		6	0.013	28,800	480	19,400	260	18,000	250	15,000	200
0.1	0.1	2	0.035	50,000	1,159	37,830	600	28,200	390	23,000	320
		4	0.024	40,000	830	27,800	440	23,600	280	21,000	230
		6	0.015	24,000	490	18,000	300	17,800	240	15,000	210
		8	0.013	24,000	466	18,000	285	17,800	228	15,000	200
		10	0.009	24,000	451	18,000	276	17,800	221	15,000	193
0.8	0.1	4	0.032	48,000	1,102	28,000	518	20,000	320	20,000	288
		6	0.019	38,700	800	25,000	461	18,000	288	18,000	256
		8	0.015	29,025	600	20,000	369	16,200	259	16,200	230
		12	0.012	29,025	570	20,000	350	16,200	246	16,200	219
	0.2	4	0.056	48,000	1,102	28,000	518	20,000	320	20,000	288
		6	0.032	38,700	800	25,000	461	18,000	288	18,000	256
1	0.1	4	0.038	32,400	1,359	27,540	1,039	24,300	815	22,680	666
		6	0.024	26,244	990	22,307	842	19,683	660	18,371	539

Recommended Cutting Condition

DB702, DB712 SERIES

Workpiece	Herdened Steels Heat Resistant Steels		Herdened Steels									
Hardness	HRc30 ~ HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65		HRc 65 ~ HRc70	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
0.2	50,000	1,200	50,000	1,050	45,000	960	40,000	770	35,000	674	31,500	570
0.3	50,000	1,500	50,000	1,350	45,000	1,200	40,000	965	35,000	840	31,500	700
0.4	50,000	1,900	50,000	1,700	45,000	1,500	40,000	1,200	35,000	1,050	31,500	890
0.5	50,000	2,400	50,000	2,100	45,000	1,900	40,000	1,500	35,000	1,300	31,500	1,100
0.6	50,000	2,900	50,000	2,500	45,000	2,200	40,000	1,800	35,000	1,600	31,500	1,400
0.8	50,000	3,900	50,000	3,300	45,000	3,000	40,000	2,400	35,000	2,100	31,500	1,800
1	50,000	4,800	50,000	4,200	45,000	3,800	40,000	3,000	35,000	2,600	35,000	2,300
1.5	50,000	5,400	48,000	4,500	43,000	4,000	37,000	3,100	33,000	2,700	29,700	2,300
2	49,700	5,700	47,800	4800	40,000	4,000	35,000	3,150	32,000	2,800	28,500	2,300
3	33,100	6,000	31,800	5300	26,500	4,000	23,500	3,150	21,000	2,800	19,000	2,300
4	24,900	6,000	23,900	5300	20,000	4,000	17,500	3,150	16,000	2,800	14,500	2,300
5	18,600	5,800	17,800	4900	15,000	3,750	13,500	3,050	11,500	2,550	10,500	2,100
6	13,900	4,850	13,400	4100	11,000	3,100	10,000	2,500	8,800	2,150	8,000	1,750
8	11,100	4,200	10,700	3,500	9,000	2,700	8,000	2,150	7,000	1,850	6,500	1,550
10	9,300	3,700	8,900	3,100	7,500	2,400	6,600	1,900	5,800	1,650	5,300	1,380
12	6,950	2,950	6,680	2,500	5,600	1,900	5,000	1,550	4,400	1,250	4,000	1,050

RPM = rev / min
FEED = mm / min



DB703 SERIES

Workpiece	Herdened Steels Heat Resistant Steels		Herdened Steels									
Hardness	HRc30 ~ HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65		HRc 65 ~ HRc70	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	57,000	7,100	55,000	6,000	46,000	5,000	40,300	3,900	36,800	3,500	32,800	2,900
2.5	57,000	7,100	55,000	6,000	46,000	5,000	40,300	3,900	36,800	3,500	32,800	2,900
3	38,000	7,500	36,600	6,600	30,500	5,000	27,000	3,900	24,200	3,500	21,900	2,900
4	28,500	7,500	27,500	6,600	23,000	5,000	20,100	3,900	18,400	3,500	16,700	2,900
5	21,500	7,300	20,500	6,100	17,300	4,700	15,500	3,800	13,200	3,200	12,100	2,600
6	16,000	6,100	15,400	5,100	12,700	3,900	11,500	3,100	10,100	2,700	9,200	2,200
8	12,700	5,300	12,300	4,400	10,400	3,400	9,200	2,700	8,100	2,300	7,500	1,900
10	10,700	4,600	10,200	3,900	8,600	3,000	7,600	2,400	6,700	2,100	6,100	1,700
12	8,000	3,700	7,700	3,100	6,400	2,400	5,800	1,900	5,100	1,600	4,600	1,300

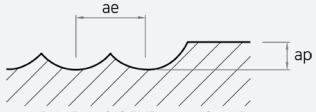
DB734 SERIES

Workpiece	Herdened Steels Heat Resistant Steels		Herdened Steels									
Hardness	HRc30 ~ HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65		HRc 65 ~ HRc70	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	62,100	8,600	59,800	7,200	50,000	6,000	43,800	4,700	40,000	4,200	35,600	3,500
2.5	62,100	8,600	59,800	7,200	50,000	6,000	43,800	4,700	40,000	4,200	35,600	3,500
3	41,400	9,000	39,800	8,000	33,100	6,000	29,400	4,700	26,300	4,200	23,800	3,500
4	31,100	9,000	29,900	8,000	25,000	6,000	21,900	4,700	20,000	4,200	18,100	3,500
5	23,300	8,700	22,300	7,400	18,800	5,600	16,900	4,600	14,400	3,800	13,100	3,200
6	17,400	7,300	16,800	6,200	13,800	4,700	12,500	3,800	11,000	3,200	10,000	2,600
8	13,900	6,300	13,400	5,300	11,300	4,100	10,000	3,200	8,800	2,800	8,100	2,300
10	11,600	5,600	11,100	4,700	9,400	3,600	8,300	2,900	7,300	2,500	6,600	2,100

ZSLNB20 SERIES

Work piece	Alloy Steels, Heat Resistant Steels			Herdened Steels			Herdened Steels			Copper, Copper alloy		
Hardness	HRc30~HRc45			HRc45~HRc55			HRc55~HRc65			-		
Diameter (mm)	RPM	FEED	Ap (mm)	RPM	FEED	Ap (mm)	RPM	FEED	Ap (mm)	RPM	FEED	Ap (mm)
0.5	34,100~49,500	600~870	0.007~0.028	31,900~35,200	490~540	0.005~0.023	31,900~35,200	440~480	0.005~0.021	49,000~50,000	1,100~1,400	0.010~0.042
0.6	28,600~40,700	590~850	0.007~0.034	26,400~29,700	480~540	0.006~0.028	26,400~29,700	400~480	0.006~0.025	42,000~50,000	1,100~1,700	0.011~0.050
0.8	22,000~30,800	640~890	0.016~0.064	19,800~22,000	490~550	0.013~0.052	19,800~22,000	440~500	0.012~0.048	31,000~50,000	1,100~2,250	0.024~0.096
1	17,600~24,200	600~850	0.008~0.080	15,400~17,600	470~540	0.007~0.065	15,400~17,600	440~500	0.006~0.060	24,000~49,500	1,100~2,200	0.012~0.120
1.2	14,300~18,700	590~780	0.024~0.032	12,000~14,000	480~540	0.020~0.026	12,000~14,000	420~480	0.018~0.024	28,500~38,500	1,480~1,950	0.036~0.048
1.5	11,000~14,300	580~760	0.031~0.048	10,000~11,500	480~540	0.025~0.039	10,000~11,500	420~480	0.023~0.036	17,000~28,500	1,100~1,950	0.046~0.072
2	8,500~11,000	590~800	0.024~0.160	7,900~8,800	470~530	0.020~0.130	7,900~8,800	440~480	0.018~0.120	12,600~24,000	1,100~2,150	0.036~0.240
3	5,700~8,200	730~1,000	0.064~0.24	5,300~5,800	590~650	0.052~0.195	5,300~5,800	550~620	0.048~0.120	11,900~17,000	1,850~2,700	0.096~0.360
4	4,300~6,200	680~990	0.080~0.320	3,950~4,400	550~620	0.065~0.260	3,850~4,400	530~570	0.060~0.240	6,600~12,500	1,260~2,500	0.120~0.480

RPM = rev / min
FEED = mm / min



ap : D1~D4=0.05XD ae : 0.1XD
D5~D8=0.25mm
D10~D12=0.3mm

Recommended Cutting Condition

ZSTNB20, ZSTNB30 SERIES

Workpiece					Carbon Steels, Alloy Steels (180~250HB)		Prehardened Steels (HRc35~45)		Herdened Steels (HRc45~55)		Herdened Steels (HRc55~65)	
Ratio to standard depth of cut					Depth of Cut X 100%		Depth of Cut X 100%		Depth of Cut X 100%		Depth of Cut X 100%	
Mill Dia (mm)	Diameter (mm)	Neck Length (mm)	Neck Angle (˚)	Depth of Cut (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
0.1	0.2	1	0.4	0.017	40,000	800	28,000	504	26,000	416	26,000	364
		1.5	0.4	0.009	40,000	800	28,000	504	26,000	416	26,000	364
		2	0.9	0.007	32,000	461	22,400	323	20,800	266	20,800	233
		2.5	0.9	0.004	26,000	333	18,200	204	16,900	189	16,900	162
0.15	0.3	2	0.4	0.025	40,000	1,200	28,000	756	26,000	624	26,000	546
		3	0.9	0.013	32,000	691	22,400	484	20,800	399	20,800	349
		4	0.9	0.01	26,000	499	18,200	306	16,900	284	16,900	243
0.2	0.4	2	0.4	0.035	40,000	1,600	28,000	1,008	26,000	832	26,000	728
		3	0.4	0.02	40,000	1,600	28,000	1,008	26,000	832	26,000	728
		4	0.4	0.007	32,000	922	22,400	645	20,800	532	20,800	466
		4	0.9	0.009	32,000	922	22,400	645	20,800	532	20,800	466
		5	0.4	0.006	26,000	666	18,200	408	16,900	379	16,900	324
		5	0.9	0.007	26,000	666	18,200	408	16,900	379	16,900	324
0.25	0.5	4	0.4	0.04	40,000	2,000	28,000	1,260	26,000	1,040	26,000	910
		8	0.9	0.01	26,000	728	18,200	446	16,900	414	16,900	355
		12	0.9	0.005	22,400	627	15,680	384	14,560	357	14,560	306
0.27	0.54	2	0.4	0.05	40,000	2,160	28,000	1,361	26,000	1,123	26,000	983
		4	0.4	0.037	40,000	2,160	28,000	1,361	26,000	1,123	26,000	983
		5	0.4	0.031	40,000	1,512	28,000	1,176	26,000	1,040	26,000	832
		6	0.4	0.025	26,000	1,244	18,200	871	16,900	676	16,900	629
		6.5	0.4	0.02	26,000	1,011	18,200	619	16,900	575	16,900	493
		7	0.4	0.015	26,000	899	18,200	585	16,900	543	16,900	465
0.3	0.6	2	0.4	0.055	40,000	2,400	28,000	1,512	26,000	1,248	26,000	1,092
		4	0.4	0.035	40,000	2,400	28,000	1,512	26,000	1,248	26,000	1,092
		6	0.4	0.018	32,000	1,382	22,400	968	20,800	799	20,800	699
		6	0.9	0.02	32,000	1,382	22,400	968	20,800	799	20,800	699
		8	0.9	0.02	26,000	998	18,200	612	16,900	568	16,900	487
		10	0.4	0.013	26,000	874	18,200	535	16,900	497	16,900	426
		10	0.9	0.015	26,000	874	18,200	535	16,900	497	16,900	426
		12	0.9	0.01	26,000	874	18,200	535	16,900	497	16,900	426
		15	0.4	0.005	22,400	753	15,680	461	14,560	367	14,560	367
		15	0.9	0.006	22,400	753	15,680	461	14,560	367	14,560	367
0.4	0.8	4	0.4	0.062	32,000	2,560	22,400	1,613	20,800	1,331	20,800	1,165
		6	0.4	0.045	32,000	2,560	22,400	1,613	20,800	1,331	20,800	1,165
		8	0.9	0.026	25,600	1,475	17,920	1,032	16,640	852	16,640	745
		12	0.9	0.02	20,800	1,065	14,560	699	13,520	606	13,520	519
		16	0.9	0.018	20,800	932	14,560	612	13,520	530	13,520	454
0.45	0.9	4	0.4	0.063	28,300	2,547	19,810	1,605	18,395	1,324	18,395	1,159
		8	0.4	0.05	28,300	2,547	19,810	1,605	18,395	1,324	18,395	1,159
		12	0.4	0.037	18,400	1,325	12,880	811	11,960	753	11,960	646
		16	0.4	0.024	18,400	1,325	12,880	811	11,960	753	11,960	646
		18	0.4	0.018	18,400	1,325	12,880	811	11,960	753	11,960	646
		20	0.4	0.015	15,850	1,141	11,095	699	10,303	649	10,303	556
		22	0.4	0.012	15,850	1,141	11,095	699	10,303	649	10,303	556

ZSTNB20, ZSTNB30 SERIES

Workpiece					Carbon Steels, Alloy Steels (180~250HB)		Prehardened Steels (HRc35~45)		Herdened Steels (HRc45~55)		Herdened Steels (HRc55~65)	
Ratio to standard depth of cut					Depth of Cut X 100%		Depth of Cut X 100%		Depth of Cut X 100%		Depth of Cut X 100%	
Mill Dia (mm)	Diameter (mm)	Neck Length (mm)	Neck Angle (˚)	Depth of Cut (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
0.45	0.9	24	0.4	0.009	14,150	1,019	9,905	624	9,198	579	9,198	497
		6	0.4	0.055	25,600	2,560	17,920	1,613	16,640	1,331	16,640	1,165
		8	0.4	0.055	25,600	2,560	17,920	1,613	16,640	1,331	16,640	1,165
		10	0.4	0.032	20,800	1,872	14,560	1,310	13,520	1,082	13,520	946
		10	0.9	0.035	20,800	1,872	14,560	1,310	13,520	1,082	13,520	946
		15	0.9	0.028	16,640	1,331	11,648	874	10,816	757	10,816	649
		20	0.4	0.018	16,640	1,331	11,648	874	10,816	757	10,816	649
		20	0.9	0.02	16,640	1,331	11,648	874	10,816	757	10,816	649
0.5	1	25	0.9	0.017	14,560	1,165	10,192	764	9,464	662	9,464	568
		30	0.4	0.015	12,480	874	8,736	568	8,112	487	8,112	406
		30	0.9	0.017	12,480	874	8,736	568	8,112	487	8,112	406
		35	0.9	0.01	10,400	728	7,280	473	6,760	406	6,760	338
		40	0.9	0.009	10,000	700	7,000	455	6,500	390	6,500	325
		50	0.9	0.007	9,500	665	6,650	432	6,175	371	6,175	309
		60	0.9	0.005	9,000	630	6,300	410	5,850	351	5,850	293
		70	0.9	0.003	8,500	595	5,950	387	5,525	332	5,525	276
		8	0.4	0.07	16,960	2,544	11,872	1,603	11,024	1,323	11,024	1,158
		10	0.4	0.07	16,960	2,544	11,872	1,603	11,024	1,323	11,024	1,158
0.75	1.5	12	0.4	0.07	16,960	2,544	11,872	1,603	11,024	1,323	11,024	1,158
		15	0.9	0.045	13,568	1,832	9,498	1,282	8,819	1,058	8,819	926
		20	0.9	0.04	11,024	1,323	7,717	810	7,166	752	7,166	645
		30	0.9	0.028	11,024	1,323	7,717	810	7,166	752	7,166	645
		4	0.4	0.12	14,200	2,556	9,940	1,610	9,230	1,329	9,230	1,163
		8	0.4	0.1	14,200	2,556	9,940	1,610	9,230	1,329	9,230	1,163
		12	0.4	0.08	14,200	2,556	9,940	1,610	9,230	1,329	9,230	1,163
		16	0.4	0.071	14,200	2,556	9,940	1,610	9,230	1,329	9,230	1,163
		20	0.4	0.062	9,230	1,329	6,461	814	6,000	756	6,000	648
0.9	1.8	24	0.4	0.053	9,230	1,329	6,461	814	6,000	756	6,000	648
		28	0.4	0.044	9,230	1,329	6,461	814	6,000	756	6,000	648
		32	0.4	0.036	9,230	1,329	6,461	814	6,000	756	6,000	648
		36	0.4	0.028	9,230	1,329	6,461	814	6,000	756	6,000	648
		38	0.4	0.02	8,000	1,152	5,600	706	5,200	655	5,200	562
		40	0.4	0.015	8,000	1,152	5,600	706	5,200	655	5,200	562
		8	0.4	0.15	15,200	3,040	10,640	1,915	9,880	1,581	9,880	1,383
		12	0.4	0.09	15,200	3,040	10,640	1,915	9,880	1,581	9,880	1,383
		16	0.4	0.09	15,200	3,040	10,640	1,915	9,880	1,581	9,880	1,383
		20	0.4	0.06	12,160	2,189	8,512	1,532	7,904	1,265	7,904	1,107
		20	0.9	0.07	12,160	2,189	8,512	1,532	7,904	1,265	7,904	1,107
1	2	25	0.9	0.07	9,880	1,581	6,916	968	6,442	899	6,422	771
		30	0.4	0.04	9,880	1,581	6,916	968	6,442	899	6,422	771
		30	0.9	0.045	9,880	1,581	6,916	968	6,442	899	6,422	771
		35	0.9	0.045	9,880	1,581	6,916	968	6,442	899	6,422	771
		40	0.4	0.03	9,880	1,581	6,916	968	6,442	899	6,422	771
		40	0.9	0.035	9,880	1,581	6,916	968	6,442	899	6,422	771

Recommended Cutting Condition

ZSTNB20, ZSTNB30 SERIES

Workpiece					Carbon Steels, Alloy Steels (180~250HB)		Prehardened Steels (HRc35~45)		Herdened Steels (HRc45~55)		Herdened Steels (HRc55~65)	
Ratio to standard depth of cut					Depth of Cut X 100%		Depth of Cut X 100%		Depth of Cut X 100%		Depth of Cut X 100%	
Mill Dia (mm)	Diameter (mm)	Neck Length (mm)	Neck Angle (˚)	Depth of Cut (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
1	2	50	0.9	0.17	8,512	1,192	5,958	775	5,533	664	5,533	553
		60	0.9	0.009	7,235	1,013	5,065	658	4,703	564	4,703	470
		70	0.9	0.005	6,150	861	4,305	560	3,997	480	3,997	400
1.5	3	8	0.4	0.32	12,720	3,816	8,904	2,404	8,268	1,984	8,268	1,736
		16	0.4	0.22	12,720	3,816	8,904	2,404	8,268	1,984	8,268	1,736
		20	0.4	0.15	12,720	3,434	8,904	2,137	8,268	1,736	8,268	1,488
		30	0.4	0.08	10,176	2,748	7,123	1,496	6,614	1,389	6,614	1,191
		30	0.9	0.09	10,176	2,748	7,123	1,496	6,614	1,389	6,614	1,191
		40	0.4	0.06	8,268	1,984	5,788	1,215	5,374	1,129	5,374	967
		40	0.9	0.07	8,268	1,984	5,788	1,215	5,374	1,129	5,374	967
		50	0.9	0.05	8,268	1,984	5,788	1,215	5,374	1,129	5,374	967
		60	0.9	0.03	7,123	1,710	4,986	1,047	4,630	972	4,630	833
		70	0.9	0.02	6,233	1,496	4,363	916	4,051	851	4,051	729
2	4	20	1	0.32	11,900	2,860	9,000	2,050	7,800	1,680	7,800	1,590
		30	1	0.23	11,900	2,570	9,000	1,850	7,800	1,520	7,800	1,430
		40	1	0.14	9,500	1,940	7,200	1,400	6,200	1,140	6,200	1,080
		50	1	0.11	7,800	1,590	5,800	1,120	5,000	920	5,000	870
		60	1	0.07	7,800	1,590	5,800	1,120	5,000	920	5,000	870
2.5	5	30	1	0.34	9,500	2,140	7,200	1,540	6,200	1,260	6,200	1,190
		40	1	0.25	9,500	2,140	7,200	1,540	6,200	1,260	6,200	1,190
		60	1	0.15	6,200	1,320	4,700	950	4,000	770	4,000	720
3	6	30	1	0.45	8,000	2,000	6,000	1,430	5,200	1,170	5,200	1,110
		40	1	0.4	8,000	1,800	6,000	1,280	5,200	1,050	5,200	990
		50	1	0.32	8,000	1,800	6,000	1,280	5,200	1,050	5,200	990
		60	1	0.22	6,400	1,360	4,800	970	4,100	780	4,100	740
		70	1	0.18	5,200	1,110	3,900	790	3,400	650	3,400	610
		80	1	0.14	5,200	1,110	3,900	790	3,400	650	3,400	610
4	8	50	1	0.5	6,000	1,460	4,500	1,040	3,900	850	3,900	810
		60	1	0.43	6,000	1,460	4,500	1,040	3,900	850	3,900	810
		70	1	0.33	6,000	1,460	4,500	1,040	3,900	850	3,900	810
		80	1	0.25	4,800	1,100	3,600	780	3,100	640	3,100	600
5	10	60	1	0.7	4,800	1,300	3,600	920	3,100	750	3,100	710
		75	1	0.5	4,800	1,300	3,600	920	3,100	750	3,100	710

· Please adjust the cutting depth index according to the cutting depth factors of above table.

· For Rib or Slotting machining process which are not easy for chip ejection, please reduce the cutting depth by 20~30% from the above cutting condition.

ex)ZSTNB2040-20-10, HRC 55, Rib processing

Cutting depth : 0.32(standard cutting depth) X 0.65 X 0.8 = 0.17mm

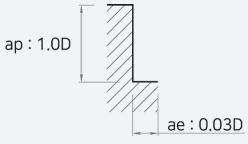
· In actual machining, the condition should be adjusted according to the machining shape, purpose and the machine type.

· If RPM of the machine is low, the feed rate should be low in the same ratio as RPM.

ESE702 SERIES ▶ Side Cutting

Workpiece	Herdened Steels Heat Resistant Steels		Herdened Steels									
Hardness	HRc30 ~ HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65		HRc 65 ~ HRc70	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1	48,000	1,050	38,000	820	25,500	510	20,500	310	16,000	190	12,500	125
2	33,300	1,200	26,000	970	17,500	600	14,500	370	11,000	230	9,500	165
3	21,800	1,200	17,300	970	11,500	600	9,500	370	7,500	230	6,400	165
4	16,700	1,250	13,200	1,000	8,800	625	7,200	385	5,600	240	4,750	170
5	15,700	1,450	12,500	1,150	8,300	710	6,400	410	5,100	260	4,450	190
6	13,100	1,350	10,350	1,100	6,900	690	5,300	400	4,200	255	3,700	185
8	9,880	1,320	7,800	1,030	5,200	635	4,000	365	3,200	235	2,800	170
10	7,800	1,200	6,150	970	4,100	590	3,200	340	2,550	220	2,200	160
12	6,650	1,200	5,250	970	3,500	590	2,650	340	2,100	220	1,860	160
16	4,900	1,050	3,900	840	2,600	520	2,000	300	1,600	190	1,400	140
20	3,900	950	3,100	750	2,050	475	1,600	275	1,300	175	1,100	125

RPM = rev / min
FEED = mm / min



Recommended Cutting Condition

ESE702 SERIES ▶ Slotting

Workpiece	Herdened Steels Heat Resistant Steels		Herdened Steels									
Hardness	HRc30 ~ HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65		HRc 65 ~ HRc70	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
~0.2	50,000	130	45,000	115	40,000	95	33,000	60	33,000	45	26,400	30
0.3	50,000	190	45,000	140	40,000	115	33,000	70	25,000	50	20,000	35
0.4	50,000	235	45,000	180	40,000	140	33,000	90	25,000	55	20,000	40
0.5	50,000	370	45,000	280	40,000	220	33,000	140	25,000	85	20,000	60
0.6	50,000	470	45,000	360	40,000	285	33,000	160	25,000	105	20,000	75
0.8	50,000	600	40,000	440	30,000	295	25,000	185	19,000	110	15,200	80
0.9	49,000	655	39,000	520	27,800	330	22,700	205	17,500	125	14,000	90
1	48,000	750	38,000	570	25,500	360	20,500	215	16,000	135	12,500	85
2	33,300	850	26,000	680	17,500	420	14,500	260	11,000	160	9,500	115
3	21,800	850	17,300	680	11,500	420	9,500	260	7,500	160	6,400	115
4	16,700	880	13,200	700	8,800	440	7,200	270	5,600	170	4,750	118
5	15,700	1,000	12,500	805	8,300	500	6,400	285	5,100	180	4,450	132
6	13,100	950	10,350	770	6,900	480	5,300	280	4,200	180	3,700	130
8	9,880	930	7,800	720	5,200	445	4,000	255	3,200	165	2,800	120
10	7,800	850	6,150	680	4,100	415	3,200	240	2,550	155	2,200	122
12	6,650	850	5,250	680	3,500	415	2,650	240	2,100	155	1,860	112
16	4,900	730	3,900	580	2,600	365	2,000	210	1,600	135	1,400	95
20	3,900	660	3,100	525	2,050	335	1,600	195	1,300	125	1,100	85

RPM = rev / min
FEED = mm / min

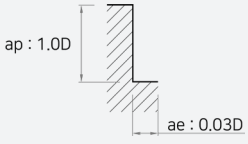




ESE712 SERIES ▶ Side Cutting

Workpiece	Herdened Steels Heat Resistant Steels		Herdened Steels									
Hardness	HRc30 ~ HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65		HRc 65 ~ HRc70	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1	48,000	1,050	38,000	820	25,500	510	20,500	310	16,000	190	12,500	125
2	33,300	1,200	26,000	970	17,500	600	14,500	370	11,000	230	9,500	165
3	21,800	1,200	17,300	970	11,500	600	9,500	370	7,500	230	6,400	165
4	16,700	1,250	13,200	1,000	8,800	625	7,200	385	5,600	240	4,750	170
5	15,700	1,450	12,500	1,150	8,300	710	6,400	410	5,100	260	4,450	190
6	13,100	1,350	10,350	1,100	6,900	690	5,300	400	4,200	255	3,700	185
8	9,880	1,320	7,800	1,030	5,200	635	4,000	365	3,200	235	2,800	170
10	7,800	1,200	6,150	970	4,100	590	3,200	340	2,550	220	2,200	160
12	6,650	1,200	5,250	970	3,500	590	2,650	340	2,100	220	1,860	160
16	4,900	1,050	3,900	840	2,600	520	2,000	300	1,600	190	1,400	140
20	3,900	950	3,100	750	2,050	475	1,600	275	1,300	175	1,100	125

RPM = rev / min
FEED = mm / min



Recommended Cutting Condition

ESE712 SERIES ▶ Slotting

Workpiece	Herdened Steels Heat Resistant Steels		Herdened Steels									
Hardness	HRc30 ~ HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65		HRc 65 ~ HRc70	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
0.2	50,000	130	45,000	115	40,000	95	33,000	60	33,000	45	26,400	30
0.3	50,000	190	45,000	140	40,000	115	33,000	70	25,000	50	20,000	35
0.4	50,000	235	45,000	180	40,000	140	33,000	90	25,000	55	20,000	40
0.5	50,000	370	45,000	280	40,000	220	33,000	140	25,000	85	20,000	60
0.6	50,000	470	45,000	360	40,000	285	30,000	160	25,000	105	20,000	75
0.8	50,000	600	40,000	440	30,000	295	25,000	185	19,000	110	15,200	80
0.9	49,000	655	39,000	520	27,800	330	22,700	205	17,500	125	14,000	90
1	48,000	750	38,000	570	25,500	360	20,500	215	16,000	135	12,500	85
2	33,300	850	26,000	680	17,500	420	14,500	260	11,000	160	9,500	115
3	21,800	850	17,300	680	11,500	420	9,500	260	7,500	160	6,400	115
4	16,700	880	13,200	700	8,800	440	7,200	270	5,600	170	4,750	118
5	15,700	1,000	12,500	805	8,300	500	6,400	285	5,100	180	4,450	132
6	13,100	950	10,350	770	6,900	480	5,300	280	4,200	180	3,700	130
8	9,880	930	7,800	720	5,200	445	4,000	255	3,200	165	2,800	120
10	7,800	850	6,150	680	4,100	415	3,200	240	2,550	155	2,200	112
12	6,650	850	5,250	680	3,500	415	2,650	240	2,100	155	1,860	112
16	4,900	730	3,900	580	2,600	365	2,000	210	1,600	135	1,400	95
20	3,900	660	3,100	525	2,050	335	1,600	195	1,300	125	1,100	85

RPM = rev / min
FEED = mm / min

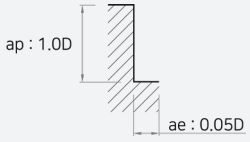


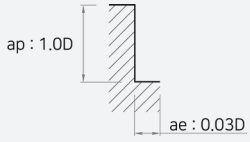


ESE704, ESE714, ESE744 SERIES ▶ Side Cutting

Workpiece	Herdened Steels Heat Resistant Steels		Herdened Steels									
Hardness	HRc30 ~ HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65		HRc 65 ~ HRc70	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1	48,000	1,480	38,000	1,050	25,500	710	20,500	430	16,000	270	12,500	175
2	33,300	1,750	26,000	1,250	17,500	840	14,500	520	11,000	320	9,500	230
3	21,800	1,750	17,300	1,250	11,500	840	9,500	520	7,500	320	6,400	230
4	16,700	1,800	13,200	1,300	8,800	880	7,200	540	5,600	335	4,750	240
5	15,700	2,000	12,500	1,500	8,300	1,000	6,400	580	5,100	370	4,450	270
6	13,100	1,950	10,350	1,400	6,900	950	5,300	560	4,200	350	3,700	260
8	9,880	1,880	7,800	1,350	5,200	900	4,000	520	3,200	330	2,800	240
10	7,800	1,750	6,150	1,260	4,100	840	3,200	480	2,550	310	2,200	220
12	6,650	1,750	5,250	1,260	3,500	840	2,650	480	2,100	300	1,860	220
16	4,900	1,500	3,900	1,100	2,600	730	2,000	420	1,600	270	1,400	200
20	3,900	1,300	3,100	970	2,050	650	1,600	380	1,300	250	1,100	180

RPM = rev / min
FEED = mm / min

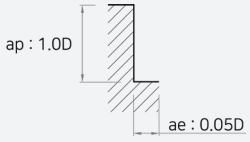


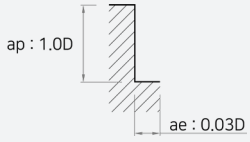


ESE724 SERIES ▶ Side Cutting

Workpiece	Herdened Steels Heat Resistant Steels		Herdened Steels									
Hardness	HRc30 ~ HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65		HRc 65 ~ HRc70	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1	48,000	1,480	38,000	1,050	25,500	710	20,500	430	16,000	270	12,500	175
2	33,300	1,750	26,000	1,250	17,500	840	14,500	520	11,000	320	9,500	230
3	21,800	1,750	17,300	1,250	11,500	840	9,500	520	7,500	320	6,400	230
4	16,700	1,800	13,200	1,300	8,800	880	7,200	540	5,600	335	4,750	240
5	15,700	2,000	12,500	1,500	8,300	1,000	6,400	580	5,100	370	4,450	270
6	13,100	1,950	10,350	1,400	6,900	950	5,300	560	4,200	350	3,700	260
8	9,880	1,880	7,800	1,350	5,200	900	4,000	520	3,200	330	2,800	240
10	7,800	1,750	6,150	1,260	4,100	840	3,200	480	2,550	310	2,200	220
12	6,650	1,750	5,250	1,260	3,500	840	2,650	480	2,100	300	1,860	220
16	4,900	1,500	3,900	1,100	2,600	730	2,000	420	1,600	270	1,400	200
20	3,900	1,300	3,100	970	2,050	650	1,600	380	1,300	250	1,100	180

RPM = rev / min
FEED = mm / min



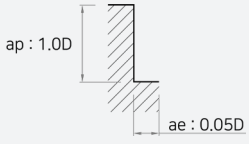


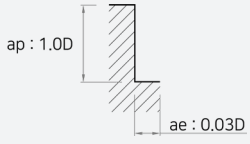
Recommended Cutting Condition

ESE726, ESR736 SERIES

Workpiece	Herdened Steels Heat Resistant Steels		Herdened Steels									
Hardness	HRc30 ~ HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65		HRc 65 ~ HRc70	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6	24,800	5,350	23,500	4,900	16,000	4,900	13,500	3,300	10,500	2,100	8,000	1,450
8	20,000	5,500	19,000	5,000	12,000	4,600	10,000	3,100	8,000	2,000	6,000	1,400
10	16,000	4,900	15,500	4,500	9,500	4,100	8,000	2,900	6,400	1,800	4,800	1,300
12	13,000	4,500	12,500	4,100	8,000	3,800	6,600	2,500	5,300	1,600	4,000	1,150
16	10,000	4,000	9,700	3,700	6,000	3,400	5,000	2,300	4,000	1,250	3,000	870
20	8,000	3,350	7,800	3,400	4,800	3,200	4,000	2,100	3,200	1,020	2,400	690

RPM = rev / min
FEED = mm / min

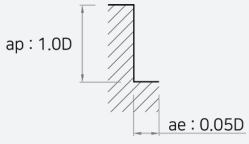


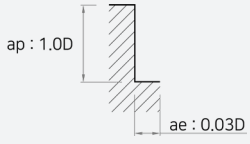


ESE716 SERIES ▶ Side Cutting

Workpiece	Herdened Steels Heat Resistant Steels		Herdened Steels									
Hardness	HRc30 ~ HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65		HRc 65 ~ HRc70	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6	24,800	5,350	23,500	4,900	16,000	4,900	13,500	3,300	10,500	2,100	8,000	1,450
8	20,000	5,500	19,000	5,000	12,000	4,600	10,000	3,100	8,000	2,000	6,000	1,400
10	16,000	4,900	15,500	4,500	9,500	4,100	8,000	2,900	6,400	1,800	4,800	1,300
12	13,000	4,500	12,500	4,100	8,000	3,800	6,600	2,500	5,300	1,600	4,000	1,150
16	10,000	4,000	9,700	3,700	6,000	3,400	5,000	2,300	4,000	1,250	3,000	870
20	8,000	3,350	7,800	3,400	4,800	3,200	4,000	2,100	3,200	1,020	2,400	690

RPM = rev / min
FEED = mm / min





ESRE712 SERIES ▶ Side Cutting

Workpiece		CARBON STEEL, Alloy Steels (SCM, SNCM, S45C)			Prehardened Steels (NAK, CENA, KP4)			Herdened Steels (SKD, SKT, STAVAX)		
Hardness		~HRc35			HRc35~HRc45			HRc45~HRc55		
Strength		~1100N/mm2			1100~1500N/mm2			1500~2000N/mm2		
Diameter (mm)	Effective Length	RPM	FEED	Ap (mm)	RPM	FEED	Ap (mm)	RPM	FEED	Ap (mm)
0.1	0.3	50,000	315	0.009	46,200	230	0.007	40,600	170	0.005
	0.5	50,000	315	0.006	46,200	230	0.005	40,600	170	0.004
	1	45,000	255	0.002	41,580	185	0.002	36,540	140	0.001
0.2	0.5	38,500	380	0.018	36,300	270	0.014	32,100	200	0.01
	1	38,500	380	0.013	36,300	270	0.01	32,100	200	0.007
	1.5	34,650	310	0.007	32,670	220	0.006	28,890	160	0.004
	2	34,650	310	0.005	32,670	220	0.004	28,890	160	0.003
0.3	1	34,200	390	0.019	32,300	270	0.015	28,500	230	0.011
	1.5	34,200	390	0.019	32,300	270	0.015	25,800	230	0.011
	2	30,780	315	0.011	29,070	220	0.008	25,650	185	0.006
	2.5	30,780	315	0.007	29,070	220	0.005	25,650	185	0.004
	3	30,780	315	0.007	29,070	220	0.005	25,650	185	0.004
	4	27,360	250	0.004	25,840	175	0.003	22,800	145	0.002
	5	20,520	165	0.003	19,380	115	0.002	17,100	95	0.002
0.4	1	27,400	540	0.036	25,800	380	0.028	22,800	280	0.02
	1.5	27,400	540	0.025	25,800	380	0.02	22,800	280	0.014
	2	27,400	540	0.025	25,800	380	0.02	22,800	280	0.014
	2.5	24,660	435	0.014	23,220	310	0.011	20,520	225	0.008
	3	24,660	435	0.014	23,220	310	0.011	20,520	225	0.008
	4	24,660	435	0.009	23,220	310	0.007	20,520	225	0.005
	5	21,920	345	0.009	20,640	245	0.007	18,240	180	0.005
	6	21,920	345	0.005	20,640	245	0.004	18,240	180	0.003
	8	16,440	225	0.004	15,480	160	0.003	13,680	120	0.002
	10	8,220	95	0.004	7,740	70	0.003	6,840	50	0.002
0.5	1	27,400	540	0.045	25,800	425	0.035	22,800	285	0.025
	1.5	27,400	540	0.045	25,800	425	0.035	22,800	285	0.025
	2	27,400	540	0.032	25,800	425	0.025	22,800	285	0.018
	2.5	27,400	540	0.032	25,800	425	0.025	22,800	285	0.018
	3	24,660	435	0.018	23,220	345	0.014	20,520	230	0.01
	4	24,660	435	0.018	23,220	345	0.014	20,520	230	0.01
	5	24,660	435	0.011	23,220	345	0.009	20,520	230	0.006
	6	21,920	345	0.011	20,640	270	0.009	18,240	180	0.006
	8	16,440	225	0.007	15,480	180	0.005	13,680	120	0.004
	10	16,440	225	0.005	15,480	180	0.004	13,680	120	0.003
	12	8,220	95	0.005	7,740	75	0.004	6,840	50	0.003
	14	8,220	95	0.005	7,740	75	0.004	6,840	50	0.003
	16	2,740	25	0.005	2,580	20	0.004	2,280	15	0.003
0.6	2	27,400	775	0.038	25,800	545	0.029	22,800	405	0.021
	3	27,400	775	0.038	25,800	545	0.029	22,800	405	0.021
	4	24,660	630	0.022	23,220	440	0.017	20,520	330	0.012
	5	24,660	630	0.014	23,220	440	0.011	20,520	330	0.008
	6	24,660	630	0.014	23,220	440	0.011	20,520	330	0.008
	8	21,920	495	0.008	20,640	350	0.006	18,240	260	0.005

Recommended Cutting Condition

ESRE712 SERIES ▶ Side Cutting

Workpiece		CARBON STEEL, Alloy Steels (SCM, SNCM, S45C)			Prehardened Steels (NAK, CENA, KP4)			Herdened Steels (SKD, SKT, STAVAX)		
Hardness		~HRc35			HRc35~HRc45			HRc45~HRc55		
Strength		~1100N/mm2			1100~1500N/mm2			1500~2000N/mm2		
Diameter (mm)	Effective Length	RPM	FEED	Ap (mm)	RPM	FEED	Ap (mm)	RPM	FEED	Ap (mm)
0.6	10	16,440	325	0.005	15,480	230	0.004	13,680	170	0.003
	12	16,440	325	0.005	15,480	230	0.004	13,680	170	0.003
	14	8,220	140	0.005	7,740	100	0.004	6,840	75	0.003
	16	8,220	140	0.005	7,740	100	0.004	6,840	75	0.003
0.7	2	27,400	775	0.063	25,800	545	0.049	22,800	405	0.035
	4	24,660	630	0.025	23,220	440	0.02	20,520	330	0.014
	6	24,660	630	0.016	23,220	440	0.012	20,520	330	0.009
	8	21,920	495	0.016	20,640	350	0.012	18,240	260	0.009
	10	21,920	495	0.009	20,640	350	0.007	18,240	260	0.005
	12	16,440	325	0.009	15,480	230	0.005	13,680	170	0.004
0.8	2	27,400	775	0.072	25,800	605	0.056	22,800	450	0.04
	3	27,400	775	0.05	25,800	605	0.039	22,800	450	0.028
	4	27,400	775	0.05	25,800	605	0.039	22,800	450	0.028
	5	24,660	630	0.029	23,220	490	0.022	20,520	365	0.016
	6	24,660	630	0.029	23,220	490	0.022	20,520	365	0.016
	8	24,660	630	0.018	23,220	490	0.014	20,520	365	0.01
	10	21,920	495	0.018	20,640	385	0.014	18,240	290	0.01
	12	21,920	495	0.011	20,640	385	0.008	18,240	290	0.006
	14	16,440	325	0.007	15,480	255	0.006	13,680	190	0.004
	16	16,440	325	0.007	15,480	255	0.006	13,680	190	0.004
	20	8,220	140	0.007	7,740	110	0.006	6,840	80	0.004
0.9	6	22,140	575	0.032	20,970	440	0.025	18,450	330	0.018
	8	22,140	575	0.02	20,970	440	0.016	18,450	330	0.011
	10	19,680	455	0.02	18,640	350	0.016	16,400	260	0.011
1	2	24,600	1,045	0.09	23,300	890	0.07	20,500	665	0.05
	3	24,600	1,045	0.09	23,300	890	0.07	20,500	665	0.05
	4	24,600	1,045	0.063	23,300	890	0.049	20,500	665	0.035
	5	24,600	1,045	0.063	23,300	890	0.049	20,500	665	0.035
	6	22,140	845	0.036	20,970	720	0.028	18,450	540	0.02
	7	22,140	845	0.036	20,970	720	0.028	18,450	540	0.02
	8	22,140	845	0.036	20,970	720	0.028	18,450	540	0.02
	10	22,140	845	0.023	20,970	720	0.018	18,450	540	0.013
	12	19,680	670	0.023	18,640	570	0.018	16,400	425	0.013
	14	19,680	670	0.014	18,640	570	0.011	16,400	425	0.008
	16	14,760	440	0.014	13,980	375	0.011	12,300	280	0.008
	18	14,760	440	0.009	13,980	375	0.007	12,300	280	0.005
	20	14,760	440	0.009	13,980	375	0.007	12,300	280	0.005
	22	7,380	190	0.009	6,990	160	0.007	6,150	120	0.005
	26	7,380	190	0.009	6,990	160	0.007	6,150	120	0.005
	30	7,380	190	0.009	6,990	160	0.007	6,150	120	0.005
	40	2,460	50	0.009	2,330	45	0.007	2,050	35	0.005
	50	2,460	50	0.006	2,330	45	0.005	2,050	35	0.003
1.2	4	21,900	930	0.076	20,700	720	0.059	18,200	485	0.042

ESRE712 SERIES ▶ Side Cutting

Workpiece		CARBON STEEL, Alloy Steels (SCM, SNCM, S45C)			Prehardened Steels (NAK, CENA, KP4)			Herdened Steels (SKD, SKT, STAVAX)		
Hardness		~HRc35			HRc35~HRc45			HRc45~HRc55		
Strength		~1100N/mm2			1100~1500N/mm2			1500~2000N/mm2		
Diameter (mm)	Effective Length	RPM	FEED	Ap (mm)	RPM	FEED	Ap (mm)	RPM	FEED	Ap (mm)
1.2	6	21,900	930	0.076	20,700	720	0.059	18,200	485	0.042
	8	19,710	755	0.043	18,630	585	0.034	16,380	395	0.024
	10	19,710	755	0.027	18,630	585	0.021	16,380	395	0.015
	12	19,710	755	0.027	18,630	585	0.021	16,380	395	0.015
	14	17,520	595	0.027	16,560	460	0.021	14,560	310	0.015
	16	17,520	595	0.016	16,560	460	0.013	14,560	310	0.009
	20	13,140	390	0.011	12,420	300	0.008	10,920	205	0.006
	26	6,570	165	0.011	6,210	130	0.008	5,460	85	0.006
	30	6,570	165	0.011	6,210	130	0.008	5,460	85	0.006
1.4	6	19,200	815	0.088	18,100	570	0.069	16,000	425	0.049
	8	17,280	660	0.05	16,290	460	0.039	14,400	345	0.028
	10	17,280	660	0.05	16,290	460	0.039	14,400	345	0.028
	14	17,280	660	0.032	16,290	460	0.025	14,400	345	0.018
	16	15,360	520	0.032	14,480	365	0.025	12,800	270	0.018
	20	15,360	520	0.019	14,480	365	0.015	12,800	270	0.011
1.5	4	19,200	905	0.135	18,100	635	0.105	16,000	475	0.075
	5	19,200	905	0.095	18,100	635	0.074	16,000	475	0.053
	6	19,200	905	0.095	18,100	635	0.074	16,000	475	0.053
	7	19,200	905	0.095	18,100	635	0.074	16,000	475	0.053
	8	17,280	735	0.054	16,290	515	0.042	14,400	385	0.03
	10	17,280	735	0.054	16,290	515	0.042	14,400	385	0.03
	12	17,280	735	0.054	16,290	515	0.042	14,400	385	0.03
	14	17,280	735	0.034	16,290	515	0.026	14,400	385	0.019
	16	15,360	580	0.034	14,480	405	0.026	12,800	305	0.019
	18	15,360	580	0.034	14,480	405	0.026	12,800	305	0.019
	20	15,360	580	0.02	14,480	405	0.016	12,800	305	0.011
	22	15,360	580	0.02	14,480	405	0.016	12,800	305	0.011
	26	11,520	380	0.014	10,860	265	0.011	9,600	200	0.008
	30	11,520	380	0.014	10,860	265	0.011	9,600	200	0.008
1.6	8	17,800	840	0.101	16,800	655	0.078	14,800	490	0.056
	10	16,020	680	0.058	15,120	530	0.045	13,320	395	0.032
	12	16,020	680	0.058	15,120	530	0.045	13,320	395	0.032
	16	16,020	680	0.036	15,120	530	0.028	13,320	395	0.02
	20	14,240	540	0.036	13,440	420	0.028	11,840	315	0.02
1.8	8	17,800	840	0.113	16,800	655	0.088	14,800	490	0.063
	10	16,020	680	0.065	15,120	530	0.05	13,320	395	0.036
	12	16,020	680	0.065	15,120	530	0.05	13,320	395	0.036
	16	16,020	680	0.041	15,120	530	0.032	13,320	395	0.023
	20	14,240	540	0.041	13,440	420	0.032	11,840	315	0.023
2	6	14,400	820	0.18	13,600	620	0.14	12,000	475	0.1
	8	14,400	820	0.126	13,600	620	0.098	12,000	475	0.07
	10	14,400	820	0.126	13,600	620	0.098	12,000	475	0.07
	12	12,960	665	0.072	12,240	500	0.056	10,800	385	0.04

Recommended Cutting Condition

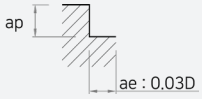
ESRE712 SERIES ▶ Side Cutting

Workpiece		CARBON STEEL, Alloy Steels (SCM, SNCM, S45C)			Prehardened Steels (NAK, CENA, KP4)			Herdened Steels (SKD, SKT, STAVAX)		
Hardness		~HRc35			HRc35~HRc45			HRc45~HRc55		
Strength		~1100N/mm2			1100~1500N/mm2			1500~2000N/mm2		
Diameter (mm)	Effective Length	RPM	FEED	Ap (mm)	RPM	FEED	Ap (mm)	RPM	FEED	Ap (mm)
2	14	12,960	665	0.072	12,240	500	0.056	10,800	385	0.04
	16	12,960	665	0.072	12,240	500	0.056	10,800	385	0.04
	18	12,960	665	0.045	12,240	500	0.035	10,800	385	0.025
	20	12,960	665	0.045	12,240	500	0.035	10,800	385	0.025
	22	11,520	525	0.045	10,880	395	0.035	9,600	305	0.025
	26	11,520	525	0.045	10,880	395	0.035	9,600	305	0.025
	30	11,520	525	0.027	10,880	395	0.021	9,600	305	0.015
	35	8,640	345	0.018	8,160	260	0.014	7,200	200	0.01
	40	8,640	345	0.018	8,160	260	0.014	7,200	200	0.01
	45	4,320	150	0.018	4,080	110	0.014	3,600	85	0.01
	50	4,320	150	0.018	4,080	110	0.014	3,600	85	0.01
	60	4,320	150	0.018	4,080	110	0.014	3,600	85	0.01
2.5	8	12,300	970	0.158	11,600	680	0.123	10,300	510	0.088
	10	12,300	970	0.158	11,600	680	0.123	10,300	510	0.088
	12	12,300	970	0.158	11,600	680	0.123	10,300	510	0.088
	14	11,070	785	0.09	10,440	550	0.07	9,270	415	0.05
	16	11,070	785	0.09	10,440	550	0.07	9,270	415	0.05
	18	11,070	785	0.09	10,440	550	0.07	9,270	415	0.05
	20	11,070	785	0.09	10,440	550	0.07	9,270	415	0.05
	22	11,070	785	0.056	10,440	550	0.044	9,270	415	0.031
	26	9,840	620	0.056	9,280	435	0.044	8,240	325	0.031
	30	9,840	620	0.056	9,280	435	0.044	8,240	325	0.031
	35	9,840	620	0.034	9,280	435	0.026	8,240	325	0.019
	40	7,380	405	0.034	6,960	285	0.026	6,180	215	0.019
	45	7,380	405	0.023	6,960	285	0.018	6,180	215	0.013
	50	7,380	405	0.023	6,960	285	0.018	6,180	215	0.013
3	6	10,900	860	0.27	10,300	605	0.21	6,600	450	0.15
	8	10,900	860	0.27	10,300	605	0.21	6,600	450	0.15
	10	10,900	860	0.189	10,300	605	0.147	6,600	450	0.105
	12	10,900	860	0.189	10,300	605	0.147	6,600	450	0.105
	14	10,900	860	0.189	10,300	605	0.147	6,600	450	0.105
	16	9,810	695	0.108	9,270	490	0.084	5,940	365	0.06
	18	9,810	695	0.108	9,270	490	0.084	5,940	365	0.06
	20	9,810	695	0.108	9,270	490	0.084	5,940	365	0.06
	22	9,810	695	0.108	9,270	490	0.084	5,940	365	0.06
	26	9,810	695	0.068	9,270	490	0.053	5,940	365	0.038
	30	9,810	695	0.068	9,270	490	0.053	5,940	365	0.038
	35	8,720	550	0.068	8,240	385	0.053	5,280	290	0.038
	40	8,720	550	0.041	8,240	385	0.032	5,280	290	0.023
	45	8,720	550	0.041	8,240	385	0.032	5,280	290	0.023
	50	6,540	360	0.027	6,180	255	0.021	3,960	190	0.015
	60	6,540	360	0.027	6,180	255	0.021	3,960	190	0.015
4	8	8,000	1,300	0.36	7,600	1,160	0.28	6,700	770	0.2

ESRE712 SERIES ▶ Side Cutting

Workpiece		CARBON STEEL, Alloy Steels (SCM, SNCM, S45C)			Prehardened Steels (NAK, CENA, KP4)			Herdened Steels (SKD, SKT, STAVAX)		
Hardness		~HRc35			HRc35~HRc45			HRc45~HRc55		
Strength		~1100N/mm2			1100~1500N/mm2			1500~2000N/mm2		
Diameter (mm)	Effective Length	RPM	FEED	Ap (mm)	RPM	FEED	Ap (mm)	RPM	FEED	Ap (mm)
4	10	8,000	1,300	0.36	7,600	1,160	0.28	6,700	770	0.2
	12	8,000	1,300	0.36	7,600	1,160	0.28	6,700	770	0.2
	14	8,000	1,300	0.252	7,600	1,160	0.196	6,700	770	0.14
	16	8,000	1,300	0.252	7,600	1,160	0.196	6,700	770	0.14
	18	8,000	1,300	0.252	7,600	1,160	0.196	6,700	770	0.14
	20	8,000	1,300	0.252	7,600	1,160	0.196	6,700	770	0.14
	22	7,200	1,055	0.144	6,840	940	0.112	6,030	625	0.08
	26	7,200	1,055	0.144	6,840	940	0.112	6,030	625	0.08
	30	7,200	1,055	0.144	6,840	940	0.112	6,030	625	0.08
	35	7,200	1,055	0.09	6,840	940	0.07	6,030	625	0.05
	40	7,200	1,055	0.09	6,840	940	0.07	6,030	625	0.05
	45	6,400	830	0.09	6,080	740	0.07	5,360	495	0.05
	50	6,400	830	0.09	6,080	740	0.07	5,360	495	0.05
	60	6,400	830	0.054	6,080	740	0.042	5,360	495	0.03
5	16	6,400	1,155	0.315	6,100	900	0.245	5,400	605	0.175
	20	6,400	1,155	0.315	6,100	900	0.245	5,400	605	0.175
	26	5,760	935	0.18	5,490	730	0.14	4,860	490	0.1
	30	5,760	935	0.18	5,490	730	0.14	4,860	490	0.1
	35	5,760	935	0.18	5,490	730	0.14	4,860	490	0.1
	40	5,760	935	0.18	5,490	730	0.14	4,860	490	0.1
	50	5,760	935	0.113	5,490	730	0.088	4,860	490	0.063
	60	5,120	740	0.113	4,880	575	0.088	4,320	385	0.063
6	15	5,300	1,055	0.54	5,000	820	0.42	4,400	550	0.3
	20	5,300	1,055	0.378	5,000	820	0.294	4,400	550	0.21
	30	5,300	1,055	0.378	5,000	820	0.294	4,400	550	0.21
	32	4,770	855	0.216	4,500	665	0.168	3,960	445	0.12
8	25	4,000	950	0.504	3,800	750	0.392	3,300	500	0.28
	30	4,000	950	0.504	3,800	750	0.392	3,300	500	0.28
	42	3,600	770	0.288	3,400	605	0.224	2,950	405	0.16
10	30	3,200	900	0.9	3,050	680	0.7	2,630	400	0.5
	35	3,200	900	0.63	3,050	680	0.49	2,630	400	0.35
	45	3,200	900	0.63	3,050	680	0.49	2,630	400	0.35
12	35	2,650	800	1.08	2,520	600	0.84	2,180	350	0.6
	40	2,650	800	0.756	2,520	600	0.588	2,180	350	0.42
	50	2,650	800	0.756	2,520	600	0.588	2,180	350	0.42

RPM = rev / min
FEED = mm / min



Recommended Cutting Condition

ESRE714 SERIES

Workpiece		CARBON STEEL, Alloy Steels (SCM, SNCM, S45C)			Prehardened Steels (NAK, CENA, KP4)			Herdened Steels (SKD, SKT, STAVAX)		
Hardness		~HRc35			HRc35~HRc45			HRc45~HRc55		
Strength		~1100N/mm2			1100~1500N/mm2			1500~2000N/mm2		
Diameter (mm)	Effective Length	RPM	FEED	Ap (mm)	RPM	FEED	Ap (mm)	RPM	FEED	Ap (mm)
0.5	1	27,400	756	0.045	25,800	595	0.035	22,800	399	0.025
	2	27,400	756	0.032	25,800	595	0.025	22,800	399	0.018
	3	24,660	609	0.018	23,220	483	0.014	20,520	322	0.01
	4	24,660	609	0.018	23,220	483	0.014	20,520	322	0.01
	5	24,660	609	0.011	23,220	483	0.009	20,520	322	0.006
	6	21,920	483	0.011	20,640	378	0.009	18,240	252	0.006
	8	16,440	315	0.007	15,480	252	0.005	13,680	168	0.004
	10	16,440	315	0.005	15,480	252	0.004	13,680	168	0.003
0.6	1	27,400	1085	0.038	25,800	763	0.029	22,800	567	0.021
	2	27,400	1085	0.038	25,800	763	0.029	22,800	567	0.021
	3	27,400	1085	0.038	25,800	763	0.029	22,800	567	0.021
	4	24,660	882	0.022	23,220	616	0.017	20,520	462	0.012
	5	24,660	882	0.014	23,220	616	0.011	20,520	462	0.008
	6	24,660	882	0.014	23,220	616	0.011	20,520	462	0.008
	8	21,920	693	0.008	20,640	490	0.006	18,240	364	0.005
	10	16,440	455	0.005	15,480	322	0.004	13,680	238	0.003
	12	16,440	455	0.005	15,480	322	0.004	13,680	238	0.003
0.7	2	27,400	1085	0.063	25,800	763	0.049	22,800	567	0.035
	4	24,660	882	0.025	23,220	616	0.02	20,520	462	0.014
	6	24,660	693	0.016	23,220	616	0.012	20,520	462	0.009
	8	21,920	693	0.016	20,640	490	0.012	18,240	364	0.009
	10	21,920		0.009	20,640	490	0.007	18,240	364	0.005
0.8	1	27,400	1085	0.072	25,800	847	0.056	22,800	630	0.04
	2	27,400	1085	0.072	25,800	847	0.056	22,800	630	0.04
	3	27,400	1085	0.05	25,800	847	0.039	22,800	630	0.028
	4	27,400	1085	0.05	25,800	847	0.039	22,800	630	0.028
	5	24,660	882	0.029	23,220	686	0.022	20,520	511	0.016
	6	24,660	882	0.029	23,220	686	0.022	20,520	511	0.016
	8	24,660	882	0.018	23,220	686	0.014	20,520	511	0.01
	10	21,920	693	0.018	20,640	539	0.014	18,240	406	0.01
	12	21,920	693	0.011	20,640	539	0.008	18,240	406	0.006
	16	16,440	455	0.007	15,480	357	0.006	13,680	266	0.004
1	2	24,600	1463	0.09	23,300	1246	0.07	20,500	931	0.05
	3	24,600	1463	0.09	23,300	1246	0.07	20,500	931	0.05
	4	24,600	1463	0.063	23,300	1246	0.049	20,500	931	0.035
	6	22,140	1183	0.036	20,970	1008	0.028	18,450	756	0.02
	8	22,140	1183	0.036	20,970	1008	0.028	18,450	756	0.02
	10	22,140	1183	0.023	20,970	1008	0.018	18,450	756	0.013
	12	19,680	938	0.023	18,640	798	0.018	16,400	595	0.013
	14	19,680	938	0.014	18,640	798	0.011	16,400	595	0.008
	16	14,760	616	0.014	13,980	525	0.011	12,300	392	0.008
	18	14,760	616	0.009	13,980	525	0.007	12,300	392	0.005
	20	14,760	616	0.009	13,980	525	0.007	12,300	392	0.005

ESRE714 SERIES

Workpiece		CARBON STEEL, Alloy Steels (SCM, SNCM, S45C)			Prehardened Steels (NAK, CENA, KP4)			Herdened Steels (SKD, SKT, STAVAX)		
Hardness		~HRc35			HRc35~HRc45			HRc45~HRc55		
Strength		~1100N/mm2			1100~1500N/mm2			1500~2000N/mm2		
Diameter (mm)	Effective Length	RPM	FEED	Ap (mm)	RPM	FEED	Ap (mm)	RPM	FEED	Ap (mm)
1.2	4	21,900	1,302	0.076	20,700	1008	0.059	18,200	679	0.042
	6	21,900	1,302	0.076	20,700	1008	0.059	18,200	679	0.042
	8	19,710	1,057	0.043	18,630	819	0.034	16,380	553	0.024
	10	19,710	1,057	0.027	18,630	819	0.021	16,380	553	0.015
	12	19,710	1057	0.027	18,630	819	0.021	16,380	553	0.015
	16	17,520	833	0.016	16,560	644	0.013	14,560	434	0.009
	18	17,520	833	0.016	16,560	644	0.013	14,560	434	0.009
	20	13,140	546	0.011	12,420	420	0.008	10,920	287	0.006
1.4	6	19,200	1141	0.088	18,100	798	0.069	16,000	595	0.049
	8	17,280	924	0.05	16,290	644	0.039	14,400	483	0.028
	10	17,280	924	0.05	16,290	644	0.039	14,400	483	0.028
	12	17,280	924	0.05	16,290	644	0.039	14,400	483	0.028
	14	17,280	924	0.032	16,290	644	0.025	14,400	483	0.018
	16	15,360	728	0.032	14,480	511	0.025	12,800	378	0.018
1.5	4	19,200	1267	0.135	18,100	889	0.105	16,000	665	0.075
	6	19,200	1267	0.095	18,100	889	0.074	16,000	665	0.053
	8	17,280	1029	0.054	16,290	721	0.042	14,400	539	0.03
	10	17,280	1029	0.054	16,290	721	0.042	14,400	539	0.03
	12	17,280	1029	0.054	16,290	721	0.042	14,400	539	0.03
	16	15,360	812	0.034	14,480	567	0.026	12,800	427	0.019
	18	15,360	812	0.034	14,480	567	0.026	12,800	427	0.019
	20	15,360	812	0.02	14,480	567	0.016	12,800	427	0.011
	25	11,520	532	0.014	10,860	371	0.011	9,600	280	0.008
	30	11,520	532	0.014	10,860	371	0.011	9,600	280	0.008
1.6	6	17,800	1176	0.101	16,800	917	0.078	14,800	686	0.056
	8	17,800	1176	0.101	16,800	917	0.078	14,800	686	0.056
	10	16,020	952	0.058	15,120	742	0.045	13,320	553	0.032
	12	16,020	952	0.058	15,120	742	0.045	13,320	553	0.032
	14	16,020	952	0.058	15,120	742	0.045	13,320	553	0.032
	16	16,020	952	0.036	15,120	752	0.028	13,320	553	0.02
	18	16,020	952	0.036	15,120	752	0.028	13,320	553	0.02
	20	14,240	756	0.036	13,440	588	0.028	11,840	441	0.02
	25	14,240	756	0.036	13,440	588	0.028	11,840	441	0.02
1.8	6	17,800	1176	0.113	16,800	917	0.088	14,800	686	0.063
	8	17,800	1176	0.113	16,800	917	0.088	14,800	686	0.063
	10	16,020	952	0.065	15,120	742	0.05	13,320	553	0.036
	12	16,020	952	0.065	15,120	742	0.05	13,320	553	0.036
	16	16,020	952	0.041	15,120	742	0.032	13,320	553	0.023
	20	14,240	756	0.041	13,440	588	0.032	11,840	441	0.023
	25	14,240	756	0.041	13,440	588	0.032	11,840	441	0.023
2	4	14,400	1148	0.18	13,600	868	0.14	12,000	665	0.1
	6	14,400	1148	0.18	13,600	868	0.14	12,000	665	0.1
	8	14,400	1148	0.126	13,600	868	0.098	12,000	665	0.07

Recommended Cutting Condition

ESRE714 SERIES

Workpiece		CARBON STEEL, Alloy Steels (SCM, SNCM, S45C)			Prehardened Steels (NAK, CENA, KP4)			Herdened Steels (SKD, SKT, STAVAX)		
Hardness		~HRc35			HRc35~HRc45			HRc45~HRc55		
Strength		~1100N/mm2			1100~1500N/mm2			1500~2000N/mm2		
Diameter (mm)	Effective Length	RPM	FEED	Ap (mm)	RPM	FEED	Ap (mm)	RPM	FEED	Ap (mm)
2	10	14,400	1148	0.126	13,600	868	0.098	12,000	665	0.07
	12	12,960	931	0.072	12,240	700	0.056	10,800	539	0.04
	14	12,960	931	0.072	12,240	700	0.056	10,800	539	0.04
	16	12,960	931	0.072	12,240	700	0.056	10,800	539	0.04
	18	12,960	931	0.045	12,240	700	0.035	10,800	539	0.025
	20	12,960	931	0.045	12,240	700	0.035	10,800	539	0.025
	22	11,520	735	0.045	10,880	553	0.035	9,600	427	0.025
	25	11,520	735	0.045	10,880	553	0.035	9,600	427	0.025
	30	11,520	735	0.027	10,880	553	0.021	9,600	427	0.015
2.5	10	12,300	1358	0.158	11,600	952	0.123	10,300	714	0.088
	12	12,300	1358	0.158	11,600	952	0.123	10,300	714	0.088
	16	11,070	1099	0.09	10,440	770	0.07	9,270	581	0.05
	20	11,070	1099	0.09	10,440	770	0.07	9,270	581	0.05
	25	9,840	868	0.056	9,280	609	0.044	8,240	455	0.031
	30	9,840	868	0.056	9,280	609	0.044	8,240	455	0.031
3	6	10,900	1204	0.27	10,300	847	0.21	6,600	630	0.15
	8	10,900	1204	0.27	10,300	847	0.21	6,600	630	0.15
	10	10,900	1204	0.189	10,300	847	0.147	6,600	630	0.105
	12	10,900	1204	0.189	10,300	847	0.147	6,600	630	0.105
	16	9,810	973	0.108	9,270	686	0.084	5,940	511	0.06
	20	9,810	973	0.108	9,270	686	0.084	5,940	511	0.06
	25	9,810	973	0.068	9,270	686	0.053	5,940	511	0.038
	30	9,810	973	0.068	9,270	686	0.053	5,940	511	0.038
	35	8,720	770	0.068	8,240	539	0.053	5,280	406	0.038
	40	8,720	770	0.041	8,240	539	0.032	5,280	406	0.023
	45	8,720	770	0.041	8,240	539	0.032	5,280	406	0.023
	50	6,540	504	0.027	6,180	357	0.021	3,960	266	0.015
	60	6,540	504	0.027	6,180	357	0.021	3,960	266	0.015
3.5	12	9,310	1430	0.236	8,800	1008	0.183	5,640	750	0.131
	16	8,380	1158	0.135	7,920	816	0.105	5,070	608	0.075
	20	8,380	1158	0.135	7,920	816	0.105	5,070	608	0.047
	25	8,380	1158	0.085	7,920	816	0.066	5,070	608	0.047
	30	8,380	1158	0.085	7,920	816	0.066	5,070	608	0.047
	35	7,450	916	0.085	7,040	641	0.066	4,510	483	0.047
	40	7,450	916	0.051	7,040	641	0.04	4,510	483	0.028
4	6	8,000	1820	0.36	7,600	1624	0.28	6,700	1078	0.2
	8	8,000	1820	0.36	7,600	1624	0.28	6,700	1078	0.2
	10	8,000	1820	0.36	7,600	1624	0.28	6,700	1078	0.2
	12	8,000	1820	0.36	7,600	1624	0.28	6,700	1078	0.2
	16	8,000	1820	0.252	7,600	1624	0.196	6,700	1078	0.14
	20	8,000	1820	0.252	7,600	1624	0.196	6,700	1078	0.14
	25	7,200	1477	0.144	6,840	1316	0.112	6,030	875	0.08
	30	7,200	1477	0.144	6,840	1316	0.112	6,030	875	0.08

ESRE714 SERIES

Workpiece		CARBON STEEL, Alloy Steels (SCM, SNCM, S45C)			Prehardened Steels (NAK, CENA, KP4)			Herdened Steels (SKD, SKT, STAVAX)		
Hardness		~HRc35			HRc35~HRc45			HRc45~HRc55		
Strength		~1100N/mm2			1100~1500N/mm2			1500~2000N/mm2		
Diameter (mm)	Effective Length	RPM	FEED	Ap (mm)	RPM	FEED	Ap (mm)	RPM	FEED	Ap (mm)
4	40	7,200	1477	0.09	6,840	1316	0.07	6,030	875	0.05
	45	6,400	1162	0.09	6,080	1036	0.07	5,360	693	0.05
	50	6,400	1162	0.09	6,080	1036	0.07	5,360	693	0.05
	60	6,400	1162	0.054	6,080	1036	0.042	5,360	693	0.03
4.5	12	6,830	2166	0.45	6,490	1933	0.35	5,720	1283	0.25
	16	6,830	2166	0.315	6,490	1933	0.245	5,720	1283	0.175
	20	6,830	2166	0.315	6,490	1933	0.245	5,720	1283	0.175
	25	6,150	1758	0.18	5,840	1566	0.14	5,150	1041	0.1
	30	6,150	1758	0.18	5,840	1566	0.14	5,150	1041	0.1
	40	6,150	1758	0.112	5,840	1566	0.087	5,150	1041	0.062
5	16	6,400	1617	0.315	6,100	1260	0.245	5,400	847	0.175
	20	6,400	1617	0.315	6,100	1260	0.245	5,400	847	0.175
	25	5,760	1309	0.18	5,490	1022	0.14	4,860	686	0.1
	30	5,760	1309	0.18	5,490	1022	0.14	4,860	686	0.1
	40	5,760	1309	0.18	5,490	1022	0.14	4,860	686	0.1
	50	5,760	1309	0.113	5,490	1022	0.088	4,860	686	0.063
	60	5,120	1036	0.113	4,880	805	0.088	4,320	539	0.063
6	20	5,300	1477	0.378	5,000	1148	0.294	4,400	770	0.21
	30	5,300	1,477	0.378	5,000	1,148	0.294	4,400	770	0.21
	40	4,770	1,197	0.216	4,500	931	0.168	3,960	623	0.12
	50	4,770	1,197	0.216	4,500	931	0.168	3,960	623	0.12
	60	4,370	958	0.141	4,171	931	0.11	3,690	623	0.078
8	25	4,000	1,330	0.504	3,800	1,050	0.392	3,300	700	0.28
	40	3,600	1,078	0.288	3,400	847	0.224	2,950	567	0.16
	50	3,600	1,078	0.288	3,400	847	0.224	2,950	567	0.16
10	30	3,200	1,260	0.9	3,050	952	0.7	2,630	560	0.5
	50	3,200	1,260	0.63	3,050	952	0.49	2,630	560	0.35
	60	3,200	1,260	0.63	3,050	952	0.49	2,630	560	0.35
12	40	2,650	1,120	0.756	2,520	840	0.588	2,180	490	0.42
	60	2,360	896	0.472	2,250	672	0.367	1,940	392	0.262
	70	2,360	896	0.472	2,250	672	0.367	1,940	392	0.262

RPM = rev / min
FEED = mm / min

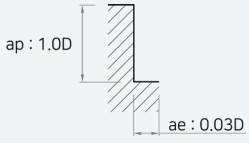


Recommended Cutting Condition

ESXE704, ESXE714, ESXR704 SERIES ▶ Side Cutting

Workpiece	Herdened Steels Heat Resistant Steels		Herdened Steels							
Hardness	HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65		HRc 65 ~ HRc70	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
4	17,200	1,690	11,440	1,140	9,360	700	7,280	430	6,170	310
6	13,450	1,820	8,970	1,230	6,890	720	5,460	450	4,810	330
8	9,100	1,750	6,760	1,170	5,200	670	4,160	420	3,640	310
10	8,000	1,630	5,330	1,090	4,160	620	3,320	400	2,860	280
12	6,830	1,630	4,550	1,010	3,450	580	2,730	370	2,420	260

RPM = rev / min
FEED = mm / min



ESLNS20, ESLNS40 SERIES

Workpiece	Alloy Steels, Heat Resistant Steels			Herdened Steels			Herdened Steels			Copper, Copper alloy		
Hardness	HRc30~HRc45			HRc45~HRc55			HRc55~HRc65					
Diameter (mm)	RPM	FEED	Ap (mm)	RPM	FEED	Ap (mm)	RPM	FEED	Ap (mm)	RPM	FEED	Ap (mm)
0.4	34,100~50,000	350~590	0.005~0.028	30,500~35,200	295~340	0.003~0.020	18,300~24,600	120~200	0.002~0.012	48,000~50,000	790~920	0.008~0.048
0.5	25,650~33,000	370~470	0.006~0.035	23,750~26,000	285~315	0.004~0.025	14,200~18,000	115~130	0.003~0.015	44,000~50,000	800~1,150	0.010~0.060
0.6	20,900~35,200	330~560	0.007~0.030	19,900~22,000	260~290	0.005~0.021	11,900~15,500	100~120	0.003~0.013	37,500~50,000	770~1,250	0.011~0.051
0.8	16,150~26,400	360~590	0.009~0.040	15,200~16,700	280~310	0.006~0.028	9,000~11,700	110~125	0.004~0.017	28,500~47,000	770~1,300	0.015~0.068
1	12,300~18,700	350~540	0.011~0.028	10,500~11,500	250~280	0.008~0.020	6,300~8,050	100~115	0.005~0.012	22,500~34,000	810~1,300	0.018~0.048
1.2	10,450~17,600	350~590	0.025~0.070	9,100~10,000	250~280	0.015~0.042	5,400~7,000	100~115	0.009~0.026	22,500~31,500	950~1,350	0.036~0.101
1.5	9,100~17,600	430~830	0.017~0.077	7,000~8,000	250~280	0.012~0.055	4,300~5,500	100~115	0.007~0.033	14,500~25,000	770~1,320	0.028~0.132
2	6,350~10,550	340~570	0.021~0.140	6,100~6,700	270~300	0.015~0.100	3,600~4,700	100~120	0.009~0.060	11,500~18,500	770~1,250	0.036~0.240
3	4,300~7,050	550~900	0.056~0.210	3,990~4,600	445~515	0.040~0.150	2,400~3,200	105~310	0.024~0.090	9,000~13,000	1,400~2,110	0.096~0.360
4	3,200~5,300	400~675	0.074~0.280	3,000~3,400	335~380	0.053~0.200	1,800~2,400	75~230	0.032~0.120	6,750~9,750	1,050~1,575	0.128~0.480

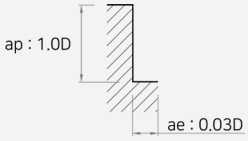
RPM = rev / min
FEED = mm / min



ESR702 SERIES ▶ Side Cutting

Workpiece	Herdened Steels Heat Resistant Steels		Herdened Steels									
Hardness	HRc30 ~ HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65		HRc 65 ~ HRc70	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	33,300	960	26,000	776	17,500	480	14,500	296	11,000	184	9,500	132
3	21,800	960	17,300	776	11,500	480	9,500	296	7,500	184	6,400	132
4	16,700	1,000	13,200	800	8,800	500	7,200	308	5,600	192	4,750	136
5	15,700	1,160	12,500	920	8,300	568	6,400	328	5,100	208	4,450	152
6	13,100	1,080	10,350	880	6,900	552	5,300	320	4,200	204	3,700	148
8	9,880	1,056	7,800	824	5,200	508	4,000	292	3,200	188	2,800	136
10	7,800	960	6,150	776	4,100	472	3,200	272	2,550	176	2,200	128
12	6,650	960	5,250	776	3,500	472	2,650	272	2,100	176	1,860	128
16	4,900	840	3,900	672	2,600	416	2,000	240	1,600	152	1,400	112
20	3,900	760	3,100	600	2,050	380	1,600	220	1,300	140	1,100	100

RPM = rev / min
FEED = mm / min



ESR702, ESR732 SERIES ▶ Slotting

Workpiece	Herdened Steels Heat Resistant Steels		Herdened Steels									
Hardness	HRc30 ~ HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65		HRc 65 ~ HRc70	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	33,300	680	26,000	544	17,500	336	14,500	208	11,000	128	9,500	92
3	21,800	680	17,300	544	11,500	336	9,500	208	7,500	128	6,400	92
4	16,700	704	13,200	560	8,800	352	7,200	216	5,600	136	4,750	94
5	15,700	800	12,500	644	8,300	400	6,400	228	5,100	144	4,450	106
6	13,100	760	10,350	616	6,900	384	5,300	224	4,200	144	3,700	104
8	9,880	744	7,800	576	5,200	356	4,000	204	3,200	132	2,800	96
10	7,800	680	6,150	544	4,100	332	3,200	192	2,550	124	2,200	90
12	6,650	680	5,250	544	3,500	332	2,650	192	2,100	124	1,860	90
16	4,900	584	3,900	464	2,600	292	2,000	168	1,600	108	1,400	78
20	3,900	528	3,100	420	2,050	268	1,600	168	1,300	100	1,100	70

RPM = rev / min
FEED = mm / min



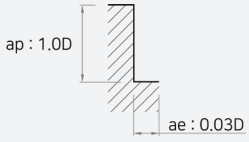


Recommended Cutting Condition

ESR704, ESR714, ESR724, ESR734 SERIES ▶ Side Cutting

Workpiece	Herdened Steels Heat Resistant Steels		Herdened Steels									
Hardness	HRc30 ~ HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65		HRc 65 ~ HRc70	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
3	21,800	1,400	17,300	1,000	11,500	672	9,500	416	7,500	256	6,400	184
4	16,700	1,440	13,200	1,040	8,800	704	7,200	432	5,600	268	4,750	192
5	15,700	1,600	12,500	1,200	8,300	800	6,400	464	5,100	296	4,450	216
6	13,100	1,560	10,350	1,120	6,900	760	5,300	448	4,200	280	3,700	208
8	9,880	1,504	7,800	1,080	5,200	720	4,000	416	3,200	264	2,800	192
10	7,800	1,400	6,150	1,008	4,100	672	3,200	384	2,550	248	2,200	176
12	6,650	1,400	5,250	1,008	3,500	672	2,650	384	2,100	240	1,860	176
16	4,900	1,200	3,900	880	2,600	584	2,000	336	1,600	216	1,400	160
20	3,900	1,040	3,100	776	2,050	520	1,600	304	1,300	200	1,100	144

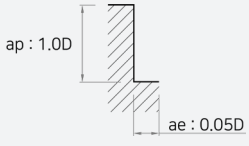
RPM = rev / min
FEED = mm / min

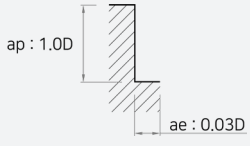


ESR706 SERIES

Workpiece	Herdened Steels Heat Resistant Steels		Herdened Steels									
Hardness	HRc30 ~ HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65		HRc 65 ~ HRc70	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6	24,800	5,350	23,500	4,900	16,000	4,900	13,500	3,300	10,500	2,100	8,000	1,450
8	20,000	5,500	19,000	5,000	12,000	4,600	10,000	3,100	8,000	2,000	6,000	1,400
10	16,000	4,900	15,500	4,500	9,500	4,100	8,000	2,900	6,400	1,800	4,800	1,300
12	13,000	4,500	12,500	4,100	8,000	3,800	6,600	2,500	5,300	1,600	4,000	1,150
16	10,000	4,000	9,700	3,700	6,000	3,400	5,000	2,300	4,000	1,250	3,000	870
20	8,000	3,350	7,800	3,400	4,800	3,200	4,000	2,100	3,200	1,020	2,400	690

RPM = rev / min
FEED = mm / min





ESRR712 SERIES

Workpiece				Carbon Steels, Alloy Steels (180~250HB)		Prehardened Steels (HRc35~45)		Herdened Steels (HRc45~55)		Herdened Steels (HRc55~65)	
Ratio to standard depth of cut				Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
Mill Dia (mm)	Diameter (mm)	Neck Length (mm)	Depth of Cut (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
0.2	0.02	0.5	0.016	50,000	258	50,000	205	50,000	180	50,000	160
		1	0.011	50,000	258	50,000	205	50,000	180	50,000	160
		1.5	0.007	42,000	202	36,700	176	36,700	162	36,700	147
	0.05	0.5	0.02	50,000	258	50,000	205	50,000	180	50,000	160
		1	0.014	50,000	258	50,000	205	50,000	180	50,000	160
		1.5	0.008	50,000	240	45,900	202	45,900	170	45,900	153
0.3	0.02	1	0.016	50,000	585	50,000	456	50,000	336	50,000	320
		2	0.011	45,000	530	45,000	420	45,000	300	45,000	290
		3	0.007	35,000	412	35,000	326	30,000	200	30,000	194
	0.05	1	0.021	50,000	585	50,000	456	50,000	336	50,000	320
		2	0.012	45,000	530	45,000	420	45,000	300	45,000	290
		3	0.008	35,000	412	35,000	326	30,000	200	30,000	194
0.4	0.02	1	0.016	50,000	580	50,000	461	40,000	320	36,000	270
		2	0.013	45,000	520	45,000	410	36,000	290	34,000	240
		3	0.01	40,000	410	40,000	330	32,800	240	25,600	200
		4	0.007	30,000	320	30,000	250	21,600	160	19,200	150
	0.05	1	0.025	50,000	580	50,000	461	40,000	320	36,000	270
		2	0.016	45,000	520	45,000	410	36,000	290	34,000	240
		3	0.014	40,000	410	40,000	330	32,800	240	25,600	200
		4	0.008	30,000	320	30,000	250	21,600	160	19,200	150
	0.1	1	0.033	50,000	580	50,000	461	40,000	320	36,000	270
		1.5	0.03	50,000	580	50,000	461	40,000	320	36,000	270
		2	0.028	45,000	520	45,000	410	36,000	290	34,000	240
		3	0.016	40,000	410	40,000	330	32,800	240	25,600	200
		4	0.01	30,000	320	30,000	250	21,600	160	19,200	150
0.5	0.02	1	0.016	50,000	898	40,000	464	30,000	378	28,000	315
		1.5	0.014	50,000	898	40,000	464	30,000	378	28,000	315
		2	0.013	50,000	898	40,000	464	30,000	378	28,000	315
		2.5	0.011	45,000	810	36,000	414	27,000	315	24,500	261
		3	0.01	45,000	810	36,000	414	27,000	315	24,500	261
		4	0.008	40,000	720	32,000	378	24,000	279	20,000	234
		5	0.007	40,000	720	32,000	378	24,000	279	20,000	234
		6	0.006	28,800	480	19,400	260	18,000	250	15,000	200
		8	0.005	28,800	480	19,400	260	18,000	250	15,000	200
		10	0.004	28,800	480	19,400	260	18,000	250	15,000	200
	0.05	1	0.03	50,000	898	40,000	464	30,000	378	28,000	315
		1.5	0.026	50,000	898	40,000	464	30,000	378	28,000	315
		2	0.023	50,000	898	40,000	464	30,000	378	28,000	315
		2.5	0.02	45,000	810	36,000	414	27,000	315	24,500	261
		3	0.017	45,000	810	36,000	414	27,000	315	24,500	261
		4	0.017	40,000	720	32,000	378	24,000	279	20,000	234
		5	0.011	28,800	540	19,400	280	18,000	250	15,000	200
		6	0.008	28,800	480	19,400	260	18,000	250	15,000	200
		8	0.007	28,800	480	19,400	260	18,000	250	15,000	200

Recommended Cutting Condition

ESRR712 SERIES

Workpiece				Carbon Steels, Alloy Steels (180~250HB)		Prehardened Steels (HRc35~45)		Herdened Steels (HRc45~55)		Herdened Steels (HRc55~65)	
Ratio to standard depth of cut				Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
Mill Dia (mm)	Diameter (mm)	Neck Length (mm)	Depth of Cut (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
0.5	0.05	10	0.006	28,800	480	19,400	260	18,000	250	15,000	200
	0.1	1	0.035	50,000	898	40,000	464	30,000	378	28,000	315
		1.5	0.032	50,000	898	40,000	464	30,000	378	28,000	315
		2	0.03	50,000	898	40,000	464	30,000	378	28,000	315
		2.5	0.025	45,000	810	36,000	414	27,000	315	24,500	261
		3	0.02	45,000	810	36,000	414	27,000	315	24,500	261
		4	0.02	40,000	720	32,000	378	24,000	279	20,000	234
		5	0.013	28,800	540	19,400	280	18,000	250	15,000	200
		6	0.013	28,800	480	19,400	260	18,000	250	15,000	200
		8	0.01	28,800	480	19,400	260	18,000	250	15,000	200
		10	0.08	28,800	480	19,400	260	18,000	250	15,000	200
0.6	0.02	2	0.016	50,000	1,159	37,830	600	28,200	390	23,000	320
		3	0.014	40,000	830	27,800	440	23,600	280	21,000	230
		4	0.013	40,000	830	27,800	440	23,600	280	21,000	230
		6	0.01	24,000	490	18,000	300	17,800	240	15,000	210
		8	0.008	24,000	466	18,000	285	17,800	228	15,000	200
		10	0.007	24,000	451	18,000	276	17,800	221	15,000	193
		12	0.006	24,000	451	18,000	276	17,800	221	15,000	193
	0.05	2	0.028	50,000	1,159	37,830	600	28,200	390	23,000	320
		3	0.023	40,000	830	27,800	440	23,600	280	21,000	230
		4	0.019	40,000	830	27,800	440	23,600	280	21,000	230
		6	0.012	24,000	490	18,000	300	17,800	240	15,000	210
		8	0.01	24,000	466	18,000	285	17,800	228	15,000	200
		10	0.007	24,000	451	18,000	276	17,800	221	15,000	193
		12	0.006	24,000	451	18,000	276	17,800	221	15,000	193
	0.1	2	0.035	50,000	1,159	37,830	600	28,200	390	23,000	320
		3	0.03	40,000	830	27,800	440	23,600	280	21,000	230
		4	0.024	40,000	830	27,800	440	23,600	280	21,000	230
		6	0.015	24,000	490	18,000	300	17,800	240	15,000	210
		8	0.013	24,000	466	18,000	285	17,800	228	15,000	200
		10	0.009	24,000	451	18,000	276	17,800	221	15,000	193
		12	0.007	24,000	451	18,000	276	17,800	221	15,000	193
0.7	0.1	2	0.042	49,200	1,054	34,190	558	29,030	355	25,830	292
		4	0.029	40,000	830	27,800	440	23,600	280	21,000	230
		6	0.018	24,000	490	18,000	300	17,800	240	15,000	210
		8	0.015	24,000	490	18,000	300	17,800	240	15,000	210
		10	0.012	24,000	490	18,000	300	17,800	240	15,000	210
0.8	0.02	2	0.016	48,000	1,378	28,000	647	20,000	400	20,000	360
		4	0.016	48,000	1,102	28,000	518	20,000	320	20,000	288
		6	0.013	38,700	800	25,000	461	18,000	288	18,000	256
		8	0.011	29,025	600	20,000	369	16,200	259	16,200	230
		10	0.01	29,025	570	20,000	350	16,200	246	16,200	219
		12	0.09	29,025	570	20,000	350	16,200	246	16,200	219
	0.05	2	0.038	48,000	1,378	28,000	647	20,000	400	20,000	360

ESRR712 SERIES

Workpiece				Carbon Steels, Alloy Steels (180~250HB)		Prehardened Steels (HRc35~45)		Herdened Steels (HRc45~55)		Herdened Steels (HRc55~65)	
Ratio to standard depth of cut				Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
Mill Dia (mm)	Diameter (mm)	Neck Length (mm)	Depth of Cut (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
0.8	0.05	4	0.026	48,000	1,102	28,000	518	20,000	320	20,000	288
		6	0.015	38,700	800	25,000	461	18,000	288	18,000	256
		8	0.012	29,025	600	20,000	369	16,200	259	16,200	230
		10	0.011	29,025	570	20,000	350	16,200	246	16,200	219
		12	0.01	29,025	570	20,000	350	16,200	246	16,200	219
	0.1	2	0.047	48,000	1,378	28,000	647	20,000	400	20,000	360
		4	0.032	48,000	1,102	28,000	518	20,000	320	20,000	288
		6	0.019	38,700	800	25,000	461	18,000	288	18,000	256
		8	0.015	29,025	600	20,000	369	16,200	259	16,200	230
		10	0.013	29,025	570	20,000	350	16,200	246	16,200	219
		12	0.012	29,025	570	20,000	350	16,200	246	16,200	219
	0.2	2	0.081	48,000	1,378	28,000	647	20,000	400	20,000	360
		4	0.056	48,000	1,102	28,000	518	20,000	320	20,000	288
		6	0.032	38,700	800	25,000	461	18,000	288	18,000	256
		8	0.018	29,025	600	20,000	369	16,200	259	16,200	230
		10	0.016	29,025	570	20,000	350	16,200	246	16,200	219
		12	0.015	29,025	570	20,000	350	16,200	246	16,200	219
1	0.02	4	0.013	32,400	1,359	27,540	1,039	24,300	815	22,680	666
		6	0.01	26,244	990	22,307	842	19,683	660	18,371	539
		8	0.008	23,328	880	19,829	748	17,496	587	16,330	479
		10	0.006	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.005	18,144	609	15,422	453	13,608	399	12,701	320
		14	0.004	18,144	533	15,422	420	13,608	342	12,701	266
		16	0.004	18,144	533	15,422	420	13,608	342	12,701	266
		20	0.003	13,608	399	11,567	315	10,206	257	9,526	200
	0.05	4	0.027	32,400	1,359	28,917	1,128	24,300	815	22,680	666
		6	0.017	26,244	990	24,538	928	19,683	660	18,371	539
		8	0.016	23,328	880	19,829	748	17,496	587	16,330	479
		10	0.011	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.01	18,144	609	15,422	453	13,608	399	12,701	320
		14	0.008	18,144	533	15,422	420	13,608	342	12,701	266
		16	0.006	18,144	533	15,422	420	13,608	342	12,701	266
		20	0.004	13,608	399	11,567	315	10,206	257	9,526	200
	0.1	4	0.038	32,400	1,359	27,540	1,039	24,300	815	22,680	666
		6	0.024	26,244	990	22,307	842	19,683	660	18,371	539
		8	0.024	23,328	880	19,829	748	17,496	587	16,330	479
		10	0.015	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.015	18,144	609	15,422	453	13,608	399	12,701	320
		14	0.012	18,144	533	15,422	420	13,608	342	12,701	266
		16	0.009	18,144	533	15,422	420	13,608	342	12,701	266
		20	0.006	13,608	399	11,567	315	10,206	257	9,526	200
	0.2	4	0.07	32,400	1,359	27,540	1,039	24,300	815	22,680	666
		6	0.04	26,244	990	22,307	842	19,683	660	18,371	539
		8	0.04	23,328	880	19,829	748	17,496	587	16,330	479

Recommended Cutting Condition

ESRR712 SERIES

Workpiece				Carbon Steels, Alloy Steels (180~250HB)		Prehardened Steels (HRc35~45)		Herdened Steels (HRc45~55)		Herdened Steels (HRc55~65)	
Ratio to standard depth of cut				Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
Mill Dia (mm)	Diameter (mm)	Neck Length (mm)	Depth of Cut (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
1	0.2	10	0.025	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.025	18,144	609	15,422	453	13,608	399	12,701	320
		14	0.02	18,144	533	15,422	420	13,608	342	12,701	266
		16	0.015	18,144	533	15,422	420	13,608	342	12,701	266
		20	0.01	13,608	399	11,567	315	10,206	257	9,526	200
	0.3	4	0.07	32,400	1,359	27,540	1,039	24,300	815	22,680	666
		6	0.04	26,244	990	22,307	842	19,683	660	18,371	539
		8	0.04	23,328	880	19,829	748	17,496	587	16,330	479
		10	0.025	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.025	18,144	609	15,422	453	13,608	399	12,701	320
		14	0.02	18,144	533	15,422	420	13,608	342	12,701	266
		16	0.015	18,144	533	15,422	420	13,608	342	12,701	266
		20	0.01	13,608	399	11,567	315	10,206	257	9,526	200
1.2	0.02	4	0.013	28,868	1,154	24,538	928	21,651	727	20,208	594
		6	0.01	28,868	1,154	24,538	928	21,651	727	20,208	594
		8	0.008	24,640	962	20,944	791	18,480	620	17,248	506
		10	0.006	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.005	19,278	652	16,386	554	14,458	428	13,494	342
		14	0.004	18,144	533	15,422	453	13,608	342	12,701	266
		16	0.004	18,144	533	15,422	453	13,608	342	12,701	266
		20	0.003	13,608	399	11,567	315	10,206	257	9,526	200
	0.05	4	0.027	28,868	1,154	24,538	928	21,651	727	20,208	594
		6	0.017	28,868	1,154	24,538	928	21,651	727	20,208	594
		8	0.016	24,640	962	20,944	791	18,480	620	17,248	506
		10	0.011	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.01	19,278	652	16,386	554	14,458	428	13,494	342
		14	0.008	18,144	533	15,422	453	13,608	342	12,701	266
		16	0.006	18,144	533	15,422	453	13,608	342	12,701	266
		20	0.004	13,608	399	11,567	315	10,206	257	9,526	200
	0.1	4	0.03	28,868	1,154	24,538	928	21,651	727	20,208	594
		6	0.03	28,868	1,154	24,538	928	21,651	727	20,208	594
		8	0.022	24,640	962	20,944	791	18,480	620	17,248	506
		10	0.015	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.012	19,278	652	16,386	554	14,458	428	13,494	342
		14	0.01	18,144	533	15,422	453	13,608	342	12,701	266
		16	0.01	18,144	533	15,422	453	13,608	342	12,701	266
		20	0.006	13,608	399	11,567	315	10,206	257	9,526	200
	0.2	4	0.05	28,868	1,154	24,538	928	21,651	727	20,208	594
		6	0.05	28,868	1,154	24,538	928	21,651	727	20,208	594
		8	0.037	24,640	962	20,944	791	18,480	620	17,248	506
		10	0.025	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.02	19,278	651	16,386	554	14,458	428	13,494	342
		14	0.016	18,144	533	15,422	453	13,608	342	12,701	266
		16	0.016	18,144	533	15,422	453	13,608	342	12,701	266

ESRR712 SERIES

Workpiece				Carbon Steels, Alloy Steels (180~250HB)		Prehardened Steels (HRc35~45)		Herdened Steels (HRc45~55)		Herdened Steels (HRc55~65)	
Ratio to standard depth of cut				Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
Mill Dia (mm)	Diameter (mm)	Neck Length (mm)	Depth of Cut (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
1.2	0.2	20	0.01	13,608	399	11,567	315	10,206	257	9,526	200
	0.3	4	0.05	28,868	1,154	24,538	928	21,651	727	20,208	594
		6	0.05	28,868	1,154	24,538	928	21,651	727	20,208	594
		8	0.037	24,640	962	20,944	791	18,480	620	17,248	506
		10	0.025	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.02	19,278	651	16,386	554	14,458	428	13,494	342
		14	0.016	18,144	533	15,422	453	13,608	342	12,701	266
		16	0.016	18,144	533	15,422	453	13,608	342	12,701	266
		20	0.01	13,608	399	11,567	315	10,206	257	9,526	200
1.5	0.02	4	0.013	24,930	1,130	20,956	947	18,711	752	17,364	611
		6	0.01	23,779	1,074	20,382	921	17,834	716	16,560	582
		8	0.008	22,680	1,027	19,278	873	17,010	685	15,876	559
		10	0.006	20,412	924	17,350	785	15,309	616	14,288	503
		12	0.005	18,144	822	15,422	698	13,608	548	12,701	447
		14	0.004	14,112	568	11,995	423	10,584	373	9,878	298
		16	0.004	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.003	14,112	568	11,995	423	10,584	373	9,878	298
	0.05	4	0.027	24,930	1,130	20,956	947	18,711	752	17,364	611
		6	0.017	23,779	1,074	20,382	921	17,834	716	16,560	582
		8	0.016	22,680	1,027	19,278	873	17,010	685	15,876	559
		10	0.011	20,412	924	17,350	785	15,309	616	14,288	503
		12	0.01	18,144	822	15,422	698	13,608	548	12,701	447
		14	0.008	14,112	568	11,995	423	10,584	373	9,878	298
		16	0.006	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.004	14,112	568	11,995	423	10,584	373	9,878	298
	0.1	4	0.042	24,930	1,130	20,956	947	18,711	752	17,364	611
		6	0.04	23,779	1,074	20,382	921	17,834	716	16,560	582
		8	0.036	22,680	1,027	19,278	873	17,010	685	15,876	559
		10	0.036	20,412	924	17,350	785	15,309	616	14,288	503
		12	0.036	18,144	822	15,422	698	13,608	548	12,701	447
		14	0.023	14,112	568	11,995	423	10,584	373	9,878	298
		16	0.023	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.018	14,112	568	11,995	423	10,584	373	9,878	298
	0.2	4	0.07	24,930	1,130	20,956	868	18,711	678	17,364	556
		6	0.065	23,779	1,074	20,382	921	17,834	716	16,560	582
		8	0.06	22,680	1,027	19,278	873	17,010	685	15,876	559
		10	0.06	20,412	924	17,350	785	15,309	616	14,288	503
		12	0.06	18,144	822	15,422	698	13,608	548	12,701	447
		14	0.038	14,112	568	11,995	423	10,584	373	9,878	298
		16	0.038	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.03	14,112	568	11,995	423	10,584	373	9,878	298
	0.3	4	0.07	24,930	1,130	20,956	868	18,711	678	17,364	556
		6	0.065	23,779	1,074	20,382	921	17,834	716	16,560	582
		8	0.06	22,680	1,027	19,278	873	17,010	685	15,876	559

Recommended Cutting Condition

ESRR712 SERIES

Workpiece				Carbon Steels, Alloy Steels (180~250HB)		Prehardened Steels (HRc35~45)		Herdened Steels (HRc45~55)		Herdened Steels (HRc55~65)	
Ratio to standard depth of cut				Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
Mill Dia (mm)	Diameter (mm)	Neck Length (mm)	Depth of Cut (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
1.5	0.3	10	0.06	20,412	924	17,350	785	15,309	616	14,288	503
		12	0.06	18,144	822	15,422	698	13,608	548	12,701	447
		14	0.038	14,112	568	11,995	423	10,584	373	9,878	298
		16	0.038	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.03	14,112	568	11,995	423	10,584	373	9,878	298
	0.5	4	0.085	24,930	1,130	20,956	868	18,711	678	17,364	556
		6	0.08	23,779	1,074	20,382	921	17,834	716	16,560	582
		8	0.07	22,680	1,027	19,278	873	17,010	685	15,876	559
		10	0.067	20,412	924	17,350	785	15,309	616	14,288	503
		12	0.065	18,144	822	15,422	698	13,608	548	12,701	447
		14	0.045	14,112	568	11,995	423	10,584	373	9,878	298
		16	0.045	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.035	14,112	568	11,995	423	10,584	373	9,878	298
2	0.02	6	0.013	20,790	1,635	17,672	1,389	15,593	981	14,553	801
		8	0.01	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		10	0.008	17104	1284	14539	1092	12828	807	11973	659
		12	0.006	15,309	1,083	13,013	921	11,482	722	10,716	590
		14	0.005	14,458	1023	12,290	869	10,844	682	10,121	557
		16	0.004	13,608	963	11,567	818	10,206	642	9,526	524
		20	0.004	11,907	843	10,121	716	8,930	562	8,335	459
		25	0.003	11,907	757	10,121	643	8,930	505	8,335	411
	0.05	6	0.027	20,790	1,635	17,672	1,389	15,593	981	14,553	801
		8	0.017	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		10	0.016	17104	1284	14539	1092	12828	807	11973	659
		12	0.011	15,309	1,083	13,013	921	11,482	722	10,716	590
		14	0.01	14,458	1023	12,290	869	10,844	682	10,121	557
		16	0.008	13,608	963	11,567	818	10,206	642	9,526	524
		20	0.006	11,907	843	10,121	716	8,930	562	8,335	459
		25	0.004	11,907	757	10,121	643	8,930	505	8,335	411
	0.1	6	0.07	20,790	1,635	17,672	1,389	15,593	981	14,553	801
		8	0.055	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		10	0.042	17104	1284	14539	1092	12828	807	11973	659
		12	0.03	15,309	1,083	13,013	921	11,482	722	10,716	590
		14	0.03	14,458	1023	12,290	869	10,844	682	10,121	557
		16	0.03	13,608	963	11,567	818	10,206	642	9,526	524
		20	0.025	11,907	843	10,121	716	8,930	562	8,335	459
		25	0.015	11,907	757	10,121	643	8,930	505	8,335	411
		30	0.01	11,312	719	9,615	611	8,484	480	7,918	391
	0.2	6	0.08	20,790	1,635	17,672	1,389	15,593	981	14,553	801
		8	0.07	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		10	0.055	17,104	1,284	14,539	1,092	12,828	807	11,973	659
		12	0.04	15,309	1,083	13,013	921	11,482	722	10,716	590
		14	0.04	14,458	1,023	12,290	869	10,844	682	10,121	557
		16	0.04	13,608	963	11,567	818	10,206	642	9,526	524

ESRR712 SERIES

Workpiece				Carbon Steels, Alloy Steels (180~250HB)		Prehardened Steels (HRc35~45)		Herdened Steels (HRc45~55)		Herdened Steels (HRc55~65)	
Ratio to standard depth of cut				Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
Mill Dia (mm)	Diameter (mm)	Neck Length (mm)	Depth of Cut (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
2	0.2	20	0.035	11,907	843	10,121	716	8,930	562	8,335	459
		25	0.025	11,907	757	10,121	643	8,930	505	8,335	411
		30	0.017	11,312	719	9,615	611	8,484	480	7,918	391
	0.3	6	0.11	20,790	1,635	17,672	1,389	15,593	981	14,553	801
		8	0.09	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		10	0.075	17,104	1,284	14,539	1,092	12,828	807	11,973	659
		12	0.06	15,309	1,083	13,013	921	11,482	722	10,716	590
		14	0.06	14,458	1023	12,290	869	10,844	682	10,121	557
		16	0.06	13,608	963	11,567	818	10,206	642	9,526	524
		20	0.037	11,907	843	10,121	716	8,930	562	8,335	459
		25	0.03	11,907	757	10,121	643	8,930	505	8,335	411
		30	0.021	11,312	719	9,615	611	8,484	480	7,918	391
	0.5	6	0.17	20,790	1,635	17,672	1,389	15,593	981	14,553	801
		8	0.14	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		10	0.11	17,104	1284	14,539	1143	12,828	807	11,973	659
		12	0.08	15,309	1,083	13,013	1,023	11,482	722	10,716	590
		14	0.08	14,458	1023	12,290	920	1,084	682	10,121	557
		16	0.08	13,608	963	11,567	818	10,206	642	9,526	524
		20	0.05	11,907	843	10,121	716	8,930	562	8,335	459
		25	0.05	11,907	757	10,121	643	8,930	505	8,335	411
		30	0.03	11,312	719	9,615	611	8,484	480	7,918	391
2.5	0.1	10	0.055	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		16	0.042	16,254	1224	13,816	1040	12,190	767	11,378	626
		20	0.03	13,608	963	11,567	818	10,206	642	9,526	524
		25	0.022	12,757	860	10,844	730	9,568	573	8,930	467
		30	0.015	11,907	757	10,121	643	8,930	505	8,335	411
	0.2	10	0.07	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		16	0.055	16,254	1,224	1,386	1040	12,190	767	11,378	626
		20	0.04	13,608	963	11,567	818	10,206	642	9,526	524
	0.3	10	0.09	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		16	0.075	16,254	1,224	1,386	1040	12,190	767	11,378	626
		20	0.06	13,608	963	11,567	818	10,206	642	9,526	524
	0.5	10	0.14	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		16	0.11	16,254	1,224	1,386	1040	12,190	767	11,378	626
		20	0.08	13,608	963	11,567	818	10,206	642	9,526	524
3	0.1	10	0.06	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		12	0.05	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		16	0.035	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		20	0.035	11,664	1,146	9,914	974	8,748	687	8,165	561
		25	0.031	10,368	973	8,812	827	7,776	583	7,257	477
		30	0.027	9,072	801	7,711	681	6,804	480	6,350	393
		35	0.02	9,072	801	7,711	681	6,804	480	6,350	393
		40	0.015	9,072	801	7,711	681	6,804	480	6,350	393
	0.2	10	0.08	14,400	1,415	12,240	1,203	10,800	849	10,080	693

Recommended Cutting Condition

ESRR712 SERIES

Workpiece				Carbon Steels, Alloy Steels (180~250HB)		Prehardened Steels (HRc35~45)		Herdened Steels (HRc45~55)		Herdened Steels (HRc55~65)	
Ratio to standard depth of cut				Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
Mill Dia (mm)	Diameter (mm)	Neck Length (mm)	Depth of Cut (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
3	0.2	12	0.07	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		16	0.05	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		20	0.05	11,664	1,146	9,914	974	8,748	687	8,165	561
		25	0.045	10,368	973	8,812	827	7,776	583	7,257	477
		30	0.04	9,072	801	7,711	681	6,804	480	6,350	393
		35	0.035	9,072	801	7,711	681	6,804	480	6,350	393
		40	0.03	9,072	801	7,711	681	6,804	480	6,350	393
	0.3	10	0.115	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		12	0.1	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		16	0.075	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		20	0.075	11,664	1,146	9,914	974	8,748	687	8,165	561
		25	0.067	10,368	973	8,812	827	7,776	583	7,257	477
		30	0.06	9,072	801	7,711	681	6,804	480	6,350	393
		35	0.05	9,072	801	7,711	681	6,804	480	6,350	393
		40	0.04	9,072	801	7,711	681	6,804	480	6,350	393
	0.5	10	0.155	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		12	0.13	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		16	0.1	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		20	0.1	11,664	1,146	9,914	974	8,748	687	8,165	561
		25	0.09	10,368	973	8,812	827	7,776	583	7,257	477
		30	0.08	9,072	801	7,711	681	6,804	480	6,350	393
		35	0.065	9,072	801	7,711	681	6,804	480	6,350	393
		40	0.05	9,072	801	7,711	681	6,804	480	6,350	393
	1	10	0.175	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		12	0.15	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		16	0.12	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		20	0.11	11,664	1,146	9,914	974	8,748	687	8,165	561
		25	0.1	10,368	973	8,812	827	7,776	583	7,257	477
		30	0.09	9,072	801	7,711	681	6,804	480	6,350	393
		35	0.075	9,072	801	7,711	681	6,804	480	6,350	393
		40	0.06	9,072	801	7,711	681	6,804	480	6,350	393
4	0.1	12	0.065	11,213	1,950	9,531	1,658	8,410	1,170	7,849	956
		16	0.06	10,255	1,783	8,697	1,512	7,599	1,057	6,684	814
		20	0.055	10,255	1,783	8,697	1,512	7,599	1,057	6,684	814
		25	0.05	10,255	1,783	7,782	1293	6,545	872	5,904	687
		30	0.045	10,255	1,783	6,867	1,075	5,491	688	5,124	561
		35	0.04	10,255	1,783	6,867	1,075	5,491	688	5,124	561
		40	0.035	10,255	1,783	6,867	1,075	5,491	688	5,124	561
	0.2	12	0.14	11,213	1,950	9,531	1,658	8,410	1,170	7,849	956
		16	0.13	10,255	1,783	8,697	1,512	7,599	1,057	6,684	814
		20	0.11	10,255	1,783	8,697	1,512	7,599	1,057	6,684	814
		25	0.105	10,255	1,783	7,782	1293	6,545	872	5,904	687
		30	0.1	10,255	1,783	6,867	1,075	5,491	688	5,124	561
		35	0.08	10,255	1,783	6,867	1,075	5,491	688	5,124	561

ESRR712 SERIES

Workpiece				Carbon Steels, Alloy Steels (180~250HB)		Prehardened Steels (HRc35~45)		Herdened Steels (HRc45~55)		Herdened Steels (HRc55~65)	
Ratio to standard depth of cut				Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
Mill Dia (mm)	Diameter (mm)	Neck Length (mm)	Depth of Cut (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
4	0.2	40	0.07	9,247	1,429	6,225	901	5,217	602	4,621	459
	0.3	12	0.22	11,213	1,950	9,531	1,658	8,410	1,170	7,849	956
		16	0.2	10,255	1,783	8,697	1,512	7,599	1,057	6,684	814
		20	0.18	10,255	1,783	8,697	1,512	7,599	1,057	6,684	814
		25	0.17	10,255	1,783	7,782	1293	6,545	872	5,904	687
		30	0.16	10,255	1,783	6,867	1,075	5,491	688	5,124	561
		35	0.14	10,255	1,783	6,867	1,075	5,491	688	5,124	561
		40	0.13	9,247	1,429	6,225	901	5,217	602	4,621	459
	0.5	12	0.35	11,213	1,950	9,531	1,658	8,410	1,170	7,849	956
		16	0.25	10,255	1,783	8,697	1,512	7,599	1,057	6,684	814
		20	0.2	10,255	1,783	8,697	1,512	7,599	1,057	6,684	814
		25	0.175	10,255	1,783	7,782	1293	6,545	872	5,904	687
		30	0.15	10,255	1,783	6,867	1,075	5,491	688	5,124	5
		35	0.1	10,255	1,783	6,867	1,075	5,491	688	5,124	561
		40	0.075	9,247	1,429	6,225	901	5,217	602	4,621	459
	1	12	0.4	11,213	1,950	9,531	1,658	8,410	1,170	7,849	956
		16	0.29	10,255	1,783	8,697	1,512	7,599	1,057	6,684	814
		20	0.23	10,255	1,783	8,697	1,512	7,599	1,057	6,684	814
		25	0.2	10,255	1,783	7,782	1293	6,545	872	5,904	687
		30	0.17	10,255	1,783	6,867	1,075	5,491	688	5,124	561
		35	0.12	10,255	1,783	6,867	1,075	5,491	688	5,124	561
		40	0.09	9,247	1,429	6,225	901	5,217	602	4,621	459
5	0.2	15	0.16	9,154	1,990	7,781	1,692	6,866	1,194	6,408	975
		25	0.152	8,513	1813	7,236	1541	6,385	1088	5,959	888
		30	0.145	7,872	1637	6,691	1391	5,904	982	5,510	802
		40	0.13	6,590	1,284	5,602	1,091	4,943	770	4,613	629
	0.5	15	0.35	9,154	1,990	7,781	1,692	6,866	1,194	6,408	975
		25	0.296	8,513	1813	7,236	1541	6,385	1088	5,959	888
		30	0.24	7,872	1637	6,691	1391	5,904	982	5,510	802
		40	0.135	6,590	1,284	5,602	1,091	4,943	770	4,613	629
	1	15	0.4	9,154	1,990	7,781	1,692	6,866	1,194	6,408	975
		25	0.337	8,513	1813	7,236	1541	6,385	1088	5,959	888
		30	0.275	7,872	1637	6,691	1391	5,904	982	5,510	802
		40	0.15	6,590	1,284	5,602	1,091	4,943	770	4,613	629
6	0.1	20	0.065	7,630	1,991	6,486	1,692	5,722	1,194	5,342	975
		40	0.05	6,486	1,523	5,513	1,294	4,865	914	4,540	746
	0.2	20	0.14	7,630	1,991	6,486	1,692	5,722	1,194	5,342	975
		40	0.11	6,486	1,523	5,513	1,294	4,865	914	4,540	746
	0.3	20	0.22	7,630	1,991	6,486	1,692	5,722	1,194	5,342	975
		40	0.18	6,486	1,523	5,513	1,294	4,865	914	4,540	746
	0.5	20	0.35	7,630	1,991	6,486	1,692	5,722	1,194	5,342	975
		40	0.24	6,486	1,523	5,513	1,294	4,865	914	4,540	746
	1	20	0.4	7,630	1,991	6,486	1,692	5,722	1,194	5,342	975
		40	0.28	6,486	1,523	5,513	1,294	4,865	914	4,540	746

Recommended Cutting Condition

ESRR712 SERIES

Workpiece				Carbon Steels, Alloy Steels (180~250HB)		Prehardened Steels (HRc35~45)		Herdened Steels (HRc45~55)		Herdened Steels (HRc55~65)	
Ratio to standard depth of cut				Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
Mill Dia (mm)	Diameter (mm)	Neck Length (mm)	Depth of Cut (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
6	1.5	20	0.45	7,630	1,991	6,486	1,692	5,722	1,194	5,342	975
		40	0.3	6,486	1,523	5,513	1,294	4,865	914	4,540	746
8	0.2	22	0.35	5,730	1900	4,524	1483	3,016	914	2,320	584
	0.3	22	0.5	5,730	1900	4,524	1483	3,016	914	2,320	584
	0.5	22	0.6	5,730	1900	4,524	1483	3,016	914	2,320	584
	1	22	0.7	5,730	1900	4,524	1483	3,016	914	2,320	584
	1.5	22	0.8	5,730	1900	4,524	1483	3,016	914	2,320	584
10	0.2	24	0.4	4,524	1728	3,567	1396	2,378	849	1,856	544
	0.3	24	0.5	4,524	1728	3,567	1396	2,378	849	1,856	544
	0.5	24	0.6	4,524	1728	3,567	1396	2,378	849	1,856	544
	1	24	0.7	4,524	1728	3,567	1396	2,378	849	1,856	544
	1.5	24	0.8	4,524	1728	3,567	1396	2,378	849	1,856	544
	2	24	0.9	4,524	1728	3,567	1396	2,378	849	1,856	544
12	0.2	26	0.5	3,857	1728	3,045	1396	2,030	849	1,537	544
	0.3	26	0.6	3,857	1728	3,045	1396	2,030	849	1,537	544
	0.5	26	0.7	3,857	1728	3,045	1396	2,030	849	1,537	544
	1	26	0.8	3,857	1728	3,045	1396	2,030	849	1,537	544
	1.5	26	0.9	3,857	1728	3,045	1396	2,030	849	1,537	544
	2	26	1	3,857	1728	3,045	1396	2,030	849	1,537	544
	3	26	1	3,857	1728	3,045	1396	2,030	849	1,537	544
16	0.5	35	2	2,842	1,512	2,262	1209	1,508	748	1,160	480
	1	35	2	2,842	453	2,262	362	1,508	224	1,160	480

· The above recommendation table may differ from the actual situation, adjust it according to the machine condition, processing type and purpose.

· In the case of low RPM, reduce the feed rate at the same rate.

ESRR714 SERIES

Workpiece				Carbon Steels, Alloy Steels (180~250HB)		Prehardened Steels (HRc35~45)		Herdened Steels (HRc45~55)		Herdened Steels (HRc55~65)	
Ratio to standard depth of cut				Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
Mill Dia (mm)	Diameter (mm)	Neck Length (mm)	Depth of Cut (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
0.5	0.05	2	0.023	50,000	1257	40,000	649	30,000	529	28,000	441
		4	0.017	40,000	1008	32,000	529	24,000	390	20,000	327
		6	0.008	28,800	672	19,400	364	18,000	350	15,000	280
		8	0.007	28,800	672	19,400	364	18,000	350	15,000	280
	0.1	2	0.03	50,000	1257	40,000	649	30,000	529	28,000	441
		4	0.02	40,000	1008	32,000	529	24,000	390	20,000	327
		6	0.013	28,800	672	19,400	364	18,000	350	15,000	280
		8	0.01	28,800	672	19,400	364	18,000	350	15,000	280
0.6	0.05	2	0.028	50,000	1622	37,830	840	28,200	546	23,000	448
		4	0.019	40,000	1,162	27,800	616	23,600	392	21,000	322
		6	0.012	24,000	686	18,000	420	17,800	336	15,000	294
		8	0.01	24,000	652	18,000	399	17,800	319	15,000	280
	0.1	2	0.035	50,000	1622	37,830	840	28,200	546	23,000	448
		4	0.024	40,000	1,162	27,800	616	23,600	392	21,000	322
		6	0.015	24,000	686	18,000	420	17,800	336	15,000	294
		8	0.013	24,000	652	18,000	399	17,800	319	15,000	280
0.7	0.05	2	0.028	49,200	1,475	34,190	781	29,030	497	25,830	408
		4	0.019	40,000	1,162	27,800	616	23,600	392	21,000	322
		6	0.012	24,000	686	18,000	420	17,800	336	15,000	294
		8	0.01	24,000	686	18,000	420	17,800	336	15,000	294
	0.1	2	0.042	49,200	1,475	34,190	781	29,030	497	25,830	408
		4	0.029	40,000	1,162	27,800	616	23,600	392	21,000	322
		6	0.018	24,000	686	18,000	420	17,800	336	15,000	294
		8	0.015	24,000	686	18,000	420	17,800	336	15,000	294
0.8	0.02	2	0.016	48,000	1929	28,000	905	20,000	560	360	504
		4	0.016	48,000	1,542	28,000	725	20,000	448	288	403
		6	0.013	38,700	1,120	25,000	645	18,000	403	256	358
		8	0.011	29,025	840	20,000	516	16,200	362	230	322
		10	0.01	29,025	798	20,000	490	16,200	344	219	306
		12	0.09	29,025	798	20,000	490	16,200	344	219	306
	0.05	2	0.038	48,000	1929	28,000	905	20,000	560	360	504
		4	0.026	48,000	1,542	28,000	725	20,000	448	288	403
		6	0.015	38,700	1,120	25,000	645	18,000	403	256	358
		8	0.012	29,025	840	20,000	516	16,200	362	230	322
		10	0.011	29,025	798	20,000	490	16,200	344	219	306
		12	0.01	29,025	798	20,000	490	16,200	344	219	306
	0.1	2	0.047	48,000	1929	28,000	905	20,000	560	360	504
		4	0.032	48,000	1,542	28,000	725	20,000	448	288	403
		6	0.019	38,700	1,120	25,000	645	18,000	403	256	358
		8	0.015	29,025	840	20,000	516	16,200	362	230	322
		10	0.013	29,025	798	20,000	490	16,200	344	219	306
		12	0.012	29,025	798	20,000	490	16,200	344	219	306
1	0.02	4	0.013	32,400	1902	27,540	1454	24,300	1141	22,680	932
		6	0.01	26,244	1386	22,307	1178	19,683	924	18,371	754

Recommended Cutting Condition

ESRR714 SERIES

Workpiece				Carbon Steels, Alloy Steels (180~250HB)		Prehardened Steels (HRc35~45)		Herdened Steels (HRc45~55)		Herdened Steels (HRc55~65)	
Ratio to standard depth of cut				Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
Mill Dia (mm)	Diameter (mm)	Neck Length (mm)	Depth of Cut (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
1	0.02	8	0.008	23,328	1232	19,829	1047	17,496	821	16,330	670
		10	0.006	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.005	18,144	852	15,422	634	13,608	558	12,701	448
		14	0.004	18,144	746	15,422	588	13,608	478	12,701	372
		16	0.004	18,144	746	15,422	588	13,608	478	12,701	372
		20	0.003	13,608	558	11,567	441	10,206	359	9,526	280
	0.05	3	0.027	32,400	1902	27,540	1454	24,300	1141	22,680	932
		4	0.027	32,400	1902	27,540	1454	24,300	1141	22,680	932
		6	0.017	26,244	1386	22,307	1178	19,683	924	18,371	754
		8	0.016	23,328	1232	19,829	1047	17,496	821	16,330	670
		10	0.011	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.01	18,144	852	15,422	634	13,608	558	12,701	448
		14	0.008	18,144	746	15,422	588	13,608	478	12,701	372
		16	0.006	18,144	746	15,422	588	13,608	478	12,701	372
		20	0.004	13,608	558	11,567	441	10,206	359	9,526	280
	0.1	3	0.038	32,400	1902	27,540	1454	24,300	1141	22,680	932
		4	0.038	32,400	1902	27,540	1454	24,300	1141	22,680	932
		6	0.024	26,244	1386	22,307	1178	19,683	924	18,371	754
		8	0.024	23,328	1232	19,829	1047	17,496	821	16,330	670
		10	0.015	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.015	18,144	852	15,422	634	13,608	558	12,701	448
		14	0.012	18,144	746	15,422	588	13,608	478	12,701	372
		16	0.009	18,144	746	15,422	588	13,608	478	12,701	372
		20	0.006	13,608	558	11,567	441	10,206	359	9,526	280
	0.2	3	0.07	32,400	1902	27,540	1454	24,300	1141	22,680	932
		4	0.07	32,400	1902	27,540	1454	24,300	1141	22,680	932
		6	0.04	26,244	1386	22,307	1178	19,683	924	18,371	754
		8	0.04	23,328	1232	19,829	1047	17,496	821	16,330	670
		10	0.025	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.025	18,144	852	15,422	634	13,608	558	12,701	448
		14	0.02	18,144	746	15,422	588	13,608	478	12,701	372
		16	0.015	18,144	746	15,422	588	13,608	478	12,701	372
		20	0.01	13,608	558	11,567	441	10,206	359	9,526	280
	0.3	3	0.07	32,400	1902	27,540	1454	24,300	1141	22,680	932
		4	0.07	32,400	1902	27,540	1454	24,300	1141	22,680	932
		6	0.04	26,244	1386	22,307	1178	19,683	924	18,371	754
		8	0.04	23,328	1232	19,829	1047	17,496	821	16,330	670
		10	0.025	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.025	18,144	852	15,422	634	13,608	558	12,701	448
		14	0.02	18,144	746	15,422	588	13,608	478	12,701	372
		16	0.015	18,144	746	15,422	588	13,608	478	12,701	372
		20	0.01	13,608	558	11,567	441	10,206	359	9,526	280
1.2	0.02	4	0.013	28,868	1,615	24,538	1,299	21,651	1017	20,208	831
		6	0.01	28,868	1,615	24,538	1,299	21,651	1,017	20,208	831

ESRR714 SERIES

Workpiece				Carbon Steels, Alloy Steels (180~250HB)		Prehardened Steels (HRc35~45)		Herdened Steels (HRc45~55)		Herdened Steels (HRc55~65)	
Ratio to standard depth of cut				Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
Mill Dia (mm)	Diameter (mm)	Neck Length (mm)	Depth of Cut (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
1.2	0.02	8	0.008	24,640	1,346	20,944	1,107	18,480	868	17,248	708
		10	0.006	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.005	19,278	912	16,386	775	14,458	599	13,494	478
		14	0.004	18,144	746	15,422	634	13,608	478	12,701	372
		16	0.004	18,144	746	15,422	634	13,608	478	12,701	372
		20	0.003	13,608	558	11,567	441	10,206	359	9,526	280
	0.05	3	0.027	28,868	1,615	24,538	1,299	21,651	1017	20,208	831
		4	0.027	28,868	1,615	24,538	1,299	21,651	1017	20,208	831
		6	0.017	28,868	1,615	24,538	1,299	21,651	1,017	20,208	831
		8	0.016	24,640	1,346	20,944	1,107	18,480	868	17,248	708
		10	0.011	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.01	19,278	912	16,386	775	14,458	599	13,494	478
		14	0.008	18,144	746	15,422	634	13,608	478	12,701	372
		16	0.006	18,144	746	15,422	634	13,608	478	12,701	372
		20	0.004	13,608	558	11,567	441	10,206	359	9,526	280
	0.1	3	0.03	28,868	1,615	24,538	1,299	21,651	1017	20,208	831
		4	0.03	28,868	1,615	24,538	1,299	21,651	1017	20,208	831
		6	0.03	28,868	1,615	24,538	1,299	21,651	1,017	20,208	831
		8	0.022	24,640	1,346	20,944	1,107	18,480	868	17,248	708
		10	0.015	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.012	19,278	912	16,386	775	14,458	599	13,494	478
		14	0.01	18,144	746	15,422	634	13,608	478	12,701	372
		16	0.01	18,144	746	15,422	634	13,608	478	12,701	372
		20	0.006	13,608	558	11,567	441	10,206	359	9,526	280
	0.2	3	0.05	28,868	1,615	24,538	1,299	21,651	1017	20,208	831
		4	0.05	28,868	1,615	24,538	1,299	21,651	1017	20,208	831
		6	0.05	28,868	1,615	24,538	1,299	21,651	1,017	20,208	831
		8	0.037	24,640	1,346	20,944	1,107	18,480	868	17,248	708
		10	0.025	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.02	19,278	912	16,386	775	14,458	599	13,494	478
		14	0.016	18,144	746	15,422	634	13,608	478	12,701	372
		16	0.016	18,144	746	15,422	634	13,608	478	12,701	372
		20	0.01	13,608	558	11,567	441	10,206	359	9,526	280
	0.3	3	0.05	28,868	1,615	24,538	1,299	21,651	1017	20,208	831
		4	0.05	28,868	1,615	24,538	1,299	21,651	1017	20,208	831
		6	0.05	28,868	1,615	24,538	1,299	21,651	1,017	20,208	831
		8	0.037	24,640	1,346	20,944	1,107	18,480	868	17,248	708
		10	0.025	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.02	19,278	912	16,386	775	14,458	599	13,494	478
		16	0.016	18,144	746	15,422	634	13,608	478	12,701	372
		20	0.01	13,608	558	11,567	441	10,206	359	9,526	280
1.5	0.02	6	0.01	23,779	1,503	20,382	1,325	17,834	1,052	16,560	855
		8	0.008	22,680	1,437	19,278	1,289	17,010	1,002	15,876	814
		10	0.006	20,412	1,293	17,350	1,222	15,309	959	14,288	782

Recommended Cutting Condition

ESRR714 SERIES

Workpiece				Carbon Steels, Alloy Steels (180~250HB)		Prehardened Steels (HRc35~45)		Herdened Steels (HRc45~55)		Herdened Steels (HRc55~65)	
Ratio to standard depth of cut				Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
Mill Dia (mm)	Diameter (mm)	Neck Length (mm)	Depth of Cut (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
1.5	0.02	8	0.008	24,640	1,346	20,944	1,107	18,480	868	17,248	708
		10	0.006	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.005	19,278	912	16,386	775	14,458	599	13,494	478
		14	0.004	18,144	746	15,422	634	13,608	478	12,701	372
		16	0.004	18,144	746	15,422	634	13,608	478	12,701	372
		20	0.003	13,608	558	11,567	441	10,206	359	9,526	280
	0.05	3	0.027	28,868	1,615	24,538	1,299	21,651	1017	20,208	831
		4	0.027	28,868	1,615	24,538	1,299	21,651	1017	20,208	831
		6	0.017	28,868	1,615	24,538	1,299	21,651	1,017	20,208	831
		8	0.016	24,640	1,346	20,944	1,107	18,480	868	17,248	708
		10	0.011	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.01	19,278	912	16,386	775	14,458	599	13,494	478
		14	0.008	18,144	746	15,422	634	13,608	478	12,701	372
		16	0.006	18,144	746	15,422	634	13,608	478	12,701	372
		20	0.004	13,608	558	11,567	441	10,206	359	9,526	280
	0.1	3	0.03	28,868	1,615	24,538	1,299	21,651	1017	20,208	831
		4	0.03	28,868	1,615	24,538	1,299	21,651	1017	20,208	831
		6	0.03	28,868	1,615	24,538	1,299	21,651	1,017	20,208	831
		8	0.022	24,640	1,346	20,944	1,107	18,480	868	17,248	708
		10	0.015	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.012	19,278	912	16,386	775	14,458	599	13,494	478
		14	0.01	18,144	746	15,422	634	13,608	478	12,701	372
		16	0.01	18,144	746	15,422	634	13,608	478	12,701	372
		20	0.006	13,608	558	11,567	441	10,206	359	9,526	280
	0.2	3	0.05	28,868	1,615	24,538	1,299	21,651	1017	20,208	831
		4	0.05	28,868	1,615	24,538	1,299	21,651	1017	20,208	831
		6	0.05	28,868	1,615	24,538	1,299	21,651	1,017	20,208	831
		8	0.037	24,640	1,346	20,944	1,107	18,480	868	17,248	708
		10	0.025	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.02	19,278	912	16,386	775	14,458	599	13,494	478
		14	0.016	18,144	746	15,422	634	13,608	478	12,701	372
		16	0.016	18,144	746	15,422	634	13,608	478	12,701	372
		20	0.01	13,608	558	11,567	441	10,206	359	9,526	280
	0.3	3	0.05	28,868	1,615	24,538	1,299	21,651	1017	20,208	831
		4	0.05	28,868	1,615	24,538	1,299	21,651	1017	20,208	831
		6	0.05	28,868	1,615	24,538	1,299	21,651	1,017	20,208	831
		8	0.037	24,640	1,346	20,944	1,107	18,480	868	17,248	708
		10	0.025	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.02	19,278	912	16,386	775	14,458	599	13,494	478
		16	0.016	18,144	746	15,422	634	13,608	478	12,701	372
		20	0.01	13,608	558	11,567	441	10,206	359	9,526	280
1.5	0.02	6	0.01	23,779	1,503	20,382	1,325	17,834	1,052	16,560	855
		8	0.008	22,680	1,437	19,278	1,289	17,010	1,002	15,876	814
		10	0.006	20,412	1,293	17,350	1,222	15,309	959	14,288	782

ESRR714 SERIES

Workpiece				Carbon Steels, Alloy Steels (180~250HB)		Prehardened Steels (HRc35~45)		Herdened Steels (HRc45~55)		Herdened Steels (HRc55~65)	
Ratio to standard depth of cut				Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
Mill Dia (mm)	Diameter (mm)	Neck Length (mm)	Depth of Cut (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
1.5	0.02	12	0.005	18,144	1,150	15,422	1,099	13,608	862	12,701	704
		14	0.004	14,112	795	11,995	977	10,584	767	9,878	625
		16	0.004	14,112	795	11,995	592	10,584	522	9,878	417
		20	0.003	14,112	795	11,995	592	10,584	522	9,878	417
		22	0.003	14,112	795	11,995	592	10,584	522	9,878	417
	0.05	4	0.027	24,930	1,582	20,956	1325	18,711	1052	17,364	855
		6	0.017	23,779	1,503	20,382	1,325	17,834	1,052	16,560	855
		8	0.016	22,680	1,437	19,278	1,289	17,010	1,002	15,876	814
		10	0.011	20,412	1,293	17,350	1,222	15,309	959	14,288	782
		12	0.01	18,144	1,150	15,422	1,099	13,608	862	12,701	704
		14	0.008	14,112	795	11,995	977	10,584	767	9,878	625
		16	0.006	14,112	795	11,995	592	10,584	522	9,878	417
		20	0.004	14,112	795	11,995	592	10,584	522	9,878	417
		22	0.004	14,112	795	11,995	592	10,584	522	9,878	417
		26	0.003	14,112	795	11,995	592	10,584	522	9,878	417
	0.1	4	0.042	24,930	1,582	20,956	1325	18,711	1052	17,364	855
		6	0.04	23,779	1,503	20,382	1,325	17,834	1,052	16,560	855
		8	0.036	22,680	1,437	19,278	1,289	17,010	1,002	15,876	814
		10	0.036	20,412	1,293	17,350	1,222	15,309	959	14,288	782
		12	0.036	18,144	1,150	15,422	1,099	13,608	862	12,701	704
		14	0.023	14,112	795	11,995	977	10,584	767	9,878	625
		16	0.023	14,112	795	11,995	592	10,584	522	9,878	417
		20	0.018	14,112	795	11,995	592	10,584	522	9,878	417
		22	0.015	14,112	795	11,995	592	10,584	522	9,878	417
		26	0.01	14,112	795	11,995	592	10,584	522	9,878	417
	0.2	4	0.07	24,930	1,582	20,956	1325	18,711	1052	17,364	855
		6	0.065	23,779	1,503	20,382	1,325	17,834	1,052	16,560	855
		8	0.06	22,680	1,437	19,278	1,289	17,010	1,002	15,876	814
		10	0.06	20,412	1,293	17,350	1,222	15,309	959	14,288	782
		12	0.06	18,144	1,150	15,422	1,099	13,608	862	12,701	704
		14	0.038	14,112	795	11,995	977	10,584	767	9,878	625
		16	0.038	14,112	795	11,995	592	10,584	522	9,878	417
		20	0.03	14,112	795	11,995	592	10,584	522	9,878	417
		22	0.025	14,112	795	11,995	592	10,584	522	9,878	417
		25	0.02	14,112	795	11,995	592	10,584	522	9,878	417
	0.3	4	0.07	24,930	1,582	20,956	1325	18,711	1052	17,364	855
		6	0.065	23,779	1,503	20,382	1,325	17,834	1,052	16,560	855
		8	0.06	22,680	1,437	19,278	1,289	17,010	1,002	15,876	814
		10	0.06	20,412	1,293	17,350	1,222	15,309	959	14,288	782
		12	0.06	18,144	1,150	15,422	1,099	13,608	862	12,701	704
		14	0.038	14,112	795	11,995	977	10,584	767	9,878	625
		16	0.038	14,112	795	11,995	592	10,584	522	9,878	417
		20	0.03	14,112	795	11,995	592	10,584	522	9,878	417
		22	0.025	14,112	795	11,995	592	10,584	522	9,878	417

Recommended Cutting Condition

ESRR714 SERIES

Workpiece				Carbon Steels, Alloy Steels (180~250HB)		Prehardened Steels (HRc35~45)		Herdened Steels (HRc45~55)		Herdened Steels (HRc55~65)	
Ratio to standard depth of cut				Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
Mill Dia (mm)	Diameter (mm)	Neck Length (mm)	Depth of Cut (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
1.5	0.3	25	0.02	14,112	795	11,995	592	10,584	522	9,878	417
	0.5	4	0.085	24,930	1,582	20,956	1325	18,711	1052	17,364	855
		6	0.08	23,779	1,503	20,382	1,325	17,834	1,052	16,560	855
		8	0.07	22,680	1,437	19,278	1,289	17,010	1,002	15,876	814
		10	0.067	20,412	1,293	17,350	1,222	15,309	959	14,288	782
		12	0.065	18,144	1,150	15,422	1,099	13,608	862	12,701	704
		14	0.045	14,112	795	11,995	977	10,584	767	9,878	625
		16	0.045	14,112	795	11,995	592	10,584	522	9,878	417
		20	0.035	14,112	795	11,995	592	10,584	522	9,878	417
		22	0.03	14,112	795	11,995	592	10,584	522	9,878	417
		25	0.025	14,112	795	11,995	592	10,584	522	9,878	417
2	0.02	6	0.013	20,790	2289	17,672	1944	15,593	1373	14,553	1121
		8	0.01	18,900	2080	16,065	1768	14,175	1248	13,230	1019
		10	0.008	17104	1797	14539	1528	12828	1129	11973	922
		12	0.006	15,309	1516	13,013	1289	11,482	1010	10,716	826
		14	0.005	14,458	1432	12,290	1216	10,844	954	10,121	779
		16	0.004	13,608	1,348	11,567	1145	10,206	898	9,526	733
		20	0.004	11,907	1180	10,121	1002	8,930	786	8,335	642
		25	0.003	11,907	1059	10,121	900	8,930	707	8,335	575
		30	0.003	11,312	1006	9,615	855	8,484	672	7,918	547
	0.05	6	0.027	20,790	2289	17,672	1944	15,593	1373	14,553	1121
		8	0.017	18,900	2080	16,065	1768	14,175	1248	13,230	1019
		10	0.016	17104	1797	14539	1528	12828	1129	11973	922
		12	0.011	15,309	1516	13,013	1289	11,482	1010	10,716	826
		14	0.01	14,458	1432	12,290	1216	10,844	954	10,121	779
		16	0.008	13,608	1,348	11,567	1145	10,206	898	9,526	733
		20	0.006	11,907	1180	10,121	1002	8,930	786	8,335	642
		25	0.004	11,907	1059	10,121	900	8,930	707	8,335	575
		30	0.003	11,312	1006	9,615	855	8,484	672	7,918	547
	0.1	6	0.07	20,790	2289	17,672	1944	15,593	1373	14,553	1121
		8	0.055	18,900	2080	16,065	1768	14,175	1248	13,230	1019
		10	0.042	17104	1797	14539	1528	12828	1129	11973	922
		12	0.03	15,309	1516	13,013	1289	11,482	1010	10,716	826
		14	0.03	14,458	1432	12,290	1216	10,844	954	10,121	779
		16	0.03	13,608	1,348	11,567	1145	10,206	898	9,526	733
		20	0.025	11,907	1180	10,121	1002	8,930	786	8,335	642
		22	0.02	11,907	1059	10,121	900	8,930	707	8,335	575
		25	0.015	11,907	1059	10,121	900	8,930	707	8,335	575
		30	0.01	11,312	1006	9,615	855	8,484	672	7,918	547
	0.2	6	0.08	20,790	2289	17,672	1944	15,593	1373	14,553	1121
		8	0.07	18,900	2080	16,065	1768	14,175	1248	13,230	1019
		10	0.055	17104	1797	14539	1528	12828	1129	11973	922
		12	0.04	15,309	1516	13,013	1289	11,482	1010	10,716	826
		14	0.04	14,458	1432	12,290	1216	10,844	954	10,121	779

ESRR714 SERIES

Workpiece				Carbon Steels, Alloy Steels (180~250HB)		Prehardened Steels (HRc35~45)		Herdened Steels (HRc45~55)		Herdened Steels (HRc55~65)	
Ratio to standard depth of cut				Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
Mill Dia (mm)	Diameter (mm)	Neck Length (mm)	Depth of Cut (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
2	0.2	16	0.04	13,608	1,348	11,567	1145	10,206	898	9,526	733
		20	0.035	11,907	1180	10,121	1002	8,930	786	8,335	642
		22	0.03	11,907	1059	10,121	900	8,930	707	8,335	575
		25	0.025	11,907	1059	10,121	900	8,930	707	8,335	575
		30	0.017	11,312	1006	9,615	855	8,484	672	7,918	547
	0.3	6	0.11	20,790	2289	17,672	1944	15,593	1373	14,553	1121
		8	0.09	18,900	2080	16,065	1768	14,175	1248	13,230	1019
		10	0.075	17104	1797	14539	1528	12828	1129	11973	922
		12	0.06	15,309	1516	13,013	1289	11,482	1010	10,716	826
		14	0.06	14,458	1432	12,290	1216	10,844	954	10,121	779
		16	0.06	13,608	1,348	11,567	1145	10,206	898	9,526	733
		20	0.037	11,907	1180	10,121	1002	8,930	786	8,335	642
		22	0.033	11,907	1059	10,121	900	8,930	707	8,335	575
		25	0.03	11,907	1059	10,121	900	8,930	707	8,335	575
		30	0.021	11,312	1006	9,615	855	8,484	672	7,918	547
	0.5	6	0.17	20,790	2289	17,672	1944	15,593	1373	14,553	1121
		8	0.14	18,900	2080	16,065	1768	14,175	1248	13,230	1019
		10	0.11	17104	1797	14539	1528	12828	1129	11973	922
		12	0.08	15,309	1516	13,013	1289	11,482	1010	10,716	826
		14	0.08	14,458	1432	12,290	1216	10,844	954	10,121	779
		16	0.08	13,608	1,348	11,567	1145	10,206	898	9,526	733
		20	0.05	11,907	1180	10,121	1002	8,930	786	8,335	642
		22	0.05	11,907	1059	10,121	900	8,930	707	8,335	575
		25	0.05	11,907	1059	10,121	900	8,930	707	8,335	575
		30	0.03	11,312	1006	9,615	855	8,484	672	7,918	547
2.5	0.1	8	0.06	18,900	2,080	16,065	1,768	14,175	1248	13,230	1019
		10	0.055	18,900	2,080	16,065	1,768	14,175	1248	13,230	1019
		12	0.051	18,018	1,958	15,315	1664	13,513	1190	12,613	1019
		14	0.046	17,136	1835	14,566	1560	12,852	1132	11,995	971
		16	0.042	16,254	1,713	13,816	1,456	12,190	1,073	11,378	876
		20	0.03	13,608	1,348	11,567	1,145	10,206	898	9,526	733
		25	0.022	12,757	1204	10,844	1022	9,568	802	8,930	653
		30	0.015	11,907	1,059	10,121	900	8,930	707	8,335	575
	0.2	8	0.08	18,900	2,080	16,065	1,768	14,175	1248	13,230	1019
		10	0.07	18,900	2,080	16,065	1,768	14,175	1248	13,230	1019
		12	0.06	18,018	1,958	15,315	1664	13,513	1190	12,613	1019
		14	0.05	17,136	1835	14,566	1560	12,852	1132	11,995	971
		16	0.055	16,254	1,713	13,816	1,456	12,190	1,073	11,378	876
		20	0.04	13,608	1,348	11,567	1,145	10,206	898	9,526	733
		25	0.03	12,757	1204	10,844	1022	9,568	802	8,930	653
		30	0.02	11,907	1,059	10,121	900	8,930	707	8,335	575
	0.3	8	0.1	18,900	2,080	16,065	1,768	14,175	1248	13,230	1019
		10	0.09	18,900	2,080	16,065	1,768	14,175	1248	13,230	1019
		12	0.085	18,018	1,958	15,315	1664	13,513	1190	12,613	1019

Recommended Cutting Condition

ESRR714 SERIES

Workpiece				Carbon Steels, Alloy Steels (180~250HB)		Prehardened Steels (HRc35~45)		Herdened Steels (HRc45~55)		Herdened Steels (HRc55~65)	
Ratio to standard depth of cut				Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
Mill Dia (mm)	Diameter (mm)	Neck Length (mm)	Depth of Cut (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
2.5	0.3	14	0.08	17,136	1835	14,566	1560	12,852	1132	11,995	971
		16	0.075	16,254	1,713	13,816	1,456	12,190	1,073	11,378	876
		20	0.06	13,608	1,348	11,567	1,145	10,206	898	9,526	733
		25	0.065	12,757	1204	10,844	1022	9,568	802	8,930	653
		30	0.06	11,907	1,059	10,121	900	8,930	707	8,335	575
	0.5	8	0.15	18,900	2,080	16,065	1,768	14,175	1248	13,230	1019
		10	0.14	18,900	2,080	16,065	1,768	14,175	1248	13,230	1019
		12	0.13	18,018	1,958	15,315	1664	13,513	1190	12,613	1019
		14	0.12	17,136	1835	14,566	1560	12,852	1132	11,995	971
		16	0.11	16,254	1,713	13,816	1,456	12,190	1,073	11,378	876
		20	0.08	13,608	1,348	11,567	1,145	10,206	898	9,526	733
		25	0.07	12,757	1204	10,844	1022	9,568	802	8,930	653
		30	0.05	11,907	1,059	10,121	900	8,930	707	8,335	575
3	0.1	8	0.07	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		10	0.06	14400	1,981	12240	1,684	10800	1188	10080	970
		12	0.05	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		14	0.047	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		16	0.035	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		20	0.035	11,664	1,604	9,914	1,363	8,748	961	8,165	785
		25	0.031	10368	1,362	8812.5	1,158	7776	816	7257.5	667
		30	0.027	9,072	1,121	7,711	953	6,804	672	6,350	550
		35	0.02	9,072	1,121	7,711	953	6,804	672	6,350	550
		40	0.015	8,164	897	6,939	762	6,123	537	5,715	440
		45	0.01	7,258	672	6,169	572	5,443	403	5,080	330
	0.2	8	0.09	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		10	0.08	14400	1,981	12240	1,684	10800	1188	10080	970
		12	0.07	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		14	0.06	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		16	0.05	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		20	0.05	11,664	1,604	9,914	1,363	8,748	961	8,165	785
		25	0.045	10368	1,362	8812.5	1,158	7776	816	7257.5	667
		30	0.04	9,072	1,121	7,711	953	6,804	672	6,350	550
		35	0.035	9,072	1,121	7,711	953	6,804	672	6,350	550
		40	0.03	8,164	897	6,939	762	6,123	537	5,715	440
		45	0.025	7,258	672	6,169	572	5,443	403	5,080	330
	0.3	8	0.13	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		10	0.115	14400	1,981	12240	1,684	10800	1188	10080	970
		12	0.1	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		14	0.085	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		16	0.075	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		20	0.075	11,664	1,604	9,914	1,363	8,748	961	8,165	785
		25	0.0675	10368	1,362	8812.5	1,158	7776	816	7257.5	667
		30	0.06	9,072	1,121	7,711	953	6,804	672	6,350	550
		35	0.05	9,072	1,121	7,711	953	6,804	672	6,350	550

ESRR714 SERIES

Workpiece				Carbon Steels, Alloy Steels (180~250HB)		Prehardened Steels (HRc35~45)		Herdened Steels (HRc45~55)		Herdened Steels (HRc55~65)	
Ratio to standard depth of cut				Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
Mill Dia (mm)	Diameter (mm)	Neck Length (mm)	Depth of Cut (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
3	0.3	40	0.04	8,164	897	6,939	762	6,123	537	5,715	440
		45	0.03	7,258	672	6,169	572	5,443	403	5,080	330
	0.5	8	0.18	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		10	0.155	14400	1,981	12240	1,684	10800	1188	10080	970
		12	0.13	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		14	0.12	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		16	0.1	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		20	0.1	11,664	1,604	9,914	1,363	8,748	961	8,165	785
		25	0.09	10368	1,362	8812.5	1,158	7776	816	7257.5	667
		30	0.08	9,072	1,121	7,711	953	6,804	672	6,350	550
		35	0.065	9,072	1,121	7,711	953	6,804	672	6,350	550
		40	0.05	8,164	897	6,939	762	6,123	537	5,715	440
		45	0.04	7,258	672	6,169	572	5,443	403	5,080	330
		50	0.03	6,532	538	5,552	457	4,899	322	4,572	264
	1	8	0.2	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		10	0.175	14400	1,981	12240	1,684	10800	1188	10080	970
		12	0.15	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		14	0.13	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		16	0.12	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		20	0.11	11,664	1,604	9,914	1,363	8,748	961	8,165	785
		25	0.1	10368	1,362	8812.5	1,158	7776	816	7257.5	667
		30	0.09	9,072	1,121	7,711	953	6,804	672	6,350	550
		35	0.075	9,072	1,121	7,711	953	6,804	672	6,350	550
		40	0.06	8,164	897	6,939	762	6,123	537	5,715	440
		45	0.045	7,258	672	6,169	572	5,443	403	5,080	330
		50	0.03	6,532	538	5,552	457	4,899	322	4,572	264
4	0.1	10	0.072	11,213	2,730	9,531	2,321	8,410	1,638	7,849	1338
		12	0.065	11,213	2,730	9,531	2,321	8,410	1638	7,849	1338
		13	0.062	10,734	2,613	9,114	2,219	8,004	1558	7,266	1239
		16	0.06	10,255	2,496	8,697	2116	7,599	1479	6,684	1139
		20	0.055	10,255	2496	8,697	2,116	7,599	1479	6,884	1139
		25	0.05	10,255	2,496	7,782	1,810	6,545	1,221	5,904	962
		30	0.045	10,255	2,496	6,867	1,505	5,491	963	5,124	785
		35	0.04	10,255	2,496	6,867	1505	5,491	963	5,124	785
		40	0.035	9,247	2,000	6,225	1,262	5,217	842	4,621	643
		45	0.03	8,240	1,505	5,584	1,019	4,944	722	4,119	501
		50	0.02	7,398	1,200	4,980	757	4,174	505	3,697	385
	0.2	10	0.15	11,213	2,730	9,531	2,321	8,410	1,638	7,849	1338
		12	0.14	11,213	2,730	9,531	2,321	8,410	1638	7,849	1338
		13	0.135	10,734	2,613	9,114	2,219	8,004	1558	7,266	1239
		16	0.13	10,255	2,496	8,697	2116	7,599	1479	6,684	1139
		20	0.11	10,255	2496	8,697	2,116	7,599	1479	6,884	1139
		25	0.105	10,255	2,496	7,782	1,810	6,545	1,221	5,904	962
		30	0.1	10,255	2,496	6,867	1,505	5,491	963	5,124	785

Recommended Cutting Condition

ESRR714 SERIES

Workpiece				Carbon Steels, Alloy Steels (180~250HB)		Prehardened Steels (HRc35~45)		Herdened Steels (HRc45~55)		Herdened Steels (HRc55~65)	
Ratio to standard depth of cut				Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
Mill Dia (mm)	Diameter (mm)	Neck Length (mm)	Depth of Cut (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
4	0.2	35	0.08	10,255	2,496	6,867	1505	5,491	963	5,124	785
		40	0.07	9,247	2,000	6,225	1,262	5,217	842	4,621	643
		45	0.06	8,240	1,505	5,584	1,019	4,944	722	4,119	501
		50	0.05	7,398	1,200	4,980	757	4,174	505	3,697	385
	0.3	10	0.23	11,213	2,730	9,531	2,321	8,410	1,638	7,849	1338
		12	0.22	11,213	2,730	9,531	2,321	8,410	1638	7,849	1338
		13	0.21	10,734	2,613	9,114	2,219	8,004	1558	7,266	1239
		16	0.2	10,255	2,496	8,697	2116	7,599	1479	6,684	1139
		20	0.18	10,255	2496	8,697	2,116	7,599	1479	6,884	1139
		25	0.17	10,255	2,496	7,782	1,810	6,545	1,221	5,904	962
		30	0.16	10,255	2,496	6,867	1,505	5,491	963	5,124	785
		35	0.14	10,255	2,496	6,867	1505	5,491	963	5,124	785
		40	0.13	9,247	2,000	6,225	1,262	5,217	842	4,621	643
		45	0.12	8,240	1,505	5,584	1,019	4,944	722	4,119	501
		50	0.11	7,398	1,200	4,980	757	4,174	505	3,697	385
	0.5	10	0.4	11,213	2,730	9,531	2,321	8,410	1,638	7,849	1338
		12	0.35	11,213	2,730	9,531	2,321	8,410	1638	7,849	1338
		13	0.3	10,734	2,613	9,114	2,219	8,004	1558	7,266	1239
		16	0.25	10,255	2,496	8,697	2116	7,599	1479	6,684	1139
		20	0.2	10,255	2496	8,697	2,116	7,599	1479	6,884	1139
		25	0.175	10,255	2,496	7,782	1,810	6,545	1,221	5,904	962
		30	0.15	10,255	2,496	6,867	1,505	5,491	963	5,124	785
		35	0.1	10,255	2,496	6,867	1505	5,491	963	5,124	785
		40	0.075	9,247	2,000	6,225	1,262	5,217	842	4,621	643
		45	0.05	8,240	1,505	5,584	1,019	4,944	722	4,119	501
		50	0.04	7,398	1,200	4,980	757	4,174	505	3,697	385
		55	0.03	6,592	9903	4,467	611	3,955	433	3,295	300
	1	10	0.5	11,213	2,730	9,531	2,321	8,410	1,638	7,849	1338
		12	0.4	11,213	2,730	9,531	2,321	8,410	1638	7,849	1338
		13	0.35	10,734	2,613	9,114	2,219	8,004	1558	7,266	1239
		16	0.29	10,255	2,496	8,697	2116	7,599	1479	6,684	1139
		20	0.23	10,255	2496	8,697	2,116	7,599	1479	6,884	1139
		25	0.2	10,255	2,496	7,782	1,810	6,545	1,221	5,904	962
		30	0.17	10,255	2,496	6,867	1,505	5,491	963	5,124	785
		35	0.12	10,255	2,496	6,867	1505	5,491	963	5,124	785
		40	0.09	9,247	2,000	6,225	1,262	5,217	842	4,621	643
		45	0.06	8,240	1,505	5,584	1,019	4,944	722	4,119	501
		50	0.05	7,398	1,200	4,980	757	4,174	505	3,697	385
		55	0.04	6,592	9903	4,467	611	3,955	433	3,295	300
5	0.1	16	0.08	9,154	2786	7,781	2368	6,866	1671	6,408	1365
		30	0.07	7,872	2291	6,691	1948	5,904	1374	5,510	1122
		40	0.06	6,590	1797	5,602	1527	4,943	1078	4,613	880
	0.2	16	0.16	9,154	2786	7,781	2368	6,866	1671	6,408	1365
		30	0.145	7,872	2291	6,691	1948	5,904	1374	5,510	1122

ESRR714 SERIES

Workpiece				Carbon Steels, Alloy Steels (180~250HB)		Prehardened Steels (HRc35~45)		Herdened Steels (HRc45~55)		Herdened Steels (HRc55~65)	
Ratio to standard depth of cut				Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
Mill Dia (mm)	Diameter (mm)	Neck Length (mm)	Depth of Cut (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
5	0.2	40	0.13	6,590	1797	5,602	1527	4,943	1078	4,613	880
	0.3	16	0.24	9,154	2786	7,781	2368	6,866	1671	6,408	1365
		30	0.22	7,872	2291	6,691	1948	5,904	1374	5,510	1122
		40	0.2	6,590	1797	5,602	1527	4,943	1078	4,613	880
	0.5	16	0.35	9,154	2786	7,781	2368	6,866	1671	6,408	1365
		30	0.296	7,872	2291	6,691	1948	5,904	1374	5,510	1122
		40	0.135	6,590	1797	5,602	1527	4,943	1078	4,613	880
		50	0.12	5,272	1078	4,482	916	3,954	646	3,690	528
		60	0.1	4,218	647	3,585	549	3,164	388	2,952	317
	1	16	0.4	9,154	2786	7,781	2368	6,866	1671	6,408	1365
		30	0.275	7,872	2291	6,691	1948	5,904	1374	5,510	1122
		40	0.15	6,590	1797	5,602	1527	4,943	1078	4,613	880
		50	0.13	5,272	1078	4,482	916	3,954	646	3,690	528
		60	0.11	4,218	647	3,585	549	3,164	388	2,952	317
	1.5	15	0.45	9,154	2786	7,781	2368	6,866	1671	6,408	1365
	2	15	0.5	9,154	2786	7,781	2368	6,866	1671	6,408	1365
6	0.1	20	0.065	7,630	2787	6,486	2368	5,722	1671	5,432	1365
		40	0.05	6,486	2132	5,513	1811	4,865	1279	4,540	1044
		50	0.04	5,491	1,470	4,668	1,248	4,118	872	3,844	711
	0.2	20	0.14	7,630	2787	6,486	2368	5,722	1671	5,432	1365
		40	0.11	6,486	2132	5,513	1811	4,865	1279	4,540	1044
		50	0.08	5,491	1,470	4,668	1,248	4,118	872	3,844	711
	0.3	20	0.22	7,630	2787	6,486	2368	5,722	1671	5,432	1365
		30	0.2	7,630	2787	6,486	2368	5,722	1671	5,432	1365
		40	0.18	6,486	2132	5,513	1811	4,865	1279	4,540	1044
		50	0.14	5,491	1,470	4,668	1,248	4,118	872	3,844	711
	0.5	20	0.35	7,630	2787	6,486	2368	5,722	1671	5,432	1365
		30	0.29	7,630	2787	6,486	2368	5,722	1671	5,432	1365
		40	0.24	6,486	2132	5,513	1811	4,865	1279	4,540	1044
		50	0.165	5,491	1,470	4,668	1,248	4,118	872	3,844	711
		60	0.1	5,491	1,470	4,668	1,248	4,118	872	3,844	711
	1	20	0.4	7,630	2787	6,486	2368	5,722	1671	5,432	1365
		30	0.35	7,630	2787	6,486	2368	5,722	1671	5,432	1365
		40	0.28	6,486	2132	5,513	1811	4,865	1279	4,540	1044
		50	0.2	5,491	1,470	4,668	1,248	4,118	872	3,844	711
		60	0.15	5,491	1,470	4,668	1,248	4,118	872	3,844	711
	1.5	20	0.45	7,630	2787	6,486	2368	5,722	1671	5,432	1365
		40	0.4	6,486	2132	5,513	1811	4,865	1279	4,540	1044
		50	0.3	5,491	1,470	4,668	1,248	4,118	872	3,844	711
	2	20	0.5	7,630	2787	6,486	2368	5,722	1671	5,432	1365
		30	0.4	7,630	2787	6,486	2368	5,722	1671	5,432	1365
		40	0.3	6,486	2132	5,513	1811	4,865	1279	4,540	1044
		50	0.2	5,491	1,470	4,668	1,248	4,118	872	3,844	711
8	0.1	25	0.35	5,730	2660	4,524	2076	3,016	1279	2,320	817

Recommended Cutting Condition

ESRR714 SERIES

Workpiece				Carbon Steels, Alloy Steels (180~250HB)		Prehardened Steels (HRc35~45)		Herdened Steels (HRc45~55)		Herdened Steels (HRc55~65)	
Ratio to standard depth of cut				Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
Mill Dia (mm)	Diameter (mm)	Neck Length (mm)	Depth of Cut (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
8	0.2	22	0.5	5,730	2660	4,524	2076	3,016	1279	2,320	817
		40	0.25	5,730	2660	4,524	2076	3,016	1279	2,320	817
	0.3	22	0.6	5,730	2660	4,524	2076	3,016	1279	2,320	817
		40	0.3	5,730	2660	4,524	2076	3,016	1279	2,320	817
	0.5	22	0.7	5,730	2660	4,524	2076	3,016	1279	2,320	817
		35	0.5	5,730	2660	4,524	2076	3,016	1279	2,320	817
		40	0.35	5,730	2660	4,524	2076	3,016	1279	2,320	817
		50	0.3	4,584	1596	3,619	1245	2,413	767	1,856	490
		60	0.25	4,584	1596	3,619	1245	2,413	767	1,856	490
	1	22	0.8	5,730	2660	4,524	2076	3,016	1279	2,320	817
		35	0.6	5,730	2660	4,524	2076	3,016	1279	2,320	817
		40	0.4	5,730	2660	4,524	2076	3,016	1279	2,320	817
		50	0.4	4,584	1596	3,619	1245	2,413	767	1,856	490
		60	0.3	4,584	1596	3,619	1245	2,413	767	1,856	490
	1.2	22	0.9	5,730	2660	4,524	2076	3,016	1279	2,320	817
		40	0.45	5,730	2660	4,524	2076	3,016	1279	2,320	817
	2	22	1	5,730	2660	4,524	2076	3,016	1279	2,320	817
		40	0.5	5,730	2660	4,524	2076	3,016	1279	2,320	817
		50	0.4	4,584	1596	3,619	1245	2,413	767	1,856	490
10	0.1	30	0.4	4,524	2419	3,567	1954	2,378	1188	1,856	761
	0.2	24	0.5	4,524	2419	3,567	1954	2,378	1188	1,856	761
		40	0.25	4,524	2419	3,567	1954	2,378	1188	1,856	761
	0.3	24	0.6	4,524	2419	3,567	1954	2,378	1188	1,856	761
		40	0.3	4,524	2419	3,567	1954	2,378	1188	1,856	761
	0.5	24	0.7	4,524	2419	3,567	1954	2,378	1188	1,856	761
		40	0.4	4,524	2419	3,567	1954	2,378	1188	1,856	761
		50	0.3	3,619	1451	2,854	1172	1,902	713	1,485	456
		60	0.2	3,619	1451	2,854	1172	1,902	713	1,485	456
	1	24	0.8	4,524	2419	3,567	1954	2,378	1188	1,856	761
		40	0.5	4,524	2419	3,567	1954	2,378	1188	1,856	761
		50	0.4	3,619	1451	2,854	1172	1,902	713	1,485	456
		60	0.3	3,619	1451	2,854	1172	1,902	713	1,485	456
	1.5	24	0.9	4,524	2419	3,567	1954	2,378	1188	1,856	761
		40	0.55	4,524	2419	3,567	1954	2,378	1188	1,856	761
	2	24	1	4,524	2419	3,567	1954	2,378	1188	1,856	761
		40	0.5	3,619	1451	2,854	1172	1,902	713	1,485	456
		50	0.4	2,895	870	2,283	703	1,522	427	1,188	274
	2.5	24	1.1	4,524	2419	3,567	1954	2,378	1188	1,856	761
12	0.2	32	0.5	3,857	2419	3,045	1954	2,030	1188	1,537	761
	0.3	26	0.6	3,857	2419	3,045	1954	2,030	1188	1,537	761
		45	0.3	3,857	2419	3,045	1954	2,030	1188	1,537	761
	0.5	26	0.7	3,857	2419	3,045	1954	2,030	1188	1,537	761
		40	0.4	3,857	2419	3,045	1954	2,030	1188	1,537	761
		60	0.3	3,086	1451	2,436	1172	1,624	713	1,230	456

ESRR714 SERIES

Workpiece				Carbon Steels, Alloy Steels (180~250HB)		Prehardened Steels (HRc35~45)		Herdened Steels (HRc45~55)		Herdened Steels (HRc55~65)	
Ratio to standard depth of cut				Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
Mill Dia (mm)	Diameter (mm)	Neck Length (mm)	Depth of Cut (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
12	1	26	0.8	3,857	2419	3,045	1954	2,030	1188	1,537	761
		40	0.5	3,857	2419	3,045	1954	2,030	1188	1,537	761
		60	0.3	3,086	1451	2,436	1172	1,624	713	1,230	456
	1.5	26	0.9	3,857	2419	3,045	1954	2,030	1188	1,537	761
	2	26	1	3,857	2419	3,045	1954	2,030	1188	1,537	761
		40	0.5	3,857	2419	3,045	1954	2,030	1188	1,537	761
	3	26	1	3,857	2419	3,045	1954	2,030	1188	1,537	761
16	0.5	35	2	2,842	2116	2,262	1692	1,508	1047	1,160	672
		50	1	2,842	2116	2,262	1692	1,508	1047	1,160	672
	1	35	2	2,842	2116	2,262	1692	1,508	1047	1,160	672
		50	1	2,842	2116	2,262	1692	1,508	1047	1,160	672
20	0.5	40	2	2,262	1915	1,798	1512	1,189	957	928	616
		55	1	2,262	1915	1,798	1512	1,189	957	928	616
	1	40	2	2,262	1915	1,798	1512	1,189	957	928	616
		55	1	2,262	1915	1,798	1512	1,189	957	928	616

· The above recommendation table may differ from the actual situation, adjust it according to the machine condition, processing type and purpose.

· In the case of low RPM, reduce the feed rate at the same rate.

Recommended Cutting Condition

ESLNR20 SERIES

Workpiece				Carbon Steels, Alloy Steels (180~250HB)		Prehardened Steels (HRc35~45)		Herdened Steels (HRc45~55)		Herdened Steels (HRc55~65)	
Ratio to standard depth of cut				Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
Mill Dia (mm)	Diameter (mm)	Neck Length (mm)	Depth of Cut (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
0.2	0.05	0.5	0.02	50,000	258	50,000	205	50,000	180	50,000	160
		1	0.014	50,000	258	50,000	205	50,000	180	50,000	160
		1.5	0.008	50,000	240	45,900	202	45,900	170	45,900	153
		2	0.008	42,000	202	36,700	176	36,700	162	36,700	147
0.3	0.05	1	0.021	50,000	585	50,000	456	50,000	336	50,000	320
		1.5	0.016	50,000	585	45,000	456	45,000	336	45,000	320
		2	0.012	45,000	530	45,000	420	45,000	300	45,000	290
		2.5	0.01	40,000	471	40,000	373	40,000	267	40,000	258
		3	0.008	35,000	412	35,000	326	30,000	200	30,000	194
0.4	0.05	1	0.025	50,000	580	50,000	461	40,000	320	36,000	270
		1.5	0.02	50,000	580	50,000	461	40,000	320	36,000	270
		2	0.016	45,000	520	45,000	410	36,000	290	34,000	240
		2.5	0.015	40,500	480	40,500	370	33,400	270	30,600	220
		3	0.014	40,000	410	40,000	330	32,800	240	25,600	200
		3.5	0.012	36,000	380	36,000	300	29,400	200	22,920	180
		4	0.008	30,000	320	30,000	250	21,600	160	19,200	150
	0.1	2	0.028	45,000	520	45,000	410	36,000	290	34,000	240
		3	0.016	40,000	410	40,000	330	32,800	240	25,600	200
		4	0.01	30,000	320	30,000	250	21,600	160	19,200	150
0.5	0.05	1	0.03	50,000	898	40,000	464	30,000	378	28,000	315
		2	0.023	50,000	898	40,000	464	30,000	378	28,000	315
		3	0.017	45,000	810	36,000	414	27,000	315	24,500	261
		4	0.017	40,000	820	32,000	378	24,000	279	20,000	234
		5	0.011	28,800	540	19,400	280	18,000	250	15,000	200
		6	0.008	28,800	480	19,400	260	18,000	250	15,000	200
	0.1	1	0.035	50,000	898	40,000	464	30,000	378	28,000	315
		2	0.03	50,000	898	40,000	464	30,000	378	28,000	315
		3	0.02	45,000	810	36,000	414	27,000	315	24,500	261
		4	0.02	40,000	720	32,000	378	24,000	279	20,000	234
		5	0.013	28,800	540	19,400	280	18,000	250	15,000	200
		6	0.013	28,800	480	19,400	260	18,000	250	15,000	200
0.6	0.1	2	0.035	50,000	1,159	37,830	600	28,200	390	23,000	320
		4	0.024	40,000	830	27,800	440	23,600	280	21,000	230
		6	0.015	24,000	490	18,000	300	17,800	240	15,000	210
		8	0.013	24,000	466	18,000	285	17,800	228	15,000	200
		10	0.009	24,000	451	18,000	276	17,800	221	15,000	193
2	0.2	6	0.08	20,790	1,635	17,672	1,389	15,593	981	14,553	801
		8	0.07	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		12	0.04	15,309	1,083	13,013	921	11,482	722	10,716	590
		16	0.04	13,608	963	11,567	818	10,206	642	9,526	524
		20	0.035	11,907	843	10,121	716	8,930	562	8,335	459
		25	0.025	11,907	843	10,121	716	8,930	562	8,335	459
		30	0.017	11,312	800	9,615	680	8,484	534	7,918	436
	0.3	8	0.09	18,900	1,651	16,065	1,403	14,175	991	13,230	809

ESLNR20 SERIES

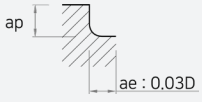
Workpiece				Carbon Steels, Alloy Steels (180~250HB)		Prehardened Steels (HRc35~45)		Herdened Steels (HRc45~55)		Herdened Steels (HRc55~65)	
Ratio to standard depth of cut				Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
Mill Dia (mm)	Diameter (mm)	Neck Length (mm)	Depth of Cut (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
2	0.3	16	0.06	13,608	1,070	11,567	909	10,206	713	9,526	583
		20	0.037	11,907	936	10,121	796	8,930	624	8,335	510
	0.5	6	0.017	20,709	1,635	17,672	1,389	15,593	981	14,553	801
		8	0.014	18,900	1,651	16,065	1,403	14,175	991	13,230	809
		12	0.08	15,309	1,204	13,013	1,023	11,482	802	10,716	655
		16	0.08	13,608	1,070	11,567	909	10,206	713	9,526	583
		20	0.05	11,907	936	10,121	796	8,930	624	8,335	510
		25	0.05	11,907	936	10,121	796	8,930	624	8,335	510
		30	0.03	11,312	889	9,615	756	8,484	593	7,918	484
	0.8	8	0.2	18,900	1,651	16,065	1,403	14,175	991	13,230	809
		16	0.1	13,608	1,070	11,567	909	10,206	713	9,526	583
		20	0.06	11,907	936	10,121	796	8,930	624	8,335	510
3	0.2	8	0.09	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		12	0.07	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		16	0.05	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		20	0.05	11,664	1,146	9,914	974	8,748	764	8,165	624
		30	0.04	9,072	1,146	7,711	974	6,804	764	6,350	624
		35	0.035	9,072	1,146	7,711	974	6,804	764	6,350	624
	0.3	8	0.13	14,400	1,572	12,240	1,337	10,800	943	10,080	771
		16	0.075	14,400	1,572	12,240	1,337	10,800	943	10,080	771
		20	0.075	11,664	1,274	9,914	1,083	8,748	849	8,165	693
		30	0.06	9,072	1,274	7,711	1,083	6,804	849	6,350	693
	0.5	8	0.18	14,400	1,572	12,240	1,337	10,800	943	10,080	771
		12	0.13	14,400	1,572	12,240	1,337	10,800	943	10,080	771
		16	0.1	14,400	1,572	12,240	1,337	10,800	943	10,080	771
		20	0.1	11,664	1,274	9,914	1,083	8,748	849	8,165	693
		30	0.08	9,072	1,274	7,711	1,083	6,804	849	6,350	693
		35	0.065	9,072	1,274	7,711	1,083	6,804	849	6,350	693
0.8	0.1	4	0.032	48,000	1,102	28,000	518	20,000	320	20,000	288
		6	0.019	38,700	800	25,000	461	18,000	288	18,000	256
		8	0.015	29,025	600	20,000	369	16,200	259	16,200	230
		12	0.012	29,025	570	20,000	350	16,200	246	16,200	219
	0.2	4	0.056	48,000	1,102	28,000	518	20,000	320	20,000	288
		6	0.032	38,700	800	25,000	461	18,000	288	18,000	256
1	0.1	4	0.038	32,400	1,359	27,540	1,039	24,300	815	22,680	666
		6	0.024	26,244	990	22,307	842	19,683	660	18,371	539
		8	0.024	23,328	880	19,829	748	17,496	587	16,330	479
		10	0.015	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.015	18,144	609	15,422	453	13,608	399	12,701	320
		16	0.009	18,144	533	15,422	420	13,608	342	12,701	266
		20	0.006	13,608	399	11,567	315	10,206	257	9,526	200
	0.2	4	0.07	32,400	1,359	27,540	1,039	24,300	815	22,680	666
		6	0.04	26,244	990	22,307	842	19,683	660	18,371	539
		8	0.04	23,328	880	19,829	748	17,496	587	16,330	479

Recommended Cutting Condition

ESLNR20 SERIES

Workpiece				Carbon Steels, Alloy Steels (180~250HB)		Prehardened Steels (HRc35~45)		Herdened Steels (HRc45~55)		Herdened Steels (HRc55~65)	
Ratio to standard depth of cut				Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
Mill Dia (mm)	Diameter (mm)	Neck Length (mm)	Depth of Cut (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
1	0.2	10	0.025	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.025	18,144	609	15,422	453	13,608	399	12,701	320
		16	0.015	18,144	533	15,422	420	13,608	342	12,701	266
		20	0.01	13,608	399	11,567	315	10,206	257	9,526	200
	0.3	6	0.04	26,244	990	22,307	842	19,683	660	18,371	539
		10	0.025	20,412	770	17,350	655	15,309	514	14,288	419
		16	0.015	18,144	533	15,422	420	13,608	342	12,701	266
		20	0.01	13,608	399	11,567	315	10,206	257	9,526	200
1.5	0.1	4	0.042	24,930	1,130	20,956	868	18,711	678	17,364	556
		8	0.036	22,680	1,027	19,278	873	17,010	685	15,876	559
		12	0.036	18,144	822	15,422	698	13,608	548	12,701	447
		15	0.023	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.018	14,112	568	11,995	423	10,584	373	9,878	298
	0.2	4	0.07	24,930	1,130	20,956	868	18,711	678	17,364	556
		8	0.06	22,680	1,027	19,278	873	17,010	685	15,876	559
		12	0.06	18,144	822	15,422	698	13,608	548	12,701	447
		15	0.038	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.03	14,112	568	11,995	423	10,584	373	9,878	298
	0.3	8	0.06	22,680	1,027	19,278	873	17,010	685	15,876	559
		15	0.038	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.03	14,112	568	11,995	423	10,584	373	9,878	298

RPM = rev / min
FEED = mm / min



· The above recommendation table may differ from the actual situation, adjust it according to the machine condition, processing type and purpose.
· In the case of low RPM, reduce the feed rate at the same rate.

ESTNR20 SERIES

Workpiece				Carbon Steels, Alloy Steels (180~250HB)		Prehardened Steels (HRc35~45)		Herdened Steels (HRc45~55)		Herdened Steels (HRc55~65)	
Ratio to standard depth of cut				Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
Mill Dia (mm)	Diameter (mm)	Neck Length (mm)	Depth of Cut (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
0.2	0.05	2	0.007	39,660	887	33,660	754	29,700	591	27,720	483
0.4	0.05	4	0.009	30,096	899	25,582	764	22,572	599	21,067	489
		5	0.007	26,752	710	22,739	528	20,064	466	18,726	373
	0.1	4	0.009	31,680	946	26,928	804	23,760	631	22,176	515
		5	0.007	28,160	747	23,936	556	21,120	490	19,712	392
0.5	0.1	5	0.013	30,413	1,090	25,851	753	22,810	562	21,289	453
		8	0.008	24,330	678	20,681	468	18,248	350	17,031	282
		10	0.007	18,248	509	15,511	351	13,686	262	12,773	211
0.6	0.1	12	0.01	20,377	791	17,320	546	15,282	408	14,264	329
		15	0.006	16,727	649	14,218	448	12,545	335	11,709	270
0.8	0.2	6	0.045	31,680	1,084	26,928	921	23,760	723	22,176	590
		12	0.02	28,160	943	23,936	695	21,120	613	19,712	490
1	0.2	8	0.04	28,512	1,463	24,235	1,244	21,384	976	19,958	797
		10	0.035	28,512	1,596	24,235	1,357	21,384	1,064	19,958	869
		15	0.028	25,344	1,261	21,542	938	19,008	828	17,741	662
		20	0.02	19,008	828	16,157	653	14,256	532	13,306	414
		25	0.017	15,840	690	13,464	544	11,880	443	11,088	345
		30	0.017	15,840	690	13,464	544	11,880	443	11,088	345
		35	0.01	15,840	690	13,464	544	11,880	443	11,088	345
	0.3	8	0.04	28,512	1,463	24,235	1,244	21,384	976	19,958	797
		15	0.028	25,344	1,261	21,542	938	19,008	828	17,741	662
		25	0.017	15,840	690	13,464	544	11,880	443	11,088	345
		30	0.017	15,840	690	13,464	544	11,880	443	11,088	345
1.5	0.2	10	0.05	21,683	1,079	18,431	803	16,262	708	15,178	567
		15	0.045	19,712	981	16,755	730	14,784	644	13,798	515
		20	0.042	17,347	863	14,745	642	13,010	567	12,143	453
		25	0.032	14,784	644	12,566	508	11,088	414	10,349	322
		30	0.028	12,320	536	10,472	423	9,240	345	8,624	268
	0.3	10	0.05	21,683	1,079	18,431	803	16,262	708	15,178	567
		20	0.042	17,347	863	14,745	642	13,010	567	12,143	453
		25	0.032	14,784	644	12,566	508	11,088	414	10,349	322
		30	0.028	12,320	536	10,472	423	9,240	345	8,624	268
2	0.2	30	0.045	13,440	1,254	11,424	933	10,080	823	9,408	658
		40	0.035	10,080	823	8,568	650	7,560	529	7,056	412
		50	0.017	8,400	686	7,140	541	6,300	441	5,880	343
	0.3	12	0.088	22,680	1,814	19,278	1,427	17,010	1,191	15,876	1,048
		20	0.054	18,144	1,452	15,422	1,141	13,608	953	12,701	838
		30	0.045	13,440	1,393	11,424	1,036	10,080	914	9,408	732
		40	0.035	10,080	914	8,568	722	7,560	588	7,056	457
		50	0.017	8,400	762	7,140	601	6,300	490	5,880	381
	0.5	8	0.17	22,680	1,814	19,278	1,427	17,010	1,191	15,876	1,048
		12	0.088	22,680	1,814	19,278	1,427	17,010	1,191	15,876	1,048
		16	0.088	19,278	1,542	16,386	1,213	14,459	1,012	13,495	891
		20	0.054	18,114	1,452	15,422	1,141	13,608	953	12,701	838

Recommended Cutting Condition

ESTNR20 SERIES

Workpiece				Carbon Steels, Alloy Steels (180~250HB)		Prehardened Steels (HRc35~45)		Herdened Steels (HRc45~55)		Herdened Steels (HRc55~65)	
Ratio to standard depth of cut				Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
Mill Dia (mm)	Diameter (mm)	Neck Length (mm)	Depth of Cut (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
2	0.5	25	0.054	15,876	1,270	13,495	999	11,907	833	11,113	733
		30	0.045	13,440	1,393	11,424	1,036	10,080	914	9,408	732
		40	0.035	10,080	914	8,568	722	7,560	588	7,056	457
		50	0.017	8,400	762	7,140	601	6,300	490	5,880	381
3	0.2	40	0.07	10,240	956	8,704	711	7,680	627	7,168	502
		50	0.05	7,680	627	6,528	495	5,760	403	5,376	314
		60	0.03	6,400	523	5,440	412	4,800	336	4,480	261
	0.3	40	0.07	10,240	1,062	8,704	790	7,680	697	7,168	557
		50	0.05	7,680	697	6,528	550	5,760	448	5,376	348
		60	0.03	6,400	581	5,440	458	4,800	373	4,480	290
	0.5	40	0.07	10,240	1,062	8,704	790	7,680	697	7,168	557
		50	0.05	7,680	697	6,528	550	5,760	448	5,376	348
		60	0.03	6,400	581	5,440	458	4,800	373	4,480	290

RPM = rev / min
FEED = mm / min

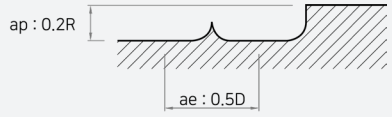


· The above recommendation table may differ from the actual situation, adjust it according to the machine condition, processing type and purpose.
· In the case of low RPM, reduce the feed rate at the same rate.

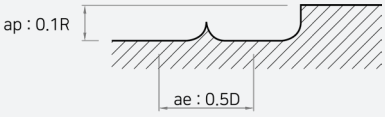
ESPM4 SERIES ▶ Side Cutting

Workpiece	Herdened Steels									
Hardness	~HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65	
D X R (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
3 X R0.5	9,550	6,500	6,900	4,150	4,550	2,750	2,850	1,150	1,900	610
4 X R0.5	7,950	7,000	5,750	4,600	4,000	3,200	2,550	1,350	1,750	700
6 X R0.5	5,800	7,650	4,100	4,900	2,900	3,500	1,850	1,850	1,350	795
6 X R1.0	5,800	7,650	4,100	4,900	2,900	3,500	1,850	1,850	1,350	795
8 X R1.0	4,350	7,650	3,050	4,900	2,200	3,500	1,400	1,850	995	795
8 X R2.0	4,350	7,650	3,050	4,900	2,200	3,500	1,400	1,850	995	795
10 X R1.0	3,500	7,650	2,450	4,900	1,750	3,500	1,100	1,850	795	795
10 X R2.0	3,500	7,650	2,450	4,900	1,750	3,500	1,100	1,850	795	795
12 X R2.0	2,900	7,650	2,050	4,900	1,450	3,500	925	1,850	665	795
12 X R3.0	2,900	7,650	2,050	4,900	1,450	3,500	925	1,850	665	795

RPM = rev / min
FEED = mm / min



*ae shouldn't be over max. 0.5D

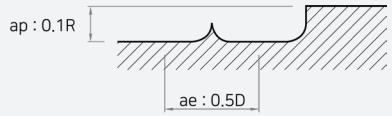


*ae shouldn't be over max. 0.5D

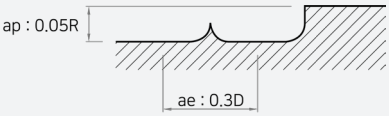
ESPM4 SERIES ▶ High Speed Cutting

Workpiece	Herdened Steels									
Hardness	~HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65	
D X R (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
3 X R0.5	22,000	16,000	17,000	10,000	12,500	8,000	9,500	4,600	6,900	2,500
4 X R0.5	17,000	17,500	13,000	12,000	11,000	9,200	8,000	5,500	5,600	2,900
6 X R0.5	13,500	18,500	10,500	13,800	9,000	11,000	6,400	6,400	4,500	3,600
6 X R1.0	13,500	18,500	10,500	13,800	9,000	11,000	6,400	6,400	4,500	3,600
8 X R1.0	10,000	18,500	8,000	14,000	6,800	11,000	4,800	6,700	3,400	4,100
8 X R2.0	10,000	18,500	8,000	14,000	6,800	11,000	4,800	6,700	3,400	4,100
10 X R1.0	8,000	18,500	6,400	14,000	5,400	11,000	3,800	6,800	2,700	3,800
10 X R2.0	8,000	18,500	6,400	14,000	5,400	11,000	3,800	6,800	2,700	3,800
12 X R2.0	6,600	18,500	5,300	14,000	4,500	11,000	3,200	7,000	2,250	3,600
12 X R3.0	6,600	18,500	5,300	14,000	4,500	11,000	3,200	7,000	2,250	3,600

RPM = rev / min
FEED = mm / min



*ae shouldn't be over max. 0.5D



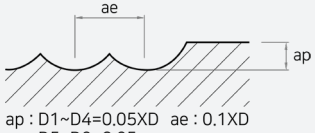
*ae shouldn't be over max. 0.3D

Recommended Cutting Condition

ESB702, ESB712 SERIES

Workpiece	Herdened Steels Heat Resistant Steels		Herdened Steels									
Hardness	HRc30 ~ HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65		HRc 65 ~ HRc70	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
~0.2	50,000	1,200	50,000	1,050	45,000	960	40,000	770	35,000	674	31,500	570
0.3	50,000	1,500	50,000	1,350	45,000	1,200	40,000	765	35,000	840	31,500	700
0.4	50,000	1,900	50,000	1,700	45,000	1,500	40,000	1,200	35,000	1,050	31,500	1,100
0.5	50,000	2,400	50,000	2,100	45,000	1,900	40,000	1,500	35,000	1,300	31,500	1,100
0.6	50,000	2,900	50,000	2,500	45,000	2,200	40,000	1,800	35,000	1,600	31,500	1,400
0.8	50,000	3,900	50,000	3,300	45,000	3,000	40,000	2,400	35,000	1,600	31,500	1,800
1	50,000	4,800	50,000	4,200	45,000	3,800	40,000	3,000	35,000	2,600	35,000	2,300
1.5	50,000	5,400	48,000	4,500	43,000	4,000	23,000	3,100	33,000	2,700	29,700	2,300
2	49,700	5,700	47,800	4,800	40,000	4,000	35,000	3,150	32,000	2,800	28,500	2,300
3	33,100	6,000	31,800	5,300	26,500	4,000	23,500	3,150	21,000	28,00	19,000	2,300
4	24,900	6,000	23,900	5,300	20,000	4,000	17,500	3,150	16,000	2,800	14,500	2,300
5	18.6	5,800	17,800	4,900	15,000	3,750	13,500	3,050	11,500	2,550	10,500	2,100
6	13,900	4,850	13,400	4,100	11,000	3,100	10,000	2,500	8,800	2,150	8,000	1,750
8	11,100	4,200	10,700	3,500	9,000	2,700	8,000	2,150	7,000	1,850	6,500	1,550
10	9,300	3,700	8,900	3,100	7,500	2,400	6,600	1,900	5,800	1,650	5,300	1,380
12	6,950	2,950	6,680	2,500	5,600	1,900	5,000	1,550	4,400	1,250	4,000	1,050

RPM = rev / min
FEED = mm / min

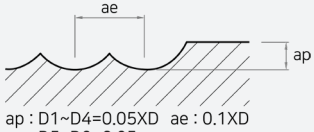


ap : D1~D4=0.05XD ae : 0.1XD
D5~D8=0.25mm
D10~D12=0.3mm

ESB703 SERIES

Workpiece	Herdened Steels Heat Resistant Steels		Herdened Steels									
Hardness	HRc30 ~ HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65		HRc 65 ~ HRc70	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	57,000	7,100	55,000	6,000	46,000	5,000	40,300	3,900	36,800	3,500	32,800	2,900
2.5	57,000	7,100	55,000	6,000	46,000	5,000	40,300	3,900	36,800	3,500	32,800	2,900
3	38,000	7,500	36,600	6,600	30,500	5,000	27,000	3,900	24,200	3,500	21,900	2,900
4	28,500	7,500	27,500	6,600	23,000	5,000	20,100	3,900	18,400	3,500	16,700	2,900
5	21,500	7,300	20,500	6,100	17,300	4,700	15,500	3,800	13,200	3,200	12,100	2,600
6	16,000	6,100	15,400	5,100	12,700	3,900	11,500	3,100	10,100	2,700	9,200	2,200
8	12,700	5,300	12,300	4,400	10,400	3,400	9,200	2,700	8,100	2,300	7,500	1,900
10	10,700	4,600	10,200	3,900	8,600	3,000	7,600	2,400	6,700	2,100	6,100	1,700
12	8,000	3,700	7,700	3,100	6,400	2,400	5,800	1,900	5,100	1,600	4,600	1,300

RPM = rev / min
FEED = mm / min

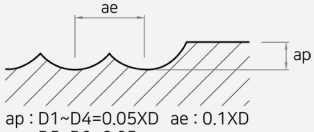


ap : D1~D4=0.05XD ae : 0.1XD
D5~D8=0.25mm
D10~D12=0.3mm

ESB734 SERIES

Workpiece	Herdened Steels Heat Resistant Steels		Herdened Steels									
Hardness	HRc30 ~ HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65		HRc 65 ~ HRc70	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	62,100	8,600	59,800	7,200	50,000	6,000	43,800	4,700	40,000	4,200	35,600	3,500
2.5	62,100	8,600	59,800	7,200	50,000	6,000	43,800	4,700	40,000	4,200	35,600	3,500
3	41,400	9,000	39,800	8,000	33,100	6,000	29,400	4,700	26,300	4,200	23,800	3,500
4	31,100	9,000	29,900	8,000	25,000	6,000	21,900	4,700	20,000	4,200	18,100	3,500
5	23,300	8,700	22,300	7,400	18,800	5,600	16,900	4,600	14,400	3,800	13,100	3,200
6	17,400	7,300	16,800	6,200	13,800	4,700	12,500	3,800	11,000	3,200	10,000	2,600
8	13,900	6,300	13,400	5,300	11,300	4,100	10,000	3,200	8,800	2,800	8,100	2,300
10	11,600	5,600	11,100	4,700	9,400	3,600	8,300	2,900	7,300	2,500	6,600	2,100

RPM = rev / min
FEED = mm / min



ap : D1~D4=0.05XD ae : 0.1XD
D5~D8=0.25mm
D10~D12=0.3mm

Recommended Cutting Condition

ESRB712 SERIES

Workpiece		CARBON STEEL, Alloy Steels (SCM, SNCM, S45C)			Prehardened Steels (NAK, CENA, KP4)			Herdened Steels (SKD, SKT, STAVAX)		
Hardness		~HRc35			HRc35~HRc45			HRc45~HRc55		
Strength		~1100N/mm2			1100~1500N/mm2			1500~2000N/mm2		
Diameter (mm)	Effective Length	RPM	FEED	Ap (mm)	RPM	FEED	Ap (mm)	RPM	FEED	Ap (mm)
0.1	0.3	50,000	240	0.009	50,000	215	0.007	50,000	190	0.005
	0.5	50,000	240	0.006	50,000	215	0.005	50,000	190	0.004
	1	45,000	195	0.002	45,000	175	0.002	45,000	155	0.001
0.2	0.5	50,000	335	0.018	50,000	310	0.014	43,200	260	0.01
	1	50,000	335	0.013	50,000	310	0.01	43,200	260	0.007
	1.5	45,000	270	0.007	45,000	250	0.006	38,880	210	0.004
	2	45,000	270	0.005	45,000	250	0.004	38,880	210	0.003
	3	45,000	270	0.003	45,000	250	0.003	38,880	210	0.002
0.3	1	50,000	475	0.019	50,000	430	0.015	42,800	365	0.011
	1.5	50,000	475	0.019	50,000	430	0.015	42,800	365	0.011
	2	45,000	385	0.011	45,000	350	0.008	38,520	295	0.006
	2.5	45,000	385	0.007	45,000	350	0.005	38,520	295	0.004
	3	45,000	385	0.007	45,000	350	0.005	38,520	295	0.004
	4	40,000	305	0.004	40,000	275	0.003	34,240	235	0.002
	5	30,000	200	0.003	30,000	180	0.002	25,680	155	0.002
0.4	1	41,000	490	0.036	38,800	425	0.028	34,200	340	0.02
	1.5	41,000	490	0.025	38,800	425	0.02	34,200	340	0.014
	2	41,000	490	0.025	38,800	425	0.02	34,200	340	0.014
	2.5	36,900	395	0.014	34,920	345	0.011	30,780	275	0.008
	3	36,900	395	0.014	34,920	345	0.011	30,780	275	0.008
	4	36,900	395	0.009	34,920	345	0.007	30,780	275	0.005
	5	32,800	315	0.009	31,040	270	0.007	27,360	220	0.005
	6	32,800	315	0.005	31,040	270	0.004	27,360	220	0.003
	8	24,600	205	0.004	23,280	180	0.003	20,520	145	0.002
	10	12,300	90	0.004	11,640	75	0.003	10,260	60	0.002
0.5	1	34,200	685	0.045	32,300	580	0.035	28,500	515	0.025
	1.5	34,200	685	0.045	32,300	580	0.035	28,500	515	0.025
	2	34,200	685	0.032	32,300	580	0.025	28,500	515	0.018
	2.5	34,200	685	0.032	32,300	580	0.025	28,500	515	0.018
	3	30,780	555	0.018	29,070	470	0.014	25,650	415	0.01
	4	30,780	555	0.018	29,070	470	0.014	25,650	415	0.01
	5	30,780	555	0.011	29,070	470	0.009	25,650	415	0.006
	6	27,360	440	0.011	25,840	370	0.009	22,800	330	0.006
	8	20,520	290	0.007	19,380	245	0.005	17,100	215	0.004
	10	20,520	290	0.005	19,380	245	0.004	17,100	215	0.003
	12	10,260	125	0.005	9,690	105	0.004	8,550	95	0.003
	14	10,260	125	0.005	9,690	105	0.004	8,550	95	0.003
	16	3,420	35	0.005	3,230	30	0.004	2,850	25	0.003
0.6	1	34,200	1,025	0.038	32,300	840	0.029	28,500	685	0.021
	2	34,200	1,025	0.038	32,300	840	0.029	28,500	685	0.021
	3	34,200	1,025	0.038	32,300	840	0.029	28,500	685	0.021
	4	30,780	830	0.022	29,070	680	0.017	25,650	555	0.012
	5	30,780	830	0.014	29,070	680	0.011	25,650	555	0.008

ESRB712 SERIES

Workpiece		CARBON STEEL, Alloy Steels (SCM, SNCM, S45C)			Prehardened Steels (NAK, CENA, KP4)			Herdened Steels (SKD, SKT, STAVAX)		
Hardness		~HRc35			HRc35~HRc45			HRc45~HRc55		
Strength		~1100N/mm2			1100~1500N/mm2			1500~2000N/mm2		
Diameter (mm)	Effective Length	RPM	FEED	Ap (mm)	RPM	FEED	Ap (mm)	RPM	FEED	Ap (mm)
0.6	6	30,780	830	0.014	29,070	680	0.011	25,650	555	0.008
	8	27,360	655	0.008	25,840	540	0.006	22,800	440	0.005
	10	20,520	430	0.005	19,380	355	0.004	17,100	290	0.003
	12	20,520	430	0.005	19,380	355	0.004	17,100	290	0.003
	14	10,260	185	0.005	9,690	150	0.004	8,550	125	0.003
	16	10,260	185	0.005	9,690	150	0.004	8,550	125	0.003
0.7	2	34,200	1,130	0.063	32,300	930	0.049	28,500	765	0.035
	4	30,780	915	0.025	29,070	755	0.02	25,650	620	0.014
	6	30,780	915	0.016	29,070	755	0.012	25,650	620	0.009
	8	27,360	725	0.016	25,840	595	0.012	22,800	490	0.009
	10	27,360	725	0.009	25,840	595	0.007	22,800	490	0.005
	12	20,520	475	0.006	19,380	390	0.005	17,100	320	0.004
0.8	2	34,200	1,230	0.072	32,300	1,035	0.056	28,500	855	0.04
	3	34,200	1,230	0.05	32,300	1,035	0.039	28,500	855	0.028
	4	34,200	1,230	0.05	32,300	1,035	0.039	28,500	855	0.028
	5	30,780	995	0.029	29,070	840	0.022	25,650	695	0.016
	6	30,780	995	0.029	29,070	840	0.022	25,650	695	0.016
	8	30,780	995	0.018	29,070	840	0.014	25,650	695	0.01
	10	27,360	785	0.018	25,840	660	0.014	22,800	545	0.01
	12	27,360	785	0.011	25,840	660	0.008	22,800	545	0.006
	14	20,520	515	0.007	19,380	435	0.006	17,100	360	0.004
	16	20,520	515	0.007	19,380	435	0.006	17,100	360	0.004
	20	10,260	220	0.007	9,690	185	0.006	8,550	155	0.004
0.9	4	29,250	1,120	0.032	27,630	935	0.025	24,390	775	0.018
	6	29,250	1,120	0.032	27,630	935	0.025	24,390	775	0.018
	8	29,250	1,120	0.02	27,630	935	0.016	24,390	775	0.011
	10	26,000	885	0.02	24,560	740	0.016	21,680	610	0.011
1	2	30,800	1,540	0.09	29,100	1,310	0.07	25,700	1,075	0.05
	3	30,800	1,540	0.09	29,100	1,310	0.07	25,700	1,075	0.05
	4	30,800	1,540	0.063	29,100	1,310	0.049	25,700	1,075	0.035
	5	30,800	1,540	0.063	29,100	1,310	0.049	25,700	1,075	0.035
	6	27,720	1,245	0.036	26,190	1,060	0.028	23,130	870	0.02
	7	27,720	1,245	0.036	26,190	1,060	0.028	23,130	870	0.02
	8	27,720	1,245	0.036	26,190	1,060	0.028	23,130	870	0.02
	10	27,720	1,245	0.023	26,190	1,060	0.018	23,130	870	0.013
	12	24,640	985	0.023	23,280	840	0.018	20,560	690	0.013
	14	24,640	985	0.014	23,280	840	0.011	20,560	690	0.008
	16	18,480	645	0.014	17,460	550	0.011	15,420	450	0.008
	18	18,480	645	0.009	17,460	550	0.007	15,420	450	0.005
	20	18,480	645	0.009	17,460	550	0.007	15,420	450	0.005
	22	9,240	275	0.009	8,730	235	0.007	7,710	195	0.005
	26	9,240	275	0.009	8,730	235	0.007	7,710	195	0.005
	30	9,240	275	0.009	8,730	235	0.007	7,710	195	0.005

Recommended Cutting Condition

ESRB712 SERIES

Workpiece		CARBON STEEL, Alloy Steels (SCM, SNCM, S45C)			Prehardened Steels (NAK, CENA, KP4)			Herdened Steels (SKD, SKT, STAVAX)		
Hardness		~HRc35			HRc35~HRc45			HRc45~HRc55		
Strength		~1100N/mm2			1100~1500N/mm2			1500~2000N/mm2		
Diameter (mm)	Effective Length	RPM	FEED	Ap (mm)	RPM	FEED	Ap (mm)	RPM	FEED	Ap (mm)
1	40	3,080	75	0.009	2,910	65	0.007	2,570	55	0.005
	50	3,080	75	0.006	2,910	65	0.005	2,570	55	0.003
1.2	4	26,300	1,375	0.076	24,800	1,150	0.059	21,900	950	0.042
	6	26,300	1,375	0.076	24,800	1,150	0.059	21,900	950	0.042
	8	23,670	1,115	0.043	22,320	930	0.034	19,710	770	0.024
	10	23,670	1,115	0.027	22,320	930	0.021	19,710	770	0.015
	12	23,670	1,115	0.027	22,320	930	0.021	19,710	770	0.015
	16	21,040	880	0.016	19,840	735	0.013	17,520	610	0.009
	20	15,780	580	0.011	14,880	485	0.008	13,140	400	0.006
	26	7,890	245	0.011	7,440	205	0.008	6,570	170	0.006
1.4	6	21,500	1,295	0.088	20,300	1,100	0.069	18,000	935	0.049
	8	19,350	1,050	0.05	18,270	890	0.039	16,200	755	0.028
	10	19,350	1,050	0.05	18,270	890	0.039	16,200	755	0.028
	16	17,200	830	0.032	16,240	705	0.025	14,400	600	0.018
1.5	4	23,900	1,580	0.135	22,600	1,355	0.105	20,000	1,075	0.075
	5	23,900	1,580	0.095	22,600	1,355	0.074	20,000	1,075	0.053
	6	23,900	1,580	0.095	22,600	1,355	0.074	20,000	1,075	0.053
	7	23,900	1,580	0.095	22,600	1,355	0.074	20,000	1,075	0.053
	8	21,510	1,280	0.054	20,340	1,100	0.042	18,000	870	0.03
	10	21,510	1,280	0.054	20,340	1,100	0.042	18,000	870	0.03
	12	21,510	1,280	0.054	20,340	1,100	0.042	18,000	870	0.03
	14	21,510	1,280	0.034	20,340	1,100	0.026	18,000	870	0.019
	16	19,120	1,010	0.034	18,080	865	0.026	16,000	690	0.019
	18	19,120	1,010	0.034	18,080	865	0.026	16,000	690	0.019
	20	19,120	1,010	0.02	18,080	865	0.016	16,000	690	0.011
	22	19,120	1,010	0.02	18,080	865	0.016	16,000	690	0.011
	26	14,340	665	0.014	13,560	570	0.011	12,000	450	0.008
	30	14,340	665	0.014	13,560	570	0.011	12,000	450	0.008
	35	7,170	285	0.01	6,780	245	0.008	6,000	195	0.005
	40	7,170	285	0.01	6,780	245	0.008	6,000	195	0.005
1.6	4	22,200	1,555	0.101	21,000	1,300	0.078	18,500	1,110	0.056
	6	22,200	1,555	0.101	21,000	1,300	0.078	18,500	1,110	0.056
	8	22,200	1,555	0.101	21,000	1,300	0.078	18,500	1,110	0.056
	10	19,980	1,260	0.058	18,900	1,055	0.045	16,650	900	0.032
	12	19,980	1,260	0.058	18,900	1,055	0.045	16,650	900	0.032
	16	19,980	1,260	0.036	18,900	1,055	0.028	16,650	900	0.02
	20	17,760	995	0.036	16,800	830	0.028	14,800	710	0.02
1.8	4	22,200	1,780	0.113	21,000	1,470	0.088	18,500	1,225	0.063
	6	22,200	1,780	0.113	21,000	1,470	0.088	18,500	1,225	0.063
	8	22,200	1,780	0.113	21,000	1,470	0.088	18,500	1,225	0.063
	10	19,980	1,440	0.065	18,900	1,190	0.05	16,650	990	0.036
	12	19,980	1,440	0.065	18,900	1,190	0.05	16,650	990	0.036
	16	19,980	1,440	0.041	18,900	1,190	0.032	16,650	990	0.023

ESRB712 SERIES

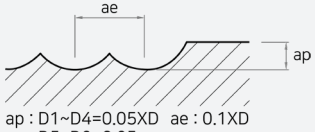
Workpiece		CARBON STEEL, Alloy Steels (SCM, SNCM, S45C)			Prehardened Steels (NAK, CENA, KP4)			Herdened Steels (SKD, SKT, STAVAX)		
Hardness		~HRc35			HRc35~HRc45			HRc45~HRc55		
Strength		~1100N/mm2			1100~1500N/mm2			1500~2000N/mm2		
Diameter (mm)	Effective Length	RPM	FEED	Ap (mm)	RPM	FEED	Ap (mm)	RPM	FEED	Ap (mm)
1.8	20	17,760	1,140	0.041	16,800	940	0.032	14,800	785	0.023
2	6	18,000	1,795	0.18	17,000	1,525	0.14	15,000	1,285	0.1
	8	18,000	1,795	0.126	17,000	1,525	0.098	15,000	1,285	0.07
	10	18,000	1,795	0.126	17,000	1,525	0.098	15,000	1,285	0.07
	12	16,200	1,455	0.072	15,300	1,235	0.056	13,500	1,040	0.04
	14	16,200	1,455	0.072	15,300	1,235	0.056	13,500	1,040	0.04
	16	16,200	1,455	0.072	15,300	1,235	0.056	13,500	1,040	0.04
	18	16,200	1,455	0.045	15,300	1,235	0.035	13,500	1,040	0.025
	20	16,200	1,455	0.045	15,300	1,235	0.035	13,500	1,040	0.025
	22	14,400	1,150	0.045	13,600	975	0.035	12,000	820	0.025
	26	14,400	1,150	0.045	13,600	975	0.035	12,000	820	0.025
	30	14,400	1,150	0.027	13,600	975	0.021	12,000	820	0.015
	35	10,800	755	0.018	10,200	640	0.014	9,000	540	0.01
	40	10,800	755	0.018	10,200	640	0.014	9,000	540	0.01
	45	5,400	325	0.018	5,100	275	0.014	4,500	230	0.01
	50	5,400	325	0.018	5,100	275	0.014	4,500	230	0.01
	60	5,400	325	0.018	5,100	275	0.014	4,500	230	0.01
2.5	8	15,800	1,925	0.158	14,900	1,605	0.123	13,200	1,305	0.088
	10	15,800	1,925	0.158	14,900	1,605	0.123	13,200	1,305	0.088
	12	15,800	1,925	0.158	14,900	1,605	0.123	13,200	1,305	0.088
	16	14,220	1,560	0.09	13,410	1,300	0.07	11,880	1,055	0.05
	20	14,220	1,560	0.09	13,410	1,300	0.07	11,880	1,055	0.05
	22	14,220	1,560	0.056	13,410	1,300	0.044	11,880	1,055	0.031
	26	12,640	1,230	0.056	11,920	1,025	0.044	10,560	835	0.031
	30	12,640	1,230	0.056	11,920	1,025	0.044	10,560	835	0.031
	35	12,640	1,230	0.034	11,920	1,025	0.026	10,560	835	0.019
	40	9,480	810	0.034	8,940	675	0.026	7,920	550	0.019
	45	9,480	810	0.023	8,940	675	0.018	7,920	550	0.013
	50	9,480	810	0.023	8,940	675	0.018	7,920	550	0.013
3	6	13,700	2,050	0.27	12,900	1,730	0.21	11,400	1,435	0.15
	8	13,700	2,050	0.27	12,900	1,730	0.21	11,400	1,435	0.15
	10	13,700	2,050	0.189	12,900	1,730	0.147	11,400	1,435	0.105
	12	13,700	2,050	0.189	12,900	1,730	0.147	11,400	1,435	0.105
	14	13,700	2,050	0.189	12,900	1,730	0.147	11,400	1,435	0.105
	16	12,330	1,660	0.108	11,610	1,400	0.084	10,260	1,160	0.06
	18	12,330	1,660	0.108	11,610	1,400	0.084	10,260	1,160	0.06
	20	12,330	1,660	0.108	11,610	1,400	0.084	10,260	1,160	0.06
	22	12,330	1,660	0.108	11,610	1,400	0.084	10,260	1,160	0.06
	26	12,330	1,660	0.068	11,610	1,400	0.053	10,260	1,160	0.038
	30	12,330	1,660	0.068	11,610	1,400	0.053	10,260	1,160	0.038
	35	10,960	1,310	0.068	10,320	1,105	0.053	9,120	920	0.038
	40	10,960	1,310	0.041	10,320	1,105	0.032	9,120	920	0.023
	45	10,960	1,310	0.041	10,320	1,105	0.032	9,120	920	0.023

Recommended Cutting Condition

ESRB712 SERIES

Workpiece		CARBON STEEL, Alloy Steels (SCM, SNCM, S45C)			Prehardened Steels (NAK, CENA, KP4)			Herdened Steels (SKD, SKT, STAVAX)		
Hardness		~HRc35			HRc35~HRc45			HRc45~HRc55		
Strength		~1100N/mm2			1100~1500N/mm2			1500~2000N/mm2		
Diameter (mm)	Effective Length	RPM	FEED	Ap (mm)	RPM	FEED	Ap (mm)	RPM	FEED	Ap (mm)
3	50	8,220	860	0.027	7,740	725	0.021	6,840	605	0.015
	60	8,220	860	0.027	7,740	725	0.021	6,840	605	0.015
4	8	9,800	1,965	0.36	9,300	1,670	0.28	8,200	1,395	0.2
	10	9,800	1,965	0.36	9,300	1,670	0.28	8,200	1,395	0.2
	12	9,800	1,965	0.36	9,300	1,670	0.28	8,200	1,395	0.2
	14	9,800	1,965	0.252	9,300	1,670	0.196	8,200	1,395	0.14
	16	9,800	1,965	0.252	9,300	1,670	0.196	8,200	1,395	0.14
	18	9,800	1,965	0.252	9,300	1,670	0.196	8,200	1,395	0.14
	20	9,800	1,965	0.252	9,300	1,670	0.196	8,200	1,395	0.14
	22	8,820	1,590	0.144	8,370	1,355	0.112	7,380	1,130	0.08
	26	8,820	1,590	0.144	8,370	1,355	0.112	7,380	1,130	0.08
	30	8,820	1,590	0.144	8,370	1,355	0.112	7,380	1,130	0.08
	35	8,820	1,590	0.09	8,370	1,355	0.07	7,380	1,130	0.05
	40	8,820	1,590	0.09	8,370	1,355	0.07	7,380	1,130	0.05
	45	7,840	1,260	0.09	7,440	1,070	0.07	6,560	895	0.05
	50	7,840	1,260	0.09	7,440	1,070	0.07	6,560	895	0.05
	60	7,840	1,260	0.054	7,440	1,070	0.042	6,560	895	0.03
5	15	7,700	1,845	0.315	7,300	1,455	0.245	6,400	1,285	0.175
	20	7,700	1,845	0.315	7,300	1,455	0.245	6,400	1,285	0.175
	26	6,930	1,495	0.18	6,570	1,180	0.14	5,760	1,040	0.1
	30	6,930	1,495	0.18	6,570	1,180	0.14	5,760	1,040	0.1
	35	6,930	1,495	0.18	6,570	1,180	0.14	5,760	1,040	0.1
	40	6,930	1,495	0.18	6,570	1,180	0.14	5,760	1,040	0.1
	50	6,930	1,495	0.113	6,570	1,180	0.088	5,760	1,040	0.063
	60	6,160	1,180	0.113	5,840	930	0.088	5,120	820	0.063
6	20	6,500	1,900	0.378	6,200	1,600	0.294	5,500	1,330	0.21
	30	6,500	1,900	0.378	6,200	1,600	0.294	5,500	1,330	0.21
8	25	4,850	1,800	0.504	4,600	1,500	0.392	4,000	1,280	0.28
	30	4,850	1,800	0.504	4,600	1,500	0.392	4,000	1,280	0.28
10	30	3,850	1,650	0.9	3,680	1,400	0.7	3,200	1,200	0.5
	40	3,850	1,650	0.63	3,680	1,400	0.49	3,200	1,200	0.35
12	32	3,200	1,520	1.08	3,050	1,300	0.84	2,650	1,100	0.6
	45	3,200	1,520	0.756	3,050	1,300	0.588	2,650	1,100	0.42

RPM = rev / min
FEED = mm / min

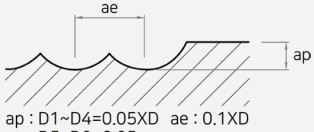


ap : D1~D4=0.05XD ae : 0.1XD
D5~D8=0.25mm
D10~D12=0.3mm

ESLNB20 SERIES

Work-piece	Alloy Steels, Heat Resistant Steels			Herdened Steels			Herdened Steels			Copper, Copper alloy		
Hardness	HRc30~HRc45			HRc45~HRc55			HRc55~HRc65			-		
Diameter (mm)	RPM	FEED	Ap (mm)	RPM	FEED	Ap (mm)	RPM	FEED	Ap (mm)	RPM	FEED	Ap (mm)
0.5	34,100~49,500	600~870	0.007~0.028	31,900~35,200	490~540	0.005~0.023	31,900~35,200	440~480	0.005~0.021	49,000~50,000	1,100~1,400	0.010~0.042
0.6	28,600~40,700	590~850	0.007~0.034	26,400~29,700	480~540	0.006~0.028	26,400~29,700	400~480	0.006~0.025	42,000~50,000	1,100~1,700	0.011~0.050
0.8	22,000~30,800	640~890	0.016~0.064	19,800~22,000	490~550	0.013~0.052	19,800~22,000	440~500	0.012~0.048	31,000~50,000	1,100~2,250	0.024~0.096
1	17,600~24,200	600~850	0.008~0.080	15,400~17,600	470~540	0.007~0.065	15,400~17,600	440~500	0.006~0.060	24,000~49,500	1,100~2,200	0.012~0.120
1.2	14,300~18,700	590~780	0.024~0.032	12,000~14,000	480~540	0.020~0.026	12,000~14,000	420~480	0.018~0.024	28,500~38,500	1,480~1,950	0.036~0.048
1.5	11,000~14,300	580~760	0.031~0.048	10,000~11,500	480~540	0.025~0.039	10,000~11,500	420~480	0.023~0.036	17,000~28,500	1,100~1,950	0.046~0.072
2	8,500~11,000	590~800	0.024~0.160	7,900~8,800	470~530	0.020~0.130	7,900~8,800	440~480	0.018~0.120	12,600~24,000	1,100~2,150	0.036~0.240
3	5,700~8,200	730~1,000	0.064~0.24	5,300~5,800	590~650	0.052~0.195	5,300~5,800	550~620	0.048~0.120	11,900~17,000	1,850~2,700	0.096~0.360
4	4,300~6,200	680~990	0.080~0.320	3,950~4,400	550~620	0.065~0.260	3,850~4,400	530~570	0.060~0.240	6,600~12,500	1,260~2,500	0.120~0.480

RPM = rev / min
FEED = mm / min



ap : D1~D4=0.05XD ae : 0.1XD
D5~D8=0.25mm
D10~D12=0.3mm

Recommended Cutting Condition

ESTNB20 SERIES

Workpiece					Carbon Steels, Alloy Steels (180~250HB)		Prehardened Steels (HRc35~45)		Herdened Steels (HRc45~55)		Herdened Steels (HRc55~65)	
Ratio to standard depth of cut					Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
Mill Dia (mm)	Diameter (mm)	Neck Length (mm)	Neck Angle (˚)	Depth of Cut (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
0.4	0.8	4	0.4	0.062	32,000	2,560	22,400	1,613	20,800	1,331	20,800	1,165
		6	0.4	0.045	32,000	2,560	22,400	1,613	20,800	1,331	20,800	1,165
		8	0.9	0.026	25,600	1,475	17,920	1,032	16,640	852	16,640	745
		12	0.9	0.02	20,800	1,065	14,560	699	13,520	606	13,520	519
		16	0.9	0.018	20,800	932	14,560	612	13,520	530	13,520	454
0.45	0.9	4	0.4	0.063	28,300	2,547	19,810	1,605	18,395	1,324	18,395	1,159
		8	0.4	0.05	28,300	2,547	19,810	1,605	18,395	1,324	18,395	1,159
		12	0.4	0.037	18,400	1,325	12,880	811	11,960	753	11,960	646
		16	0.4	0.024	18,400	1,325	12,880	811	11,960	753	11,960	646
		18	0.4	0.018	18,400	1,325	12,880	811	11,960	753	11,960	646
		20	0.4	0.015	15,850	1,141	11,095	699	10,303	649	10,303	556
		22	0.4	0.012	15,850	1,141	11,095	699	10,303	649	10,303	556
		24	0.4	0.009	14,150	1,019	9,905	624	9,198	579	9,198	497
0.5	1	6	0.4	0.055	25,600	2,560	17,920	1,613	16,640	1,331	16,640	1,165
		8	0.4	0.055	25,600	2,560	17,920	1,613	16,640	1,331	16,640	1,165
		10	0.4	0.032	20,800	1,872	14,560	1,310	13,520	1,082	13,520	946
		10	0.9	0.035	20,800	1,872	14,560	1,310	13,520	1,082	13,520	946
		15	0.9	0.028	16,640	1,331	11,648	874	10,816	757	10,816	649
		20	0.4	0.018	16,640	1,331	11,648	874	10,816	757	10,816	649
		20	0.9	0.02	16,640	1,331	11,648	874	10,816	757	10,816	649
		25	0.9	0.017	14,560	1,165	10,192	764	9,464	662	9,464	568
		30	0.4	0.015	12,480	874	8,736	568	8,112	487	8,112	406
		30	0.9	0.017	12,480	874	8,736	568	8,112	487	8,112	406
		35	0.9	0.01	10,400	728	7,280	473	6,760	406	6,760	338
		40	0.9	0.009	10,000	700	7,000	455	6,500	390	6,500	325
		50	0.9	0.007	9,500	665	6,650	432	6,175	371	6,175	309
		60	0.9	0.005	9,000	630	6,300	410	5,850	351	5,850	293
		70	0.9	0.003	8,500	595	5,950	387	5,525	332	5,525	276
0.75	1.5	8	0.4	0.07	16,960	2,544	11,872	1,603	11,024	1,323	11,024	1,158
		10	0.4	0.07	16,960	2,544	11,872	1,603	11,024	1,323	11,024	1,158
		12	0.4	0.07	16,960	2,544	11,872	1,603	11,024	1,323	11,024	1,158
		15	0.9	0.045	13,568	1,832	9,498	1,282	8,819	1,058	8,819	926
		20	0.9	0.04	11,024	1,323	7,717	810	7,166	752	7,166	645
		30	0.9	0.028	11,024	1,323	7,717	810	7,166	752	7,166	645
0.9	1.8	4	0.4	0.12	14,200	2,556	9,940	1,610	9,230	1,329	9,230	1,163
		8	0.4	0.1	14,200	2,556	9,940	1,610	9,230	1,329	9,230	1,163
		12	0.4	0.08	14,200	2,556	9,940	1,610	9,230	1,329	9,230	1,163
		16	0.4	0.071	14,200	2,556	9,940	1,610	9,230	1,329	9,230	1,163
		20	0.4	0.062	9,230	1,329	6,461	814	6,000	756	6,000	648
		24	0.4	0.053	9,230	1,329	6,461	814	6,000	756	6,000	648
		28	0.4	0.044	9,230	1,329	6,461	814	6,000	756	6,000	648
		32	0.4	0.036	9,230	1,329	6,461	814	6,000	756	6,000	648
		36	0.4	0.028	9,230	1,329	6,461	814	6,000	756	6,000	648
		38	0.4	0.02	8,000	1,152	5,600	706	5,200	655	5,200	562

ESTNB20 SERIES

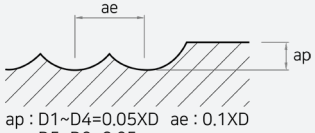
Workpiece					Carbon Steels, Alloy Steels (180~250HB)		Prehardened Steels (HRc35~45)		Herdened Steels (HRc45~55)		Herdened Steels (HRc55~65)	
Ratio to standard depth of cut					Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
Mill Dia (mm)	Diameter (mm)	Neck Length (mm)	Neck Angle (˚)	Depth of Cut (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
0.9	1.8	40	0.4	0.015	8,000	1,152	5,600	706	5,200	655	5,200	562
1	2	8	0.4	0.15	15,200	3,040	10,640	1,915	9,880	1,581	9,880	1,383
		12	0.4	0.09	15,200	3,040	10,640	1,915	9,880	1,581	9,880	1,383
		16	0.4	0.09	15,200	3,040	10,640	1,915	9,880	1,581	9,880	1,383
		20	0.4	0.06	12,160	2,189	8,512	1,532	7,904	1,265	7,904	1,107
		20	0.9	0.07	12,160	2,189	8,512	1,532	7,904	1,265	7,904	1,107
		25	0.9	0.07	9,880	1,581	6,916	968	6,442	899	6,422	771
		30	0.4	0.04	9,880	1,581	6,916	968	6,442	899	6,422	771
		30	0.9	0.045	9,880	1,581	6,916	968	6,442	899	6,422	771
		35	0.9	0.045	9,880	1,581	6,916	968	6,442	899	6,422	771
		40	0.4	0.03	9,880	1,581	6,916	968	6,442	899	6,422	771
		40	0.9	0.035	9,880	1,581	6,916	968	6,442	899	6,422	771
		50	0.9	0.17	8,512	1,192	5,958	775	5,533	664	5,533	553
		60	0.9	0.009	7,235	1,013	5,065	658	4,703	564	4,703	470
		70	0.9	0.005	6,150	861	4,305	560	3,997	480	3,997	400
1.5	3	8	0.4	0.32	12,720	3,816	8,904	2,404	8,268	1,984	8,268	1,736
		16	0.4	0.22	12,720	3,816	8,904	2,404	8,268	1,984	8,268	1,736
		20	0.4	0.15	12,720	3,434	8,904	2,137	8,268	1,736	8,268	1,488
		30	0.4	0.08	10,176	2,748	7,123	1,496	6,614	1,389	6,614	1,191
		30	0.9	0.09	10,176	2,748	7,123	1,496	6,614	1,389	6,614	1,191
		40	0.4	0.06	8,268	1,984	5,788	1,215	5,374	1,129	5,374	967
		40	0.9	0.07	8,268	1,984	5,788	1,215	5,374	1,129	5,374	967
		50	0.9	0.05	8,268	1,984	5,788	1,215	5,374	1,129	5,374	967
		60	0.9	0.03	7,123	1,710	4,986	1,047	4,630	972	4,630	833
		70	0.9	0.02	6,233	1,496	4,363	916	4,051	851	4,051	729
2	4	20	1	0.32	11,900	2,860	9,000	2,050	7,800	1,680	7,800	1,590
		30	1	0.23	11,900	2,570	9,000	1,850	7,800	1,520	7,800	1,430
		40	1	0.14	9,500	1,940	7,200	1,400	6,200	1,140	6,200	1,080
		50	1	0.11	7,800	1,590	5,800	1,120	5,000	920	5,000	870
		60	1	0.07	7,800	1,590	5,800	1,120	5,000	920	5,000	870
2.5	5	30	1	0.34	9,500	2,140	7,200	1,540	6,200	1,260	6,200	1,190
		40	1	0.25	9,500	2,140	7,200	1,540	6,200	1,260	6,200	1,190
		60	1	0.15	6,200	1,320	4,700	950	4,000	770	4,000	720
3	6	30	1	0.45	8,000	2,000	6,000	1,430	5,200	1,170	5,200	1,110
		40	1	0.4	8,000	1,800	6,000	1,280	5,200	1,050	5,200	990
		50	1	0.32	8,000	1,800	6,000	1,280	5,200	1,050	5,200	990
		60	1	0.22	6,400	1,360	4,800	970	4,100	780	4,100	740
		70	1	0.18	5,200	1,110	3,900	790	3,400	650	3,400	610
		80	1	0.14	5,200	1,110	3,900	790	3,400	650	3,400	610
4	8	50	1	0.5	6,000	1,460	4,500	1,040	3,900	850	3,900	810
		60	1	0.43	6,000	1,460	4,500	1,040	3,900	850	3,900	810
		70	1	0.33	6,000	1,460	4,500	1,040	3,900	850	3,900	810
		80	1	0.25	4,800	1,100	3,600	780	3,100	640	3,100	600
5	10	60	1	0.7	4,800	1,300	3,600	920	3,100	750	3,100	710

Recommended Cutting Condition

ESTNB20 SERIES

Workpiece					Carbon Steels, Alloy Steels (180~250HB)		Prehardened Steels (HRc35~45)		Herdened Steels (HRc45~55)		Herdened Steels (HRc55~65)	
Ratio to standard depth of cut					Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
Mill Dia (mm)	Diameter (mm)	Neck Length (mm)	Neck Angle (˚)	Depth of Cut (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
5	10	75	1	0.5	4,800	1,300	3,600	920	3,100	750	3,100	710

RPM = rev / min
FEED = mm / min



ap : D1~D4=0.05XD ae : 0.1XD
D5~D8=0.25mm
D10~D12=0.3mm

· Please try to use 20-30% slow down than recommendation when chips are not evacuated well -Rib machining, slotting, etc.
ex)ESTNB2040-20-10, HRc 55, Rib machining
ap : 0.32(ap from chart) X 0.65(constant value) X 0.8 = 0.17mm
· The above recommendation table may differ from the actual situation, adjust it according to the machine condition, processing type and purpose.
· In the case of low RPM, reduce the feed rate at the same rate.

ESTNB30 SERIES

Workpiece					Carbon Steels, Alloy Steels (180~250HB)		Prehardened Steels (HRc35~45)		Herdened Steels (HRc45~55)		Herdened Steels (HRc55~65)	
Ratio to standard depth of cut					Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
Mill Dia (mm)	Diameter (mm)	Neck Length (mm)	Neck Angle (˚)	Depth of Cut (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
0.1	0.2	1	0.4	0.017	40,000	800	28,000	504	26,000	416	26,000	364
		1.5	0.4	0.009	40,000	800	28,000	504	26,000	416	26,000	364
		2	0.9	0.007	32,000	461	22,400	323	20,800	266	20,800	233
		2.5	0.9	0.004	26,000	333	18,200	204	16,900	189	16,900	162
0.15	0.3	2	0.4	0.025	40,000	1,200	28,000	756	26,000	624	26,000	546
		3	0.9	0.013	32,000	691	22,400	484	20,800	399	20,800	349
		4	0.9	0.01	26,000	499	18,200	306	16,900	284	16,900	243
0.2	0.4	2	0.4	0.035	40,000	1,600	28,000	1,008	26,000	832	26,000	728
		3	0.4	0.02	40,000	1,600	28,000	1,008	26,000	832	26,000	728
		4	0.4	0.007	32,000	922	22,400	645	20,800	532	20,800	466
		4	0.9	0.009	32,000	922	22,400	645	20,800	532	20,800	466
		5	0.4	0.006	26,000	666	18,200	408	16,900	379	16,900	324
		5	0.9	0.007	26,000	666	18,200	408	16,900	379	16,900	324
0.25	0.5	4	0.4	0.04	40,000	2,000	28,000	1,260	26,000	1,040	26,000	910
		8	0.9	0.01	26,000	728	18,200	446	16,900	414	16,900	355
		12	0.9	0.005	22,400	627	15,680	384	14,560	357	14,560	306
0.27	0.54	2	0.4	0.05	40,000	2,160	28,000	1,361	26,000	1,123	26,000	983
		4	0.4	0.037	40,000	2,160	28,000	1,361	26,000	1,123	26,000	983
		5	0.4	0.031	40,000	1,512	28,000	1,176	26,000	1,040	26,000	832
		6	0.4	0.025	26,000	1,244	18,200	871	16,900	676	16,900	629
		6.5	0.4	0.02	26,000	1,011	18,200	619	16,900	575	16,900	493
		7	0.4	0.015	26,000	899	18,200	585	16,900	543	16,900	465
0.3	0.6	2	0.4	0.055	40,000	2,400	28,000	1,512	26,000	1,248	26,000	1,092
		4	0.4	0.035	40,000	2,400	28,000	1,512	26,000	1,248	26,000	1,092
		6	0.4	0.018	32,000	1,382	22,400	968	20,800	799	20,800	699
		6	0.9	0.02	32,000	1,382	22,400	968	20,800	799	20,800	699
		8	0.9	0.02	26,000	998	18,200	612	16,900	568	16,900	487
		10	0.4	0.013	26,000	874	18,200	535	16,900	497	16,900	426
		10	0.9	0.015	26,000	874	18,200	535	16,900	497	16,900	426
		12	0.9	0.01	26,000	874	18,200	535	16,900	497	16,900	426
		15	0.4	0.005	22,400	753	15,680	461	14,560	367	14,560	367
		15	0.9	0.006	22,400	753	15,680	461	14,560	367	14,560	367
0.4	0.8	4	0.4	0.062	32,000	2,560	22,400	1,613	20,800	1,331	20,800	1,165
		6	0.4	0.045	32,000	2,560	22,400	1,613	20,800	1,331	20,800	1,165
		8	0.9	0.026	25,600	1,475	17,920	1,032	16,640	852	16,640	745
		12	0.9	0.02	20,800	1,065	14,560	699	13,520	606	13,520	519
		16	0.9	0.018	20,800	932	14,560	612	13,520	530	13,520	454
0.45	0.9	4	0.4	0.063	28,300	2,547	19,810	1,605	18,395	1,324	18,395	1,159
		8	0.4	0.05	28,300	2,547	19,810	1,605	18,395	1,324	18,395	1,159
		12	0.4	0.037	18,400	1,325	12,880	811	11,960	753	11,960	646
		16	0.4	0.024	18,400	1,325	12,880	811	11,960	753	11,960	646
		18	0.4	0.018	18,400	1,325	12,880	811	11,960	753	11,960	646
		20	0.4	0.015	15,850	1,141	11,095	699	10,303	649	10,303	556
		22	0.4	0.012	15,850	1,141	11,095	699	10,303	649	10,303	556

Recommended Cutting Condition

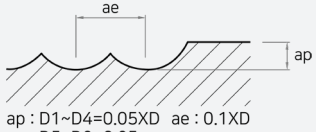
ESTNB30 SERIES

Workpiece					Carbon Steels, Alloy Steels (180~250HB)		Prehardened Steels (HRc35~45)		Herdened Steels (HRc45~55)		Herdened Steels (HRc55~65)	
Ratio to standard depth of cut					Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
Mill Dia (mm)	Diameter (mm)	Neck Length (mm)	Neck Angle (˚)	Depth of Cut (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
0.45	0.9	24	0.4	0.009	14,150	1,019	9,905	624	9,198	579	9,198	497
0.5	1	6	0.4	0.055	25,600	2,560	17,920	1,613	16,640	1,331	16,640	1,165
		8	0.4	0.055	25,600	2,560	17,920	1,613	16,640	1,331	16,640	1,165
		10	0.4	0.032	20,800	1,872	14,560	1,310	13,520	1,082	13,520	946
		10	0.9	0.035	20,800	1,872	14,560	1,310	13,520	1,082	13,520	946
		15	0.9	0.028	16,640	1,331	11,648	874	10,816	757	10,816	649
		20	0.4	0.018	16,640	1,331	11,648	874	10,816	757	10,816	649
		20	0.9	0.02	16,640	1,331	11,648	874	10,816	757	10,816	649
		25	0.9	0.017	14,560	1,165	10,192	764	9,464	662	9,464	568
		30	0.4	0.015	12,480	874	8,736	568	8,112	487	8,112	406
		30	0.9	0.017	12,480	874	8,736	568	8,112	487	8,112	406
		35	0.9	0.01	10,400	728	7,280	473	6,760	406	6,760	338
		40	0.9	0.009	10,000	700	7,000	455	6,500	390	6,500	325
		50	0.9	0.007	9,500	665	6,650	432	6,175	371	6,175	309
		60	0.9	0.005	9,000	630	6,300	410	5,850	351	5,850	293
		70	0.9	0.003	8,500	595	5,950	387	5,525	332	5,525	276
0.75	1.5	8	0.4	0.07	16,960	2,544	11,872	1,603	11,024	1,323	11,024	1,158
		10	0.4	0.07	16,960	2,544	11,872	1,603	11,024	1,323	11,024	1,158
		12	0.4	0.07	16,960	2,544	11,872	1,603	11,024	1,323	11,024	1,158
		15	0.9	0.045	13,568	1,832	9,498	1,282	8,819	1,058	8,819	926
		20	0.9	0.04	11,024	1,323	7,717	810	7,166	752	7,166	645
		30	0.9	0.028	11,024	1,323	7,717	810	7,166	752	7,166	645
0.9	1.8	4	0.4	0.12	14,200	2,556	9,940	1,610	9,230	1,329	9,230	1,163
		8	0.4	0.1	14,200	2,556	9,940	1,610	9,230	1,329	9,230	1,163
		12	0.4	0.08	14,200	2,556	9,940	1,610	9,230	1,329	9,230	1,163
		16	0.4	0.071	14,200	2,556	9,940	1,610	9,230	1,329	9,230	1,163
		20	0.4	0.062	9,230	1,329	6,461	814	6,000	756	6,000	648
		24	0.4	0.053	9,230	1,329	6,461	814	6,000	756	6,000	648
		28	0.4	0.044	9,230	1,329	6,461	814	6,000	756	6,000	648
		32	0.4	0.036	9,230	1,329	6,461	814	6,000	756	6,000	648
		36	0.4	0.028	9,230	1,329	6,461	814	6,000	756	6,000	648
		38	0.4	0.02	8,000	1,152	5,600	706	5,200	655	5,200	562
		40	0.4	0.015	8,000	1,152	5,600	706	5,200	655	5,200	562
1	2	8	0.4	0.15	15,200	3,040	10,640	1,915	9,880	1,581	9,880	1,383
		12	0.4	0.09	15,200	3,040	10,640	1,915	9,880	1,581	9,880	1,383
		16	0.4	0.09	15,200	3,040	10,640	1,915	9,880	1,581	9,880	1,383
		20	0.4	0.06	12,160	2,189	8,512	1,532	7,904	1,265	7,904	1,107
		20	0.9	0.07	12,160	2,189	8,512	1,532	7,904	1,265	7,904	1,107
		25	0.9	0.07	9,880	1,581	6,916	968	6,442	899	6,422	771
		30	0.4	0.04	9,880	1,581	6,916	968	6,442	899	6,422	771
		30	0.9	0.045	9,880	1,581	6,916	968	6,442	899	6,422	771
		35	0.9	0.045	9,880	1,581	6,916	968	6,442	899	6,422	771
		40	0.4	0.03	9,880	1,581	6,916	968	6,442	899	6,422	771
		40	0.9	0.035	9,880	1,581	6,916	968	6,442	899	6,422	771

ESTNB30 SERIES

Workpiece					Carbon Steels, Alloy Steels (180~250HB)		Prehardened Steels (HRc35~45)		Herdened Steels (HRc45~55)		Herdened Steels (HRc55~65)	
Ratio to standard depth of cut					Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
Mill Dia (mm)	Diameter (mm)	Neck Length (mm)	Neck Angle (˚)	Depth of Cut (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
1	2	50	0.9	0.17	8,512	1,192	5,958	775	5,533	664	5,533	553
		60	0.9	0.009	7,235	1,013	5,065	658	4,703	564	4,703	470
		70	0.9	0.005	6,150	861	4,305	560	3,997	480	3,997	400
1.5	3	8	0.4	0.32	12,720	3,816	8,904	2,404	8,268	1,984	8,268	1,736
		16	0.4	0.22	12,720	3,816	8,904	2,404	8,268	1,984	8,268	1,736
		20	0.4	0.15	12,720	3,434	8,904	2,137	8,268	1,736	8,268	1,488
		30	0.4	0.08	10,176	2,748	7,123	1,496	6,614	1,389	6,614	1,191
		30	0.9	0.09	10,176	2,748	7,123	1,496	6,614	1,389	6,614	1,191
		40	0.4	0.06	8,268	1,984	5,788	1,215	5,374	1,129	5,374	967
		40	0.9	0.07	8,268	1,984	5,788	1,215	5,374	1,129	5,374	967
		50	0.9	0.05	8,268	1,984	5,788	1,215	5,374	1,129	5,374	967
		60	0.9	0.03	7,123	1,710	4,986	1,047	4,630	972	4,630	833
		70	0.9	0.02	6,233	1,496	4,363	916	4,051	851	4,051	729
2	4	20	1	0.32	11,900	2,860	9,000	2,050	7,800	1,680	7,800	1,590
		30	1	0.23	11,900	2,570	9,000	1,850	7,800	1,520	7,800	1,430
		40	1	0.14	9,500	1,940	7,200	1,400	6,200	1,140	6,200	1,080
		50	1	0.11	7,800	1,590	5,800	1,120	5,000	920	5,000	870
		60	1	0.07	7,800	1,590	5,800	1,120	5,000	920	5,000	870
2.5	5	30	1	0.34	9,500	2,140	7,200	1,540	6,200	1,260	6,200	1,190
		40	1	0.25	9,500	2,140	7,200	1,540	6,200	1,260	6,200	1,190
		60	1	0.15	6,200	1,320	4,700	950	4,000	770	4,000	720
3	6	30	1	0.45	8,000	2,000	6,000	1,430	5,200	1,170	5,200	1,110
		40	1	0.4	8,000	1,800	6,000	1,280	5,200	1,050	5,200	990
		50	1	0.32	8,000	1,800	6,000	1,280	5,200	1,050	5,200	990
		60	1	0.22	6,400	1,360	4,800	970	4,100	780	4,100	740
		70	1	0.18	5,200	1,110	3,900	790	3,400	650	3,400	610
		80	1	0.14	5,200	1,110	3,900	790	3,400	650	3,400	610
4	8	50	1	0.5	6,000	1,460	4,500	1,040	3,900	850	3,900	810
		60	1	0.43	6,000	1,460	4,500	1,040	3,900	850	3,900	810
		70	1	0.33	6,000	1,460	4,500	1,040	3,900	850	3,900	810
		80	1	0.25	4,800	1,100	3,600	780	3,100	640	3,100	600
5	10	60	1	0.7	4,800	1,300	3,600	920	3,100	750	3,100	710
		75	1	0.5	4,800	1,300	3,600	920	3,100	750	3,100	710

RPM = rev / min
FEED = mm / min



ap : D1~D4=0.05XD ae : 0.1XD
D5~D8=0.25mm
D10~D12=0.3mm

· Please try to use 20-30% slow down than recommendation when chips are not evacuated well -Rib machining, slotting, etc.
ex)ESTNB3040-20-10, HRc 55, Rib machining
ap : 0.32(ap from chart) X 0.65(constant value) X 0.8 = 0.17mm
· The above recommendation table may differ from the actual situation, adjust it according to the machine condition, processing type and purpose.
· In the case of low RPM, reduce the feed rate at the same rate.

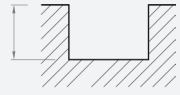
Recommended Cutting Condition

UE502, UXE502 SERIES

Workpiece	Alloy Steels Carbon Steels (SCM, SNCM, S45C)		Prehardened Steels (NAK, CENA, KP4)		Stainless Steels (SUS)		Herdened Steels (SKD, SKT, STAVAX)	
Hardness	~ HRc35		HRc35 ~ HRc45		-		HRc45 ~ HRc55	
Strength	~ 1100N/mm2		1100 ~ 1500N/mm2		-		1500 ~ 2000N/mm2	
Diameter (mm)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)	n (min-1)	Vf (mm/min)
2	11,560	190	7,560	120	6,300	90	5,040	35
3	8,920	210	5,560	140	4,620	120	3,360	40
4	7,560	300	4,620	180	3,880	150	2,940	40
5	6,300	320	3,780	190	3,160	160	2,320	50
6	5,560	350	3,360	220	2,840	180	2,000	55
8	4,200	380	2,520	200	2,100	180	1,680	75
10	3,260	330	2,000	160	1,680	160	1,360	60
12	2,740	280	1,680	130	1,360	130	1,160	55
16	2,200	220	1,360	110	1,060	110	900	40
20	1,680	170	1,060	80	840	80	680	30
25	1,360	130	840	70	680	60	540	20

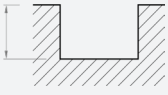
RPM = rev / min
FEED = mm / min

ap : 0.5D



(ap : UP TO Ø 3.0 : 0.2D)

ap : 0.05D



UE512 SERIES

Workpiece		Alloy Steels, Carbon Steels (SCM, SNCM, S45C)			Prehardened Steels (NAK, CENA, KP4)			Herdened Steels (SKD, SKT, STAVAX)		
Hardness		~ HRc35			HRc35 ~ HRc45			HRc45 ~ HRc55		
Strength		~ 1100N/mm2			1100 ~ 1500N/mm2			1500 ~ 2000N/mm2		
Diameter (mm)	Effective Length (mm)	RPM	FEED	ap (mm)	RPM	FEED	ap (mm)	RPM	FEED	ap (mm)
0.1	0.3	50000	315	0.009	46200	230	0.007	40600	170	0.005
	0.5	50000	315	0.006	46200	230	0.005	40600	170	0.004
	1	45000	255	0.002	41580	185	0.002	36540	140	0.001
0.2	0.5	38500	380	0.018	36300	270	0.014	32100	200	0.01
	1	38500	380	0.013	36300	270	0.010	32100	200	0.007
	1.5	34650	310	0.007	32670	220	0.006	28890	160	0.004
	2	34650	310	0.005	32670	220	0.004	28890	160	0.003
0.3	1	34200	390	0.019	32300	270	0.015	28500	230	0.011
	1.5	34200	390	0.019	32300	270	0.015	25800	230	0.011
	2	30780	315	0.011	29070	220	0.008	25650	185	0.006
	2.5	30780	315	0.007	29070	220	0.005	25650	185	0.004
	3	30780	315	0.007	29070	220	0.005	25650	185	0.004
	4	27360	250	0.004	25840	175	0.003	22800	145	0.002
	5	20520	165	0.003	19380	115	0.002	17100	95	0.002
0.4	1	27400	540	0.036	25800	380	0.028	22800	280	0.02
	1.5	27400	540	0.025	25800	380	0.020	22800	280	0.014
	2	27400	540	0.025	25800	380	0.020	22800	280	0.014
	2.5	24660	435	0.014	23220	310	0.011	20520	225	0.008
	3	24660	435	0.014	23220	310	0.011	20520	225	0.008
	4	24660	435	0.009	23220	310	0.007	20520	225	0.005
	5	21920	345	0.009	20640	245	0.007	18240	180	0.005
	6	21920	345	0.005	20640	245	0.004	18240	180	0.003
	8	16440	225	0.004	15480	160	0.003	13680	120	0.002
	10	8220	95	0.004	7740	70	0.003	6840	50	0.002
0.5	1	27400	540	0.045	25800	425	0.035	22800	285	0.025
	1.5	27400	540	0.045	25800	425	0.035	22800	285	0.025
	2	27400	540	0.032	25800	425	0.025	22800	285	0.018
	2.5	27400	540	0.032	25800	425	0.025	22800	285	0.018
	3	24660	435	0.018	23220	345	0.014	20520	230	0.01
	4	24660	435	0.018	23220	345	0.014	20520	230	0.01
	5	24660	435	0.011	23220	345	0.009	20520	230	0.006
	6	21920	345	0.011	20640	270	0.009	18240	180	0.006
	8	16440	225	0.007	15480	180	0.005	13680	120	0.004
	10	16440	225	0.005	15480	180	0.004	13680	120	0.003
	12	8220	95	0.005	7740	75	0.004	6840	50	0.003
	14	8220	95	0.005	7740	75	0.004	6840	50	0.003
	16	2740	25	0.005	2580	20	0.004	2280	15	0.003
0.6	2	27400	775	0.038	25800	545	0.029	22800	405	0.021
	3	27400	775	0.038	25800	545	0.029	22800	405	0.021
	4	24660	630	0.022	23220	440	0.017	20520	330	0.012
	5	24660	630	0.014	23220	440	0.011	20520	330	0.008
	6	24660	630	0.014	23220	440	0.011	20520	330	0.008

Recommended Cutting Condition

UE512 SERIES

Workpiece		Alloy Steels Carbon Steels (SCM, SNCM, S45C)			Prehardened Steels (NAK, CENA, KP4)			Herdened Steels (SKD, SKT, STAVAX)		
Hardness		~ HRc35			HRc35 ~ HRc45			HRc45 ~ HRc55		
Strength		~ 1100N/mm2			1100 ~ 1500N/mm2			1500 ~ 2000N/mm2		
Diameter (mm)	Effective Length (mm)	RPM	FEED	ap (mm)	RPM	FEED	ap (mm)	RPM	FEED	ap (mm)
0.6	8	21920	495	0.008	20640	350	0.006	18240	260	0.005
	10	16440	325	0.005	15480	230	0.004	13680	170	0.003
	12	16440	325	0.005	15480	230	0.004	13680	170	0.003
	14	8220	140	0.005	7740	100	0.004	6840	75	0.003
	16	8220	140	0.005	7740	100	0.004	6840	75	0.003
0.7	2	27400	775	0.063	25800	545	0.049	22800	405	0.035
	4	24660	630	0.025	23220	440	0.020	20520	330	0.014
	6	24660	630	0.016	23220	440	0.012	20520	330	0.009
	8	21920	495	0.016	20640	350	0.012	18240	260	0.009
	10	21920	495	0.009	20640	350	0.007	18240	260	0.005
	12	16440	325	0.009	15480	230	0.005	13680	170	0.004
0.8	2	27400	775	0.072	25800	605	0.056	22800	450	0.040
	3	27400	775	0.050	25800	605	0.039	22800	450	0.028
	4	27400	775	0.050	25800	605	0.039	22800	450	0.028
	5	24660	630	0.029	23220	490	0.022	20520	365	0.016
	6	24660	630	0.029	23220	490	0.022	20520	365	0.016
	8	24660	630	0.018	23220	490	0.014	20520	365	0.010
	10	21920	495	0.018	20640	385	0.014	18240	290	0.01
	12	21920	495	0.011	20640	385	0.008	18240	290	0.006
	14	16440	325	0.007	15480	255	0.006	13680	190	0.004
	16	16440	325	0.007	15480	255	0.006	13680	190	0.004
	20	8220	140	0.007	7740	110	0.006	6840	80	0.004
0.9	6	22140	575	0.032	20970	440	0.025	18450	330	0.018
	8	22140	575	0.020	20970	440	0.016	18450	330	0.011
	10	19680	455	0.020	18640	350	0.016	16400	260	0.011
1.0	2	24600	1045	0.090	23300	890	0.070	20500	665	0.050
	3	24600	1045	0.090	23300	890	0.070	20500	665	0.050
	4	24600	1045	0.063	23300	890	0.049	20500	665	0.035
	5	24600	1045	0.063	23300	890	0.049	20500	665	0.035
	6	22140	845	0.036	20970	720	0.028	18450	540	0.020
	7	22140	845	0.036	20970	720	0.028	18450	540	0.020
	8	22140	845	0.036	20970	720	0.028	18450	540	0.020
	10	22140	845	0.023	20970	720	0.018	18450	540	0.013
	12	19680	670	0.023	18640	570	0.018	16400	425	0.013
	14	19680	670	0.014	18640	570	0.011	16400	425	0.008
	16	14760	440	0.014	13980	375	0.011	12300	280	0.008
	18	14760	440	0.009	13980	375	0.007	12300	280	0.005
	20	14760	440	0.009	13980	375	0.007	12300	280	0.005
	22	7380	190	0.009	6990	160	0.007	6150	120	0.005
	26	7380	190	0.009	6990	160	0.007	6150	120	0.005
	30	7380	190	0.009	6990	160	0.007	6150	120	0.005
	40	2460	50	0.009	2330	45	0.007	2050	35	0.005

UE512 SERIES

Workpiece		Alloy Steels Carbon Steels (SCM, SNCM, S45C)			Prehardened Steels (NAK, CENA, KP4)			Herdened Steels (SKD, SKT, STAVAX)		
Hardness		~ HRc35			HRc35 ~ HRc45			HRc45 ~ HRc55		
Strength		~ 1100N/mm2			1100 ~ 1500N/mm2			1500 ~ 2000N/mm2		
Diameter (mm)	Effective Length (mm)	RPM	FEED	ap (mm)	RPM	FEED	ap (mm)	RPM	FEED	ap (mm)
1.0	50	2460	50	0.006	2330	45	0.005	2050	35	0.003
1.2	4	21900	930	0.076	20700	720	0.059	18200	485	0.042
	6	21900	930	0.076	20700	720	0.059	18200	485	0.042
	8	19710	755	0.043	18630	585	0.034	16380	395	0.024
	10	19710	755	0.027	18630	585	0.021	16380	395	0.015
	12	19710	755	0.027	18630	585	0.021	16380	395	0.015
	14	17520	595	0.027	16560	460	0.021	14560	310	0.015
	16	17520	595	0.016	16560	460	0.013	14560	310	0.009
	20	13140	390	0.011	12420	300	0.008	10920	205	0.006
	26	6570	165	0.011	6210	130	0.008	5460	85	0.006
	30	6570	165	0.011	6210	130	0.008	5460	85	0.006
1.4	6	19200	815	0.088	18100	570	0.069	16000	425	0.049
	8	17280	660	0.050	16290	460	0.039	14400	345	0.028
	10	17280	660	0.050	16290	460	0.039	14400	345	0.028
	14	17280	660	0.032	16290	460	0.025	14400	345	0.018
	16	15360	520	0.032	14480	365	0.025	12800	270	0.018
	20	15360	520	0.019	14480	365	0.015	12800	270	0.011
1.5	4	19200	905	0.135	18100	635	0.105	16000	475	0.075
	5	19200	905	0.095	18100	635	0.074	16000	475	0.053
	6	19200	905	0.095	18100	635	0.074	16000	475	0.053
	7	19200	905	0.095	18100	635	0.074	16000	475	0.053
	8	17280	735	0.054	16290	515	0.042	14400	385	0.030
	10	17280	735	0.054	16290	515	0.042	14400	385	0.03
	12	17280	735	0.054	16290	515	0.042	14400	385	0.030
	14	17280	735	0.034	16290	515	0.026	14400	385	0.019
	16	15360	580	0.034	14480	405	0.026	12800	305	0.019
	18	15360	580	0.034	14480	405	0.026	12800	305	0.019
	20	15360	580	0.020	14480	405	0.016	12800	305	0.011
	22	15360	580	0.020	14480	405	0.016	12800	305	0.011
	26	11520	380	0.014	10860	265	0.011	9600	200	0.008
	30	11520	380	0.014	10860	265	0.011	9600	200	0.008
1.6	8	17800	840	0.101	16800	655	0.078	14800	490	0.056
	10	16020	680	0.058	15120	530	0.045	13320	395	0.032
	12	16020	680	0.058	15120	530	0.045	13320	395	0.032
	16	16020	680	0.036	15120	530	0.028	13320	395	0.020
	20	14240	540	0.036	13440	420	0.028	11840	315	0.020
1.8	8	17800	840	0.113	16800	655	0.088	14800	490	0.063
	10	16020	680	0.065	15120	530	0.050	13320	395	0.036
	12	16020	680	0.065	15120	530	0.050	13320	395	0.036
	16	16020	680	0.041	15120	530	0.032	13320	395	0.023
	20	14240	540	0.041	13440	420	0.032	11840	315	0.023
2.0	6	14400	820	0.180	13600	620	0.140	12000	475	0.100

Recommended Cutting Condition

UE512 SERIES

Workpiece		Alloy Steels Carbon Steels (SCM, SNCM, S45C)			Prehardened Steels (NAK, CENA, KP4)			Herdened Steels (SKD, SKT, STAVAX)		
Hardness		~HRc35			HRc35~HRc45			HRc45~HRc55		
Strength		~1100N/mm2			1100~1500N/mm2			1500~2000N/mm2		
Diameter (mm)	Effective Length (mm)	RPM	FEED	ap (mm)	RPM	FEED	ap (mm)	RPM	FEED	ap (mm)
2.0	8	14400	820	0.126	13600	620	0.098	12000	475	0.070
	10	14400	820	0.126	13600	620	0.098	12000	475	0.070
	12	12960	665	0.072	12240	500	0.056	10800	385	0.040
	14	12960	665	0.072	12240	500	0.056	10800	385	0.040
	16	12960	665	0.072	12240	500	0.056	10800	385	0.040
	18	12960	665	0.045	12240	500	0.035	10800	385	0.025
	20	12960	665	0.045	12240	500	0.035	10800	385	0.025
	22	11520	525	0.045	10880	395	0.035	9600	305	0.025
	26	11520	525	0.045	10880	395	0.035	9600	305	0.025
	30	11520	525	0.027	10880	395	0.021	9600	305	0.015
	35	8640	345	0.018	8160	260	0.014	7200	200	0.010
	40	8640	345	0.018	8160	260	0.014	7200	200	0.010
	45	4320	150	0.018	4080	110	0.014	3600	85	0.010
	50	4320	150	0.018	4080	110	0.014	3600	85	0.010
	60	4320	150	0.018	4080	110	0.014	3600	85	0.010
2.5	8	12300	970	0.158	11600	680	0.123	10300	510	0.088
	10	12300	970	0.158	11600	680	0.123	10300	510	0.088
	12	12300	970	0.158	11600	680	0.123	10300	510	0.088
	14	11070	785	0.090	10440	550	0.070	9270	415	0.050
	16	11070	785	0.090	10440	550	0.070	9270	415	0.050
	18	11070	785	0.090	10440	550	0.070	9270	415	0.050
	20	11070	785	0.090	10440	550	0.070	9270	415	0.050
	22	11070	785	0.056	10440	550	0.044	9270	415	0.031
	26	9840	620	0.056	9280	435	0.044	8240	325	0.031
	30	9840	620	0.056	9280	435	0.044	8240	325	0.031
	35	9840	620	0.034	9280	435	0.026	8240	325	0.019
	40	7380	405	0.034	6960	285	0.026	6180	215	0.019
	45	7380	405	0.023	6960	285	0.018	6180	215	0.013
	50	7380	405	0.023	6960	285	0.018	6180	215	0.013
3.0	6	10900	860	0.270	10300	605	0.210	6600	450	0.150
	8	10900	860	0.270	10300	605	0.210	6600	450	0.150
	10	10900	860	0.189	10300	605	0.147	6600	450	0.105
	12	10900	860	0.189	10300	605	0.147	6600	450	0.105
	14	10900	860	0.189	10300	605	0.147	6600	450	0.105
	16	9810	695	0.108	9270	490	0.084	5940	365	0.060
	18	9810	695	0.108	9270	490	0.084	5940	365	0.060
	20	9810	695	0.108	9270	490	0.084	5940	365	0.060
	22	9810	695	0.108	9270	490	0.084	5940	365	0.060
	26	9810	695	0.068	9270	490	0.053	5940	365	0.038
	30	9810	695	0.068	9270	490	0.053	5940	365	0.038
	35	8720	550	0.068	8240	385	0.053	5280	290	0.038
	40	8720	550	0.041	8240	385	0.032	5280	290	0.023

UE512 SERIES

Workpiece		Alloy Steels Carbon Steels (SCM, SNCM, S45C)			Prehardened Steels (NAK, CENA, KP4)			Herdened Steels (SKD, SKT, STAVAX)		
Hardness		~ HRc35			HRc35 ~ HRc45			HRc45 ~ HRc55		
Strength		~ 1100N/mm2			1100 ~ 1500N/mm2			1500 ~ 2000N/mm2		
Diameter (mm)	Effective Length (mm)	RPM	FEED	ap (mm)	RPM	FEED	ap (mm)	RPM	FEED	ap (mm)
3.0	45	8720	550	0.041	8240	385	0.032	5280	290	0.023
	50	6540	360	0.027	6180	255	0.021	3960	190	0.015
	60	6540	360	0.027	6180	255	0.021	3960	190	0.015
4.0	8	8000	1300	0.360	7600	1160	0.280	6700	770	0.200
	10	8000	1300	0.360	7600	1160	0.280	6700	770	0.200
	12	8000	1300	0.360	7600	1160	0.280	6700	770	0.200
	14	8000	1300	0.252	7600	1160	0.196	6700	770	0.140
	16	8000	1300	0.252	7600	1160	0.196	6700	770	0.140
	18	8000	1300	0.252	7600	1160	0.196	6700	770	0.140
	20	8000	1300	0.252	7600	1160	0.196	6700	770	0.140
	22	7200	1055	0.144	6840	940	0.112	6030	625	0.080
	26	7200	1055	0.144	6840	940	0.112	6030	625	0.080
	30	7200	1055	0.144	6840	940	0.112	6030	625	0.080
	35	7200	1055	0.090	6840	940	0.070	6030	625	0.050
	40	7200	1055	0.090	6840	940	0.070	6030	625	0.050
	45	6400	830	0.090	6080	740	0.070	5360	495	0.050
	50	6400	830	0.090	6080	740	0.070	5360	495	0.050
	60	6400	830	0.054	6080	740	0.042	5360	495	0.030
5.0	16	6400	1155	0.315	6100	900	0.245	5400	605	0.175
	20	6400	1155	0.315	6100	900	0.245	5400	605	0.175
	26	5760	935	0.180	5490	730	0.140	4860	490	0.100
	30	5760	935	0.180	5490	730	0.140	4860	490	0.100
	35	5760	935	0.180	5490	730	0.140	4860	490	0.100
	40	5760	935	0.180	5490	730	0.140	4860	490	0.100
	50	5760	935	0.113	5490	730	0.088	4860	490	0.063
	60	5120	740	0.113	4880	575	0.088	4320	385	0.063
6.0	15	5300	1055	0.540	5000	820	0.420	4400	550	0.300
	20	5300	1055	0.378	5000	820	0.294	4400	550	0.210
	30	5300	1055	0.378	5000	820	0.294	4400	550	0.210
	32	4770	855	0.216	4500	665	0.168	3960	445	0.120
8.0	25	4000	950	0.504	3800	750	0.392	3300	500	0.280
	30	4000	950	0.504	3800	750	0.392	3300	500	0.280
	42	3600	770	0.288	3400	605	0.224	2950	405	0.160
10	30	3200	900	0.900	3050	680	0.700	2630	400	0.500
	35	3200	900	0.630	3050	680	0.490	2630	400	0.350
	45	3200	900	0.630	3050	680	0.490	2630	400	0.350
12	35	2650	800	1.080	2520	600	0.840	2180	350	0.600
	40	2650	800	0.756	2520	600	0.588	2180	350	0.420
	50	2650	800	0.756	2520	600	0.588	2180	350	0.420

Recommended Cutting Condition

UE512 SERIES

RPM = rev / min
FEED = mm / min



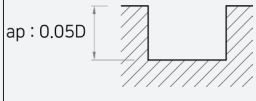
UE522 SERIES

Workpiece	Alloy Steels Carbon Steels (SCM, SNCM, S45C)		Prehardened Steels (NAK, CENA, KP4)		Herdened Steels (SKD, SKT, STAVAX)	
Hardness	~ HRc35		HRc35 ~ HRc45		HRc45~HRc55	
Strength	~ 1100N/mm2		1100 ~ 1500N/mm2		1500 ~ 2000N/mm2	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED
2	6,300	60	5,040	50	3,150	25
3	4,410	70	3,570	60	2,200	30
4	3,570	85	2,840	70	1,790	35
5	3,050	105	2,420	85	1,580	40
6	2,630	125	2,100	105	1,370	50
8	2,000	135	1,580	105	1,050	50
10	1,680	135	1,370	105	840	50
12	1,370	105	1,160	95	700	40
16	1,160	95	890	75	560	35
20	840	70	680	50	420	25

RPM = rev / min
FEED = mm / min



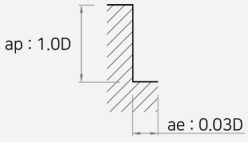
(ap : UP TO Ø 3.0 : 0.4mm)



UE504H SERIES

Workpiece	Alloy Steels Carbon Steels (SCM, SNCM, S45C)		Prehardened Steels (NAK, CENA, KP4)		Herdened Steels (SKD, SKT, STAVAX)	
Hardness	~ HRc35		HRc35 ~ HRc45		HRc45~HRc55	
Strength	~ 1100N/mm2		1100 ~ 1500N/mm2		1500 ~ 2000N/mm2	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED
1	45,000	750	37,000	560	23,000	300
2	23,500	800	18,000	540	12,000	360
3	15,750	810	12,600	580	8,280	380
4	12,150	830	9,540	600	6,345	400
6	9,450	900	7,470	640	4,950	440
8	7,110	860	5,625	620	3,780	410
10	5,580	800	4,410	570	2,925	380
12	4,770	800	3,780	570	2,520	380
16	3,600	810	2,900	570	2,000	400
20	3,000	810	2,300	570	1,600	400

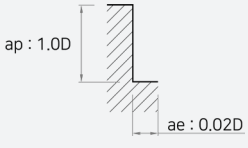
RPM = rev / min
FEED = mm / min



UE514 SERIES

Workpiece	Alloy Steels Carbon Steels (SCM, SNCM, S45C)		Prehardened Steels (NAK, CENA, KP4)		Stainless Steels (SUS)		Herdened Steels (SKD, SKT, STAVAX)	
Hardness	~ HRc35		HRc35 ~ HRc45		-		HRc45 ~ HRc55	
Strength	~ 1100N/mm2		1100 ~ 1500N/mm2		-		1500 ~ 2000N/mm2	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1.0	22,000	310	13,500	180	10,750	140	8,500	50
1.5	17,000	320	10,700	190	8,500	150	6,500	50
2.0	13,900	330	9,070	200	7,560	165	6,000	60
2.5	12,000	350	7,600	220	6,000	180	4,500	60
3.0	10,700	380	6,670	240	5,110	200	4,030	70
4.0	9,070	680	5,540	420	4,650	330	3,530	70
5.0	7,560	720	4,530	430	3,800	360	2,780	85
6.0	6,670	790	4,030	490	3,400	390	2,400	95
8.0	5,040	850	3,020	450	2,520	420	2,010	130
10	3,910	730	2,400	360	2,010	360	1,630	105
12	3,300	620	2,010	300	1,630	280	1,400	95

RPM = rev / min
FEED = mm / min

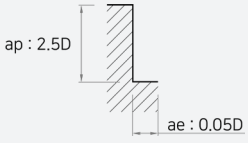


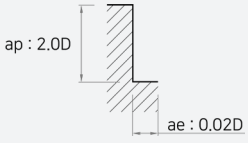
Recommended Cutting Condition

UE524 SERIES

Workpiece	Alloy Steels Carbon Steels (SCM, SNCM, S45C)		Prehardened Steels (NAK, CENA, KP4)		Herdened Steels (SKD, SKT, STAVAX)	
Hardness	~ HRc35		HRc35 ~ HRc45		HRc45~HRc55	
Strength	~ 1100N/mm2		1100 ~ 1500N/mm2		1500 ~ 2000N/mm2	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED
2	6,300	100	5,040	80	3,150	45
3	4,410	115	3,570	100	2,200	55
4	3,570	140	2,840	115	1,790	60
5	3,050	180	2,420	140	1,580	70
6	2,630	215	2,100	180	1,370	90
8	2,000	230	1,580	180	1,050	90
10	1,680	230	1,370	180	840	90
12	1,370	180	1,160	160	700	70
16	1,160	160	890	125	560	60
20	840	115	680	90	420	45

RPM = rev / min
FEED = mm / min

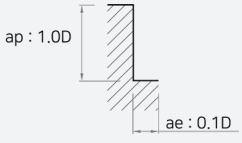


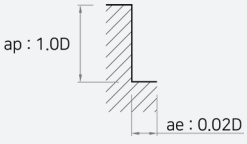


ULE504 SERIES ▶ General Cutting

Workpiece	NON-Alloy Steels, Alloy Steels, Cast Iron		Herdened Steels				Stainless Steels	
Hardness	~HRc30		HRc30 ~ HRc45		HRc45 ~ HRc55		-	
Strength	~1000N/mm2		1000 ~ 1500N/mm2		1500 ~ 2000N/mm2		-	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	12,100	320	7,900	195	2,700	47	6,600	160
3	9,400	370	5,840	230	2,000	58	4,850	195
4	7,900	655	4,850	405	1,500	58	4,070	320
5	6,600	690	3,970	415	1,300	58	3,320	345
6	5,830	760	3,530	470	1,150	58	2,980	380
8	4,410	815	2,650	435	880	58	2,200	405
10	3,420	700	2,100	345	720	46	1,760	345
12	2,880	600	1,760	290	590	46	1,430	275
16	2,310	470	1,430	230	460	29	1,150	230
20	1,760	370	1,110	185	340	29	880	175
25	1,430	290	880	150	270	23	715	140

RPM = rev / min
FEED = mm / min

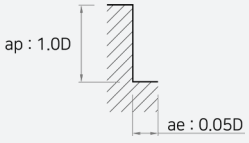




UE504, UXE504 SERIES

Workpiece	Alloy Steels Carbon Steels (SCM, SNCM, S45C)		Prehardened Steels (NAK, CENA, KP4)		Stainless Steels (SUS)		Herdened Steels (SKD, SKT, STAVAX)	
Hardness	~ HRc35		HRc35 ~ HRc45		-		HRc45 ~ HRc55	
Strength	~ 1100N/mm2		1100 ~ 1500N/mm2		-		1500 ~ 2000N/mm2	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	11,560	280	7,560	170	6,300	140	6,300	5,040
3	8,920	320	5,560	200	4,620	170	4,620	3,360
4	7,560	570	4,620	350	3,880	280	3,880	2,940
5	6,300	600	3,780	360	3,160	300	3,160	2,320
6	5,560	660	3,360	410	2,840	330	2,840	2,000
8	4,200	710	2,520	380	2,100	350	2,100	1,680
10	3,260	610	2,000	300	1,680	300	1,680	1,360
12	2,740	520	1,680	250	1,360	240	1,360	1,160
16	2,200	410	1,360	200	1,100	300	1,100	900
20	1,680	320	1,060	160	840	150	840	680
25	1,360	250	840	130	680	120	680	540

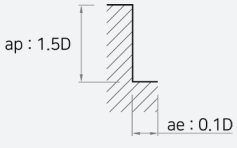
RPM = rev / min
FEED = mm / min

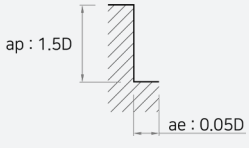


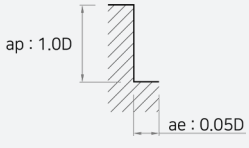
UE506 SERIES ▶ General Cutting

Workpiece	Alloy Steels Carbon Steels (SCM, SNCM, S45C)		Prehardened Steels (NAK, CENA, KP4)		Herdened Steels (SKD, SKT, STAVAX)	
Hardness	~ HRc35		HRc35 ~ HRc45		HRc45~HRc55	
Strength	~ 1100N/mm2		1100 ~ 1500N/mm2		1500 ~ 2000N/mm2	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED
6	5,560	2,000	3,880	1,370	1,580	210
8	4,200	2,000	2,940	1,370	1,160	210
10	3,360	2,000	2,320	1,370	1,000	210
12	2,840	1,680	2,000	1,160	840	180
16	2,100	1,260	1,480	880	640	130
20	1,680	1,010	1,160	690	500	110
25	1,500	90	1,100	600	430	90

RPM = rev / min
FEED = mm / min





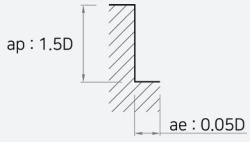


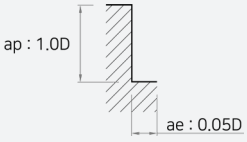
Recommended Cutting Condition

UE506 SERIES ▶ High Speed Cutting

Workpiece	Alloy Steels Carbon Steels (SCM, SNCM, S45C)		Herdened Steels (SKD, SKT, STAVAX)	
Hardness	~ HRc35		HRc45~HRc55	
Strength	~ 1100N/mm2		1500 ~ 2000N/mm2	
Diameter (mm)	RPM	FEED	RPM	FEED
6	16,800	6,090	8,400	3,050
8	12,600	6,090	6,300	3,050
10	9,980	5,990	5,040	3,050
12	8,400	5,040	4,200	2,520
16	6,300	3,780	3,160	1,890
20	5,040	3,050	2,520	1,470
25	4,500	2,700	2,200	1,300

RPM = rev / min
FEED = mm / min

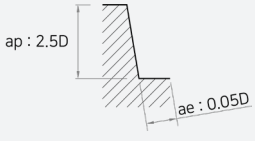




UTE502 SERIES

Workpiece	Alloy Steels Carbon Steels (SCM, SNCM, S45C)		Prehardened Steels (NAK, CENA, KP4)	
Hardness	~ HRc35		HRc35 ~ HRc45	
Strength	~ 1100N/mm2		1100 ~ 1500N/mm2	
Diameter (mm)	RPM	FEED	RPM	FEED
0.3	45,000	135	35,000	105
0.4	36,000	144	27,900	113
0.6	25,200	144	18,900	113
0.8	18,000	144	13,950	108
1	14,850	149	11,250	113
2	7,560	153	5,670	113
3	3,969	108	3,213	90
4	3,213	126	2,556	104
6	2,367	189	1,890	153
8	1,800	225	1,422	162
10	1,440	225	1,170	167

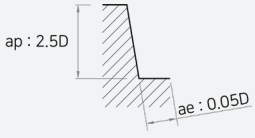
RPM = rev / min
FEED = mm / min



UTE504 SERIES

Workpiece	Alloy Steels Carbon Steels (SCM, SNCM, S45C)		Prehardened Steels (NAK, CENA, KP4)	
Hardness	~ HRc35		HRc35 ~ HRc45	
Strength	~ 1100N/mm2		1100 ~ 1500N/mm2	
Diameter (mm)	RPM	FEED	RPM	FEED
3	3,969	216	3,213	180
4	3,213	252	2,556	207
6	2,367	378	1,890	306
8	1,800	450	1,422	324
10	1,440	450	1,170	333

RPM = rev / min
FEED = mm / min



Recommended Cutting Condition

UR502 SERIES

Workpiece	Alloy Steels Carbon Steels (SCM, SNCM, S45C)		Prehardened Steels (NAK, CENA, KP4)		Herdened Steels (SKD, SKT, STAVAX)	
Hardness	~ HRc35		HRc35 ~ HRc45		HRc45~HRc55	
Strength	~ 1100N/mm2		1100 ~ 1500N/mm2		1500 ~ 2000N/mm2	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED
0.2	44,000	145	28,800	60	17,600	40
0.3	41,000	170	27,000	70	16,500	45
0.4	41,000	170	27,000	70	16,500	45
0.5	36,000	190	23,400	80	14,300	50
0.6	30,000	210	19,800	90	12,100	55
0.8	30,000	210	19,800	90	12,100	55
1	27,600	240	18,000	100	11,000	60
1.5	22,000	250	13,500	110	8,500	60
2	18,000	260	11,560	120	7,200	70
2.5	15,000	270	9,500	130	6,100	70
3	13,240	280	8,560	140	5,280	70
4	10,720	340	6,820	170	4,300	80
5	9,160	420	5,800	200	3,800	100
6	7,900	500	5,040	250	3,280	120
8	6,000	540	3,800	250	2,520	120
10	5,040	540	3,280	250	2,020	120
12	4,120	420	2,780	230	1,680	100
16	3,100	360	2,100	170	1,280	80
20	2,520	280	1,640	120	1,000	60

RPM = rev / min
FEED = mm / min

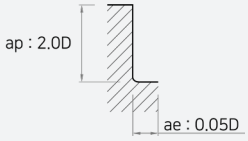


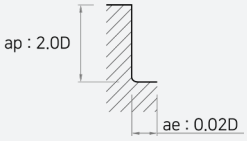


UR512, UR504 SERIES

Workpiece	Alloy Steels Carbon Steels (SCM, SNCM, S45C)		Prehardened Steels (NAK, CENA, KP4)		Herdened Steels (SKD, SKT, STAVAX)	
Hardness	~ HRc35		HRc35 ~ HRc45		HRc45~HRc55	
Strength	~ 1100N/mm2		1100 ~ 1500N/mm2		1500 ~ 2000N/mm2	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED
3	4,410	115	3,570	100	2,200	55
4	3,570	140	2,840	115	1,790	60
5	3,050	180	2,420	140	1,580	70
6	2,630	215	2,100	180	1,370	85
8	2,000	230	1,580	180	1,050	85
10	1,680	230	1,370	180	840	85
12	1,370	180	1,160	160	700	70
16	1,160	160	890	125	560	60
20	840	115	680	90	420	45

RPM = rev / min
FEED = mm / min





Recommended Cutting Condition

UR542 SERIES

Workpiece	Alloy Steels Carbon Steels (SCM, SNCM, S45C)		Prehardened Steels (NAK, CENA, KP4)		Herdened Steels (SKD, SKT, STAVAX)	
Hardness	~ HRc35		HRc35 ~ HRc45		HRc45~HRc55	
Strength	~ 1100N/mm2		1100 ~ 1500N/mm2		1500 ~ 2000N/mm2	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED
0.2	50,000	170	34,500	75	21,150	45
0.3	50,000	200	32,000	85	20,000	50
0.4	50,000	200	32,000	85	20,000	50
0.5	43,000	220	28,000	95	17,100	60
0.6	36,400	250	24,000	110	14,500	65
0.8	36,400	250	24,000	110	14,500	65
1	33,100	280	21,600	120	13,200	70
1.5	26,400	300	16,200	130	10,200	70
2	21,600	310	13,800	140	8,640	80
2.5	18,000	320	11,400	150	7,320	80
3	15,900	330	10,300	160	6,300	80
4	12,800	400	8,200	200	5,150	95
5	11,000	500	7,000	240	4,560	120
6	9,500	600	6,000	300	3,930	140
8	7,200	640	4,550	300	3,020	140
10	6,000	640	4,000	300	2,420	140
12	5,000	500	3,340	270	2,000	120
16	3,720	450	2,520	210	1,540	95
20	3,000	330	1,950	140	1,200	70

RPM = rev / min
FEED = mm / min

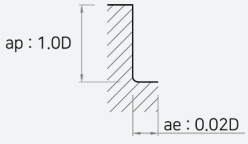




UR544, UXR514 SERIES

Workpiece	Alloy Steels Carbon Steels (SCM, SNCM, S45C)		Prehardened Steels (NAK, CENA, KP4)		Herdened Steels (SKD, SKT, STAVAX)	
Hardness	~ HRc35		HRc35 ~ HRc45		HRc45~HRc55	
Strength	~ 1100N/mm2		1100 ~ 1500N/mm2		1500 ~ 2000N/mm2	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED
1	33,100	360	21,600	260	13,200	140
1.5	26,400	370	16,200	270	10,200	140
2	21,600	380	13,800	280	8,640	150
2.5	18,000	390	11,400	300	7,320	150
3	15,900	400	10,300	310	6,300	150
4	12,800	500	8,200	360	5,150	160
5	11,000	510	7,000	430	4,560	200
6	9,500	510	6,000	430	3,930	200
8	7,200	550	4,550	430	3,020	200
10	6,000	550	4,000	430	2,420	200
12	5,000	430	3,340	380	2,000	160
16	3,720	330	2,520	280	1,540	135
20	3,000	270	1,950	210	1,200	100

RPM = rev / min
FEED = mm / min

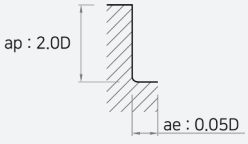


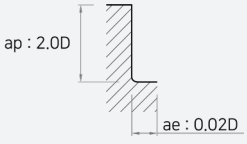
Recommended Cutting Condition

UXR504 SERIES

Workpiece	Alloy Steels Carbon Steels (SCM, SNCM, S45C)		Prehardened Steels (NAK, CENA, KP4)		Herdened Steels (SKD, SKT, STAVAX)	
Hardness	~ HRc35		HRc35 ~ HRc45		HRc45~HRc55	
Strength	~ 1100N/mm2		1100 ~ 1500N/mm2		1500 ~ 2000N/mm2	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED
1	27,600	300	18,000	220	11,000	120
1.5	22,000	310	13,500	230	8,500	120
2	18,000	320	11,560	240	7,200	130
2.5	15,000	330	9,500	250	6,100	130
3	13,240	340	8,560	260	5,280	130
4	10,720	420	6,820	300	4,300	140
5	9,160	430	5,800	360	3,800	170
6	7,900	430	5,040	360	3,280	170
8	6,000	460	3,800	360	2,520	170
10	5,040	460	3,280	360	2,020	170
12	4,120	360	2,780	320	1,680	140
16	3,100	280	2,100	230	1,280	115
20	2,520	230	1,640	180	1,000	90

RPM = rev / min
FEED = mm / min

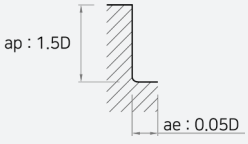


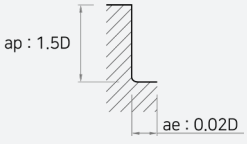


UR506 SERIES

Workpiece	Alloy Steels Carbon Steels (SCM, SNCM, S45C)		Prehardened Steels (NAK, CENA, KP4)		Herdened Steels (SKD, SKT, STAVAX)	
Hardness	~ HRc35		HRc35 ~ HRc45		HRc45~HRc55	
Strength	~ 1100N/mm2		1100 ~ 1500N/mm2		1500 ~ 2000N/mm2	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED
6	14,880	3,210	14,100	2,940	9,600	2,940
8	12,000	3,300	11,400	3,000	7,200	2,760
10	9,600	2,940	9,300	2,700	5,700	2,460
12	7,800	2,700	7,500	2,460	4,800	2,280
16	6,000	2,400	5,820	2,220	3,600	2,040
20	4,800	2,010	4,680	2,040	2,880	1,920

RPM = rev / min
FEED = mm / min

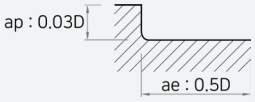


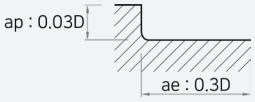


UDR503 SERIES ▶ General Cutting

Workpiece	Alloy Steels Carbon Steels (SCM, SNCM, S45C)		Prehardened Steels (NAK, CENA, KP4)		Herdened Steels (SKD, SKT, STAVAX)	
Hardness	~ HRc35		HRc35 ~ HRc45		HRc45~HRc55	
Strength	~ 1100N/mm2		1100 ~ 1500N/mm2		1500 ~ 2000N/mm2	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED
6.0	5,100	3,500	5,500	3,750	3,850	2,700
8.0	3,800	3,400	4,150	3,700	2,850	2,550
10	3,800	3,750	3,600	3,500	2,700	2,700
12	3,200	4,200	3,250	4,250	2,250	2,300
16	2,400	3,100	2,250	2,900	1,700	1,750
20	1,900	2,500	1,800	2,350	1,350	1,400

RPM = rev / min
FEED = mm / min

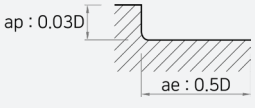


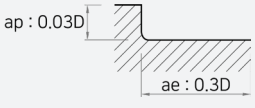


UDR503 SERIES ▶ High Speed Cutting

Workpiece	Alloy Steels Carbon Steels (SCM, SNCM, S45C)		Prehardened Steels (NAK, CENA, KP4)		Herdened Steels (SKD, SKT, STAVAX)	
Hardness	~ HRc35		HRc35 ~ HRc45		HRc45~HRc55	
Strength	~ 1100N/mm2		1100 ~ 1500N/mm2		1500 ~ 2000N/mm2	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED
6.0	8,300	5,700	7,650	5,250	6,400	4,550
8.0	6,200	5,550	5,750	5,100	5,250	4,700
10	5,750	5,650	5,000	4,900	4,200	4,250
12	4,800	6,300	4,150	5,450	3,500	3,650
16	3,600	4,700	3,100	4,050	2,650	2,700
20	2,900	3,750	2,500	3,250	2,100	2,150

RPM = rev / min
FEED = mm / min



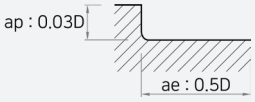


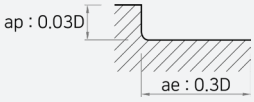
Recommended Cutting Condition

USPM4 SERIES

Workpiece	Alloy Steels Carbon Steels (SCM, SNCM, S45C)		Prehardened Steels (NAK, CENA, KP4)		Herdened Steels (SKD, SKT, STAVAX)	
Hardness	~ HRc35		HRc35 ~ HRc45		HRc45~HRc55	
Strength	~ 1100N/mm2		1100 ~ 1500N/mm2		1500 ~ 2000N/mm2	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED
1	49000	7650	40000	6500	35000	5750
1.5	37000	8550	30000	7200	27000	6400
2	29700	9000	24300	7560	21600	6750
3	19800	9900	16200	8100	14400	7650
4	15300	10800	12600	8550	10800	7920
6	9900	11700	8100	9900	7200	8640
8	7380	11700	6300	9900	5400	8640
10	5850	10800	4950	9000	4320	8550
12	4950	10800	4140	9000	3690	8100
16	3690	9000	3060	7920	2700	7020
20	2970	7200	2430	6300	2160	5670

RPM = rev / min
FEED = mm / min

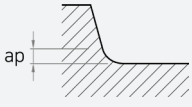




UTR504 SERIES

Workpiece	Alloy Steels Carbon Steels (SCM, SNCM, S45C)			Prehardened Steels (NAK, CENA, KP4)			Herdened Steels (SKD, SKT, STAVAX)		
Hardness	~ HRc35			HRc35 ~ HRc45			HRc45 ~ HRc55		
Strength	~ 1100N/mm2			1100 ~ 1500N/mm2			1500 ~ 2000N/mm2		
Diameter (mm)	RPM	FEED	ap (mm)	RPM	FEED	ap (mm)	RPM	FEED	ap (mm)
0.4	40,000	630	0.008~0.016	32,000	450	0.008~0.012	22,000	270	0.004~0.008
0.6	30,000	630	0.012~0.024	23,000	450	0.012~0.018	15,000	270	0.006~0.012
0.8	22,500	630	0.016~0.032	17,000	450	0.016~0.024	11,500	270	0.008~0.016
1	18,000	630	0.020~0.040	13,500	450	0.020~0.030	9,000	270	0.010~0.020
1.2	14,400	630	0.025~0.050	11,700	450	0.025~0.040	7,200	270	0.012~0.025
1.5	11,700	630	0.030~0.060	9,000	450	0.030~0.050	5,850	270	0.015~0.030
2	9,000	630	0.040~0.080	7,200	450	0.040~0.060	4,500	270	0.020~0.040

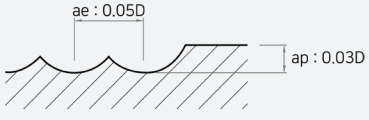
RPM = rev / min
FEED = mm / min



UB502, UB502-P SERIES

Workpiece	Alloy Steels Carbon Steels (SCM, SNCM, S45C)		Prehardened Steels (NAK, CENA, KP4)		Herdened Steels (SKD, SKT, STAVAX)	
Hardness	~ HRc35		HRc35 ~ HRc45		HRc45~HRc55	
Strength	~ 1100N/mm2		1100 ~ 1500N/mm2		1500 ~ 2000N/mm2	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED
0.1	40,000	550	40,000	500	33,000	400
0.2	30,000	720	30,000	630	27,000	575
0.3	30,000	900	30,000	810	27,000	720
0.4	30,000	1,140	30,000	1,020	27,000	900
0.5	30,000	1,440	30,000	1,260	27,000	1,140
0.6	30,000	1,740	30,000	1,500	27,000	1,320
0.8	30,000	2,340	30,000	1,980	27,000	1,800
1	30,000	2,880	30,000	2,520	27,000	2,280
1.2	30,000	3,060	28,800	2,580	25,800	2,310
1.5	30,000	3,240	28,800	2,700	25,800	2,400
2	29,820	3,420	28,680	2,880	24,000	2,400
3	19,860	3,600	19,080	3,180	15,900	2,400
4	14,940	3,600	14,340	3,180	12,000	2,400
5	11,160	3,480	10,680	2,940	9,000	2,250
6	8,340	2,910	8,040	2,460	6,600	1,860
8	6,660	2,520	6,420	2,100	5,400	1,620
10	5,580	2,220	5,340	1,860	4,500	1,440
12	4,170	1,770	4,008	1,500	3,360	1,140
16	3,340	1,590	3,210	1,320	2,700	1,020
20	2,670	1,410	2,580	1,170	2,160	900
25	2,130	1,150	2,060	950	1,730	730

RPM = rev / min
FEED = mm / min



Recommended Cutting Condition

UB512, UB512S6 SERIES

Workpiece		Alloy Steels Carbon Steels (SCM, SNCM, S45C)			Prehardened Steels (NAK, CENA, KP4)			Herdened Steels (SKD, SKT, STAVAX)		
Hardness		~ HRc35			HRc35 ~ HRc45			HRc45 ~ HRc55		
Strength		~ 1100N/mm2			1100 ~ 1500N/mm2			1500 ~ 2000N/mm2		
Diameter (mm)	Effective Length (mm)	RPM	FEED	ap (mm)	RPM	FEED	ap (mm)	RPM	FEED	ap (mm)
0.1	0.2	50000	240	0.009	50000	215	0.007	50000	190	0.005
	0.3	50000	240	0.009	50000	215	0.007	50000	190	0.005
	0.5	50000	240	0.006	50000	215	0.005	50000	190	0.004
	1	45000	195	0.002	45000	175	0.002	45000	155	0.001
0.2	0.5	50000	335	0.018	50000	310	0.014	43200	260	0.010
	1	50000	335	0.013	50000	310	0.010	43200	260	0.007
	1.5	45000	270	0.007	45000	250	0.006	38880	210	0.004
	2	45000	270	0.005	45000	250	0.004	38880	210	0.003
	3	45000	270	0.003	45000	250	0.003	38880	210	0.002
0.3	1	50000	475	0.019	50000	430	0.015	42800	365	0.011
	1.5	50000	475	0.019	50000	430	0.015	42800	365	0.011
	2	45000	385	0.011	45000	350	0.008	38520	295	0.006
	2.5	45000	385	0.007	45000	350	0.005	38520	295	0.004
	3	45000	385	0.007	45000	350	0.005	38520	295	0.004
	4	40000	305	0.004	40000	275	0.003	34240	235	0.002
	5	30000	200	0.003	30000	180	0.002	25680	155	0.002
0.4	1	41000	490	0.036	38800	425	0.028	34200	340	0.020
	1.5	41000	490	0.025	38800	425	0.020	34200	340	0.014
	2	41000	490	0.025	38800	425	0.020	34200	340	0.014
	2.5	36900	395	0.014	34920	345	0.011	30780	275	0.008
	3	36900	395	0.014	34920	345	0.011	30780	275	0.008
	4	36900	395	0.009	34920	345	0.007	30780	275	0.005
	5	32800	315	0.009	31040	270	0.007	27360	220	0.005
	6	32800	315	0.005	31040	270	0.004	27360	220	0.003
	8	24600	205	0.004	23280	180	0.003	20520	145	0.002
	10	12300	90	0.004	11640	75	0.003	10260	60	0.002
0.5	1	34200	685	0.045	32300	580	0.035	28500	515	0.025
	1.5	34200	685	0.045	32300	580	0.035	28500	515	0.025
	2	34200	685	0.032	32300	580	0.025	28500	515	0.018
	2.5	34200	685	0.032	32300	580	0.025	28500	515	0.018
	3	30780	555	0.018	29070	470	0.014	25650	415	0.010
	4	30780	555	0.018	29070	470	0.014	25650	415	0.010
	5	30780	555	0.011	29070	470	0.009	25650	415	0.006
	6	27360	440	0.011	25840	370	0.009	22800	330	0.006
	8	20520	290	0.007	19380	245	0.005	17100	215	0.004
	10	20520	290	0.005	19380	245	0.004	17100	215	0.003
	12	10260	125	0.005	9690	105	0.004	8550	95	0.003
	14	10260	125	0.005	9690	105	0.004	8550	95	0.003
	16	3420	35	0.005	3230	30	0.004	2850	25	0.003
0.6	1	34200	1025	0.038	32300	840	0.029	28500	685	0.021
	2	34200	1025	0.038	32300	840	0.029	28500	685	0.021
	3	34200	1025	0.038	32300	840	0.029	28500	685	0.021

UB512, UB512S6 SERIES

Workpiece		Alloy Steels Carbon Steels (SCM, SNCM, S45C)			Prehardened Steels (NAK, CENA, KP4)			Herdened Steels (SKD, SKT, STAVAX)		
Hardness		~ HRc35			HRc35 ~ HRc45			HRc45 ~ HRc55		
Strength		~ 1100N/mm2			1100 ~ 1500N/mm2			1500 ~ 2000N/mm2		
Diameter (mm)	Effective Length (mm)	RPM	FEED	ap (mm)	RPM	FEED	ap (mm)	RPM	FEED	ap (mm)
0.6	4	30780	830	0.022	29070	680	0.017	25650	555	0.012
	5	30780	830	0.014	29070	680	0.011	25650	555	0.008
	6	30780	830	0.014	29070	680	0.011	25650	555	0.008
	8	27360	655	0.008	25840	540	0.006	22800	440	0.005
	10	20520	430	0.005	19380	355	0.004	17100	290	0.003
	12	20520	430	0.005	19380	355	0.004	17100	290	0.003
	14	10260	185	0.005	9690	150	0.004	8550	125	0.003
	16	10260	185	0.005	9690	150	0.004	8550	125	0.003
0.7	2	34200	1130	0.063	32300	930	0.049	28500	765	0.035
	4	30780	915	0.025	29070	755	0.020	25650	620	0.014
	6	30780	915	0.016	29070	755	0.012	25650	620	0.009
	8	27360	725	0.016	25840	595	0.012	22800	490	0.009
	10	27360	725	0.009	25840	595	0.007	22800	490	0.005
	12	20520	475	0.006	19380	390	0.005	17100	320	0.004
0.8	2	34200	1230	0.072	32300	1035	0.056	28500	855	0.040
	3	34200	1230	0.050	32300	1035	0.039	28500	855	0.028
	4	34200	1230	0.050	32300	1035	0.039	28500	855	0.028
	5	30780	995	0.029	29070	840	0.022	25650	695	0.016
	6	30780	995	0.029	29070	840	0.022	25650	695	0.016
	8	30780	995	0.018	29070	840	0.014	25650	695	0.010
	10	27360	785	0.018	25840	660	0.014	22800	545	0.010
	12	27360	785	0.011	25840	660	0.008	22800	545	0.006
	14	20520	515	0.007	19380	435	0.006	17100	360	0.004
	16	20520	515	0.007	19380	435	0.006	17100	360	0.004
	20	10260	220	0.007	9690	185	0.006	8550	155	0.004
0.9	4	29250	1120	0.032	27630	935	0.025	24390	775	0.018
	6	29250	1120	0.032	27630	935	0.025	24390	775	0.018
	8	29250	1120	0.020	27630	935	0.016	24390	775	0.011
	10	26000	885	0.020	24560	740	0.016	21680	610	0.011
1.0	2	30800	1540	0.090	29100	1310	0.070	25700	1075	0.050
	3	30800	1540	0.090	29100	1310	0.070	25700	1075	0.050
	4	30800	1540	0.063	29100	1310	0.049	25700	1075	0.035
	5	30800	1540	0.063	29100	1310	0.049	25700	1075	0.035
	6	27720	1245	0.036	26190	1060	0.028	23130	870	0.020
	7	27720	1245	0.036	26190	1060	0.028	23130	870	0.020
	8	27720	1245	0.036	26190	1060	0.028	23130	870	0.020
	10	27720	1245	0.023	26190	1060	0.018	23130	870	0.013
	12	24640	985	0.023	23280	840	0.018	20560	690	0.013
	14	24640	985	0.014	23280	840	0.011	20560	690	0.008
	16	18480	645	0.014	17460	550	0.011	15420	450	0.008
	18	18480	645	0.009	17460	550	0.007	15420	450	0.005
	20	18480	645	0.009	17460	550	0.007	15420	450	0.005

Recommended Cutting Condition

UB512, UB512S6 SERIES

Workpiece		Alloy Steels Carbon Steels (SCM, SNCM, S45C)			Prehardened Steels (NAK, CENA, KP4)			Herdened Steels (SKD, SKT, STAVAX)		
Hardness		~ HRc35			HRc35 ~ HRc45			HRc45 ~ HRc55		
Strength		~ 1100N/mm2			1100 ~ 1500N/mm2			1500 ~ 2000N/mm2		
Diameter (mm)	Effective Length (mm)	RPM	FEED	ap (mm)	RPM	FEED	ap (mm)	RPM	FEED	ap (mm)
1.0	22	9240	275	0.009	8730	235	0.007	7710	195	0.005
	26	9240	275	0.009	8730	235	0.007	7710	195	0.005
	30	9240	275	0.009	8730	235	0.007	7710	195	0.005
	40	3080	75	0.009	2910	65	0.007	2570	55	0.005
	50	3080	75	0.006	2910	65	0.005	2570	55	0.003
1.2	4	26300	1375	0.076	24800	1150	0.059	21900	950	0.042
	6	26300	1375	0.076	24800	1150	0.059	21900	950	0.042
	8	23670	1115	0.043	22320	930	0.034	19710	770	0.024
	10	23670	1115	0.027	22320	930	0.021	19710	770	0.015
	12	23670	1115	0.027	22320	930	0.021	19710	770	0.015
	16	21040	880	0.016	19840	735	0.013	17520	610	0.009
	20	15780	580	0.011	14880	485	0.008	13140	400	0.006
	26	7890	245	0.011	7440	205	0.008	6570	170	0.006
1.4	6	21500	1295	0.088	20300	1100	0.069	18000	935	0.049
	8	19350	1050	0.050	18270	890	0.039	16200	755	0.028
	10	19350	1050	0.050	18270	890	0.039	16200	755	0.028
	16	17200	830	0.032	16240	705	0.025	14400	600	0.018
1.5	4	23900	1580	0.135	22600	1355	0.105	20000	1075	0.075
	5	23900	1580	0.095	22600	1355	0.074	20000	1075	0.053
	6	23900	1580	0.095	22600	1355	0.074	20000	1075	0.053
	7	23900	1580	0.095	22600	1355	0.074	20000	1075	0.053
	8	21510	1280	0.054	20340	1100	0.042	18000	870	0.030
	10	21510	1280	0.054	20340	1100	0.042	18000	870	0.03
	12	21510	1280	0.054	20340	1100	0.042	18000	870	0.030
	14	21510	1280	0.034	20340	1100	0.026	18000	870	0.019
	16	19120	1010	0.034	18080	865	0.026	16000	690	0.019
	18	19120	1010	0.034	18080	865	0.026	16000	690	0.019
	20	19120	1010	0.020	18080	865	0.016	16000	690	0.011
	22	19120	1010	0.020	18080	865	0.016	16000	690	0.011
	26	14340	665	0.014	13560	570	0.011	12000	450	0.008
	30	14340	665	0.014	13560	570	0.011	12000	450	0.008
	35	7170	285	0.010	6780	245	0.008	6000	195	0.005
	40	7170	285	0.010	6780	245	0.008	6000	195	0.005
1.6	4	22200	1555	0.101	21000	1300	0.078	18500	1110	0.056
	6	22200	1555	0.101	21000	1300	0.078	18500	1110	0.056
	8	22200	1555	0.101	21000	1300	0.078	18500	1110	0.056
	10	19980	1260	0.058	18900	1055	0.045	16650	900	0.032
	12	19980	1260	0.058	18900	1055	0.045	16650	900	0.032
	16	19980	1260	0.036	18900	1055	0.028	16650	900	0.020
	20	17760	995	0.036	16800	830	0.028	14800	710	0.020
1.8	4	22200	1780	0.113	21000	1470	0.088	18500	1225	0.063
	6	22200	1780	0.113	21000	1470	0.088	18500	1225	0.063

UB512, UB512S6 SERIES

Workpiece		Alloy Steels Carbon Steels (SCM, SNCM, S45C)			Prehardened Steels (NAK, CENA, KP4)			Herdened Steels (SKD, SKT, STAVAX)		
Hardness		~ HRc35			HRc35 ~ HRc45			HRc45 ~ HRc55		
Strength		~ 1100N/mm2			1100 ~ 1500N/mm2			1500 ~ 2000N/mm2		
Diameter (mm)	Effective Length (mm)	RPM	FEED	ap (mm)	RPM	FEED	ap (mm)	RPM	FEED	ap (mm)
1.8	8	22200	1780	0.113	21000	1470	0.088	18500	1225	0.063
	10	19980	1440	0.065	18900	1190	0.050	16650	990	0.036
	12	19980	1440	0.065	18900	1190	0.050	16650	990	0.036
	16	19980	1440	0.041	18900	1190	0.032	16650	990	0.023
	20	17760	1140	0.041	16800	940	0.032	14800	785	0.023
2.0	6	18000	1795	0.18	17000	1525	0.140	15000	1285	0.100
	8	18000	1795	0.126	17000	1525	0.098	15000	1285	0.070
	10	18000	1795	0.126	17000	1525	0.098	15000	1285	0.070
	12	16200	1455	0.072	15300	1235	0.056	13500	1040	0.040
	14	16200	1455	0.072	15300	1235	0.056	13500	1040	0.040
	16	16200	1455	0.072	15300	1235	0.056	13500	1040	0.040
	18	16200	1455	0.045	15300	1235	0.035	13500	1040	0.025
	20	16200	1455	0.045	15300	1235	0.035	13500	1040	0.025
	22	14400	1150	0.045	13600	975	0.035	12000	820	0.025
	26	14400	1150	0.045	13600	975	0.035	12000	820	0.025
	30	14400	1150	0.027	13600	975	0.021	12000	820	0.015
	35	10800	755	0.018	10200	640	0.014	9000	540	0.010
	40	10800	755	0.018	10200	640	0.014	9000	540	0.010
	45	5400	325	0.018	5100	275	0.014	4500	230	0.010
	50	5400	325	0.018	5100	275	0.014	4500	230	0.010
	60	5400	325	0.018	5100	275	0.014	4500	230	0.010
2.5	8	15800	1925	0.158	14900	1605	0.123	13200	1305	0.088
	10	15800	1925	0.158	14900	1605	0.123	13200	1305	0.088
	12	15800	1925	0.158	14900	1605	0.123	13200	1305	0.088
	16	14220	1560	0.090	13410	1300	0.070	11880	1055	0.050
	20	14220	1560	0.090	13410	1300	0.070	11880	1055	0.050
	22	14220	1560	0.056	13410	1300	0.044	11880	1055	0.031
	26	12640	1230	0.056	11920	1025	0.044	10560	835	0.031
	30	12640	1230	0.056	11920	1025	0.044	10560	835	0.031
	35	12640	1230	0.034	11920	1025	0.026	10560	835	0.019
	40	9480	810	0.034	8940	675	0.026	7920	550	0.019
	45	9480	810	0.023	8940	675	0.018	7920	550	0.013
	50	9480	810	0.023	8940	675	0.018	7920	550	0.013
3.0	6	13700	2050	0.270	12900	1730	0.21	11400	1435	0.150
	8	13700	2050	0.270	12900	1730	0.21	11400	1435	0.150
	10	13700	2050	0.189	12900	1730	0.147	11400	1435	0.105
	12	13700	2050	0.189	12900	1730	0.147	11400	1435	0.105
	14	13700	2050	0.189	12900	1730	0.147	11400	1435	0.105
	16	12330	1660	0.108	11610	1400	0.084	10260	1160	0.060
	18	12330	1660	0.108	11610	1400	0.084	10260	1160	0.060
	20	12330	1660	0.108	11610	1400	0.084	10260	1160	0.060
	22	12330	1660	0.108	11610	1400	0.084	10260	1160	0.060

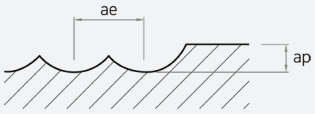
Recommended Cutting Condition

UB512, UB512S6 SERIES

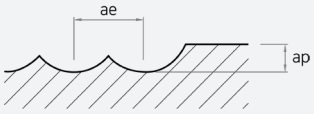
Workpiece		Alloy Steels Carbon Steels (SCM, SNCM, S45C)			Prehardened Steels (NAK, CENA, KP4)			Herdened Steels (SKD, SKT, STAVAX)		
Hardness		~ HRc35			HRc35 ~ HRc45			HRc45 ~ HRc55		
Strength		~ 1100N/mm2			1100 ~ 1500N/mm2			1500 ~ 2000N/mm2		
Diameter (mm)	Effective Length (mm)	RPM	FEED	ap (mm)	RPM	FEED	ap (mm)	RPM	FEED	ap (mm)
3.0	26	12330	1660	0.068	11610	1400	0.053	10260	1160	0.038
	30	12330	1660	0.068	11610	1400	0.053	10260	1160	0.038
	35	10960	1310	0.068	10320	1105	0.053	9120	920	0.038
	40	10960	1310	0.041	10320	1105	0.032	9120	920	0.023
	45	10960	1310	0.041	10320	1105	0.032	9120	920	0.023
	50	8220	860	0.027	7740	725	0.021	6840	605	0.015
	60	8220	860	0.027	7740	725	0.021	6840	605	0.015
4.0	8	9800	1965	0.360	9300	1670	0.28	8200	1395	0.200
	10	9800	1965	0.360	9300	1670	0.28	8200	1395	0.200
	12	9800	1965	0.360	9300	1670	0.28	8200	1395	0.200
	14	9800	1965	0.252	9300	1670	0.196	8200	1395	0.140
	16	9800	1965	0.252	9300	1670	0.196	8200	1395	0.140
	18	9800	1965	0.252	9300	1670	0.196	8200	1395	0.140
	20	9800	1965	0.252	9300	1670	0.196	8200	1395	0.140
	22	8820	1590	0.144	8370	1355	0.112	7380	1130	0.080
	26	8820	1590	0.144	8370	1355	0.112	7380	1130	0.080
	30	8820	1590	0.144	8370	1355	0.112	7380	1130	0.080
	35	8820	1590	0.090	8370	1355	0.07	7380	1130	0.050
	40	8820	1590	0.090	8370	1355	0.07	7380	1130	0.050
	45	7840	1260	0.090	7440	1070	0.07	6560	895	0.050
	50	7840	1260	0.090	7440	1070	0.07	6560	895	0.050
	60	7840	1260	0.054	7440	1070	0.042	6560	895	0.030
5.0	15	7700	1845	0.315	7300	1455	0.245	6400	1285	0.175
	20	7700	1845	0.315	7300	1455	0.245	6400	1285	0.175
	26	6930	1495	0.180	6570	1180	0.14	5760	1040	0.100
	30	6930	1495	0.180	6570	1180	0.14	5760	1040	0.100
	35	6930	1495	0.180	6570	1180	0.14	5760	1040	0.100
	40	6930	1495	0.180	6570	1180	0.14	5760	1040	0.100
	50	6930	1495	0.113	6570	1180	0.088	5760	1040	0.063
	60	6160	1180	0.113	5840	930	0.088	5120	820	0.063
6.0	20	6500	1900	0.378	6200	1600	0.294	5500	1330	0.210
	30	6500	1900	0.378	6200	1600	0.294	5500	1330	0.210
8.0	25	4850	1800	0.504	4600	1500	0.392	4000	1280	0.280
	30	4850	1800	0.504	4600	1500	0.392	4000	1280	0.280
10.0	30	3850	1650	0.900	3680	1400	0.7	3200	1200	0.500
	40	3850	1650	0.630	3680	1400	0.49	3200	1200	0.350
12.0	32	3200	1520	1.080	3050	1300	0.84	2650	1100	0.600
	45	3200	1520	0.756	3050	1300	0.588	2650	1100	0.420

UB512, UB512S6 SERIES

RPM = rev / min
FEED = mm / min



ap : D1~D6=0.2mm ae : 0.2XD
D8~D12=0.3mm

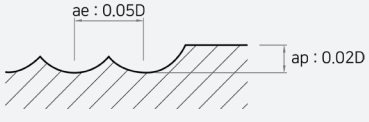


ap : D1~D4=0.05XD ae : 0.1XD
D5~D8=0.25mm
D10~D12=0.3mm

UB532 SERIES

Workpiece	Alloy Steels Carbon Steels (SCM, SNCM, S45C)		Prehardened Steels (NAK, CENA, KP4)		Herdened Steels (SKD, SKT, STAVAX)	
Hardness	~ HRc35		HRc35 ~ HRc45		HRc45~HRc55	
Strength	~ 1100N/mm2		1100 ~ 1500N/mm2		1500 ~ 2000N/mm2	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED
3	35,000	2,800	33,000	2,600	12,000	900
4	26,000	2,300	25,000	2,200	9,000	800
5	21,000	2,100	20,000	2,000	7,000	700
6	17,000	1,900	16,000	1,800	6,000	650
8	13,000	1,700	12,000	1,600	4,500	550
10	10,500	1,450	10,000	1,400	3,500	500
12	9,000	1,400	8,000	1,300	3,000	450

RPM = rev / min
FEED = mm / min

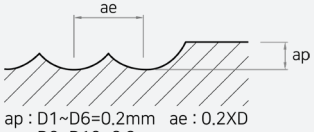


Recommended Cutting Condition

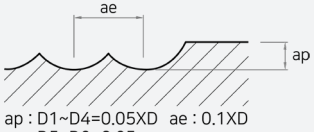
UB542 SERIES ▶ General Cutting

Workpiece	Alloy Steels Carbon Steels (SCM, SNCM, S45C)		Prehardened Steels (NAK, CENA, KP4)		Herdened Steels (SKD, SKT, STAVAX)	
Hardness	~ HRc35		HRc35 ~ HRc45		HRc45~HRc55	
Strength	~ 1100N/mm2		1100 ~ 1500N/mm2		1500 ~ 2000N/mm2	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED
0.1	16,500	80	25,500	185	25,500	160
0.2	16,500	90	25,500	220	25,500	200
0.3	15,300	112	24,000	260	24,000	220
0.4	15,300	112	24,000	260	24,000	220
0.5	13,300	128	20,800	300	20,800	250
0.6	11,200	144	17,600	330	17,600	280
0.8	11,200	144	17,600	330	17,600	280
1.0	10,180	160	16,000	370	16,000	320
1.5	9,500	220	13,000	500	12,800	400
2.0	9,250	260	11,500	640	11,300	590
3.0	8,000	370	10,200	880	9,800	850
4.0	6,720	420	8,500	880	8,200	850
5.0	5,840	460	7,500	880	7,200	850
6.0	5,500	660	6,900	920	6,500	880
8.0	4,600	740	5,600	840	5,300	800
10	4,070	820	4,850	800	4,650	770
12	3,700	890	4,350	800	4,150	770

RPM = rev / min
FEED = mm / min



ap : D1~D6=0.2mm ae : 0.2XD
D8~D12=0.3mm

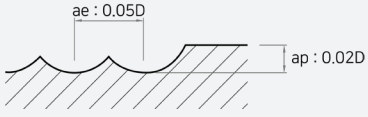


ap : D1~D4=0.05XD ae : 0.1XD
D5~D8=0.25mm
D10~D12=0.3mm

USB502 SERIES

Workpiece	Alloy Steels Carbon Steels (SCM, SNCM, S45C)		Prehardened Steels (NAK, CENA, KP4)		Herdened Steels (SKD, SKT, STAVAX)	
Hardness	~ HRc35		HRc35 ~ HRc45		HRc45~HRc55	
Strength	~ 1100N/mm2		1100 ~ 1500N/mm2		1500 ~ 2000N/mm2	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED
3	13,500	1,700	13,200	1,620	12,500	860
4	10,600	1,700	10,300	1,620	9,800	860
5	9,400	1,650	9,050	1,570	8,600	860
6	8,600	1,750	8,250	1,670	7,850	865
8	7,000	1,550	6,700	1,460	6,350	890
10	6,050	1,450	5,800	1,360	5,450	870
12	5,450	1,420	5,200	1,330	4,900	785
16	4,300	1,200	4,000	1,100	3,700	650
20	3,600	1,050	3,200	900	3,000	550

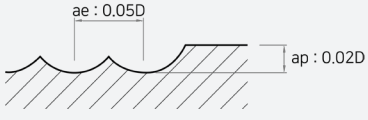
RPM = rev / min
FEED = mm / min



UB503 SERIES

Workpiece	Alloy Steels Carbon Steels (SCM, SNCM, S45C)		Prehardened Steels (NAK, CENA, KP4)		Herdened Steels (SKD, SKT, STAVAX)	
Hardness	~ HRc35		HRc35 ~ HRc45		HRc45~HRc55	
Strength	~ 1100N/mm2		1100 ~ 1500N/mm2		1500 ~ 2000N/mm2	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED
3	13,500	1,700	13,200	1,620	12,500	860
4	10,600	1,700	10,300	1,620	9,800	860
5	9,400	1,650	9,050	1,570	8,600	860
6	8,600	1,750	8,250	1,670	7,850	865
8	7,000	1,550	6,700	1,460	6,350	890
10	6,050	1,450	5,800	1,360	5,450	870
12	5,450	1,420	5,200	1,330	4,900	785
16	4,300	1,200	4,000	1,100	3,700	650
20	3,600	1,050	3,200	900	3,000	550

RPM = rev / min
FEED = mm / min

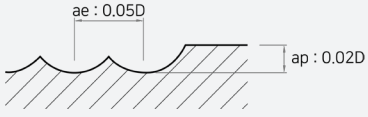


Recommended Cutting Condition

UB504 SERIES

Workpiece	Alloy Steels Carbon Steels (SCM, SNCM, S45C)		Prehardened Steels (NAK, CENA, KP4)		Herdened Steels (SKD, SKT, STAVAX)	
Hardness	~ HRc35		HRc35 ~ HRc45		HRc45~HRc55	
Strength	~ 1100N/mm2		1100 ~ 1500N/mm2		1500 ~ 2000N/mm2	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED
1	48,000	3,300	35,000	2,350	32,000	2,200
1.5	38,400	4,100	28,000	2,900	25,600	2,700
2	31,680	4,600	23,100	3,300	21,000	3,100
3	24,000	5,430	17,500	3,880	16,000	3,650
4	20,130	5,430	14,880	3,880	14,220	3,650
5	16,780	5,430	12,400	3,690	11,670	3,470
6	15,200	6,220	12,200	4,500	11,100	3,830
8	11,300	5,250	9,200	3,980	8,320	3,350
10	9,100	4,590	7,350	3,450	6,660	2,870
12	7,590	4,260	6,130	3,190	5,530	2,400

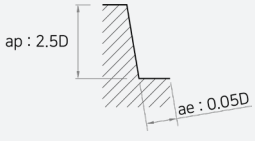
RPM = rev / min
FEED = mm / min



UTB502 SERIES

Workpiece	Alloy Steels Carbon Steels [SCM, SNCM, S45C]		Prehardened Steels (NAK, CENA, KP4)	
Hardness	~ HRc35		HRc35 ~ HRc45	
Strength	~ 1100N/mm2		1100 ~ 1500N/mm2	
Diameter (mm)	RPM	FEED	RPM	FEED
0.4	36,000	144	27,900	113
0.6	25,200	144	18,900	113
0.8	18,000	144	13,950	108
1	14,850	149	11,250	113
2	7,560	153	5,670	113
3	3,969	108	3,213	90
4	3,213	126	2,556	104

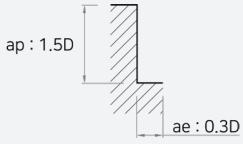
RPM = rev / min
FEED = mm / min

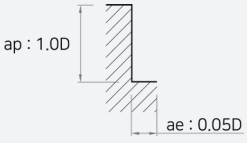


UF50 SERIES

Workpiece	Non ferrous Steel Alloy Steels Cast Iron		Alloy Steels, Heat Resistant Steels		Stainless Steel		Heat Treatment Steel			
Hardness	~HRc30		HRc30 ~ HRc38		HRc38 ~ HRc45		HRc45 ~ HRc55		HRc55 ~ HRc65	
Strength	~ 1000N/mm2		1000 ~ 1200N/mm2		1200 ~ 1400N/mm2		1400 ~ 2000N/mm2		2000N/mm2~	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6	15,600	2,320	12,400	840	8,400	570	3,400	260	2,400	190
8	11,600	2,320	9,200	840	6,300	570	2,400	240	1,800	180
10	9,200	2,320	7,600	840	5,100	570	2,000	290	1,300	190
12	8,000	2,400	6,000	800	4,200	570	1,680	260	1,200	190
14	6,800	2,400	5,200	840	3,600	570	1,400	200	900	130
16	6,000	2,400	4,800	760	3,300	510	1,200	160	800	110
18	5,200	2,320	4,400	720	2,700	420	1,100	150	700	100
20	4,800	2,160	3,600	560	2,400	360	1,000	150	660	100
25	4,300	2,150	3,200	620	2,160	410	900	160	600	100

RPM = rev / min
FEED = mm / min

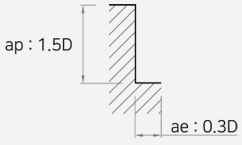


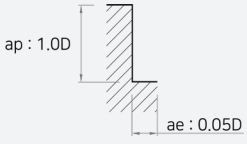


UF51 SERIES

Workpiece	Alloy Steels Carbon Steels (SCM, SNCM, S45C)		Prehardened Steels (NAK, CENA, KP4)		Herdened Steels (SKD, SKT, STAVAX)	
Hardness	~ HRc35		HRc35 ~ HRc45		HRc45~HRc55	
Strength	~ 1100N/mm2		1100 ~ 1500N/mm2		1500 ~ 2000N/mm2	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED
6	12,400	840	8,400	570	3,400	260
8	9,200	840	6,300	570	2,400	240
10	7,600	840	5,100	570	2,000	290
12	6,000	800	4,200	570	1,680	260
14	5,200	840	3,600	570	1,400	200
16	4,800	760	3,300	510	1,200	160
18	4,400	720	2,700	420	1,100	150
20	3,600	560	2,400	360	1,000	150
25	3,200	620	2,160	410	900	160

RPM = rev / min
FEED = mm / min





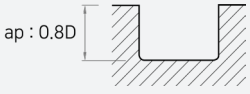
Recommended Cutting Condition

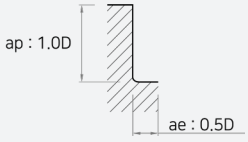
UF51-H SERIES

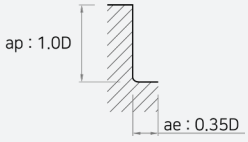
Workpiece	Alloy Steels Carbon Steels (SCM, S45C, S50C)		Alloy Steels Carbon Steels Prehardened Steels (SCM, SKD, NAK, KP4)		Alloy Steels Carbon Steels (SCM, S45C, S50C)		Alloy Steels Carbon Steels Prehardened Steels (SCM, SKD, NAK, KP4)	
Hardness	~ HRc25		HRc25 ~ HRc40		~ HRc25		HRc25 ~ HRc40	
Strength	-		-		-		-	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6	12,000	1,550	10,600	1,100	15,800	2,570	14,300	1,850
8	9,000	1,650	8,100	1,180	11,900	2,700	10,700	1,950
10	7,200	1,650	6,400	1,180	9,500	2,700	8,500	1,950
12	6,000	1,540	5,400	1,140	8,000	2,570	7,100	1,850
16	4,500	1,500	4,100	1,050	6,000	2,450	5,400	1,750
20	3,600	1,330	3,200	900	4,800	2,140	4,300	1,500

RPM = rev / min
FEED = mm / min









TX202, TX222, TX302 SERIES

Workpiece	NON-Alloy Steels, Alloy Steels, Cast Iron		Alloy Steels, Heat Resistant Steels		Stainless Steels		Cast Iron		Alumunum Alloys		Copper, Brass nonferrous Metals	
Hardness	~ HRc30		HRc30 ~ HRc45		-		-		-		-	
Strength	~ 1000N/mm2		1000 ~ 1500N/mm2		-		-		-		-	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1	14,300	105	8,500	65	7,150	50	18,700	205	44,000	330	24,700	200
1.5	9,350	150	5,550	85	5,600	80	12,100	205	27,500	385	20,300	300
2	7,850	160	5,150	100	4,300	80	9,350	220	22,000	460	16,500	340
3	6,100	180	3,800	120	3,150	100	6,050	220	15,400	460	11,000	340
4	5,150	255	3,150	155	2,650	130	4,600	220	11,000	460	8,800	340
5	4,300	270	2,550	160	2,150	135	3,650	220	9,150	460	6,800	340
6	3,800	300	2,300	190	1,950	155	2,950	255	7,600	485	5,700	375
8	2,850	325	1,700	170	1,450	155	2,200	275	5,700	485	4,400	375
10	2,200	280	1,350	135	1,150	135	1,850	285	4,600	485	3,400	375
12	1,850	240	1,150	110	950	110	1,450	295	3,750	485	2,850	375
14	1,700	215	1,050	100	850	100	1,300	310	3,300	485	2,400	375
16	1,500	185	950	95	700	95	1,100	320	2,850	485	2,200	375
20	1,150	145	700	70	550	70	900	340	2,200	485	1,700	375

RPM = rev / min
FEED = mm / min



(ap : UP TO Ø 3.0 : 0.2D)

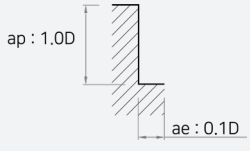


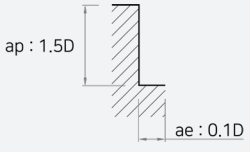
Recommended Cutting Condition

TX204, TX224, TX304 SERIES

Workpiece	NON-Alloy Steels, Alloy Steels, Cast Iron		Alloy Steels, Heat Resistant Steels		Stainless Steels		Cast Iron		Alumunum Alloys		Copper, Brass nonferrous Metals	
Hardness	~ HRc30		HRc30 ~ HRc45		-		-		-		-	
Strength	~ 1000N/mm2		1000 ~ 1500N/mm2		-		-		-		-	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1	17,600	150	10,250	85	8,650	75	18,700	620	44,000	1,050	24,700	605
1.5	11,800	215	7,050	115	7,050	120	12,100	620	27500	1,160	20,300	910
2	9,850	240	6,450	145	5,350	120	9,350	640	22000	1,320	16,500	1,035
3	7,600	270	4,750	170	3,950	145	6,050	640	15400	1,320	11,000	1,035
4	6,450	485	3,950	300	3,300	240	4,600	640	11000	1,320	8,800	1,035
5	5,350	510	3,200	305	2,700	255	3,650	640	9150	1,320	6,800	1,035
6	4,750	560	2,850	350	2,400	280	2,950	770	7600	1,430	5,700	1,100
8	3,550	605	2,150	325	1,800	300	2,200	815	5700	1,430	4,400	1,100
10	2,750	520	1,700	255	1,450	255	1,850	860	4600	1,430	3,400	1,100
12	2,350	440	1,450	215	1,150	205	1,450	900	3750	1,430	2,850	1,100
14	2,100	395	1,300	195	1,050	190	1,300	945	3300	1,430	2,400	1,100
16	1,850	350	1,150	170	950	170	1,100	970	2850	1,430	2,200	1,100
20	1,450	270	900	135	700	130	900	1,035	2200	1,430	1,700	1,100

RPM = rev / min
FEED = mm / min



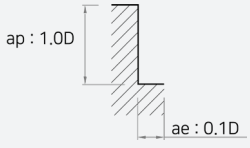


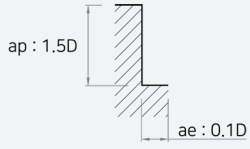
※ The FEED for long & extra long types, should be reduced by around 30~40%.

TX304H SERIES

Workpiece	NON-Alloy Steels, Alloy Steels, Cast Iron		Alloy Steels, Heat Resistant Steels		Stainless Steels		Cast Iron		Alumunum Alloys		Copper, Brass nonferrous Metals	
Hardness	≤ HRc30		HRc30 ~ HRc45		-		-		-		-	
Strength	~ 1000N/mm2		1000 ~ 1500N/mm2		-		-		-		-	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1	17,600	150	10,250	85	8,650	75	18,700	620	44,000	1,050	24,700	605
1.5	11,800	215	7,050	115	7,050	120	12,100	620	27,500	1,160	20,300	910
2	9,850	240	6,450	145	5,350	120	9,350	640	22,000	1,320	16,500	1,035
3	7,600	270	4,750	170	3,950	145	6,050	640	15,400	1,320	11,000	1,035
4	6,450	485	3,950	300	3,300	240	4,600	640	11,000	1,320	8,800	1,035
5	5,350	510	3,200	305	2,700	255	3,650	640	9,150	1,320	6,800	1,035
6	4,750	560	2,850	350	2,400	280	2,950	770	7,600	1,430	5,700	1,100
8	3,550	605	2,150	325	1,800	300	2,200	815	5,700	1,430	4,400	1,100
10	2,750	520	1,700	255	1,450	255	1,850	860	4,600	1,430	3,400	1,100
12	2,350	440	1,450	215	1,150	205	1,450	900	3,750	1,430	2,850	1,100
14	2,100	395	1,300	195	1,080	190	1,300	945	3,300	1,430	2,400	1,100
16	1,850	350	1,150	170	950	170	1,100	970	2,850	1,430	2,200	1,100
20	1,450	270	900	135	700	130	900	1,035	2,200	1,430	1,700	1,100

RPM = rev / min
FEED = mm / min





Recommended Cutting Condition

ZE302, ZE322 SERIES ▶ General Cutting

Workpiece	Alloy Steels, Heat Resistant Steels		Herdened Steels		Stainless Steels	
Hardness	HRc30 ~ HRc40		HRc40 ~ HRc50		-	
Strength	1000 ~ 1250N/mm2		1250 ~ 1750N/mm2		-	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED
2	9,700	220	6,350	135	5,300	105
3	7,500	240	4,670	160	3,880	135
4	6,350	345	3,880	205	3,250	175
5	5,300	370	3,170	220	2,650	185
6	4,670	405	2,830	255	2,380	205
8	3,530	435	2,120	230	1,760	205
10	2,730	380	1,680	185	1,420	185
12	2,310	320	1,420	150	1,140	150
16	1,850	255	1,140	125	890	125
20	1,420	195	890	90	705	90
25	1,150	150	705	80	580	70

RPM = rev / min
FEED = mm / min



(ap : UP TO Ø 3.0 : 0.2D)



ZE302, ZE322 SERIES ▶ High Speed Cutting

Workpiece	Alloy Steels, Heat Resistant Steels		Herdened Steels				Stainless Steels	
Hardness	HRc30 ~ HRc40		HRc40 ~ HRc50		HRc40 ~ HRc55		-	
Strength	1000 ~ 1250N/mm2		1250 ~ 1750N/mm2		1750 ~ 2000N/mm2		-	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	18,000	665	11,800	415	8,700	175	9,800	345
3	11,000	655	6,800	435	5,600	185	6,200	370
4	10,300	725	6,300	430	4,300	185	5,300	370
5	9,350	715	5,570	420	3,700	185	4,620	355
6	8,200	750	4,930	470	3,250	185	4,100	390
8	6,300	770	3,780	410	2,470	185	3,120	355
10	4,830	750	2,940	360	2,000	160	2,470	310
12	4,100	750	2,520	345	1,680	160	2,100	300
16	3,260	715	2,000	355	1,890	150	1,940	290
20	2,520	665	1,580	310	1,680	150	1,630	275
25	2,000	635	1,260	340	1,570	150	1,420	290

RPM = rev / min
FEED = mm / min



(ap : UP TO Ø 3.0 : 0.2D)

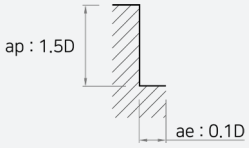


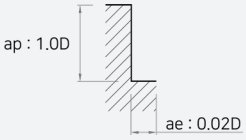
Recommended Cutting Condition

ZE304, ZE324 SERIES ▶ General Cutting

Workpiece	Alloy Steels, Heat Resistant Steels		Herdened Steels				Stainless Steels	
Hardness	~ HRc30		HRc30 ~ HRc45		HRc45 ~ HRc55		-	
Strength	~ 1000N/mm2		1000 ~ 1500N/mm2		1500 ~ 2000N/mm2		-	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	12,100	320	7,900	195	2,700	47	6,600	160
3	9,400	370	5,840	230	2,000	58	4,850	195
4	7,900	655	4,850	405	1,500	58	4,070	320
5	6,600	690	3,970	415	1,300	58	3,320	345
6	5,830	760	3,530	470	1,150	58	2,980	380
8	4,410	815	2,650	435	880	58	2,200	405
10	3,420	700	2,100	345	720	46	1,760	345
12	2,880	600	1,760	290	590	46	1,430	275
16	2,310	470	1,430	230	460	29	1,150	230
20	1,760	370	1,110	185	340	29	880	175
25	1,430	290	880	150	270	23	715	140

RPM = rev / min
FEED = mm / min



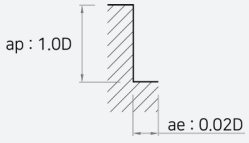


※ Please reduce cutting speed around 20~30% from the above table or ZE524 & ZE324 series.

ZE304, ZE324 SERIES ▶ High Speed Cutting

Workpiece	Alloy Steels, Heat Resistant Steels		Herdened Steels				Stainless Steels	
Hardness	~ HRc30		HRc30 ~ HRc45		HRc45 ~ HRc55		-	
Strength	~ 1000N/mm2		1000 ~ 1500N/mm2		1500 ~ 2000N/mm2		-	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	31,400	1,230	23,500	520	12,600	275	21,600	465
3	19,300	1,210	13,600	735	8,900	390	13,500	660
4	18,100	1,330	12,600	865	7,090	465	11,800	775
5	16,400	1,310	11,100	1,010	6,040	530	10,300	910
6	14,400	1,380	9,900	1,100	5,300	580	9,100	990
8	11,000	1,430	7,600	1,090	3,990	575	6,900	980
10	8,500	1,380	5,880	1,110	3,150	580	5,420	1,000
12	7,200	1,380	5,040	1,090	2,620	575	4,600	985
16	5,700	1,320	3,990	1,010	2,000	535	3,590	910
20	4,400	1,270	3,150	930	1,580	490	2,840	840
25	3,500	1,170	2,520	755	1,260	390	2,270	680

RPM = rev / min
FEED = mm / min



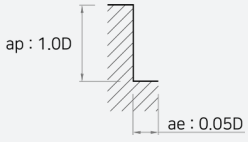
※ Please reduce cutting speed around 20~30% from the above table or ZE524 & ZE324 series.

Recommended Cutting Condition

ZR304H, ZR324H SERIES

Workpiece	NON-Alloy Steels, Alloy Steels, Cast Iron		Alloy Steels, Heat Resistant Steels		Herdened Steels	
Hardness	~ HRc30		HRc30 ~ HRc45		HRc45 ~ HRc50	
Strength	~ 1000N/mm2		1000 ~ 1500N/mm2		1500 ~ 2000N/mm2	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED
6	7,000	910	4,200	560	3,000	140
8	5,300	980	3,200	530	2,500	190
10	4,100	840	2,500	410	2,050	165
12	3,500	730	2,100	340	1,700	140

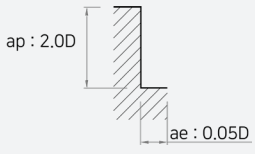
RPM = rev / min
FEED = mm / min

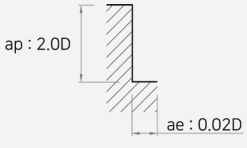


ZR322 SERIES ▶ Side Cutting

Workpiece	NON-Alloy Steels, Alloy Steels, Cast Iron		Alloy Steels, Heat Resistant Steels		Herdened Steels	
Hardness	~ HRc30		HRc30 ~ HRc45		HRc45 ~ HRc55	
Strength	~ 1000N/mm2		1000 ~ 1500N/mm2		1500 ~ 2000N/mm2	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED
3	6,950	195	4,500	150	3,300	100
4	5,600	240	3,600	170	2,700	105
5	4,800	250	3,050	210	2,350	125
6	4,150	250	2,650	210	2,050	125
8	3,150	265	2,000	210	1,600	125
10	2,150	265	1,700	210	1,250	125
12	1,800	210	1,500	185	1,050	105
16	1,800	185	1,100	140	840	90
20	1,300	130	860	105	625	65

RPM = rev / min
FEED = mm / min





ZR322 ERIES ▶ Slotting

Workpiece	NON-Alloy Steels, Alloy Steels, Cast Iron		Alloy Steels, Heat Resistant Steels		Herdened Steels	
Hardness	~ HRc30		HRc30 ~ HRc45		HRc45 ~ HRc55	
Strength	~ 1000N/mm2		1000 ~ 1500N/mm2		1500 ~ 2000N/mm2	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED
3	6,950	160	4,500	80	3,300	55
4	5,600	195	3,600	100	2,700	60
5	4,800	240	3,050	115	2,350	75
6	4,150	290	2,650	145	2,050	90
8	3,150	210	2,000	145	1,600	90
10	2,150	250	1,700	140	1,250	90
12	1,800	200	1,500	135	1,050	75
16	1,800	215	1,100	100	840	60
20	1,300	160	860	70	625	45

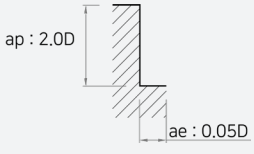
RPM = rev / min
FEED = mm / min

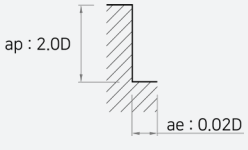


ZR324 SERIES

Workpiece	NON-Alloy Steels, Alloy Steels, Cast Iron		Alloy Steels, Heat Resistant Steels		Herdened Steels	
Hardness	~ HRc30		HRc30 ~ HRc45		HRc45 ~ HRc55	
Strength	~ 1000N/mm2		1000 ~ 1500N/mm2		1500 ~ 2000N/mm2	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED
3	6,950	195	4,500	150	3,300	100
4	5,600	240	3,600	170	2,700	105
5	4,800	250	3,050	210	2,350	125
6	4,150	250	2,650	210	2,050	125
8	3,150	265	2,000	210	1,600	125
10	2,150	265	1,700	210	1,250	125
12	1,800	210	1,500	185	1,050	105
16	1,880	185	1,100	140	840	90
20	1,300	130	860	105	625	65

RPM = rev / min
FEED = mm / min



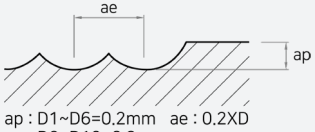


Recommended Cutting Condition

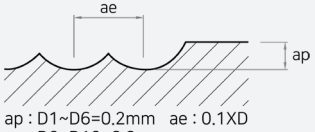
DB312, DB342 SERIES ▶ General Cutting

Workpiece	NON-Alloy Steels, Alloy Steels, Cast Iron		Alloy Steels, Heat Resistant Steels		Herdened Steels	
Hardness	~ HRc30		HRc30 ~ HRc40		HRc40 ~ HRc55	
Strength	~ 1000N/mm2		1000 ~ 1250N/mm2		1500N/mm2	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED
1	16,500	290	13,300	230	6,100	105
1.5	16,500	405	12,700	310	5,590	140
2	15,100	865	11,200	565	4,900	175
2.5	15,100	865	11,200	565	4,900	175
3	13,800	780	10,500	530	4,750	175
4	11,000	850	8,800	610	4,410	205
5	9,600	945	7,600	665	3,860	205
6	8,900	1,150	7,200	955	3,340	220
8	7,500	1,500	6,050	1,060	2,590	255
10	6,700	1,750	5,300	1,170	2,140	260
12	6,150	2,000	4,900	1,280	1,840	280
16	5,000	1,950	3,900	1,220	1,420	280
20	4,350	1,900	3,400	1,200	1,170	290

RPM = rev / min
FEED = mm / min



ap : D1~D6=0.2mm ae : 0.2XD
D8~D12=0.3mm



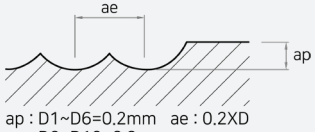
ap : D1~D6=0.2mm ae : 0.1XD
D8~D12=0.3mm

※ Please reduce cutting speed around 20~30% from the above table or DB522 series.

DB312, DB342 SERIES ▶ High Speed Cutting

Workpiece	NON-Alloy Steels, Alloy Steels, Cast Iron		Alloy Steels, Heat Resistant Steels	
Hardness	~ HRc45		HRc30 ~ HRc40	
Strength	~ 1000N/mm2		1500 ~ 2000N/mm2	
Diameter (mm)	RPM	FEED	RPM	FEED
1	26,000	1,500	26,000	920
1.5	24,000	1,600	24,000	990
2	22,000	1,700	22,000	1,080
2.5	22,000	2,000	20,000	1,130
3	22,000	2,300	17,800	1,200
4	22,000	3,350	14,300	1,300
5	22,000	4,150	12,600	1,380
6	22,000	4,600	11,000	1,440
8	17,500	4,600	8,800	1,440
10	14,700	4,450	7,350	1,380
12	12,800	4,450	6,400	1,330
16	10,000	4,000	5,000	1,150
20	8,350	3,650	4,150	1,060

RPM = rev / min
FEED = mm / min



ap : D1~D6=0.2mm ae : 0.2XD
D8~D12=0.3mm

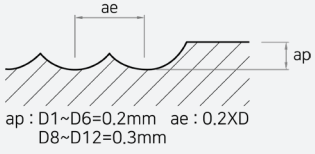
※ Please reduce cutting speed around 20~30% from the above table or DB522 series.

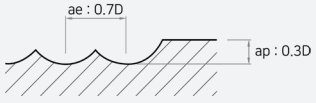
Recommended Cutting Condition

TXB202, TXB222, TXB232, TXB302 SERIES

Workpiece	Carbon Steels, Alloy Steels, Tool Steels				Herdened Steels		Cast Iron		Alumunum Alloys	
Hardness	~ HRc30		HRc30 ~ HRc45		HRc45 ~ HRc50		-		-	
Strength	~ 1000N/mm2		1000 ~ 1500N/mm2		1500N/mm2		-		-	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	12,350	640	9,150	415	4,000	125	10,500	220	30,800	395
3	11,400	575	8,550	390	3,800	125	7,050	230	20,500	395
4	8,950	630	7,150	450	3,600	150	5,150	285	15,400	395
5	7,800	700	6,200	490	3,100	150	4,150	330	12,100	470
6	7,250	870	5,900	705	2,700	160	3,400	360	10,300	470
8	6,100	1,090	4,900	785	2,050	190	2,500	460	7,900	540
10	5,450	1,330	4,350	870	1,750	190	2,050	460	6,150	540
12	4,990	1,500	3,950	950	1,500	210	1,750	460	5,150	630
14	4,530	1,495	3,600	925	1,300	210	1,400	460	4,300	630
16	4,085	1,470	3,200	905	1,150	210	1,300	460	3,850	540
18	3,800	1,425	3,000	890	1,050	210	1,100	460	3,400	540
20	3,550	1,425	2,800	885	950	210	1,050	420	2,950	540

RPM = rev / min
FEED = mm / min





※ Please reduce cutting speed 30~40% from the above table when using long and extra long type

TXB204, TXB304 SERIES

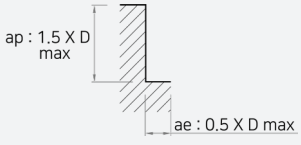
Workpiece	Alloy Steels, Tool Steels				Herdened Steels		Cast Iron		Alumunum Alloys	
Hardness	~ HRc30		HRc30 ~ HRc45		HRc45 ~ HRc50		-		-	
Strength	~ 1000N/mm2		1000 ~ 1500N/mm2		1500N/mm2		-		-	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	15,400	1,000	11,400	600	5,000	200	13,100	300	38,500	600
3	14,300	900	10,700	600	4,800	200	8,800	300	25,600	600
4	11,200	900	8,900	700	4,500	200	6,400	400	19,300	600
5	9,800	1,100	7,800	700	3,900	200	5,200	500	15,100	700
6	9,100	1,300	7,400	1,100	3,400	200	4,300	500	12,900	700
8	7,600	1,600	6,100	1,200	2,600	300	3,100	700	9,900	800
10	6,800	2,000	5,400	1,300	2,200	300	2,600	700	7,700	800
12	6,200	2,300	4,900	1,400	1,900	300	2,200	700	6,400	900
14	5,700	2,200	4,500	1,400	1,600	300	1,800	700	5,400	900
16	5,100	2,200	4,000	1,400	1,400	300	1,600	700	4,800	800
18	4,800	2,100	3,800	1,300	1,300	300	1,400	700	4,300	800
20	4,400	2,100	3,500	1,300	1,200	300	1,300	600	3,700	800

X-STAR SERIES

Workpiece	Low Carbon Steels		Low Carbon Steels		Med Alloy Steels		Mold&Die Steels		Grey Cast Iron		Cast Iron-Ductile	
Hardness	~HB175		~HB275		~HB275		~HB275		~HB200		~HB300	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
3	16,500	335	13,585	276	11,320	230	5,820	118	15,360	300	7,765	158
4	12,340	326	10,190	326	8,520	340	4,380	175	11,550	462	5,810	232
5	9,895	502	8,150	413	6,790	345	3,490	177	9,215	468	4,655	236
6	8,250	586	6,795	483	5,660	403	2,910	207	7,680	546	3,880	276
8	6,185	754	5,095	620	4,245	517	2,185	266	5,760	702	2,910	354
10	4,950	955	4,075	786	3,395	656	1,745	337	4,610	889	2,330	449
12	4,125	963	3,395	793	2,830	661	1,455	340	3,840	897	1,940	453
14	3,535	890	2,910	733	2,425	592	1,250	314	3,290	829	1,665	419
16	3,095	817	2,545	672	2,125	561	1,090	288	2,880	761	1,455	384
18	2,750	809	2,265	667	1,885	556	970	285	2,560	754	1,295	381
20	2,475	804	2,040	662	1,700	552	875	283	2,305	749	1,165	378
25	1,975	631	1,630	521	1,360	435	700	230	1,850	600	930	300

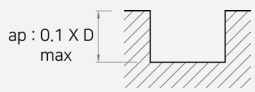
RPM = rev / min
FEED = mm / min

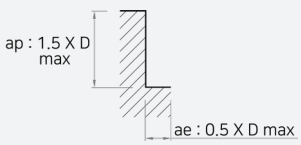




Workpiece	Cast Iron Malleable		Stainless 300 Series		Stainless 400 Series		Stainless PH Series		Titanium Alloys		Heat Resistant Steels	
Hardness	~HB300		~HB275		~HB185		~HB325		~HB295		~HB300	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
3	4,850	95	9,705	175	13,585	250	8,085	125	9,705	225	2,590	50
4	3,660	146	7,245	290	10,190	407	6,050	242	7,245	290	1,910	76
5	2,910	147	5,820	300	8,150	430	4,850	250	5,820	355	1,550	75
6	2,425	173	4,850	355	6,795	560	4,045	300	4,850	405	1,295	75
8	1,820	221	3,640	405	5,095	635	3,030	355	3,640	455	970	100
10	1,455	280	2,910	405	4,075	635	2,425	355	2,910	455	775	100
12	1,215	283	2,425	405	3,395	635	2,020	355	2,425	455	645	100
14	1,040	262	2,080	405	2,910	635	1,735	355	2,080	455	555	100
16	910	240	1,820	405	2,545	635	1,515	355	1,820	455	485	100
18	810	238	1,615	380	2,265	560	1,350	300	1,615	405	430	100
20	730	236	1,455	380	2,040	560	1,215	300	1,455	405	390	100
25	585	187	1,160	370	1,630	560	970	300	1,160	405	305	73

RPM = rev / min
FEED = mm / min





Recommended Cutting Condition

X-STAR SERIES ▶ General Cutting

Workpiece	Herdened Steels	
Hardness	HRc30 ~ HRc45	
Diameter (mm)	RPM	FEED
3	6,900	552
4	5,175	414
5	4,140	331
6	3,450	414
8	2,588	414
10	2,070	414
12	1,725	414
14	1,479	414
16	1,294	414
18	1,150	368
20	1,035	414
25	828	397

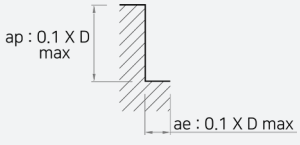
RPM = rev / min
FEED = mm / min



X-STAR SERIES ▶ Side Cutting

Workpiece	Herdened Steels	
Hardness	HRc30 ~ HRc45	
Diameter (mm)	RPM	FEED
3	8,493	679
4	6,369	510
5	5,096	611
6	4,246	849
8	3,185	764
10	2,548	713
12	2,123	764
14	1,820	728
16	1,592	701
18	1,415	679
20	1,274	662
25	1,019	611

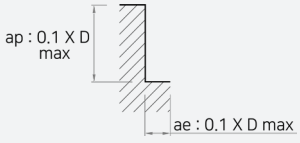
RPM = rev / min
FEED = mm / min



X-STAR SERIES ▶ High Speed Cutting

Workpiece	Herdened Steels	
Hardness	HRc30 ~ HRc45	
Diameter (mm)	RPM	FEED
3	18,047	2,166
4	13,535	1,624
5	10,828	1,732
6	9,023	2,166
8	6,768	1,895
10	5,414	1,732
12	4,512	1,985
14	3,867	1,856
16	3,384	1,895
18	3,008	1,805
20	2,707	1,841
25	2,166	1,646

RPM = rev / min
FEED = mm / min



Recommended Cutting Condition

SE502 SERIES ▶ Slotting

Workpiece	Carbon Steels, Alloy Steels, Tool Steels				Stainless Steels 300 Series	
Hardness	~ HRc30		HRc30 ~ HRc40			
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED
1	13000	220	9800	160	21000	170
1.2	12500	210	9000	150	17500	140
1.5	12000	200	8300	140	14000	110
2	11560	190	7560	120	10500	85
2.5	10240	200	6560	130	8500	70
3	8920	210	5560	140	8000	65
4	7560	300	4620	180	7500	75
5	6300	320	3780	190	6000	80
6	5560	350	3360	220	5000	80
8	4200	380	2520	200	3750	90
10	3260	330	2000	160	3000	90
12	2740	280	1680	130	2500	95
14	2470	250	1520	120	2150	100
16	2200	220	1360	110	1880	105
18	1940	195	1210	95	1670	110
20	1680	170	1060	80	1500	115

RPM = rev / min
FEED = mm / min



(ap : UP TO Ø 3.0 : 0.2D)



SE503 SERIES ▶ Slotting

Work-piece	Carbon Steels, Alloy Steels, Tool Steels						Cast Iron		Stainless Steels		Copper Alloy		Ti Alloy		Ti Alloy	
Hardness	~ HRc20		HRc20 ~ HRc30		HRc30 ~ HRc45											
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1	30000	1000	23000	800	16500	450	20000	500	16500	350	25000	360	16500	380	6500	100
1.5	20000	1000	15500	800	11000	450	13000	500	11000	350	16500	360	11000	380	4500	100
2	15000	1000	11500	800	8200	450	10000	500	8400	350	12500	360	8200	380	3500	100
2.5	12000	1000	9400	800	7500	450	8000	500	6500	350	10000	360	6500	380	2600	100
3	10080	950	7750	740	5550	395	6700	520	5550	350	8300	360	5550	395	2200	100
4	7550	1400	5850	1100	4200	595	5050	550	4200	320	6200	400	4200	595	1650	105
5	6000	1500	4700	1200	3300	650	4000	600	3300	350	5000	420	3300	600	1400	120
6	5050	1650	3850	1250	2800	700	3350	660	2800	370	4100	440	2800	700	1150	130
8	3750	1700	2950	1330	2100	710	2500	665	2100	375	3100	500	2100	710	850	120
10	3050	1650	2300	1250	1650	665	2000	630	1350	355	2500	530	1650	665	650	120
12	2500	1500	2000	1200	1350	605	1650	570	1350	320	2000	550	1350	605	555	110
14	2150	1550	1700	1200	1200	605	1450	580	1200	250	1700	600	1200	605	500	110
16	1850	1600	1450	1250	1000	650	1250	600	1000	200	1500	650	1000	610	400	115
18	1650	1650	1300	1300	920	700	1100	620	900	150	1300	700	900	615	350	120
20	1500	1700	1150	1350	840	750	1000	640	800	100	1200	750	800	620	320	125

RPM = rev / min
FEED = mm / min



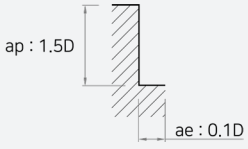


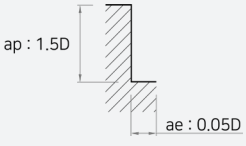
Recommended Cutting Condition

SE503 SERIES ▶ Side Cutting

Work-piece	Carbon Steels, Alloy Steels, Tool Steels						Cast Iron		Stainless Steels		Copper Alloy		Ti Alloy		Ti Alloy	
Hardness	~ HRc20		HRc20 ~ HRc30		HRc30 ~ HRc45											
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1	30000	1130	23000	904	16500	510	20000	565	16500	395	25000	405	16500	430	6500	115
1.5	20000	1130	15500	904	11000	510	13000	565	11000	395	16500	405	11000	430	4500	115
2	15000	1130	11500	904	8200	510	10000	565	8400	395	12500	405	8200	430	3500	115
2.5	12000	1130	9400	904	7500	510	8000	565	6500	395	10000	405	6500	430	2600	115
3	10080	1080	7750	850	5550	450	6700	605	5550	365	8300	390	5550	450	2200	110
4	7550	1630	5850	1260	4200	680	5050	630	4200	365	6200	440	4200	680	1650	125
5	6000	1695	4700	1355	3300	735	4000	680	3300	395	5000	475	3300	680	1400	135
6	5050	1910	3850	1470	2800	810	3350	755	2800	430	4100	490	2800	810	1150	150
8	3750	1950	2950	1500	2100	810	2500	770	2100	430	3100	550	2100	810	850	140
10	3050	1890	2300	1400	1650	775	2000	720	1350	415	2500	570	1650	775	650	140
12	2500	1700	2000	1340	1350	700	1650	665	1350	365	2000	620	1350	700	555	125
14	2150	1750	1700	1355	1200	685	1450	655	1200	280	1700	680	1200	685	500	125
16	1850	1805	1450	1410	1000	735	1250	680	1000	225	1500	735	1000	690	400	130
18	1650	1865	1300	1470	920	790	1100	700	900	170	1300	790	900	695	350	135
20	1500	1920	1150	1525	840	845	1000	725	800	115	1200	850	800	700	320	140

RPM = rev / min
FEED = mm / min





SE504 , SR504 SERIES ▶ Slotting

Workpiece	Alloy Steels, Cast Iron		Stainless Steels 300 Series		Stainless Steels 400 Series		Titanium		Inconel	
Hardness	~HB230									
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1	40,500	300	20,000	250	28,000	160	23,925	225	9330	60
1.5	27,000	300	13,000	180	18,500	160	15,730	185	6135	50
2	20,300	300	10,000	150	14,000	160	12,010	165	4685	45
2.5	16,200	300	8,000	120	11,000	165	9,490	155	3700	40
3	13,500	275	6,690	105	9,350	145	8,045	135	3135	35
4	10,100	370	5,050	135	7,000	185	6,005	195	2340	50
5	8,090	410	4,050	165	5,600	230	4,815	360	1875	60
6	6,750	480	3,350	190	4,700	265	4,030	415	1570	70
8	5,050	620	2,500	250	3,500	340	3,000	545	1170	95
10	4,050	780	2,050	320	2,800	430	2,430	695	945	120
12	3,370	750	1,680	310	2,350	435	2,010	685	780	115
14	2,890	670	1,400	280	2,000	405	1,700	820	715	150
16	2,500	630	1,250	265	1,750	370	1,500	950	600	180
18	2,250	630	1,100	260	1,550	365	1,320	1,245	515	250
20	2,000	620	1,000	260	1,400	365	1,200	1,875	480	390

RPM = rev / min
FEED = mm / min



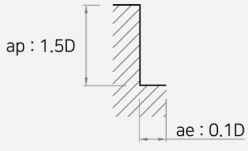


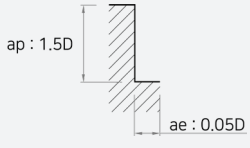
Recommended Cutting Condition

SE504, SR504 SERIES ▶ Side Cutting

Workpiece	Alloy Steels, Cast Iron		Stainless Steels 300 Series		Stainless Steels 400 Series		Titanium		Inconel	
Hardness	~HB230									
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1	40,500	335	20,000	280	28,000	180	23,925	260	9570	65
1.5	27,000	335	13,000	200	18,500	180	15,730	215	6290	55
2	20,300	335	10,000	170	14,000	180	12,010	195	4805	50
2.5	16,200	335	8,000	135	11,000	185	9,490	180	3795	45
3	13,500	310	6,690	115	9,350	160	8,045	155	3215	40
4	10,100	415	5,050	150	7,000	205	6,000	335	2520	60
5	8,090	460	4,050	185	5,600	260	4,815	410	2020	75
6	6,750	540	3,350	215	4,700	295	4,030	470	1690	85
8	5,050	700	2,500	280	3,500	380	3,000	620	1260	110
10	4,050	880	2,050	360	2,800	485	2,430	790	1020	145
12	3,370	845	1,680	350	2,350	490	2,010	780	845	140
14	2,890	755	1,400	315	2,000	455	1,700	925	715	170
16	2,500	710	1,250	295	1,750	415	1,500	1075	600	205
18	2,250	710	1,100	290	1,550	410	1,320	1410	515	275
20	2,000	700	1,000	290	1,400	410	1,200	2120	480	430

RPM = rev / min
FEED = mm / min

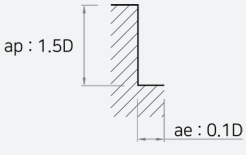


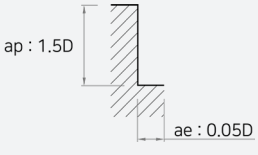


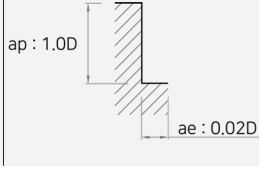
SE506 SERIES ▶ Side Cutting - Normal Speed

Workpiece	Carbon Steels, Alloy Steels, Tool Steels				Stainless Steels, Ti Alloy		Inconel	
Hardness	~ HRc30		HRc30 ~ HRc40					
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6	5560	2000	3880	1370	3370	1100	1350	280
8	4200	2000	2940	1370	2490	1100	1000	280
10	3360	2000	2320	1370	1920	1100	440	280
12	2840	1680	2000	1160	1610	1000	400	250
16	2100	1260	1480	880	1160	770	310	190
20	1680	1010	1160	690	900	620	250	155

RPM = rev / min
FEED = mm / min



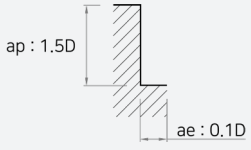


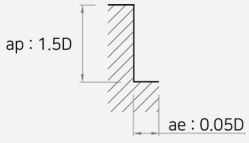


SE506 SERIES ▶ Side Cutting - High Speed

Workpiece	Carbon Steels, Alloy Steels, Tool Steels			
Hardness	~ HRc30		HRc30 ~ HRc40	
Diameter (mm)	RPM	FEED	RPM	FEED
6	22200	8000	16800	6090
8	16800	8000	12600	6090
10	13400	8000	9988	5990
12	11350	6720	8400	5040
16	8400	5040	6300	3780
20	6700	4040	5040	3050

RPM = rev / min
FEED = mm / min

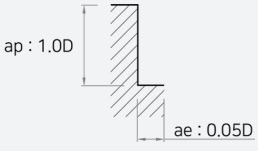




SR505, SR507 SERIES ▶ Side Cutting

Workpiece	Alloy Steels, Tool Steels (SKD61)		Stainless Steels, Titanium		High Hardened Steels	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED
6	3700	450	3200	380	1100	65
8	2800	400	2350	420	950	60
10	2250	325	1990	350	750	60
12	1990	300	1550	270	600	55
16	1550	250	1250	250	500	50
20	1200	180	900	150	350	50

RPM = rev / min
FEED = mm / min

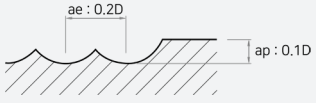


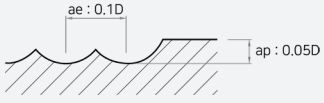
Recommended Cutting Condition

SB502 SERIES

Workpiece	Alloy Steel, Cast Iron		Alloy Steels, Prehardened Steels		Heat Treated Steels			
Hardness	150~250HB		25~35HRc		35~45HRc		45~55HRc	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	19100	770	12800	370	10200	270	8900	190
4	10800	1100	7200	550	5700	400	5000	280
6	7700	1300	5200	660	4100	480	3600	330
8	6000	1400	4000	700	3200	510	2800	360
10	4800	1400	3200	700	2600	520	2300	370
12	4000	1400	2700	710	2200	530	1900	370

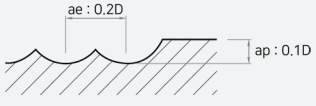
RPM = rev/min
FEED = mm/min

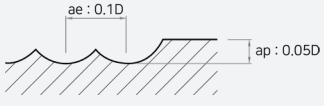




Workpiece	Stainless Steels 300 Series				Ni Alloy, Ti Alloy			
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	8900	210	6400	120	10200	270	8900	190
4	5000	310	3600	180	5700	400	5000	280
6	3600	380	2600	210	4100	480	3600	330
8	2800	400	2000	230	3200	510	2800	360
10	2300	410	1600	230	2600	520	2300	370
12	1900	410	1400	240	2200	530	1900	370

RPM = rev/min
FEED = mm/min

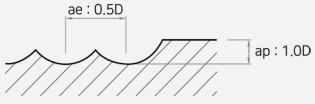




SB504 SERIES

Workpiece	Alloy Steel, Cast Iron		Stainless Steels 300 Series, Titanium		Stainless Steels 400 Series	
Hardness	~ HB230					
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED
3	13500	275	6690	105	9350	145
4	10100	370	5050	135	7000	185
5	8090	410	4050	165	5600	230
6	6750	480	3350	190	4700	265
8	5050	620	2500	250	3500	340
10	4050	780	2050	320	2800	430
12	3370	750	1680	310	2350	435
16	2530	700	1250	300	1750	395
20	2030	680	1000	290	1400	370

RPM = rev / min
FEED = mm / min



SF51H SERIES ▶ Slotting

Workpiece	Stainless Steels, Titanium alloys (SUS304, SUS316, Ti6A)	
Diameter (mm)	RPM	FEED
3	5000	380
4	4800	350
5	4700	350
6	4400	340
7	3800	340
8	3300	340
9	3000	340
10	2700	330
12	2200	330
14	2000	310
16	1750	300
20	1300	210

RPM = rev / min
FEED = mm / min



Recommended Cutting Condition

WAE301 SERIES ▶ Slotting, General Cutting

Workpiece	Acrylic		Alloy Steels	
Diameter (mm)	RPM	FEED	RPM	FEED
1	32,000	2,000	23,000	1,300
2	32,000	2,200	23,000	1,500
3	25,000	2,400	18,000	1,700
4	20,000	2,400	15,000	1,800
5	15,000	2,200	12,000	1,800
6	13,500	2,300	10,000	1,800
8	10,000	2,400	7,800	1,900
10	8,000	2,400	6,000	2,000
12	7,000	2,200	5,000	1,900

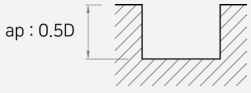
RPM = rev / min
FEED = mm / min

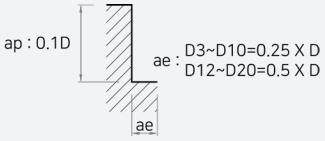


WAE302 SERIES ▶ Side Cutting, Slotting

Workpiece	Alloy Steels, Cast Iron		Aluminium	
Hardness	~ HB230		-	
Diameter (mm)	RPM	FEED	RPM	FEED
1	16,870	505	16,870	845
1.5	13,150	525	13,150	790
2	11,300	565	11,300	790
2.5	10,565	635	10,565	845
3	10,000	700	10,000	900
4	10,000	900	10,000	1,100
5	10,000	1,000	10,000	1,300
6	10,000	1,200	10,000	1,500
7	8,850	1,240	8,850	1,505
8	8,000	1,400	8,000	1,800
9	8,000	1,550	8,000	1,680
10	8,000	1,700	8,000	2,100
12	8,000	2,100	8,000	2,600
14	6,000	1,800	6,000	2,200
16	6,000	1,900	6,000	2,400
18	4,000	1,400	4,000	1,800
20	4,000	1,600	4,000	1,900

RPM = rev / min
FEED = mm / min



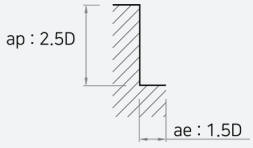


Recommended Cutting Condition

WAE30(2)3, WAR303 SERIES ▶ Side Cutting, General Cutting

Workpiece	Aluminium, NON Ferrous Metals	
Diameter (mm)	RPM	FEED
3	7,000	455
4	7,000	546
5	7,000	651
6	7,000	756
8	5,600	861
10	5,600	1,050
12	5,600	882
14	4,200	1106
16	4,200	1,211
18	2,800	910
20	2,800	956

RPM = rev / min
FEED = mm / min



WAE30(2)3, WAR303 SERIES ▶ Slotting, General Cutting

Workpiece	Aluminium, NON Ferrous Metals	
Diameter (mm)	RPM	FEED
3	7,000	350
4	7,000	441
5	7,000	504
6	7,000	606
8	5,600	700
10	5,600	854
12	5,600	1,050
14	4,200	903
16	4,200	945
18	2,800	700
20	2,800	805

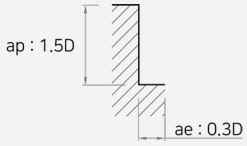
RPM = rev / min
FEED = mm / min



WAR302 SERIES ▶ Side Cutting, General Cutting

Workpiece	Aluminium Alloy							
	(<Si 4%)		(<Si 8%)		(Die Casting)		(Cu)	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
4	24,000	4,800	19,900	3,980	16,000	3,200	12,000	2,400
6	16,000	3,840	13,200	3,160	10,600	2,544	8,000	1,920
8	12,000	3,600	9,900	2,970	8,000	2,400	6,000	1,800
10	9,500	3,420	8,000	2,880	6,300	2,260	4,800	1,720
12	8,000	3,200	6,600	2,640	5,300	2,120	4,000	1,600
14	6,800	2,990	5,600	2,460	4,500	1,980	3,400	1,490
16	6,000	3,000	5,000	2,500	4,000	2,000	3,000	1,500
18	5,300	2,600	4,400	2,200	3,500	1,750	2,600	1,300
20	4,800	2,400	4,000	2,000	3,200	1,600	2,400	1,200

RPM = rev / min
FEED = mm / min



WAR302 SERIES ▶ Slotting, General Cutting

Workpiece	Aluminium Alloy							
	(<Si 4%)		(<Si 8%)		(Die Casting)		(Cu)	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
4	24,000	3,840	19,900	2,980	16,000	2,240	12,000	1,440
6	16,000	3,072	13,200	2,370	10,600	1,780	8,000	1,150
8	12,000	2,880	9,900	2,230	8,000	1,680	6,000	1,080
10	9,500	2,730	8,000	2,160	6,300	1,580	4,800	1,030
12	8,000	2,560	6,600	1,980	5,300	1,480	4,000	960
14	6,800	2,390	5,600	1,845	4,500	1,380	3,400	890
16	6,000	2,400	5,000	1,870	4,000	1,400	3,000	900
18	5,300	2,080	4,400	1,650	3,500	1,220	2,600	780
20	4,800	1,920	4,000	1,500	3,200	1,260	2,400	720

RPM = rev / min
FEED = mm / min

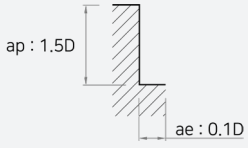


Recommended Cutting Condition

WAR502 SERIES ▶ Side Cutting, Slotting, General Cutting

Workpiece	Aluminium Alloy (A7075)		Aluminium Alloy Casting (Si13%)		Magnesium Alloy, Copper Alloy -	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED
1	32,000	220	32,000	220	23,000	220
1.2	32,000	230	32,000	230	19,000	220
1.4	32,000	260	32,000	260	16,500	220
1.5	32,000	280	32,000	280	15,500	220
1.6	32,000	320	32,000	320	14,500	220
1.8	32,000	360	32,000	360	13,000	220
2	32,000	420	32,000	420	11,500	220
2.5	25,000	600	25,000	600	9,500	250
3	21,000	700	21,000	700	7,950	250
4	15,500	725	15,500	725	5,950	280
5	12,500	760	12,500	760	4,750	295
6	10,500	830	10,500	830	3,950	310
8	7,950	890	7,950	890	2,950	300
10	6,350	995	6,350	995	2,350	365
12	5,300	1,050	5,300	1,050	1,950	390

RPM = rev / min
FEED = mm / min

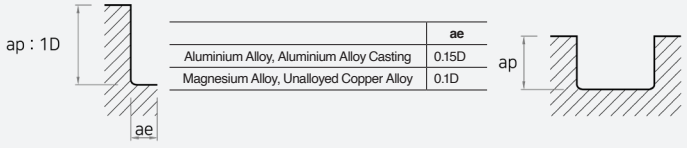




WAR502 SERIES ▶ Side Cutting, Slotting, High Speed Cutting

Workpiece	Aluminium Alloy (A7075)		Aluminium Alloy Casting (Si13%)		Magnesium Alloy, Copper Alloy -	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED
1	50,000	1,000	50,000	950	42,000	700
1.2	50,000	1,200	50,000	1,150	36,000	700
1.4	50,000	1,400	50,000	1,250	31,000	700
1.5	50,000	1,600	48,000	1,250	29,500	700
1.6	50,000	1,700	45,000	1,250	28,000	700
1.8	50,000	1,850	41,000	1,250	26,500	750
2	50,000	2,000	38,000	1,250	24,000	750
2.5	48,000	2,100	31,000	1,250	20,000	750
3	40,000	2,100	26,000	1,250	17,000	750
4	33,000	2,250	20,000	1,350	14,000	800
5	31,000	2,800	19,200	1,650	12,500	950
6	26,000	2,800	15,900	1,700	10,500	1,000
8	19,500	2,900	12,000	1,800	7,900	1,000
10	15,500	3,200	9,600	1,900	6,350	1,100
12	13,000	3,200	8,000	1,900	5,300	1,100

RPM = rev / min
FEED = mm / min

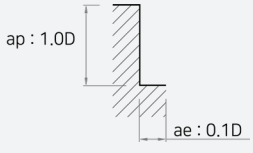


	ae
Aluminium Alloy, Aluminium Alloy Casting	0.15D
Magnesium Alloy, Unalloyed Copper Alloy	0.1D

WAR503 SERIES ▶ Side Cutting, General Cutting

Workpiece	Aluminium Alloy (A7075)		Aluminium Alloy Casting (Si13%)		Magnesium Alloy, Copper Alloy -	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED
3	21,000	1,100	21,000	1,100	7,950	325
4	15,500	1,250	15,500	1,250	5,950	365
5	12,500	1,300	12,500	1,275	4,750	385
6	10,500	1,400	10,500	1,400	3,950	400
8	7,950	1,500	7,950	1,500	2,950	460
10	6,350	1,700	6,350	1,700	2,350	475
12	5,300	1,750	5,300	1,750	1,950	510
16	3,950	1,750	3,950	1,750	1,450	510
20	3,150	1,750	3,150	1,750	1,150	510

RPM = rev / min
FEED = mm / min

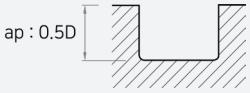


Recommended Cutting Condition

WAR503 SERIES ▶ Slotting, General Cutting

Workpiece	Aluminium Alloy (A7075)		Aluminium Alloy Casting (Si13%)		Magnesium Alloy, Copper Alloy -	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED
3	40,000	2,100	24,000	1,250	17,000	625
4	32,000	2,250	19,200	1,550	14,300	800
5	32,000	3,250	19,200	1,950	12,700	925
6	26,500	3,500	15,900	2,150	10,600	960
8	20,000	3,750	12,000	2,250	8,000	1,130
10	16,000	4,300	9,600	2,580	6,350	1,150
12	13,300	4,400	8,000	2,650	5,300	1,250
16	10,000	4,400	6,000	2,650	4,000	1,250
20	8,000	4,400	4,800	2,650	3,200	1,250

RPM = rev / min
FEED = mm / min



WAR503 SERIES ▶ Slotting, High Speed Cutting

Workpiece	Aluminium Alloy (A7075)		Aluminium Alloy Casting (Si13%)	
Diameter (mm)	RPM	FEED	RPM	FEED
3	40,000	1,450	24,000	880
4	32,000	1,700	19,200	1,000
5	32,000	2,200	19,200	1,350
6	26,500	2,400	15,900	1,450
8	20,000	2,500	12,000	1,500
10	16,000	2,800	9,600	1,700
12	13,300	2,950	8,000	1,800
16	10,000	3,000	6,000	1,800
20	8,000	3,000	4,800	1,800

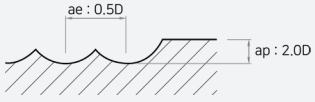
RPM = rev / min
FEED = mm / min



WAB312 SERIES

Workpiece	Aluminium Alloy		Copper Alloy	
Diameter (mm)	RPM	FEED	RPM	FEED
6	18,000	1,750	5,500	440
8	14,000	2,000	4,200	500
10	14,000	2,350	4,200	580
12	14,000	3,000	4,200	750
16	11,000	2,700	3,300	670
20	8,000	2,200	2,200	600

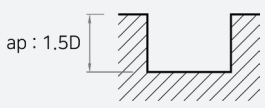
RPM = rev / min
FEED = mm / min

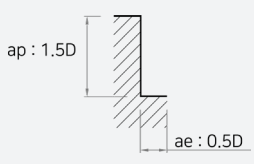


WAF303 SERIES ▶ Slotting

Workpiece	Aluminium, NON Ferrous Metals			
Diameter (mm)	RPM	FEED	RPM	FEED
6	10,500	800	13,500	1,050
8	8,000	700	10,500	900
10	6,500	750	8,500	950
12	5,250	800	6,800	1,050
16	4,000	800	5,200	1,050
20	3,200	800	4,200	1,050

RPM = rev / min
FEED = mm / min





Recommended Cutting Condition

E302, E322, EL422 SERIES

Processing method	Side Cutting				Slotting			
	Depth of Cut : 1.5D, Width : 0.1D				Depth of Cut : 0.5D, Width : 1D			
Workpiece	Carbon Steels, Alloy Steels, Tool Steels		Alloy Steels, Tool Steels		Carbon Steels, Alloy Steels, Tool Steels		Alloy Steels, Tool Steels	
Hardness	~ HB225		HB225 ~ HB325		~ HB225		HB225 ~ HB325	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1	5,300	60	4,300	50	4,300	40	3,500	20
2	4,500	80	3,800	60	3,800	50	3,100	30
3	3,700	80	3,200	60	3,200	50	2,650	30
4	2,750	110	2,400	60	2,400	50	2,000	30
6	1,850	110	1,600	60	1,600	50	1,320	30
8	1,400	110	1,200	90	1,200	60	1,000	40
10	1,100	110	950	90	950	60	800	40
12	930	110	800	90	800	60	660	40
16	700	110	600	90	600	60	500	40
20	560	110	480	90	480	60	400	40
25	450	110	380	90	380	60	320	40

※ Please reduce cutting speed around 20~30% from the above table or E322, E422 series.

E304, E324 SERIES

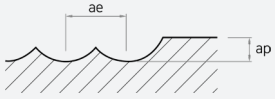
Processing method	Side Cutting				Slotting			
	Depth of Cut : 1.5D, Width : 0.1D				Depth of Cut : 0.5D, Width : 1D			
Workpiece	Carbon Steels, Alloy Steels, Tool Steels		Alloy Steels, Tool Steels		Carbon Steels, Alloy Steels, Tool Steels		Alloy Steels, Tool Steels	
Hardness	~ HB225		HB225 ~ HB325		~ HB225		HB225 ~ HB325	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1	5,300	60	4,300	50	4,300	40	3,500	20
2	4,500	80	3,800	60	3,800	50	3,100	30
3	3,700	80	3,200	60	3,200	50	2,650	30
4	2,750	110	2,400	60	2,400	50	2,000	30
6	1,850	110	1,600	60	1,600	50	1,320	30
8	1,400	110	1,200	90	1,200	60	1,000	40
10	1,100	110	950	90	950	60	800	40
12	930	110	800	90	800	60	660	40
16	700	110	600	90	600	60	500	40
20	560	110	480	90	480	60	400	40
25	450	110	380	90	380	60	320	40

※ Please reduce cutting speed around 20~30% from the above table or E324 series.

B302, BL422 SERIES

Workpiece	Carbon Steels, Alloy Steels, Tool Steels		Alloy Steels, Tool Steels	
Hardness	~ HB225		HB225 ~ HB325	
Diameter (mm)	RPM	FEED	RPM	FEED
R0.5	31,800	572	27,900	502
R1	31,800	1,910	27,900	1,670
R2	15,900	1,910	13,900	1,670
R3	10,600	1,910	9,280	1,670
R4	7,960	1,910	6,960	1,670
R5	6,370	1,780	5,570	1,560
R6	5,310	1,590	4,640	1,390
R8	4,000	1,300	3,500	1,050
R10	3,200	1,000	2,800	840
R12.5	2,400	800	2,100	650

RPM = rev / min
FEED = mm / min



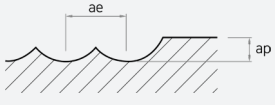
R	ap	ae
R≤1.0	0.05 x up to R	0.2 x up to R
1.0< R	0.1 x up to R	0.2 x up to R

※ Please reduce cutting speed around 20~30% from the above table or BL422 series.

B304 SERIES

Workpiece	Carbon Steels, Alloy Steels, Tool Steels		Alloy Steels, Tool Steels	
Hardness	~ HB225		HB225 ~ HB325	
Diameter (mm)	RPM	FEED	RPM	FEED
R0.5	39,750	718.25	34,875	6,275
R1	39,750	2,387.5	34,875	2,087.5
R2	19,875	2,387.5	17,375	2,087.5
R3	13,250	2,387.5	11,600	2,087.5
R4	9,950	2,387.5	8,700	2,087.5
R5	7,962.5	2,225	6,962.5	1,950
R6	6,637.5	1,987.5	5,800	1,737.5
R8	5,000	1,625	4,375	1,312.5
R10	4,000	1,250	3,500	1050
R12.5	3,000	1,000	2,625	812.5

RPM = rev / min
FEED = mm / min



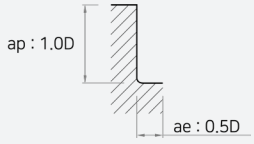
R	ap	ae
R≤1.0	0.05 x up to R	0.2 x up to R
1.0< R	0.1 x up to R	0.2 x up to R

Recommended Cutting Condition

RC502 SERIES

Workpiece	Unalloyed Copper			
Diameter (mm)	RPM	FEED	RPM	FEED
3	44,500	2,350	50,000	3,700
4	33,400	2,100	50,000	4,700
6	22,300	2,100	33,400	4,900
8	16,700	2,100	25,000	4,700
10	13,370	2,100	20,000	4,800
12	11,100	2,100	16,700	4,700

RPM = rev / min
FEED = mm / min

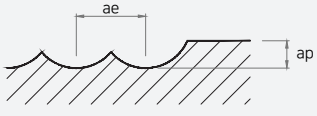




BC502 SERIES

Workpiece		Unalloyed Copper			
Mill Dia (mm)	Diameter (mm)	RPM	FEED	Rd	Ad
0.5	1	41,000	1,660	0.04	0.063
0.75	1.5	27,000	1,830	0.068	0.087
1	2	20,000	1,780	0.089	0.112
1.25	2.5	16,000	1,840	0.115	0.09
1.5	3	13,000	2,220	0.171	0.168
2	4	10,000	2,080	0.208	0.2
2.5	5	8,300	1,990	0.24	0.2
3	6	6,900	1,940	0.281	0.25
4	8	5,720	1,000	0.175	0.4
5	10	4,550	700	0.154	0.5
6	12	3,770	600	0.159	0.6

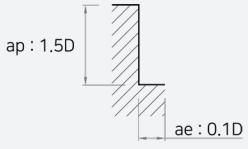
RPM = rev / min
FEED = mm / min



GE SERIES

Workpiece	Graphite	
Diameter (mm)	RPM	FEED
0.4	40,000	200
0.6	40,000	350
0.8	40,000	550
1	40,000	700
2	25,000	800
3	20,000	800
4	18,000	950
5	14,000	1,200
6	11,000	1,400
8	8,000	1,300
10	6,500	1,200
12	5,500	1,200

RPM = rev / min
FEED = mm / min

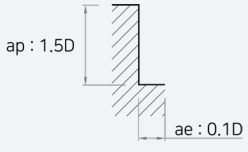


※ Please reduce cutting speed 50% from the above table when using long and extra long type

WGE504 SERIES

Workpiece	Graphite	
Diameter (mm)	RPM	FEED
3	20,000	1,600
4	18,000	1,900
5	14,000	2,400
6	11,000	2,800
8	8,000	2,600
10	6,500	2,400
12	5,500	2,400
16	4,200	2,450
20	3,300	2,400

RPM = rev / min
FEED = mm / min



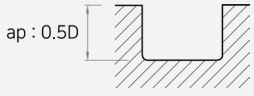
※ Please reduce cutting speed 50% from the above table when using long and extra long type

Recommended Cutting Condition

WGR502 SERIES

Workpiece	Graphite	
Diameter (mm)	RPM	FEED
0.4	40,000	640
0.6	40,000	640
0.8	40,000	800
1	40,000	960
1.2	40,000	1,200
1.5	40,000	1,440
2	40,000	1,600
3	27,000	1,900
4	20,000	2,300
5	16,000	2,300
6	14,000	2,300

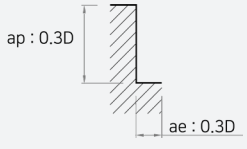
RPM = rev / min
FEED = mm / min



WGR504 SERIES

Workpiece	Graphite	
Diameter (mm)	RPM	FEED
4	40,000	3,500
6	40,000	5,600
8	32,000	5,600
10	26,000	5,700
12	21,000	5,450
16	15,800	5,450
20	12,800	5,500

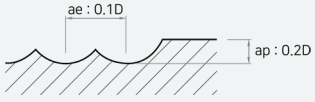
RPM = rev / min
FEED = mm / min



G SERIES

Workpiece	Graphite	
Diameter (mm)	RPM	FEED
0.5	16,000	480
0.75	16,000	640
1	16,000	800
1.5	16,000	1,450
2	16,000	2,100
3	15,000	2,950
4	13,000	3,000
5	11,500	3,050
6	10,500	3,150
8	8,555	2,960

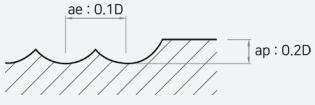
RPM = rev / min
FEED = mm / min



WGB504 SERIES

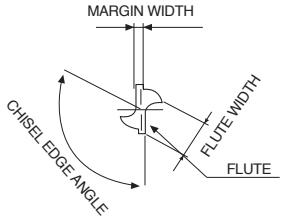
Workpiece	Graphite	
Diameter (mm)	RPM	FEED
1	20,000	700
2	16,000	1,200
3	16,000	2,000
4	16,000	3,100
5	15,000	3,800
6	15,000	4,400
8	13,000	4,500
10	12,000	4,600
12	10,000	4,700
16	7,500	3,800
20	6,000	3,500

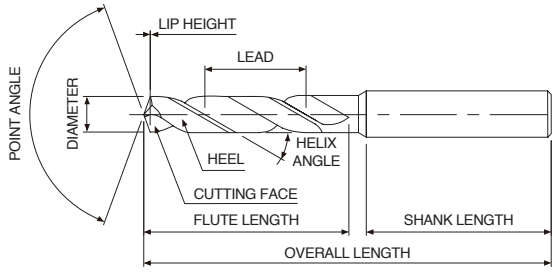
RPM = rev / min
FEED = mm / min

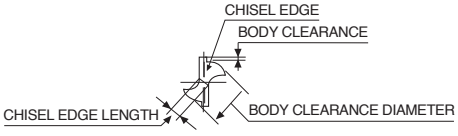


Recommended Cutting Condition

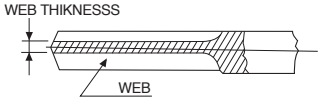
Nomenclature of Drill





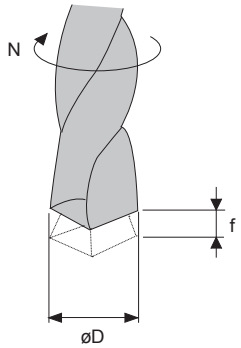






Working of Main Angle

POINT ANGLE	HELIX ANGLE	LIP RELIEF ANGLE
Low — High	Low — High	Low — High
Large → Torque → Small Small → Thrust → Large	Bad → Torque → Good Good → Thrust → Bad Large → Rigidity of tool → Small	Small → Tool Wear → Large Small → Unalloyed Copper → Large



· Cutting Speed $V = \frac{\pi \times D \times N}{1000}$ (m/min)	V : Cutting Speed D : Diameter of drill N : Revolution π : 3.14	(m/min) (mm) (rpm)
· Feed F = Fn x N(m/rev)	F : Feed Fn : Feed rate per revolution N : Revolution	(m/rev) (mm) (rpm)
· Helix Angle $\theta° = \text{Tan-1}\left(\frac{\pi D}{L}\right)$	θ° : Helix angle D : Diameter of drill L : Lead π : 3.14	 (mm)

Technical Solutions about general problems to use drill

Problems and Circumstances	Cause	Technical Countermeasures
Not drill into workpiece	• No enough Lip Relief • Thick Web	• Re-grinding of Lip Relief • Get the Web thinner
Chipping-off on margin part	• large jig-bushing	• Use the right sized bushing on drill
Balance of cutting flutes	• To overheat on drill during the operation	• Reduce feed rate Supply enoungh cutting oil
Chipped-off on cutting flutes	• Large relief angle • High feed rate	• Adjust Lip Relief • Reduce feed rate
Damage on tang	• Incomplete adhesiveness between soket and shaft	• Remove foreign substance and replace it to new one when it is worn out
Damage on a drill during a processing of brass	• Wrong choice of shape of drill • Clogged-up with chips in groove	• Choose suitable drill for material
Crack on center of drill	• Lack of number of flutes • Huge feed rate	• Re-grinding with proper relief angle • Reduce feed rate
Getting hole size larger	• Difference between point angle and cutting flutes • Loose main spindle	• Choose good qualitative drill • Adjust spindle within measure
Damage on edge	• High feed rate • Foreign substance on workpiece • Lack of cutting oil supply on drill tip • The wear and tear of a drill	• Grind tip of drill suitable for workpiece • Reduce feed rate • Regrind it on early stage
Irregular size of chip	• inappropriate grind on edge of flute or using only one side of flute	• Need a exact re-grinding • Choose good qualitative drill
Roughness of hole	• Blunt edge of flute or inappropriate grinding excessive feed rate • No supply cutting oil on tip of drill • loose fixture	• Regrind flute edge angle • Suppy plenty of appropriate cutting oil • Reduce feed rate • Fasten fixture

Recommended Cutting Condition

NDPG, NDPK SERIES

Workpiece	Alloy Steel(C<0.3%) Alloy Steels/SS400 SCM ~710N/㎟		Alloy Steel(C>0.3%) Alloy Steels/S50C SCM ~1,060N/㎟		Grey Cast Iron <HB240		Grey Cast Iron <HB350		Stainless Steels	
V(m/min)	80~120		80~120		120~200		80~130		40~45	
Diameter (mm)	RPM	fn (mm/rev)	RPM	fn (mm/rev)	RPM	fn (mm/rev)	RPM	fn (mm/rev)	RPM	fn (mm/rev)
1	13,000	0.04	13,000	0.04	21,300	0.04	14,200	0.04	7,160	0.03
2	13,000	0.06	13,000	0.06	21,300	0.06	14,200	0.06	7,160	0.04
3	13,000	0.13	13,000	0.13	21,000	0.13	14,000	0.13	4,780	0.07
4	9,500	0.14	9,500	0.14	16,000	0.14	10,500	0.14	3,600	0.08
5	7,600	0.15	7,600	0.15	13,000	0.15	8,300	0.15	2,850	0.09
6	6,400	0.17	6,400	0.17	11,000	0.17	6,900	0.17	2,400	0.1
8	4,800	0.21	4,800	0.21	8,000	0.21	5,200	0.21	1,800	0.12
10	3,800	0.25	3,800	0.25	6,400	0.25	4,150	0.25	1,450	0.15
12	3,200	0.27	3,200	0.27	5,300	0.27	3,450	0.27	1,200	0.17
14	2,750	0.29	2,750	0.29	4,550	0.29	3,000	0.29	1,000	0.19
16	2,400	0.31	2,400	0.31	4,000	0.31	2,600	0.31	900	0.21
18	2,100	0.33	2,100	0.33	3,550	0.33	2,300	0.33	800	0.23
20	1,900	0.35	1,900	0.35	3,200	0.35	2,100	0.35	700	0.25

※ Recommended conditions in the above table are ideal conditions, and work by adjusting the conditions according to the equipment and other conditions.

· 7D : Apply 85% of the table

PF50, P50, HP50 SERIES

Work piece	Alloy Steel(C<0.3%) Alloy Steels/SS400 SCM ~710N/㎟		Alloy Steel(C≥0.3%) Alloy Steels/S50C SCM ~1,060N/㎟		SUJ2·SUS440		SKD61 HRc34~43		HRc43~48		SKD11 HRc48~53		Cast Iron FC 250~350		Ductile FC 400~500	
V(m/min)	80~125		80~125		63~80		40~63		32~45		25~36		80~125		63~90	
Diameter (mm)	RPM	fn (mm/rev)	RPM	fn (mm/rev)	RPM	fn (mm/rev)	RPM	fn (mm/rev)	RPM	fn (mm/rev)	RPM	fn (mm/rev)	RPM	fn (mm/rev)	RPM	fn (mm/rev)
2	12,000	0.06~0.08	12,000	0.06~0.08	11,000	0.06~0.08	8,000	0.06~0.08	6,000	0.05~0.07	4,500	0.03~0.06	15,000	0.06~0.08	11,000	0.06~0.08
3	9,600	0.09~0.12	9,600	0.09~0.12	7,500	0.09~0.12	5,300	0.09~0.12	4,000	0.07~0.11	3,200	0.05~0.09	10,000	0.09~0.12	7,600	0.09~0.12
4	8,000	0.10~0.15	8,000	0.10~0.15	5,650	0.10~0.15	4,000	0.10~0.15	3,000	0.08~0.13	2,600	0.06~0.10	8,000	0.10~0.15	6,000	0.10~0.15
5	6,400	0.12~0.18	6,400	0.12~0.18	4,550	0.12~0.18	3,300	0.12~0.18	2,400	0.10~0.15	2,000	0.8~0.12	6,400	0.12~0.18	4,800	0.12~0.18
6	5,300	0.14~0.20	5,300	0.14~0.20	3,800	0.14~0.20	2,750	0.14~0.20	2,000	0.12~0.18	1,700	0.09~0.15	5,300	0.14~0.20	4,000	0.14~0.20
8	4,000	0.16~0.24	4,000	0.16~0.24	2,850	0.16~0.24	2,100	0.16~0.24	1,500	0.14~0.22	1,300	0.12~0.20	4,000	0.16~0.24	3,000	0.16~0.24
10	3,200	0.18~0.27	3,200	0.18~0.27	2,250	0.18~0.27	1,700	0.18~0.27	1,200	0.15~0.25	1,000	0.13~0.23	3,200	0.18~0.27	2,400	0.18~0.27
12	2,650	0.20~0.30	2,650	0.20~0.30	1,900	0.20~0.30	1,400	0.20~0.30	1,000	0.17~0.26	850	0.14~0.24	2,700	0.20~0.30	2,000	0.20~0.30
14	2,300	0.22~0.35	2,300	0.22~0.35	1,600	0.22~0.35	1,200	0.22~0.35	860	0.18~0.30	730	0.15~0.26	2,300	0.22~0.35	1,700	0.22~0.35
16	2,000	0.25~0.36	2,000	0.25~0.36	1,400	0.25~0.36	1,050	0.25~0.36	760	0.20~0.32	640	0.16~0.26	2,000	0.25~0.36	1,500	0.25~0.36
18	1,800	0.28~0.38	1,800	0.28~0.38	1,250	0.28~0.38	920	0.28~0.38	670	0.23~0.33	570	0.18~0.28	1,800	0.28~0.38	1,350	0.28~0.38
20	1,600	0.30~0.40	1,600	0.30~0.40	1,150	0.30~0.40	850	0.30~0.40	600	0.25~0.35	500	0.20~0.30	1,600	0.30~0.40	1,200	0.30~0.40

SF, PI, HPI SERIES

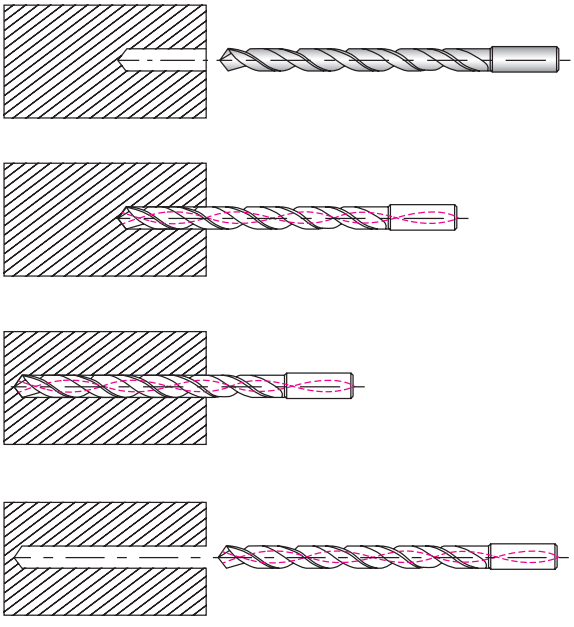
Work piece	Alloy Steel(C<0.3%) Alloy Steels/SS400 SCM ~710N/㎟		Alloy Steel(C≥0.3%) Alloy Steels/S50C SCM ~1,060N/㎟		SUJ2·SUS440		SKD61 HRc34~43		HRc43~48		SKD11 HRc48~53		Cast Iron FC 250~350		Ductile FC 400~500	
V(m/min)	80~125		80~125		63~80		40~63		32~45		25~36		80~125		63~90	
Diameter (mm)	RPM	fn (mm/rev)	RPM	fn (mm/rev)	RPM	fn (mm/rev)	RPM	fn (mm/rev)	RPM	fn (mm/rev)	RPM	fn (mm/rev)	RPM	fn (mm/rev)	RPM	fn (mm/rev)
3	12,000	0.09~0.12	13,000	0.09~0.12	7,600	0.09~0.12	6,400	0.09~0.12	5,300	0.07~0.11	3,800	0.05~0.09	12,000	0.09~0.12	8,500	0.09~0.12
4	9,500	0.1~0.15	10,000	0.1~0.15	5,700	0.1~0.15	4,800	0.1~0.15	4,000	0.08~0.13	2,950	0.06~0.1	9,000	0.1~0.15	6,350	0.1~0.15
5	7,600	0.12~0.18	8,000	0.12~0.18	4,600	0.12~0.18	3,800	0.12~0.18	3,200	0.1~0.15	2,300	0.08~0.12	7,600	0.12~0.18	5,100	0.12~0.18
6	6,400	0.14~0.20	6,600	0.14~0.20	3,800	0.14~0.20	3,200	0.14~0.20	2,650	0.12~0.18	1,900	0.09~0.15	6,400	0.14~0.20	4,250	0.14~0.20
8	4,800	0.16~0.24	5,000	0.16~0.24	2,900	0.16~0.24	2,400	0.16~0.24	2,000	0.14~0.22	1,450	0.12~0.2	4,800	0.16~0.24	3,200	0.16~0.24
10	3,800	0.18~0.27	4,000	0.18~0.27	2,300	0.18~0.27	1,900	0.18~0.27	1,600	0.15~0.25	1,150	0.13~0.23	3,800	0.18~0.27	2,550	0.18~0.27
12	3,200	0.20~0.30	3,300	0.20~0.30	1,900	0.20~0.30	1,600	0.20~0.30	1,300	0.17~0.26	950	0.14~0.24	3,200	0.20~0.30	2,100	0.20~0.30
14	2,700	0.22~0.35	2,800	0.22~0.35	1,600	0.22~0.35	1,350	0.22~0.35	1,150	0.18~0.3	800	0.15~0.26	2,700	0.22~0.35	1,800	0.22~0.35
16	2,400	0.25~0.36	2,500	0.25~0.36	1,400	0.25~0.36	1,200	0.25~0.36	1,000	0.2~0.32	700	0.16~0.26	2,400	0.25~0.36	1,600	0.25~0.36
18	2,100	0.28~0.38	2,200	0.28~0.38	1,300	0.28~0.38	1,100	0.28~0.38	900	0.23~0.33	650	0.18~0.28	2,100	0.28~0.38	1,400	0.28~0.38
20	1,900	0.30~0.40	2,000	0.30~0.40	1,150	0.30~0.40	1,000	0.30~0.40	800	0.25~0.35	600	0.2~0.3	1,900	0.30~0.40	1,250	0.30~0.40

· 8D : fn 70~80%

Recommended Cutting Condition

SF510, SF520 SERIES

Workpiece	Carbon Steels, Alloy Steels ~1060 N/mm2		Cast Iron 250~350 N/mm2		Ductile Cast Iron 400~500 N/mm2	
V(m/min)	80~125		80~125		63~90	
Diameter (mm)	RPM	fn (mm/rev)	RPM	fn (mm/rev)	RPM	fn (mm/rev)
3	7,500	0.06 ~ 0.12	7,500	0.06 ~ 0.12	7,500	0.06 ~ 0.12
4	6,400	0.08 ~ 0.16	6,400	0.08 ~ 0.16	5,600	0.08 ~ 0.16
5	5,800	0.10 ~ 0.20	5,800	0.10 ~ 0.20	4,500	0.10 ~ 0.20
6	4,800	0.12 ~ 0.24	4,800	0.12 ~ 0.24	3,800	0.12 ~ 0.24
8	3,600	0.16 ~ 0.28	3,600	0.16 ~ 0.28	2,800	0.16 ~ 0.28
10	2,900	0.20 ~ 0.35	2,900	0.20 ~ 0.35	2,300	0.20 ~ 0.35
12	2,900	0.24 ~ 0.42	2,400	0.24 ~ 0.42	1,900	0.24 ~ 0.42
14	2,050	0.28 ~ 0.46	2,050	0.28 ~ 0.46	1,600	0.28 ~ 0.46



1. Guide Drilling should be done as Diameter+0.1mm between 3D and 5D
2. For Main Drilling, proceed with low RPM at Guide Drilling segment. (RPM 300, FEED 400mm/min)
3. Just before the end of Guide Drilling segment, reduce feed to zero and increase the RPM according to Recommended
4. After then, proceed main drilling by increasing feed without step drilling.
5. When coming out from Guide Drilling start point after drilling, RPM should be reduced as 300 and feed should be 1000 mm/min.
6. When coming out from Guide Drilling segment to the outside, the feed should be decreased as 50%

SSD, SSTD, SSDL, SSTDL SERIES

Workpiece	Tool Steels, Alloy Steels		Aluminium, Aluminium Alloy		Brass, Bronze		Epoxy, Resin	
Diameter (mm)	RPM	fn (mm/rev)	RPM	fn (mm/rev)	RPM	fn (mm/rev)	RPM	fn (mm/rev)
3	4,000~7,000	0.02	10,000~12,000	0.03	7,000~10,000	0.02	9,000~12,000	0.08
5	2,400~4,200	0.03	6,000~8,000	0.05	4,200~6,000	0.04	5,400~7,200	0.08
8	1,500~2,600	0.05	3,700~5,000	0.08	2,600~3,700	0.08	3,400~4,500	0.09
12	1,000~1,700	0.06	2,500~3,200	0.12	1,700~2,500	0.12	2,200~3,000	0.11

APF505 SERIES

Workpiece	Aluminium Alloy Steels	Cast Aluminium	Magnesium	Copper&Brass	Titanium
Type	6061	380			6Al-4V
V(m/min)	140~200	90~150	75~150	75~151	30~90
Diameter (mm)	fn (mm/rev)				
4	0.15~0.20	0.11~0.23	0.11~0.23	0.08~0.18	0.08~0.18
6	0.19~0.38	0.15~0.30	0.15~0.30	0.15~0.23	0.15~0.23
8	0.27~0.45	0.23~0.38	0.23~0.38	0.15~0.23	0.15~0.23
10	0.34~0.53	0.23~0.45	0.23~0.45	0.15~0.30	0.15~0.30
12	0.45~0.60	0.27~0.53	0.27~0.53	0.23~0.38	0.23~0.38
16	0.49~0.75	0.30~0.60	0.30~0.60	0.21~0.45	0.21~0.45

Recommended Cutting Condition

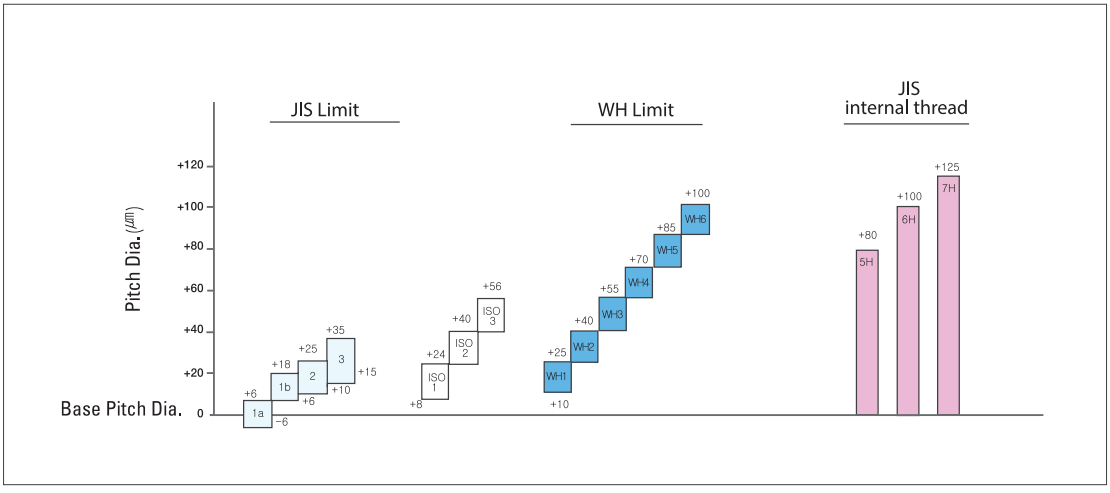
WH Limits

WIDIN applies an unique WH limits system in order to fulfill the degree of an internal thread and provides users the best taps for suitable working and operating conditions.

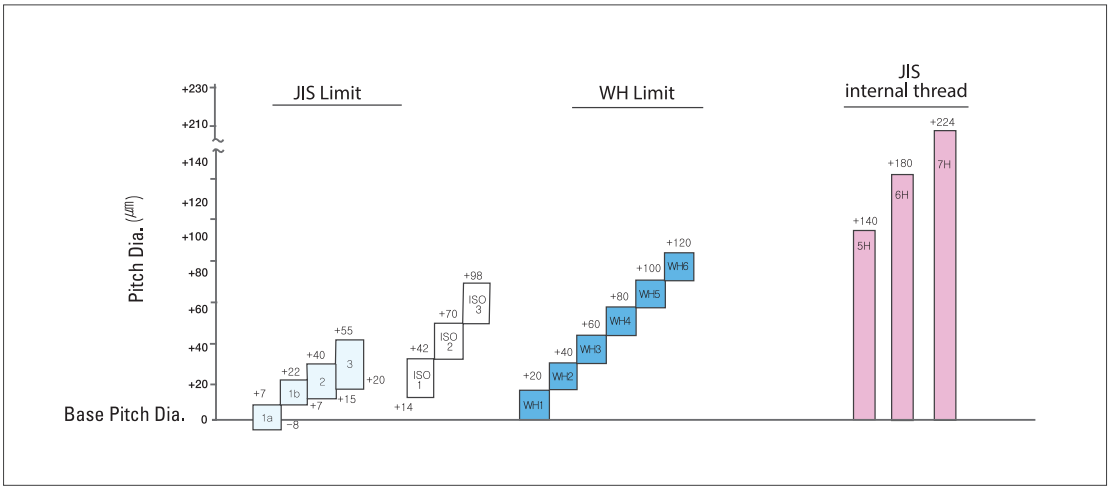
1. {P≤ 0.6(T.P.I≥40)}
Upper Limits : 0.010 + 0.015 x n
Lower Limits : Upper Limits - 0.015
Unit :mm (n=WH number)

2. {P≤ 0.7(T.P.I≤36)}
Upper Limits : 0.020 x n
Lower Limits : Upper Limits -0.020
Unit:mm (n=WH number)

Example M3×0.5



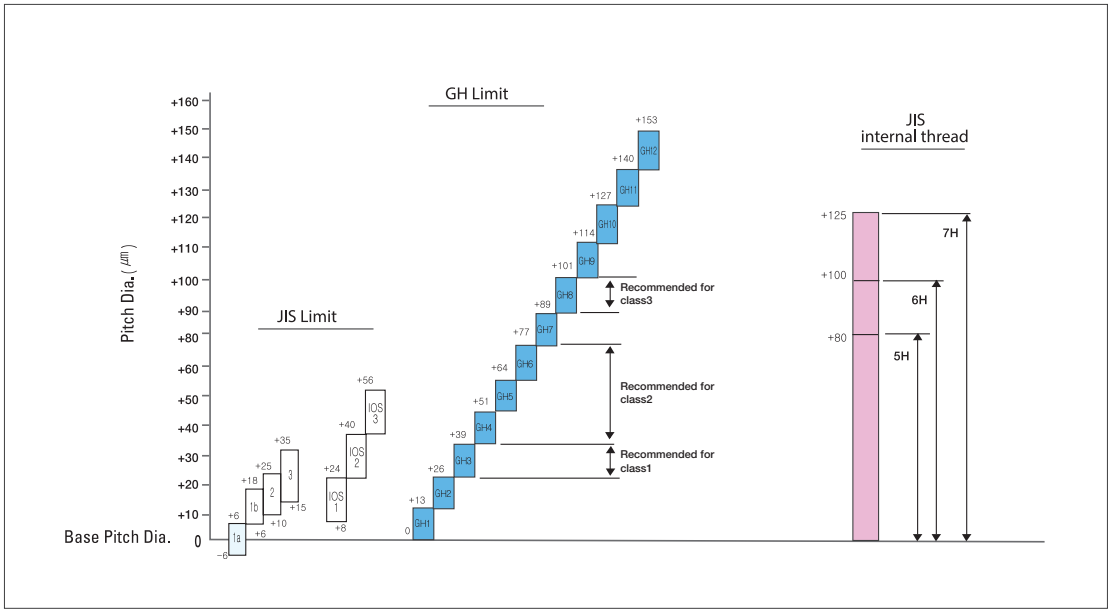
Example M10×1.5



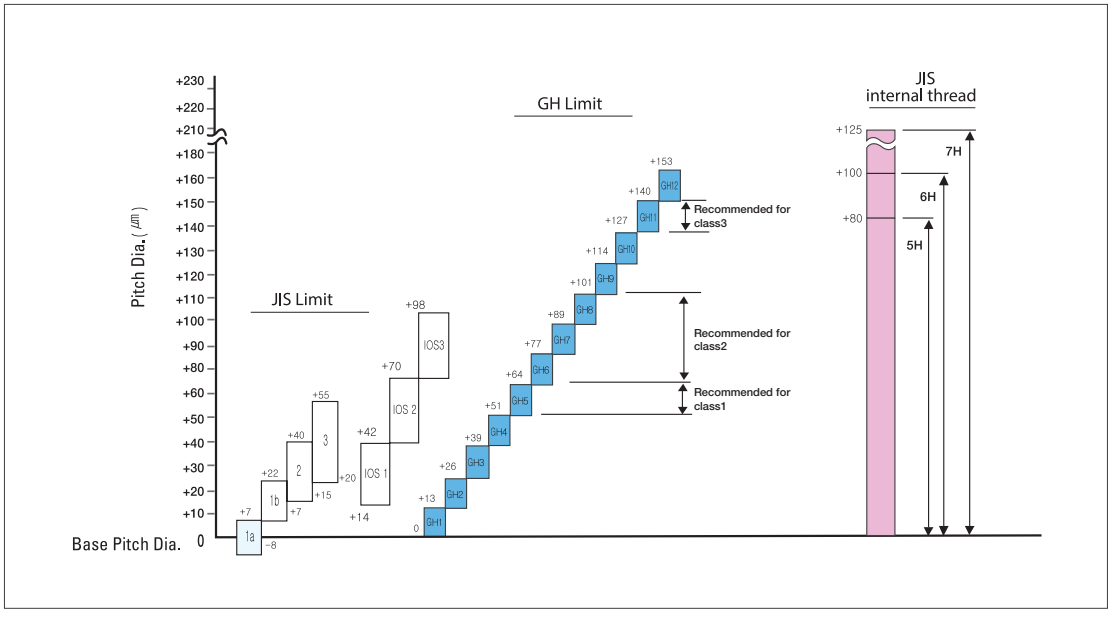
GH Limits

Since roll taps process female threads by plastic deformation, strict drill diameter management is required, unlike other cutting taps. Tap limit is strictly applied to.
WIDIN adopts the limit of 12.7㎛(0.0005") increments.

Example M3×0.5



Example M10×1.5



Recommended Cutting Condition

Recommended tapping speeds and cutting fluids

Tapping speeds depend on very important factors such as material type of tap, chamfer length, drill size, work materials and cutting fluids.
Users need to check every aspect before applying it.
Morever, cutting fluids, cooling and abrasion resistance are three important factors affecting cutting fluids.
Therefore, users should provide enough fluids during the tapping process.

Work Material		Tapping(m/min)					Cutting Fluids			
		Straight Tap	Spiral Tap	Point Tap	Carbide Tap	Roll Tap	Non Water soluble	Water soluble	Semidry	Dry
Low Carbon Steels	C~0.25%	8~13	8~13	15~25	-	8~13	◎	○	△	△
Medium Carbon Steels	C0.25~0.45%	7~12	7~12	10~15	-	7~10	◎	○	△	△
High Carbon Steels	C0.45%~	6~9	6~9	8~13	-	5~8	◎	○	△	△
Alloy Steels	SCM	7~12	7~12	10~15	-	5~8	◎	△	△	△
Hardened Steels	25~45HRc	3~5	3~5	4~6	-	-	◎	△	-	-
Stainless Steels	SUS	4~7	5~8	8~13	-	5~10	◎	○	-	-
Precipitation Hardened Stainless Steels	SUS630, SUS631	3~5	3~5	4~6	-	-	◎	-	-	-
Tool Steels	SKD	6~9	6~9	7~10	-	-	◎	-	-	-
Cast Steels	SC	6~11	6~11	10~15	-	-	◎	○	-	-
Cast Iron	FC	10~15	-	-	10~20	-	◎	○	○	○
Ductile, Cast Iron	FCD	7~12	7~12	10~20	10~20	-	◎	○	○	-
Unalloyed Copper	Cu	6~9	6~11	7~12	10~20	7~12	○	○	-	-
Brass, Brass Casting	Bs, Bsc	10~15	10~20	15~25	15~25	7~12	○	○	○	○
Bronze, Bronze Casting	PB, PBC	6~11	6~11	10~20	10~20	7~12	○	○	-	-
Aluminum	AL	10~20	10~20	15~25	-	10~20	◎	○	△	-
Aluminum, Alloy Casting	AC, ADC	10~15	10~15	15~20	10~20	10~25	◎	○	△	-
Magnesium, Alloy Casting	MC	7~12	7~12	10~15	10~20	-	◎	○	○	-
Zinc, Alloy Casting	ZDC	1~12	7~12	10~15	10~20	7~12	◎	○	△	-
Thermo, Setting Plastic	Bakelite, Phenol Epoxy	10~20	-	-	15~25	-	-	○	○	○
Thermo, Plastic	Vinyl Chloride Nylon	10~20	10~15	10~20	10~20	-	-	○	○	○

◎: Ideal / ○:Good / △: Applicable / - : Not Applicable

Recommended Drill hole size with JIS internal thread Class 2

Spiral Tap, Point Tap, Straight Tap			
Thread Size	Recommended Drill Size(mm)	Drill Size(mm)	
		Min	Max
M3 X 0.5	2.50	2.459	2.599
M4 X 0.7	3.30	3.242	3.422
M5 X 0.8	4.20	4.134	4.334
M6 X 1.0	5.00	4.917	5.153
M8 X 1.25	6.80	6.647	6.912
M10 X 1.25	8.80	8.647	8.912
M10 X 1.5	8.50	8.376	8.676
M12 X 1.0	11.00	10.917	11.153
M12 X 1.25	10.80	10.647	10.912
M12 X 1.5	10.50	10.376	10.676
M12 X 1.75	10.30	10.106	10.441
M14 X 1.5	12.50	12.376	12.676
M14 X 2.0	12.00	11.835	12.21
M16 X 1.5	14.50	14.376	14.676
M16 X 2.0	14.00	13.835	14.21
M18 X 1.5	16.50	16.376	16.676
M18 X 2.5	15.50	15.294	15.744
M20 X 1.5	18.50	18.376	18.676
M20 X 2.5	17.50	17.294	17.744

Recommended Cutting Condition

CFT, CCT, CCF SERIES ▶ Metric

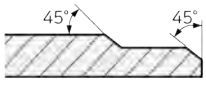
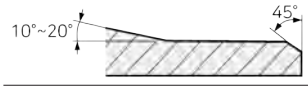
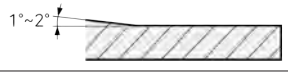
Workpiece	Alloy Steel		Alloy Steels		Prehardened Steels	
	(<Si 4%)		(<Si 8%)		(Die Casting)	
Diameter (mm)	RPM	FEED	RPM	FEED	RPM	FEED
2	3,400-7,000	70-100	2,600-5,200	50-90	2,000-4,000	40-60
3	2,700 - 5,300	60-85	2,100-4,200	45-70	1,600-3,200	35-50
4	2,000 - 4,000	50-70	1,600-3,200	40-55	1,200-2,400	30-40
5	1,700 - 3,400	45-60	1,400-2,600	35-50	1,000-2,000	26-35
6	1,300 - 2,700	40-50	1,100-2,100	30-40	800-1,600	22-30
7	1,150-2,400	35-45	950-1,900	28-37	700-1,400	21-28
8	1,000-2,000	30-40	800-1,600	26-34	600-1,200	20-25
9	900-1,800	30-40	700-1,450	24-32	550-1,100	18-23
10	800-1,600	30-37	600-1,300	23-29	500-1,000	17-22
11	750-1,450	30-37	550-1,200	22-28	450-900	16-21
12	700-1,300	28-35	500-1,100	21-27	400-800	16-20

Recommendation of Cutting Conditions in Reamer

Workpiece			Diameter(mm)	Cutting Conditions	
Material	Strength(Kg/mm2)	Hardness(HB)		V(m/min)	fn(mm/rev)
Alloy Steel Alloy Steels	~ 100	-	~10 10~25 25~40	8 ~ 12	0.15 ~ 0.25 0.20 ~ 0.40 0.30 ~ 0.50
	100 ~ 140	-	~10 10~25 25~40	6 ~ 10	0.12 ~ 0.20 0.15 ~ 0.30 0.20 ~ 0.40
Steel Castings	40 ~ 50	-	~10 10~25 25~40	8 ~ 12	0.15 ~ 0.25 0.20 ~ 0.40 0.30 ~ 0.50
	50 ~ 70	-	~10 10~25 25~40	6 ~ 10	0.12 ~ 0.20 0.15 ~ 0.30 0.20 ~ 0.40
Cast Iron	-	~ 200	~10 10~25 25~40	8 ~ 15	0.20 ~ 0.30 0.30 ~ 0.50 0.40 ~ 0.70
	-	200 ~	~10 10~25 25~40	6 ~ 12	0.15 ~ 0.25 0.20 ~ 0.40 0.30 ~ 0.50
Alumunum Alloys	-	-	~10	15 ~ 25	0.20 ~ 0.30 0.30 ~ 0.50 0.40 ~ 0.70
	-	-	10~25 25~40	20 ~30	

Recommended Cutting Condition

The Effect of Chamfer

Twist Direction	Characteristics
	If the work piece is caught by sharp blade edge, dent occurs on the machined surface. It is applied to chucking reamer, etc.
	Guide edge was rounded. The ground surface is excellent but round machining is difficult and it may deteriorate the machined surface.
	It is 2 blade-type. Chip is produced in 2 stages and it provides good results. But regrinding is difficult.
	The guide part of second stage of cutting edge is 1~2°. Cutting edge blade is long and life is limited. It provides good results on finish machining
	The guide part of second stage is 10~20. It is very economical as the length of blade is short and utilized length is long
	It is used for finish machining. It is applied to hand reamer.

The Effect of Twist Angle

Twist Direction	Characteristics
(1) Straight blade (twist angle is 0°)	• Surface is generally poor except cast iron.
(2) Right twist blade	• Excellent machinability and easy to discharge chip • Applicable work piece range is wide. • Excellent for high hardness work piece • Pulling the chip to the groove
(3) Left twist blade	• Excellent surface roughness for work piece of aluminium alloys, copper, and copper alloys • It is good for machining soft materials • Pushing the chip in the processing direction.

Trouble Shooting of Reaming

Trouble	Plan	Measures
(1) Enlarged Hole	Increase burnishing effects	• Decrease chamfer angle • Increase margin width • Decrease back taper • Grind 2 stages chamfer • Check reamer diameter
	Suppress the occurrence of built-up-edge	• Increase margin width • Grind 2 stages chamfer • Change heat treatment conditions and microstructure of workpiece • Increase cutting oil supply • Increase cutting speed and reduce feed rate
	Reduce the unbalance of cutting force	• The cutting edge difference shall be less than 0.005mm • Increase cutting speed • Reduce the deviation of main axis and basic Diameter • Check wear conditions of bush and replace it • Change water soluble cutting oil to non-water soluble oil
(2) Shrinked Hole	Reduce finish effects	• Increase the clearance angle of cutting edge • Decrease margin width • Increase back taper • Increase cutting speed
(3) Poor roundness	Reduce Chattering	• Increase the strength of machine • Reduce the tolerance of bush • Change to left helix reamer • Increase margin width • Increase back taper • Decrease cutting speed • Increase feed rate
(4) Poor surface roughness	Increase burnishing	• Use left helix • Decrease chamfer angle • Grind with 2 stage chamfer
	Remove deposit	• Increase rake angle • Reduce feed rate • Increase cutting speed
	Remove chattering	• The cutting edge difference shall be less than 0.005mm • Increase cutting speed • Align main axis center and basic diameter center • Change water soluble cutting oil to non-water soluble oil
	Remove chip interference	• Change shape of flute type • Increase the depth of flute

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