



TIG

i-SMART

MODULAR TYPE END MILLS

Ultra-micro Grain Carbide Heads with
Carbide & Steel Holders

2 & 3 & 4 & 6 Flute

Y-Coated Square & Corner Radius &
Ball Type Modular Heads

X-Coated Chamfer Type Modular Head

NEW

PRODUCT FEATURES

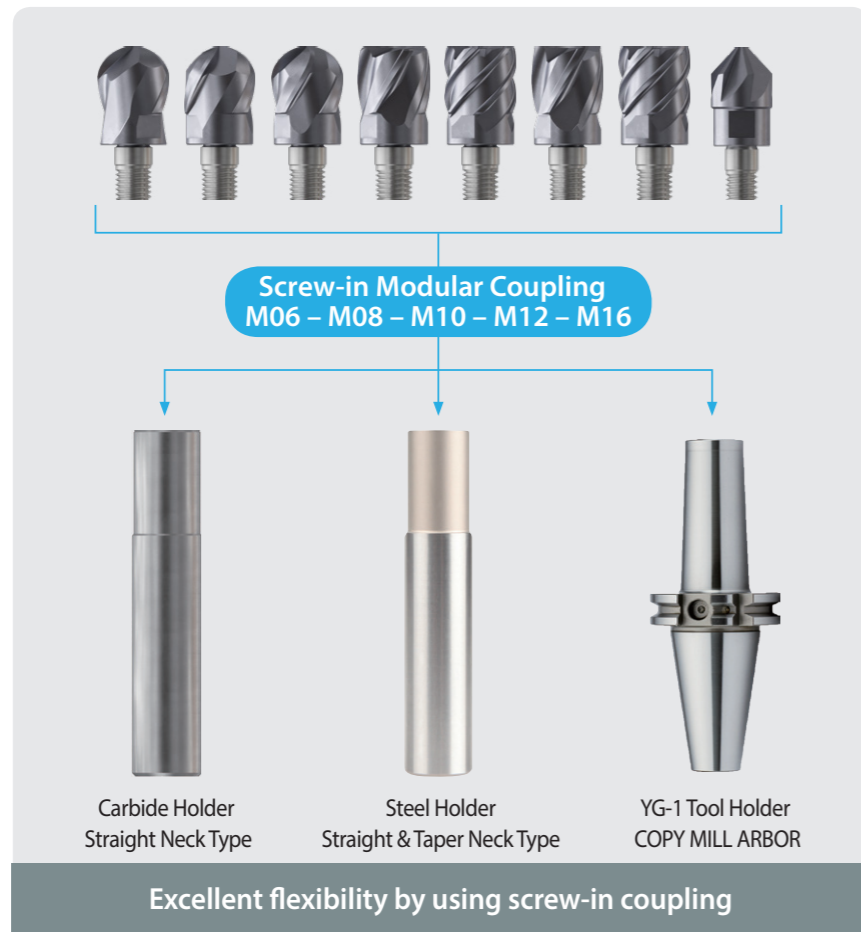
i-SMART Modular Type End mills



Modular type, Y-coated and X-coated replaceable carbide milling heads for machining steels and cast irons.

- Avoids expensive investments by using existing Copy Milling adaptor technology
- Proven performance transferred to cost effective modular system
- Optimal solution for large size or long reach Die&Mold applications

Eight different selections of modular heads fit into different holders.



GUIDE TO ICONS

CARBIDE The Tool is Made of Ultra-micro Grain Carbide

No. of Flutes: 2, 3, 4, 5, 6

Type of Coating: Y Coating, X Coating

Tolerance of Ball Radius: R ±0.01, R ±0.02

Tolerance of Corner Radius: R ±0.02, R ±0.015

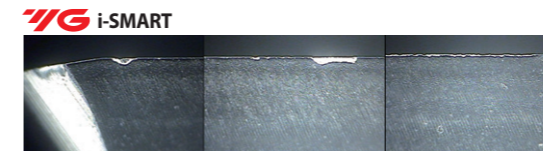
Helix Angle: 27°/30°, 30°, 30°, 45°

Cutting Conditions

CASE STUDY

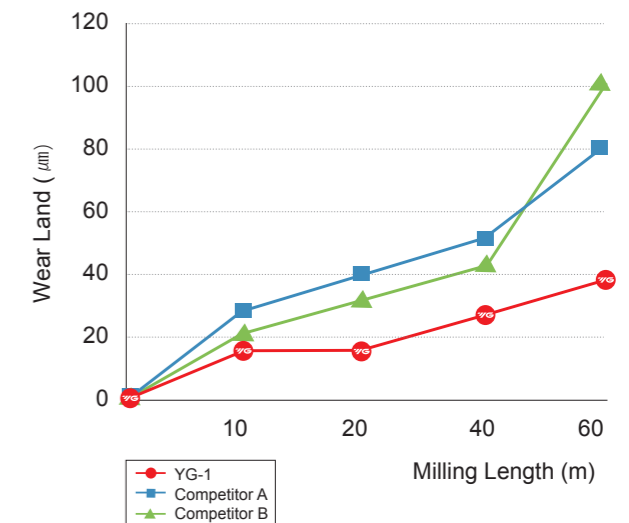
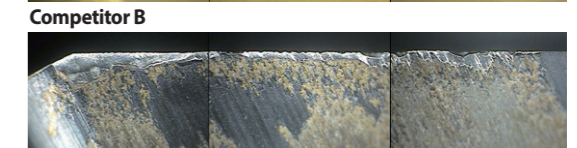
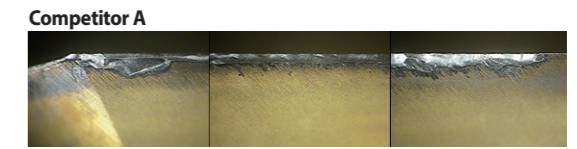
i-SMART Modular Type End mills

TEST 1 Total Milling Length : 60m

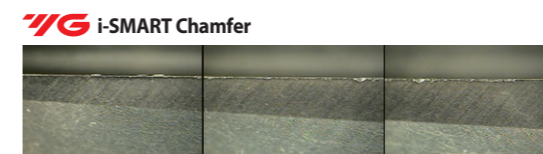


Cutting Condition (Down & Side Cutting)

Tool	4Flute Corner Radius
Size	Ø16 x R1.0
Work Material	- KP4M (HRC35) - AISI : P20+Ni - DIN : 1.2738 Improved
Vc (m/min.)	155.82
RPM (rev./min.)	3,100
Feed (mm/min.)	280
Feed per tooth (mm/tooth)	0.02
Milling Depth (mm)	Axial : 12 Radial : 0.8
Overhang (mm)	77
Coolant	Wet Cut
Machine	Machining Center

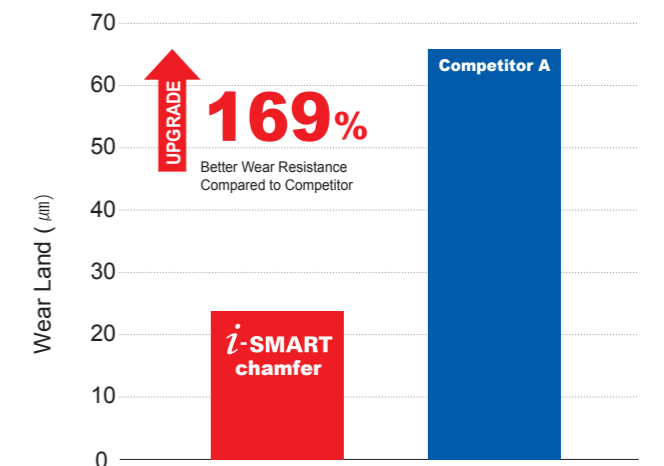


TEST 2 Total Milling Length : 74m



Cutting Condition (Chamfering)

Tool	i-SMART Chamfer	Competitor A
Milling Length (m)	74	
Size (OD, Point Angle)	Ø10.0, 90°	
Work Material	- DIN : X5CrNi18-9 - JIS : SUS304 - AISI : 304	
Vc (m/min)	60	
Feed (mm/min)	305	
Coolant	External Coolant Emulsion	
Milling Method	Chamfering	
Wear (µm)	24.664	66.33





ULTRA-MICRON GRAIN CARBIDE HEADS
FOR SCREW-IN TYPE CARBIDE AND STEEL HOLDER

SELECTION GUIDE

SERIES	XSEMD98	XSEME59	XSEME60	XSEME01
FLUTE	2	3	4	4
HELIX ANGLE	30°	30°	30°	27°/30° (MULTIPLE HELIX)
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	BALL NOSE	CORNER RADIUS
SIZE MIN	R5.0	R5.0	R5.0	D10.0
SIZE MAX	R16.0	R16.0	R16.0	D32.0
PAGE	6	7	8	9
	-	CENTER MATCH	CENTER MATCH	-
	Y-Coating	Y-Coating	Y-Coating	Y-Coating



Ultra-micron Grain Carbide Heads for Screw-In type Carbide and Steel Holder



Please visit globalyg1.com/mat for material search

Recommended cutting conditions : p. 18-24

◎ : Excellent ○ : Good



ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment	HB	HRc	XSEMD98	XSEME59	XSEME60	XSEME01
P	1	Non-alloy steel	About 0.15% C Annealed	125		○	○	○	○
	2		About 0.45% C Annealed	190	13	○	○	○	○
	3		About 0.45% C Quenched & tempered	250	25	○	○	○	◎
	4		About 0.75% C Annealed	270	28	◎	◎	◎	◎
	5	About 0.75% C Quenched & tempered	300	32	◎	◎	◎	◎	
	6	Low alloy steel	Annealed	180	10	○	○	○	○
	7		Quenched & tempered	275	29	◎	◎	◎	◎
	8		Quenched & tempered	300	32	◎	◎	◎	◎
	9		Quenched & tempered	350	38	◎	◎	◎	◎
	10	High alloyed steel, and tool steel	Annealed	200	15	○	○	○	○
	11.1		Quenched & Tempered	325	35	◎	◎	◎	◎
	11.2		Quenched & Tempered	409	44				
M	12	Stainless steel	Ferritic / Martensitic Annealed	200	15				
	13		Martensitic Quenched & Tempered	240	23				
	14.1		Austenitic	180	10				
	14.2		PH Stainless Steel	180	10				
K	15	Grey cast iron	Pearlitic / ferritic	180	10	○	○	○	○
	16		Pearlitic (Martensitic)	260	26	○	○	○	○
	17	Nodular cast iron	Ferritic	160	3	○	○	○	○
	18		Pearlitic	250	25	○	○	○	○
	19		Ferritic	130		○	○	○	○
20	Malleable cast iron	Pearlitic	230	21	○	○	○	○	
N	21	Aluminum-wrought alloy	Not Curable	60					
	22		Curable Hardened	100					
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable	75					
	24		≤ 12% Si, Curable Hardened	90					
	25		> 12% Si, Not Curable	130					
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%	110					
	27		CuZn, CuSnZn (Brass)	90					
	28		CuSn, lead-free copper and electrolytic copper	100					
	29.1		Duroplastic						
	29.2	Non Metallic Materials	GRAPHITE						
29.3	CFRP, GFRP								
30	Rubber, Wood, etc.								
S	31	Heat Resistant Super Alloys	Fe Based Annealed	200	15				
	32		Cured	280	30				
	33		Annealed	250	25				
	34		Ni or Co Based Cured	350	38				
	35	Cast	320	34					
	36	Titanium Alloys	Pure Titanium	400 Rm					
37	Alpha + Beta Alloys Hardened		1050 Rm						
H	38.1	Hardened steel	Hardened	421-469	45-49	○	○	○	○
	38.2		Hardened	481-560	50-55	○	○	○	○
	40	Chilled Cast Iron	Cast	400	42	◎	◎	◎	◎
	41	Hardened Cast Iron	Hardened	550	55	○	○	○	○

ULTRA-MICRON GRAIN CARBIDE HEADS
FOR SCREW-IN TYPE CARBIDE AND STEEL HOLDER



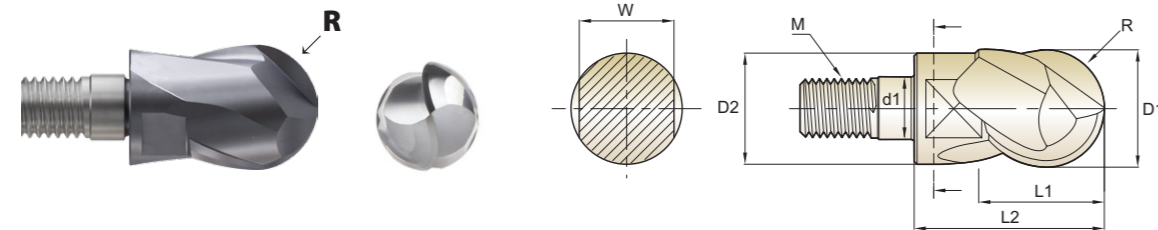
XSEME68	XSEME36	XSEME75	XCEMM	ZMC	ZMS	ZMT
6	4	6	Multi-Flute	-	-	-
45°	27°/30° (MULTIPLE HELIX)	45°	0° (Point Angle: 90° & 60°)	-	-	-
CORNER RADIUS	SQUARE	SQUARE	CHAMFER	-	-	-
D10.0	D10.0	D10.0	D10.0	-	-	-
D32.0	D32.0	D32.0	D16.0	-	-	-
11	12	13	14	15	16	17
-	-	-	-	STRAIGHT NECK TYPE	STRAIGHT NECK TYPE	TAPER NECK TYPE
Y-Coating	Y-Coating	Y-Coating	X-Coating	Carbide	Steel	Steel



ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment	HB	HRc	XSEME68	XSEME36	XSEME75	XCEMM
P	1	Non-alloy steel	About 0.15% C Annealed	125		○	○	○	◎
	2		About 0.45% C Annealed	190	13	○	○	○	◎
	3		About 0.45% C Quenched & tempered	250	25	○	◎	◎	◎
	4		About 0.75% C Annealed	270	28	◎	◎	◎	◎
	5	About 0.75% C Quenched & tempered	300	32	◎	◎	◎	◎	
	6	Low alloy steel	Annealed	180	10	○	○	○	◎
	7		Quenched & tempered	275	29	◎	◎	◎	◎
	8		Quenched & tempered	300	32	◎	◎	◎	◎
	9		Quenched & tempered	350	38	◎	◎	◎	○
	10	High alloyed steel, and tool steel	Annealed	200	15	○	○	○	◎
	11.1		Quenched & Tempered	325	35	◎	◎	◎	◎
	11.2		Quenched & Tempered	409	44				○
M	12	Stainless steel	Ferritic / Martensitic Annealed	200	15				◎
	13		Martensitic Quenched & Tempered	240	23				◎
	14.1		Austenitic	180	10		○		◎
	14.2		PH Stainless Steel	180	10				◎
K	15	Grey cast iron	Pearlitic / ferritic	180	10	○	○	○	○
	16		Pearlitic (Martensitic)	260	26	○	○	○	○
	17	Nodular cast iron	Ferritic	160	3	○	○	○	○
	18		Pearlitic	250	25	○	○	○	○
	19		Ferritic	130		○	○	○	○
20	Malleable cast iron	Pearlitic	230	21	○	○	○	○	
N	21	Aluminum-wrought alloy	Not Curable	60					
	22		Curable Hardened	100					
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable	75					
	24		≤ 12% Si, Curable Hardened	90					
	25		> 12% Si, Not Curable	130					
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%	110					
	27		CuZn, CuSnZn (Brass)	90					
	28		CuSn, lead-free copper and electrolytic copper	100					
	29.1		Duroplastic						
	29.2	Non Metallic Materials	GRAPHITE						
29.3	CFRP, GFRP								
30	Rubber, Wood, etc.								
S	31	Heat Resistant Super Alloys	Fe Based Annealed	200	15				○
	32		Cured	280	30				○
	33		Annealed	250	25				
	34		Ni or Co Based Cured	350	38				
	35	Cast	320	34					
	36	Titanium Alloys	Pure Titanium	400 Rm					
37	Alpha + Beta Alloys Hardened		1050 Rm						
H	38.1	Hardened steel	Hardened	421-469	45-49	○	○	○	○
	38.2		Hardened	481-560	50-55	○	○	○	○
	40	Chilled Cast Iron	Cast	400	42	◎	◎	◎	◎
	41	Hardened Cast Iron	Hardened	550	55	○	○	○	○

CARBIDE MODULAR HEAD
2 FLUTE BALL NOSE

XSEMD98 SERIES



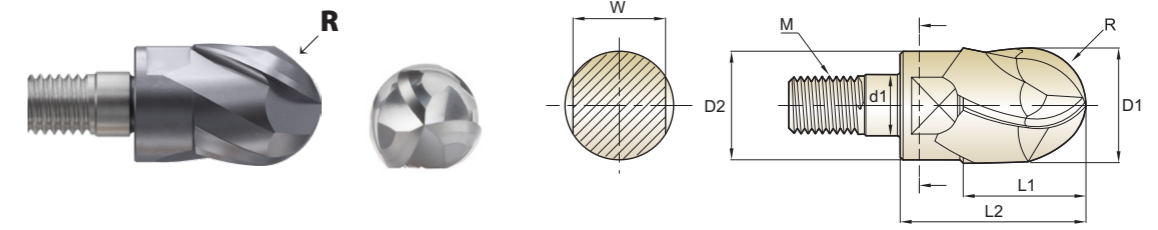
Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Neck Diameter	Length of Cut	Length Below Shank	Wrench Width	Coupling Diameter	Thread
	R	D1	D2	L1	L2	W	d1	M
XSEMD98100	R5.0	10.0	9.2	10	17.5	8	6.5	M6
XSEMD98120	R6.0	12.0	11.2	12	20.5	10	6.5	M6
XSEMD98160	R8.0	16.0	15	16	25.5	13	8.5	M8
XSEMD98200	R10.0	20.0	19	20	30	17	10.5	M10
XSEMD98250	R12.5	25.0	24	25	37	22	12.5	M12
XSEMD98300	R15.0	30.0	29	30	43	27	17.0	M16
XSEMD98320	R16.0	32.0	31	32	45	27	17.0	M16

Radius Tolerance (mm)	Mill Dia. Tolerance (mm)
±0.01	0 ~ -0.02

CARBIDE MODULAR HEAD
3 FLUTE BALL NOSE (Center Match)

XSEME59 SERIES



Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Neck Diameter	Length of Cut	Length Below Shank	Wrench Width	Coupling Diameter	Thread
	R	D1	D2	L1	L2	W	d1	M
XSEME59100	R5.0	10.0	9.2	10	17.5	8	6.5	M6
XSEME59120	R6.0	12.0	11.2	12	20.5	10	6.5	M6
XSEME59160	R8.0	16.0	15	16	25.5	13	8.5	M8
XSEME59200	R10.0	20.0	19	20	30	17	10.5	M10
XSEME59250	R12.5	25.0	24	25	37	22	12.5	M12
XSEME59300	R15.0	30.0	29	30	43	27	17.0	M16
XSEME59320	R16.0	32.0	31	32	45	27	17.0	M16

Radius Tolerance (mm)	Mill Dia. Tolerance (mm)
±0.01	0 ~ -0.02

◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel	Stainless steel			Grey cast iron	Nodular cast iron	Malleable cast iron			
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRC	13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO Material Description	N					S						H									
	Aluminum-wrought alloy	Aluminum-cast, alloyed	Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials	Heat Resistant Super Alloys	Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron											
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC											15	30	25	38	34	55	60	42	55		
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	◎	○

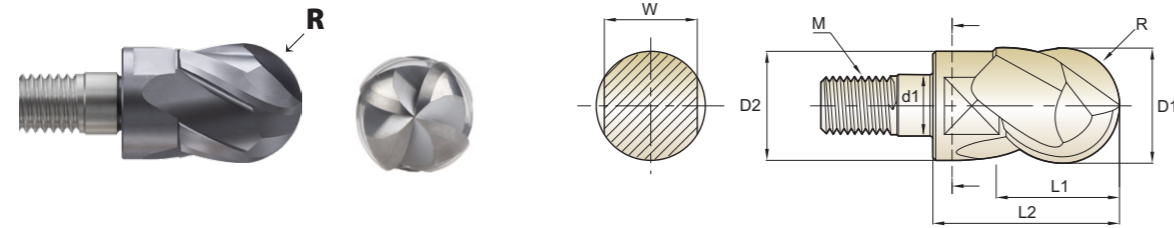
◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel	Stainless steel			Grey cast iron	Nodular cast iron	Malleable cast iron			
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRC	13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO Material Description	N					S						H									
	Aluminum-wrought alloy	Aluminum-cast, alloyed	Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials	Heat Resistant Super Alloys	Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron											
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC											15	30	25	38	34	55	60	42	55		
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	◎	○

CARBIDE MODULAR HEAD
4 FLUTE BALL NOSE (Center Match)

XSEME60 SERIES



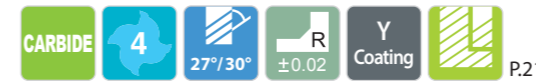
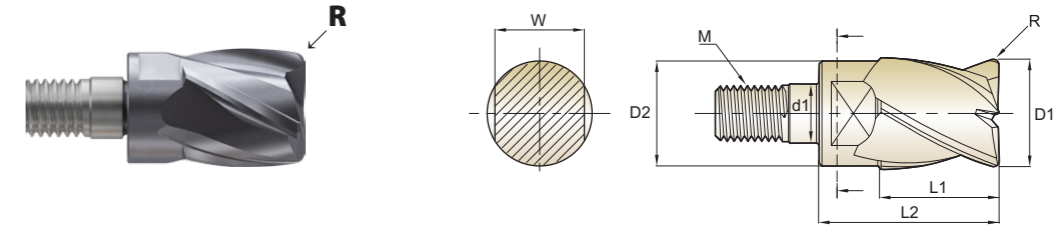
Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Neck Diameter	Length of Cut	Length Below Shank	Wrench Width	Coupling Diameter	Thread
	R	D1	D2	L1	L2	W	d1	M
XSEME60100	R5.0	10.0	9.2	10	17.5	8	6.5	M6
XSEME60120	R6.0	12.0	11.2	12	20.5	10	6.5	M6
XSEME60160	R8.0	16.0	15	16	25.5	13	8.5	M8
XSEME60200	R10.0	20.0	19	20	30	17	10.5	M10
XSEME60250	R12.5	25.0	24	25	37	22	12.5	M12
XSEME60300	R15.0	30.0	29	30	43	27	17.0	M16
XSEME60320	R16.0	32.0	31	32	45	27	17.0	M16

Radius Tolerance (mm)	Mill Dia. Tolerance (mm)
±0.01	0 ~ -0.02

CARBIDE MODULAR HEAD
4 FLUTE MULTIPLE HELIX CORNER RADIUS

XSEME01 SERIES



Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Neck Diameter	Length of Cut	Length Below Shank	Wrench Width	Coupling Diameter	Thread
	R	D1	D2	L1	L2	W	d1	M
XSEME01100 010	R0.1	10.0	9.2	10	17.5	8	6.5	M6
XSEME01100 020	R0.2	10.0	9.2	10	17.5	8	6.5	M6
XSEME01100 030	R0.3	10.0	9.2	10	17.5	8	6.5	M6
XSEME01100 050	R0.5	10.0	9.2	10	17.5	8	6.5	M6
XSEME01100 100	R1.0	10.0	9.2	10	17.5	8	6.5	M6
XSEME01100 150	R1.5	10.0	9.2	10	17.5	8	6.5	M6
XSEME01100 200	R2.0	10.0	9.2	10	17.5	8	6.5	M6
XSEME01100 250	R2.5	10.0	9.2	10	17.5	8	6.5	M6
XSEME01100 300	R3.0	10.0	9.2	10	17.5	8	6.5	M6
XSEME01100 400	R4.0	10.0	9.2	10	17.5	8	6.5	M6
XSEME01120 010	R0.1	12.0	11.2	12	20.5	10	6.5	M6
XSEME01120 020	R0.2	12.0	11.2	12	20.5	10	6.5	M6
XSEME01120 030	R0.3	12.0	11.2	12	20.5	10	6.5	M6
XSEME01120 050	R0.5	12.0	11.2	12	20.5	10	6.5	M6
XSEME01120 100	R1.0	12.0	11.2	12	20.5	10	6.5	M6
XSEME01120 150	R1.5	12.0	11.2	12	20.5	10	6.5	M6
XSEME01120 200	R2.0	12.0	11.2	12	20.5	10	6.5	M6
XSEME01120 250	R2.5	12.0	11.2	12	20.5	10	6.5	M6
XSEME01120 300	R3.0	12.0	11.2	12	20.5	10	6.5	M6
XSEME01120 400	R4.0	12.0	11.2	12	20.5	10	6.5	M6
XSEME01120 500	R5.0	12.0	11.2	12	20.5	10	6.5	M6

▶ NEXT PAGE

Radius Tolerance (mm)	Mill Dia. Tolerance (mm)
±0.02	0 ~ -0.03

◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel	Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron			
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRC	13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25			21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	◎	○	○	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO Material Description	N										S						H				
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys				Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC						15	30	25	38	34								55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	◎	○

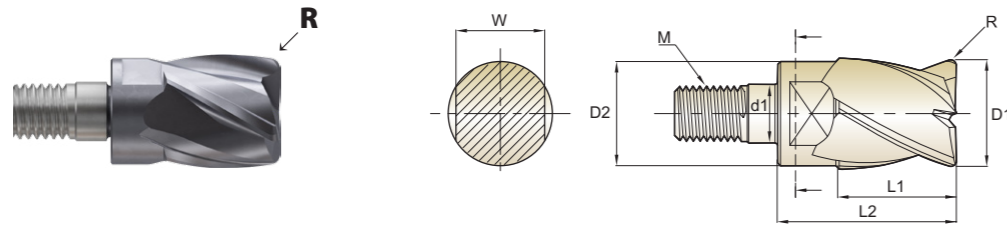
◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel	Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron				
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRC	13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25			21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended	○	○	○	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○	○

ISO Material Description	N										S						H				
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys				Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC						15	30	25	38	34								55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	◎	○

CARBIDE MODULAR HEAD
4 FLUTE MULTIPLE HELIX CORNER RADIUS

XSEME01 SERIES



Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Neck Diameter	Length of Cut	Length Below Shank	Wrench Width	Coupling Diameter	Thread
	R	D1	D2	L1	L2	W	d1	M
XSEME01160 050	R0.5	16.0	15	16	25.5	13	8.5	M8
XSEME01160 100	R1.0	16.0	15	16	25.5	13	8.5	M8
XSEME01160 150	R1.5	16.0	15	16	25.5	13	8.5	M8
XSEME01160 200	R2.0	16.0	15	16	25.5	13	8.5	M8
XSEME01200 050	R0.5	20.0	19	20	30	17	10.5	M10
XSEME01200 100	R1.0	20.0	19	20	30	17	10.5	M10
XSEME01200 150	R1.5	20.0	19	20	30	17	10.5	M10
XSEME01200 200	R2.0	20.0	19	20	30	17	10.5	M10
XSEME01250 050	R0.5	25.0	24	25	37	22	12.5	M12
XSEME01250 100	R1.0	25.0	24	25	37	22	12.5	M12
XSEME01250 150	R1.5	25.0	24	25	37	22	12.5	M12
XSEME01250 200	R2.0	25.0	24	25	37	22	12.5	M12
XSEME01300 050	R0.5	30.0	29	30	43	27	17.0	M16
XSEME01300 100	R1.0	30.0	29	30	43	27	17.0	M16
XSEME01300 150	R1.5	30.0	29	30	43	27	17.0	M16
XSEME01300 200	R2.0	30.0	29	30	43	27	17.0	M16
XSEME01320 050	R0.5	32.0	31	32	45	27	17.0	M16
XSEME01320 100	R1.0	32.0	31	32	45	27	17.0	M16
XSEME01320 150	R1.5	32.0	31	32	45	27	17.0	M16
XSEME01320 200	R2.0	32.0	31	32	45	27	17.0	M16

Radius Tolerance (mm)	Mill Dia. Tolerance (mm)
±0.02	0 ~ - 0.03

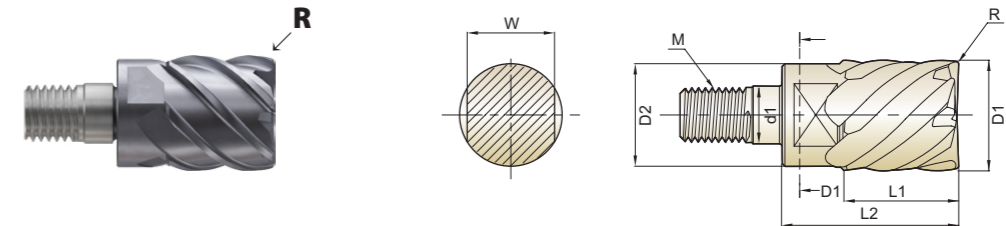
◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel	Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron					
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRC	13	25	28	32	32	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	260	160	250	130	230	230	
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○	○

ISO Material Description	N					S						H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys				Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HRC	15	30	25	38	34	15	30	25	38	34	15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55	
HB	60	100	75	90	130	110	90	100	200	280	250	350	320	400 Rm	1050 Rm	550	630	400	400	550	550	
Recommended	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	◎	○	○

CARBIDE MODULAR HEAD
6 FLUTE 45° HELIX CORNER RADIUS

XSEME68 SERIES



Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Neck Diameter	Length of Cut	Length Below Shank	Wrench Width	Coupling Diameter	Thread
	R	D1	D2	L1	L2	W	d1	M
XSEME68100 030	R0.3	10.0	9.2	10	17.5	8	6.5	M6
XSEME68100 050	R0.5	10.0	9.2	10	17.5	8	6.5	M6
XSEME68100 100	R1.0	10.0	9.2	10	17.5	8	6.5	M6
XSEME68120 030	R0.3	12.0	11.2	12	20.5	10	6.5	M6
XSEME68120 050	R0.5	12.0	11.2	12	20.5	10	6.5	M6
XSEME68120 100	R1.0	12.0	11.2	12	20.5	10	6.5	M6
XSEME68160 050	R0.5	16.0	15	16	25.5	13	8.5	M8
XSEME68160 100	R1.0	16.0	15	16	25.5	13	8.5	M8
XSEME68160 150	R1.5	16.0	15	16	25.5	13	8.5	M8
XSEME68160 200	R2.0	16.0	15	16	25.5	13	8.5	M8
XSEME68200 050	R0.5	20.0	19	20	30	17	10.5	M10
XSEME68200 100	R1.0	20.0	19	20	30	17	10.5	M10
XSEME68200 150	R1.5	20.0	19	20	30	17	10.5	M10
XSEME68200 200	R2.0	20.0	19	20	30	17	10.5	M10
XSEME68250 050	R0.5	25.0	24	25	37	22	12.5	M12
XSEME68250 100	R1.0	25.0	24	25	37	22	12.5	M12
XSEME68250 150	R1.5	25.0	24	25	37	22	12.5	M12
XSEME68250 200	R2.0	25.0	24	25	37	22	12.5	M12
XSEME68300 050	R0.5	30.0	29	30	43	27	17.0	M16
XSEME68300 100	R1.0	30.0	29	30	43	27	17.0	M16
XSEME68300 150	R1.5	30.0	29	30	43	27	17.0	M16
XSEME68300 200	R2.0	30.0	29	30	43	27	17.0	M16
XSEME68320 050	R0.5	32.0	31	32	45	27	17.0	M16
XSEME68320 100	R1.0	32.0	31	32	45	27	17.0	M16
XSEME68320 150	R1.5	32.0	31	32	45	27	17.0	M16
XSEME68320 200	R2.0	32.0	31	32	45	27	17.0	M16

Radius Tolerance (mm)	Mill Dia. Tolerance (mm)
±0.015	0 ~ - 0.03

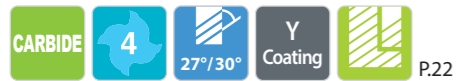
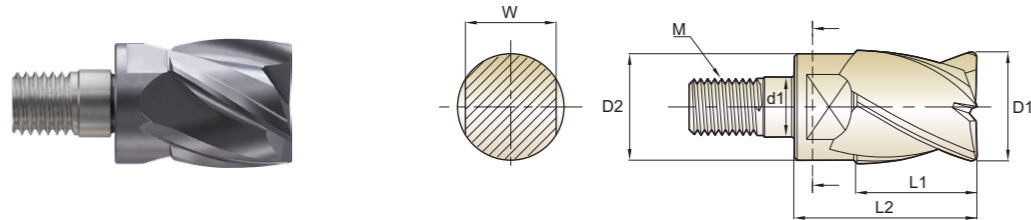
◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel	Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron					
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRC	13	25	28	32	32	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	260	160	250	130	230	230	
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○	○

ISO Material Description	N					S						H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys				Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HRC	15	30	25	38	34	15	30	25	38	34	15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55	
HB	60	100	75	90	130	110	90	100	200	280	250	350	320	400 Rm	1050 Rm	550	630	400	400	550	550	
Recommended	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	◎	○	○

CARBIDE MODULAR HEAD
4 FLUTE MULTIPLE HELIX

XSEME36 SERIES



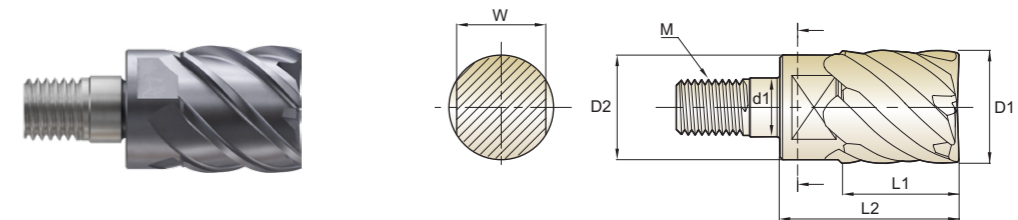
Unit : mm

EDP No.	Mill Diameter	Neck Diameter	Length of Cut	Length Below Shank	Wrench Width	Coupling Diameter	Thread
	D1	D2	L1	L2	W	d1	M
XSEME36100	10.0	9.2	10	17.5	8	6.5	M6
XSEME36120	12.0	11.2	12	20.5	10	6.5	M6
XSEME36160	16.0	15	16	25.5	13	8.5	M8
XSEME36200	20.0	19	20	30	17	10.5	M10
XSEME36250	25.0	24	25	37	22	12.5	M12
XSEME36300	30.0	29	30	43	27	17.0	M16
XSEME36320	32.0	31	32	45	27	17.0	M16

Mill Dia.
Tolerance (mm)
0 ~ - 0.03

CARBIDE MODULAR HEAD
6 FLUTE 45° HELIX

XSEME75 SERIES



Unit : mm

EDP No.	Mill Diameter	Neck Diameter	Length of Cut	Length Below Shank	Wrench Width	Coupling Diameter	Thread
	D1	D2	L1	L2	W	d1	M
XSEME75100	10.0	9.2	10	17.5	8	6.5	M6
XSEME75120	12.0	11.2	12	20.5	10	6.5	M6
XSEME75160	16.0	15	16	25.5	13	8.5	M8
XSEME75200	20.0	19	20	30	17	10.5	M10
XSEME75250	25.0	24	25	37	22	12.5	M12
XSEME75300	30.0	29	30	43	27	17.0	M16
XSEME75320	32.0	31	32	45	27	17.0	M16

Mill Dia.
Tolerance (mm)
0 ~ - 0.03

◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloy steel, and tool steel	Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRC	13	25	28	32	38	10	29	32	38	45	15	35	15	23	10	10	26	3	25	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○	○

ISO Material Description	N					S						H									
	Aluminum- wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Heat Resistant Super Alloys			Titanium Alloys			Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC	15	30	25	38	34	15	30	25	38	34	15	30	25	38	34	55	60	42	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○	◎	○

◎ : Excellent ○ : Good

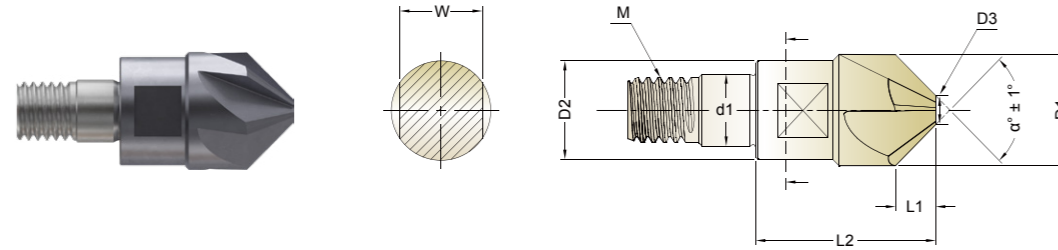
ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloy steel, and tool steel	Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRC	13	25	28	32	38	10	29	32	38	45	15	35	15	23	10	10	26	3	25	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○	○

ISO Material Description	N					S						H									
	Aluminum- wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)	Heat Resistant Super Alloys			Titanium Alloys			Hardened steel	Chilled Cast Iron	Hardened Cast Iron							
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC	15	30	25	38	34	15	30	25	38	34	15	30	25	38	34	55	60	42	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○	◎	○

CARBIDE CHAMFER TYPE MODULAR HEAD
4&5&6 FLUTE 90°&60° POINT ANGLE

NEW

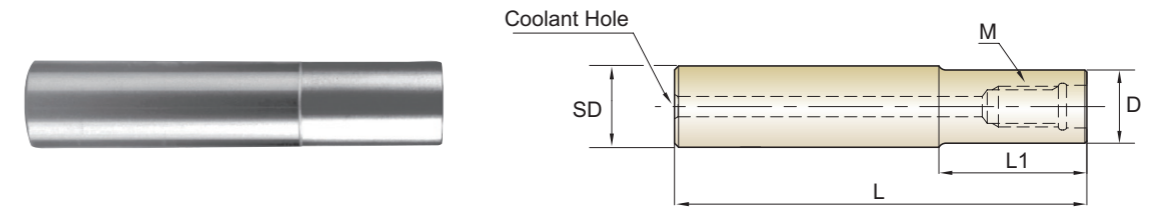
XCEMM SERIES



EDP No.	Mill Diameter	Neck Diameter	Length of Cut	Length Below Shank	Point Length	Wrench Width	Coupling Diameter	No. of Flute	Thread	Point Angle
	D1	D2	L1	L2	D3	W	d1		M	α°
XCEMM090100	10.0	9.2	4	16.5	1.95	8	6.5	4	M6	90°
XCEMM060100	10.0	9.2	7.6	16.5	1.3	8	6.5	4	M6	60°
XCEMM090120	12.0	11.2	5	19.5	1.95	10	6.5	5	M6	90°
XCEMM060120	12.0	11.2	9.3	19.5	1.3	10	6.5	5	M6	60°
XCEMM090160	16.0	15	6.5	24	3	13	8.5	6	M8	90°
XCEMM060160	16.0	15	12	24	2.1	13	8.5	6	M8	60°

CARBIDE HOLDER
STRAIGHT NECK TYPE

ZMC SERIES



EDP No.	Mill Diameter	Shank Diameter	Overall Length	Neck Length	Neck Diameter	Thread	Wrench No.	Coolant Hole
		SD	L	L1	D			
ZMC1001100	10.0	10.0	70	20	9.5	M6	SPIS0810	2
ZMC1002100	10.0	10.0	100	40	9.5	M6	SPIS0810	2
ZMC1003100	10.0	10.0	130	70	9.5	M6	SPIS0810	2
ZMC1201120	12.0	12.0	80	20	11.5	M6	SPIS0810	2
ZMC1202120	12.0	12.0	100	40	11.5	M6	SPIS0810	2
ZMC1203120	12.0	12.0	130	70	11.5	M6	SPIS0810	2
ZMC1601160	16.0	16.0	100	40	15.5	M8	SPIS1300	3
ZMC1602160	16.0	16.0	150	80	15.5	M8	SPIS1300	3
ZMC1603160	16.0	16.0	200	120	15.5	M8	SPIS1300	3
ZMC2001200	20.0	20.0	100	40	19.5	M10	SPIS1700	4
ZMC2002200	20.0	20.0	150	80	19.5	M10	SPIS1700	4
ZMC2003200	20.0	20.0	200	120	19.5	M10	SPIS1700	4
ZMC2004200	20.0	20.0	250	160	19.5	M10	SPIS1700	4
ZMC2501250	25.0	25.0	150	70	24.3	M12	SPIS2200	5
ZMC2502250	25.0	25.0	200	100	24.3	M12	SPIS2200	5
ZMC2503250	25.0	25.0	250	150	24.3	M12	SPIS2200	5
ZMC2504250	25.0	25.0	300	200	24.3	M12	SPIS2200	5
ZMC3001320	30.0/32.0	32.0	150	70	29.0	M16	SPIS2700	6
ZMC3002320	30.0/32.0	32.0	200	120	29.0	M16	SPIS2700	6
ZMC3003320	30.0/32.0	32.0	250	150	29.0	M16	SPIS2700	6
ZMC3004320	30.0/32.0	32.0	300	200	29.0	M16	SPIS2700	6
ZMC3005320	30.0/32.0	32.0	350	250	29.0	M16	SPIS2700	6

► The wrench (1pc) for the relevant item is included. More items are available for sale upon request.
► Please refer to the wrench table on the next page.

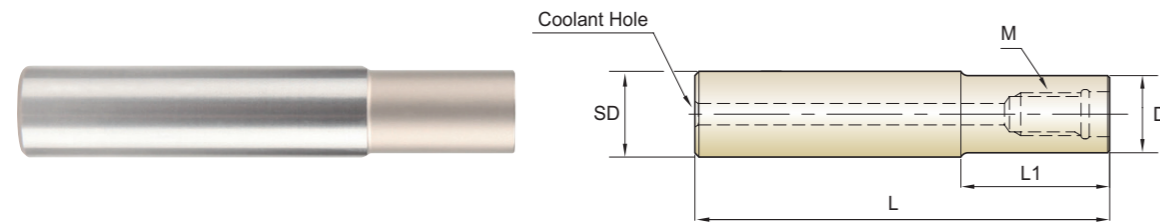
◎ : Excellent ○ : Good

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14	15	16	17	18	19	20
HRC	13	25	28	32	38	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H			
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys				Titanium Alloys			Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

STEEL HOLDER
STRAIGHT NECK TYPE

ZMS SERIES



Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Overall Length	Neck Length	Neck Diameter	Thread	Wrench No.	Coolant Hole
		SD	L	L1	D	M		
ZMS1001100	10.0	10.0	70.0	20.0	9.0	M6	SPIS0810	3
ZMS1201120	12.0	12.0	90.0	30.0	11.0	M6	SPIS0810	3
ZMS1601160	16.0	16.0	100.0	30.0	15.0	M8	SPIS1300	4
ZMS2001200	20.0	20.0	100.0	30.0	19.0	M10	SPIS1700	5
ZMS2501250	25.0	25.0	115.0	40.0	24.0	M12	SPIS2200	5
ZMS3001320	30.0/32.0	32.0	125.0	40.0	29.0	M16	SPIS2700	6

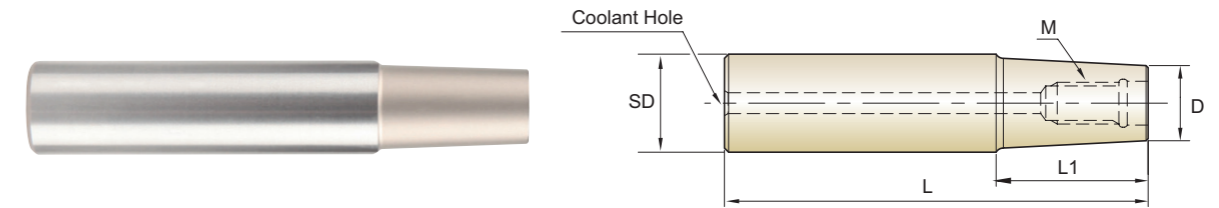
► The wrench (1pc) for the relevant item is included. More items are available for sale upon request.

WRENCH

Model	Wrench No.	Wrench Width	Mill Diameter	Clamping Torque [N·m]
	SPIS0810	8	10.0	6.5
		10	12.0	6.5
	SPIS1300	13	16.0	10
	SPIS1700	17	20.0	12
	SPIS2200	22	25.0	15
	SPIS2700	27	30.0 32.0	20

STEEL HOLDER
TAPER NECK TYPE

ZMT SERIES



Unit : mm

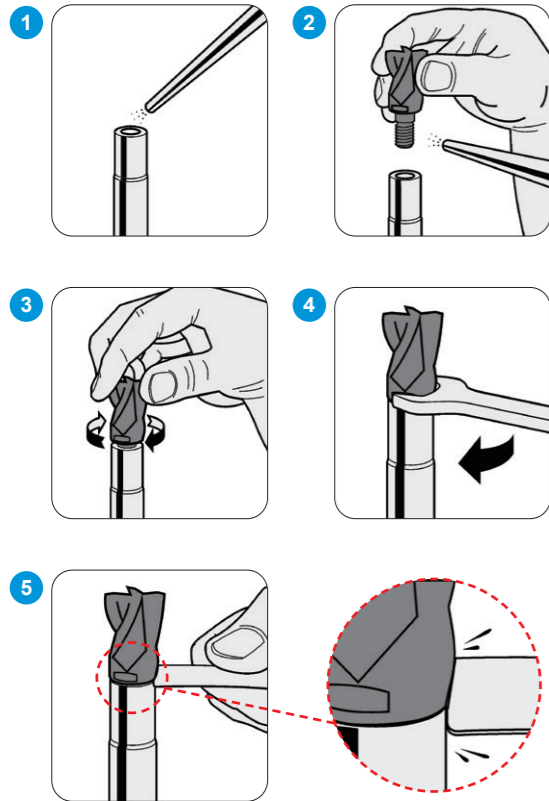
EDP No.	Mill Diameter	Shank Diameter	Overall Length	Neck Length	Neck Diameter	Thread	Wrench No.	Coolant Hole
		SD	L	L1	D	M		
ZMT1001120	10.0	12.0	100.0	50.0	9.0	M6	SPIS0810	3
ZMT1201160	12.0	16.0	130.0	70.0	11.0	M6	SPIS0810	3
ZMT1601200	16.0	20.0	150.0	90.0	15.0	M8	SPIS1300	4
ZMT2001250	20.0	25.0	170.0	100.0	19.0	M10	SPIS1700	5
ZMT2501320	25.0	32.0	200.0	110.0	24.0	M12	SPIS2200	5
ZMT3001320	30.0/32.0	32.0	200.0	110.0	29.0	M16	SPIS2700	6

► The wrench (1pc) for the relevant item is included. More items are available for sale upon request.

WRENCH

Model	Wrench No.	Wrench Width	Mill Diameter	Clamping Torque [N·m]
	SPIS0810	8	10.0	6.5
		10	12.0	6.5
	SPIS1300	13	16.0	10
	SPIS1700	17	20.0	12
	SPIS2200	22	25.0	15
	SPIS2700	27	30.0 32.0	20

INSTRUCTION MANUAL



Step 1, 2 : Clean

Please be sure to remove dirt and debris on all adjoining surfaces before assembling. (air preferred)

Step 3, 4 : Assembly

Mount the modular head onto the shank by hand until it fits then use the supplied wrench to tighten.

Step 5, 6 : Final Check

Re-check and make sure there is no gap.

Notice

Please tighten the screw with designated torque, too much torque will damage the screw.

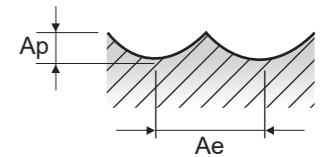
Mill Diameter	Clamping Torque
D	[N·m]
10	6.5
12	6.5
16	10.0
20	12.0
25	15.0
30	20.0
32	20.0

XSEMD98 SERIES

2 FLUTE BALL NOSE

Vc = m/min. fz = mm/tooth
RPM = rev./min. FEED = mm/min.

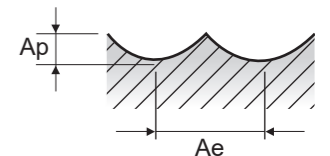
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)							
						10	12	16	20	25	30	32	
P	1-8	Non-alloy steel Low alloy steel	0.08D	0.03D	Vc	175	170	168	168	167	167	167	
					fz	0.199	0.212	0.238	0.264	0.270	0.299	0.300	
					RPM	5580	4510	3340	2670	2130	1770	1660	
	FEED		2220	1910	1590	1410	1150	1060	995				
	9		High alloyed steel, and tool steel	0.08D	0.03D	Vc	168	165	162	162	162	162	162
						fz	0.174	0.188	0.206	0.227	0.231	0.250	0.250
		RPM				5340	4380	3220	2580	2060	1720	1610	
	FEED	1860		1645	1320	1170	950	860	805				
	10-11.1	High alloyed steel, and tool steel		0.08D	0.03D	Vc	175	170	168	168	167	167	167
						fz	0.199	0.212	0.238	0.264	0.270	0.299	0.300
			RPM			5580	4510	3340	2670	2130	1770	1660	
	FEED		2220	1910	1590	1410	1150	1060	995				
11.2	High alloyed steel, and tool steel		0.08D	0.03D	Vc	168	165	162	162	162	162	162	
					fz	0.174	0.188	0.206	0.227	0.231	0.250	0.250	
		RPM			5340	4380	3220	2580	2060	1720	1610		
FEED		1860	1645	1320	1170	950	860	805					
K		15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.08D	0.03D	Vc	175	170	168	168	167	167	167
						fz	0.199	0.212	0.238	0.264	0.270	0.299	0.300
	RPM					5580	4510	3340	2670	2130	1770	1660	
	FEED	2220		1910	1590	1410	1150	1060	995				
	38	Hardened steel		0.08D	0.03D	Vc	141	138	136	136	136	136	136
						fz	0.160	0.170	0.189	0.208	0.211	0.229	0.230
			RPM			4500	3660	2700	2160	1730	1440	1350	
	FEED		1440	1245	1020	900	730	660	620				
	40		Chilled Cast Iron	0.08D	0.03D	Vc	168	165	162	162	162	162	162
						fz	0.174	0.188	0.206	0.227	0.231	0.250	0.250
		RPM				5340	4380	3220	2580	2060	1720	1610	
	FEED	1860		1645	1320	1170	950	860	805				
41	Hardened Cast Iron	0.08D		0.03D	Vc	141	138	136	136	136	136	136	
					fz	0.160	0.170	0.189	0.208	0.211	0.229	0.230	
			RPM		4500	3660	2700	2160	1730	1440	1350		
FEED		1440	1245	1020	900	730	660	620					



XSEME59 SERIES

3 FLUTE BALL NOSE

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)							
						10	12	16	20	25	30	32	
P	1-8	Non-alloy steel Low alloy steel	0.05D	0.02D	Vc	307	307	307	307	307	307	307	
					fz	0.201	0.225	0.234	0.238	0.248	0.259	0.268	
					RPM	9770	8150	6100	4880	3910	3260	3050	
	FEED		5890	5490	4280	3490	2910	2530	2450				
	9		High alloyed steel, and tool steel	0.05D	0.02D	Vc	257	257	257	257	257	257	257
						fz	0.168	0.187	0.199	0.209	0.219	0.230	0.234
		RPM				8190	6830	5110	4090	3270	2730	2560	
	FEED	4130		3830	3050	2560	2150	1880	1800				
	10-11.1	High alloyed steel, and tool steel		0.05D	0.02D	Vc	307	307	307	307	307	307	307
						fz	0.201	0.225	0.234	0.238	0.248	0.259	0.268
			RPM			9770	8150	6100	4880	3910	3260	3050	
	FEED		5890	5490	4280	3490	2910	2530	2450				
11.2	High alloyed steel, and tool steel		0.05D	0.02D	Vc	257	257	257	257	257	257	257	
					fz	0.168	0.187	0.199	0.209	0.219	0.230	0.234	
		RPM			8190	6830	5110	4090	3270	2730	2560		
FEED		4130	3830	3050	2560	2150	1880	1800					
K		15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	0.02D	Vc	307	307	307	307	307	307	307
						fz	0.201	0.225	0.234	0.238	0.248	0.259	0.268
	RPM					9770	8150	6100	4880	3910	3260	3050	
	FEED	5890		5490	4280	3490	2910	2530	2450				
	38	Hardened steel		0.05D	0.02D	Vc	208	208	208	208	208	208	208
						fz	0.156	0.173	0.180	0.190	0.200	0.210	0.221
			RPM			6620	5520	4140	3310	2650	2210	2070	
	FEED		3100	2870	2240	1890	1590	1390	1370				
	40		Chilled Cast Iron	0.05D	0.02D	Vc	257	257	257	257	257	257	257
						fz	0.168	0.187	0.199	0.209	0.219	0.230	0.234
		RPM				8190	6830	5110	4090	3270	2730	2560	
	FEED	4130		3830	3050	2560	2150	1880	1800				
41	Hardened Cast Iron	0.05D		0.02D	Vc	208	208	208	208	208	208	208	
					fz	0.156	0.173	0.180	0.190	0.200	0.210	0.221	
			RPM		6620	5520	4140	3310	2650	2210	2070		
FEED		3100	2870	2240	1890	1590	1390	1370					

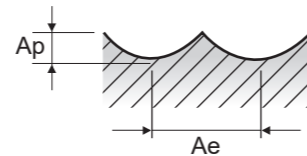


XSEME60 SERIES

4 FLUTE BALL NOSE

Vc = m/min. fz = mm/tooth
RPM = rev./min. FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)								
						10	12	16	20	25	30	32		
P	1-8	Non-alloy steel	0.05D	0.02D	Vc	341	341	341	341	341	341	341		
					fz	0.148	0.165	0.175	0.179	0.186	0.194	0.201		
					RPM	10850	9050	6780	5430	4340	3620	3390		
		Low alloy steel			FEED	6430	5960	4750	3880	3230	2810	2720		
					Vc	286	286	286	286	286	286	286		
					fz	0.126	0.140	0.149	0.156	0.164	0.172	0.176		
	9	High alloyed steel, and tool steel	0.05D	0.02D	RPM	9100	7500	5680	4550	3640	3030	2840		
					FEED	4590	4260	3390	2840	2390	2090	2000		
					Vc	341	341	341	341	341	341	341		
		High alloyed steel, and tool steel			0.05D	0.02D	fz	0.148	0.165	0.175	0.179	0.186	0.194	0.201
							RPM	10850	9050	6780	5430	4340	3620	3390
							FEED	6430	5960	4750	3880	3230	2810	2720
10-11.1	High alloyed steel, and tool steel	0.05D	0.02D	Vc			286	286	286	286	286	286	286	
				fz			0.126	0.140	0.149	0.156	0.164	0.172	0.176	
				RPM			9100	7500	5680	4550	3640	3030	2840	
	112			High alloyed steel, and tool steel	0.05D	0.02D	FEED	4590	4260	3390	2840	2390	2090	2000
							Vc	341	341	341	341	341	341	341
							fz	0.148	0.165	0.175	0.179	0.186	0.194	0.201
15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	0.02D	RPM			10850	9050	6780	5430	4340	3620	3390	
				FEED			6430	5960	4750	3880	3230	2810	2720	
				Vc			231	231	231	231	231	231	231	
	Hardened steel			0.05D	0.02D	fz	0.117	0.130	0.135	0.143	0.150	0.157	0.165	
						RPM	7350	6130	4600	3680	2940	2450	2300	
						FEED	3450	3190	2490	2100	1760	1540	1520	
38.1 - 38.2	Hardened steel	0.05D	0.02D			Vc	286	286	286	286	286	286	286	
						fz	0.126	0.140	0.149	0.156	0.164	0.172	0.176	
						RPM	9100	7500	5680	4550	3640	3030	2840	
	Chilled Cast Iron			0.05D	0.02D	FEED	4590	4260	3390	2840	2390	2090	2000	
						Vc	231	231	231	231	231	231	231	
						fz	0.117	0.130	0.135	0.143	0.150	0.157	0.165	
Hardened Cast Iron	0.05D	0.02D	RPM			7350	6130	4600	3680	2940	2450	2300		
			FEED			3450	3190	2490	2100	1760	1540	1520		
			Vc			231	231	231	231	231	231	231		
Hardened Cast Iron			0.05D	0.02D	fz	0.117	0.130	0.135	0.143	0.150	0.157	0.165		
					RPM	7350	6130	4600	3680	2940	2450	2300		
					FEED	3450	3190	2490	2100	1760	1540	1520		

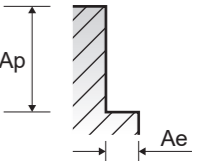


XSEME01 SERIES

4 FLUTE CORNER RADIUS - SIDE CUTTING

Vc = m/min. fz = mm/tooth
RPM = rev./min. FEED = mm/min.

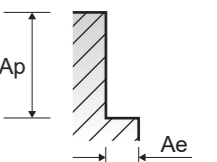
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)								
						10	12	16	20	25	30	32		
P	1-8	Non-alloy steel	0.05D	0.8D	Vc	156	156	156	156	156	156	156		
					fz	0.023	0.023	0.023	0.023	0.023	0.023	0.023		
					RPM	4970	4140	3100	2480	1990	1650	1550		
		Low alloy steel			FEED	455	380	280	230	180	150	140		
					Vc	105	105	105	105	105	105	105		
					fz	0.027	0.027	0.027	0.027	0.027	0.027	0.026		
	9	High alloyed steel, and tool steel	0.05D	0.8D	RPM	3340	2780	2090	1670	1340	1110	1040		
					FEED	360	300	225	180	145	120	110		
					Vc	156	156	156	156	156	156	156		
		High alloyed steel, and tool steel			0.05D	0.8D	fz	0.023	0.023	0.023	0.023	0.023	0.023	0.023
							RPM	4970	4140	3100	2480	1990	1650	1550
							FEED	455	380	280	230	180	150	140
10-11.1	High alloyed steel, and tool steel	0.05D	0.8D	Vc			105	105	105	105	105	105	105	
				fz			0.027	0.027	0.027	0.027	0.027	0.027	0.026	
				RPM			3340	2780	2090	1670	1340	1110	1040	
	112			High alloyed steel, and tool steel	0.05D	0.8D	FEED	360	300	225	180	145	120	110
							Vc	156	156	156	156	156	156	156
							fz	0.023	0.023	0.023	0.023	0.023	0.023	0.023
15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.02D	0.8D	RPM			4960	4140	3100	2480	1990	1650	1550	
				FEED			460	380	280	230	180	150	140	
				Vc			63	63	63	63	63	63	63	
	Hardened steel			0.02D	0.8D	fz	0.021	0.021	0.022	0.023	0.023	0.024	0.024	
						RPM	2020	1680	1250	1000	800	670	630	
						FEED	170	140	110	90	75	65	60	
38.1 - 38.2	Hardened steel	0.02D	0.8D			Vc	105	105	105	105	105	105	105	
						fz	0.027	0.027	0.027	0.027	0.027	0.027	0.026	
						RPM	3340	2780	2090	1670	1340	1110	1040	
	Chilled Cast Iron			0.05D	0.8D	FEED	360	300	225	180	145	120	110	
						Vc	63	63	63	63	63	63	63	
						fz	0.021	0.021	0.022	0.023	0.023	0.024	0.024	
Hardened Cast Iron	0.02D	0.8D	RPM			2020	1680	1250	1000	800	670	630		
			FEED			170	140	110	90	75	65	60		
			Vc			170	140	110	90	75	65	60		



XSEME68 SERIES

6 FLUTE CORNER RADIUS - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)								
						10	12	16	20	25	30	32		
P	1-8	Non-alloy steel	0.05D	1.0D	Vc	302	302	302	302	302	302	302		
					fz	0.051	0.058	0.067	0.070	0.070	0.075	0.075		
					RPM	9600	8010	6000	4800	3850	3200	3000		
		Low alloy steel			FEED	2940	2790	2400	2010	1615	1440	1350		
					Vc	294	294	294	294	294	294	294		
					fz	0.025	0.025	0.025	0.025	0.027	0.029	0.030		
	9	High alloyed steel, and tool steel	0.05D	1.0D	RPM	9360	7800	5850	4680	3740	3120	2920		
					FEED	1400	1170	880	690	600	540	525		
					Vc	302	302	302	302	302	302	302		
		High alloyed steel, and tool steel			0.05D	1.0D	fz	0.051	0.058	0.067	0.070	0.070	0.075	0.075
							RPM	9600	8010	6000	4800	3850	3200	3000
							FEED	2940	2700	2400	2010	1615	1440	1350
10-11.1	High alloyed steel, and tool steel	0.05D	1.0D	Vc			294	294	294	294	294	294	294	
				fz			0.025	0.025	0.025	0.025	0.027	0.029	0.030	
				RPM			9360	7800	5850	4680	3740	3120	2920	
	112			High alloyed steel, and tool steel	0.05D	1.0D	FEED	1400	1170	880	690	600	540	525
							Vc	302	302	302	302	302	302	302
							fz	0.051	0.058	0.067	0.070	0.070	0.075	0.075
15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	1.0D	RPM			9600	8010	6000	4800	3850	3200	3000	
				FEED			2940	2790	2400	2010	1615	1440	1350	
				Vc			181	181	181	181	181	181	181	
	Hardened steel			0.02D	1.0D	fz	0.006	0.006	0.006	0.006	0.007	0.007	0.007	
						RPM	5760	4800	3600	2880	2305	1920	1800	
						FEED	210	180	130	110	90	85	80	
38.1 - 38.2	Hardened steel	0.02D	1.0D			Vc	294	294	294	294	294	294	294	
						fz	0.025	0.025	0.025	0.025	0.027	0.029	0.030	
						RPM	9360	7800	5850	4680	3740	3120	2920	
	Chilled Cast Iron			0.05D	1.0D	FEED	1400	1170	880	690	600	540	525	
						Vc	181	181	181	181	181	181	181	
						fz	0.006	0.006	0.006	0.006	0.007	0.007	0.007	
Hardened Cast Iron	0.02D	1.0D	RPM			5760	4800	3600	2880	2305	1920	1800		
			FEED			210	180	130	110	90	85	80		
			Vc			210	180	130	110	90	85	80		

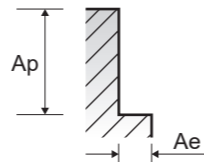


XSEME36 SERIES

4 FLUTE - SIDE CUTTING

Vc = m/min. fz = mm/tooth
RPM = rev./min. FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)						
						10	12	16	20	25	30	32
P	1-8	Non-alloy steel	0.05D	0.6D	Vc	128	129	130	132	134	134	134
					fz	0.040	0.040	0.040	0.040	0.040	0.040	0.040
		RPM			4080	3430	2590	2100	1700	1420	1330	
		FEED			650	545	415	335	270	230	215	
	9	Low alloy steel	0.05D	0.6D	Vc	79	79	80	82	82	82	82
					fz	0.030	0.030	0.030	0.030	0.031	0.032	0.032
		RPM			2500	2100	1590	1300	1050	870	820	
		FEED			300	250	190	155	130	110	105	
	10-11.1	High alloyed steel, and tool steel	0.05D	0.6D	Vc	128	129	130	132	134	134	134
					fz	0.040	0.040	0.040	0.040	0.040	0.040	0.040
		RPM			4080	3430	2590	2100	1700	1420	1330	
		FEED			650	545	415	335	270	230	215	
112		0.05D	0.6D	Vc	79	79	80	82	82	82	82	
				fz	0.030	0.030	0.030	0.030	0.031	0.032	0.032	
	RPM			2500	2100	1590	1300	1050	870	820		
	FEED			300	250	190	155	130	110	105		
M	12-13	Stainless steel	0.05D	0.6D	Vc	66	66	66	66	67	67	67
					fz	0.035	0.035	0.035	0.035	0.035	0.035	0.035
					RPM	2100	1750	1310	1050	850	710	670
					FEED	300	245	180	150	120	100	95
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	0.6D	Vc	128	129	130	132	134	134	134
					fz	0.039	0.040	0.040	0.040	0.040	0.040	0.040
					RPM	4080	3430	2590	2100	1700	1420	1330
					FEED	640	545	415	335	270	230	215
H	38.1 - 38.2	Hardened steel	0.05D	0.6D	Vc	53	53	53	53	53	53	53
					fz	0.013	0.013	0.013	0.012	0.011	0.011	0.011
					RPM	1700	1400	1050	850	680	560	530
					FEED	90	70	55	40	30	25	25
	40	Chilled Cast Iron	0.05D	0.6D	Vc	79	79	80	82	82	82	82
					fz	0.030	0.030	0.030	0.030	0.031	0.032	0.032
					RPM	2500	2100	1590	1300	1050	870	820
					FEED	300	250	190	155	130	110	105
	41	Hardened Cast Iron	0.05D	0.6D	Vc	53	53	53	53	53	53	53
					fz	0.013	0.013	0.013	0.012	0.011	0.011	0.011
					RPM	1700	1400	1050	850	680	560	530
					FEED	90	70	55	40	30	25	25



XSEME75 SERIES

6 FLUTE - SIDE CUTTING

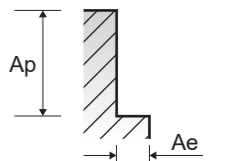
Vc = m/min. fz = mm/tooth
RPM = rev./min. FEED = mm/min.

NORMAL SPEED

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)						
						10	12	16	20	25	30	32
P	1-8	Non-alloy steel	0.1D	0.8D	Vc	111	111	111	111	111	111	111
					fz	0.099	0.099	0.100	0.100	0.100	0.100	0.100
		RPM			3530	2945	2205	1765	1410	1180	1100	
		FEED			2100	1750	1325	1060	845	710	660	
	9	Low alloy steel	0.05D	0.8D	Vc	77	77	77	77	77	77	77
					fz	0.094	0.094	0.094	0.094	0.094	0.094	0.094
		RPM			2450	2040	1530	1220	980	815	765	
		FEED			1380	1150	860	690	555	460	430	
	10-11.1	High alloyed steel, and tool steel	0.1D	0.8D	Vc	111	111	111	111	111	111	111
					fz	0.099	0.099	0.100	0.100	0.100	0.100	0.100
		RPM			3530	2945	2205	1765	1410	1180	1100	
		FEED			2100	1750	1325	1060	845	710	660	
11.2		0.05D	0.8D	Vc	77	77	77	77	77	77	77	
				fz	0.094	0.094	0.094	0.094	0.094	0.094	0.094	
	RPM			2450	2040	1530	1220	980	815	765		
	FEED			1380	1150	860	690	555	460	430		
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.1D	0.8D	Vc	111	111	111	111	111	111	111
					fz	0.099	0.099	0.100	0.100	0.100	0.100	0.100
					RPM	3530	2940	2205	1765	1410	1180	1100
					FEED	2100	1765	1325	1060	845	710	660
H	38.1 - 38.2	Hardened steel	0.05D	0.6D	Vc	33	33	33	33	33	33	33
					fz	0.033	0.034	0.034	0.035	0.035	0.036	0.036
					RPM	1050	880	655	525	420	350	330
					FEED	210	180	130	110	85	75	70
	40	Chilled Cast Iron	0.05D	0.8D	Vc	77	77	77	77	77	77	77
					fz	0.094	0.094	0.094	0.094	0.094	0.094	0.094
					RPM	2450	2040	1530	1220	980	815	765
					FEED	1380	1150	860	690	555	460	430
	41	Hardened Cast Iron	0.05D	0.6D	Vc	33	33	33	33	33	33	33
					fz	0.033	0.034	0.034	0.035	0.035	0.036	0.036
					RPM	1050	880	655	525	420	350	330
					FEED	210	180	130	110	85	75	70

HIGH SPEED

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)						
						10	12	16	20	25	30	32
P	11.2	High alloyed steel, and tool steel	0.05D	0.6D	Vc	332	332	332	332	332	332	332
					fz	0.095	0.095	0.095	0.095	0.095	0.095	0.095
					RPM	10570	8810	6600	5290	4230	3520	3300
					FEED	6020	5020	3765	3050	2400	2000	1890
H	38.1 - 38.2	Hardened steel	0.05D	0.4D	Vc	166	166	166	166	166	166	166
					fz	0.096	0.095	0.095	0.095	0.095	0.095	0.095
					RPM	5290	4410	3300	2645	2114	1761	1651
					FEED	3050	2520	1880	1470	1200	1000	940
	40	Chilled Cast Iron	0.05D	0.6D	Vc	332	332	332	332	332	332	332
					fz	0.095	0.095	0.095	0.095	0.095	0.095	0.095
					RPM	10570	8810	6600	5290	4230	3520	3300
					FEED	6020	5020	3765	3050	2400	2000	1890
	41	Hardened Cast Iron	0.05D	0.4D	Vc	166	166	166	166	166	166	166
					fz	0.096	0.095	0.095	0.095	0.095	0.095	0.095
					RPM	5290	4410	3300	2645	2114	1761	1651
					FEED	3050	2520	1880	1470	1200	1000	940



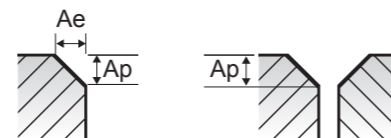
XCEMM SERIES

4&5&6 FLUTE - CHAMFERING

Vc = m/min. fz = mm/tooth
RPM = rev./min. FEED = mm/min.

ISO	VDI 3323	Material Description	Point angle	Ae	Ap	Parameter	Diameter (Ø)			
							10	12	16	
P	1-8	Non-alloy steel Low alloy steel	60°	0.35xD	0.7xD	Vc	120~140	120~140	120~140	
			90°		0.35xD	fz	0.05	0.05	0.05	
			9		60°	0.7xD	RPM	3820~4456	3183~3714	2387~2485
					90°	0.35xD	FEED	764~892	795~929	716~746
	10-11.1	High alloyed steel, and tool steel	60°	0.35xD	0.7xD	Vc	70~90	70~90	70~90	
			90°		0.35xD	fz	0.03	0.03	0.03	
			112		60°	0.7xD	RPM	2228~2865	1857~2387	1393~1790
					90°	0.35xD	FEED	268~344	279~358	251~323
M	12-14	Stainless steel	60°	0.35xD	0.7xD	Vc	120~140	120~140		
			90°		0.35xD	fz	0.05	0.05		
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	60°	0.35xD	0.7xD	RPM	3820~4456	3183~3714		
			90°		0.35xD	FEED	764~892	795~929		
S	31-32	Heat Resistant Super Alloys	60°	0.35xD	0.7xD	Vc	30~40	30~40		
			90°		0.35xD	fz	0.04	0.04		
H	38.1 - 38.2	Hardened steel	60°	0.35xD	0.7xD	RPM	955~1273	796~1061		
			90°		0.35xD	FEED	152~203	159~212		
	40	Chilled Cast Iron	60°	0.35xD	0.7xD	Vc	40~50	40~50		
			90°		0.35xD	fz	0.04	0.04		
	41	Hardened Cast Iron	60°	0.35xD	0.7xD	RPM	1273~1592	1061~1326		
			90°		0.35xD	FEED	203~254	212~265		

► When the length of overhang exceeds 4xD, we recommend using the carbide shank holder with 20% lower feed



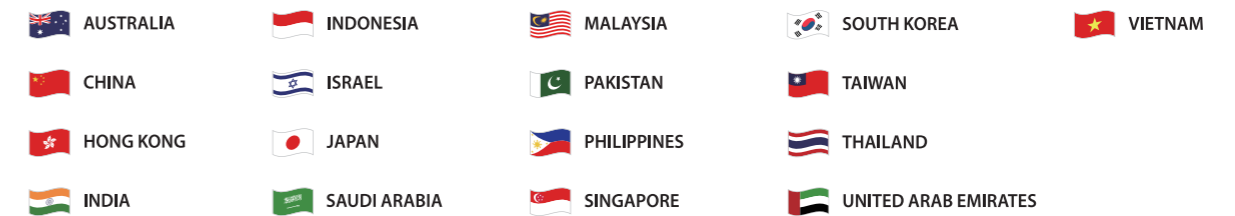
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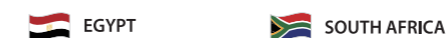
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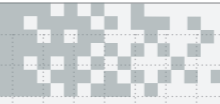
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