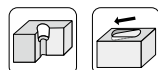
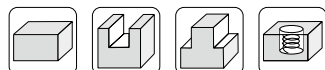
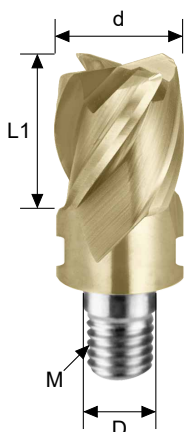


Winmaster Series Exchangeable Head Endmills

- *Carbide Exchangeable Head Endmill and Carbide Adapter*
- *A single adapter to accommodate a wide variety of exchangeable head endmills*
- *ISO M screw threads suitable for most adapter*
- *Reconditioning Services*



EHSWH4



Ød	Tolerance
All	0 ~ -0.03

Work Material						
Carbon Steel (S45C, S55C)	Alloy Steel (SK, SCM)	Pre-Hardened Steel / Hardened Steel			Stainless Steel (SUS304, 316)	Cast Iron
		~ HRC 40	~ HRC 45	~ HRC 55		
○	◎	◎	◎	◎	○	◎

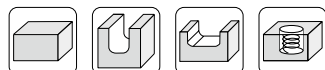
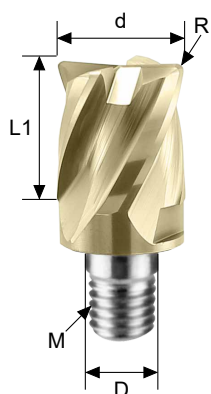
[illegible]

Ød	R Tolerance
All	± 0.02

Work Material						
Carbon Steel (S45C, S55C)	Alloy Steel (SK, SCM)	Pre-Hardened Steel / Hardened Steel			Stainless Steel (SUS304, 316)	Cast Iron
		~ HRC 40	~ HRC 45	~ HRC 55		
○	◎	◎	◎	◎	○	◎

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EHCWH4



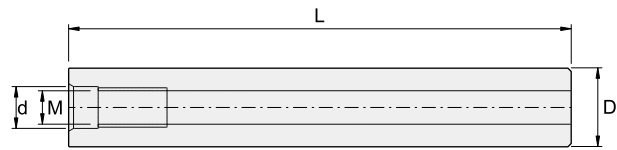
Ød	Tolerance
All	0 ~ -0.03
R	± 0.02

Work Material						
Carbon Steel (S45C, S55C)	Alloy Steel (SK, SCM)	Pre-Hardened Steel / Hardened Steel			Stainless Steel (SUS304, 316)	Cast Iron
		~ HRC 40	~ HRC 45	~ HRC 55		
○	◎	◎	◎	◎	○	◎

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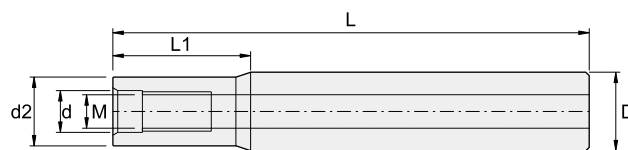
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SWMEA



Straight

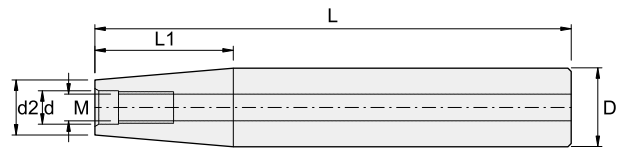
Order No.	Dimensions (mm)			
	D	L	d	M
ISWMEA10075050	10	75	5.5	M5
ISWMEA10100050	10	100	5.5	M5
ISWMEA10150050	10	150	5.5	M5
ISWMEA10100060	10	100	5.5	M6
ISWMEA10150060	10	150	5.5	M6
ISWMEA11100060	11	100	6.5	M6
ISWMEA11150060	11	150	6.5	M6
ISWMEA12075060	12	75	6.5	M6
ISWMEA12100060	12	100	6.5	M6
ISWMEA12150060	12	150	6.5	M6
ISWMEA12200060	12	200	6.5	M6
ISWMEA15100080	15	100	8.5	M8
ISWMEA15150080	15	150	8.5	M8
ISWMEA15200080	15	200	8.5	M8
ISWMEA16100080	16	100	8.5	M8
ISWMEA16150080	16	150	8.5	M8
ISWMEA16200080	16	200	8.5	M8
ISWMEA16250080	16	250	8.5	M8
ISWMEA20100100	20	100	10.5	M10
ISWMEA20150100	20	150	10.5	M10
ISWMEA20200100	20	200	10.5	M10
ISWMEA20250100	20	250	10.5	M10
ISWMEA20300100	20	300	10.5	M10
ISWMEA25100120	25	100	12.5	M12
ISWMEA25150120	25	150	12.5	M12
ISWMEA25200120	25	200	12.5	M12
ISWMEA25250120	25	250	12.5	M12
ISWMEA25300120	25	300	12.5	M12
ISWMEA32200160	32	200	17.0	M16
ISWMEA32300160	32	300	17.0	M16



Straight Neck

[illegible]

SWMET



Taper Neck

Order No.	Dimensions (mm)					
	D	L	L1	d	d2	M
ISWMET12150050	12	150	60	5.5	9.8	M5
ISWMET12150060	12	150	60	5.5	9.8	M6
ISWMET16150060	16	150	70	6.5	11.8	M6
ISWMET20200080	20	200	90	8.5	15.5	M8
ISWMET25200100	25	200	90	10.5	19.8	M10
ISWMET32200120	32	200	90	12.5	24.5	M12

Wrench Specifications

Order No.	Wrench Size (mm)	Suitable Head Endmill Diameter (mm)
ISP100	8 × 9	10
ISP120	10 × 11	12
ISP160	12 × 13	16
ISP200	16 × 17	20

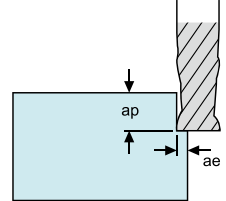
Cutting Conditions

Recommended Cutting Conditions

EHSWH4, EHCWH4 (Square Head - 4F, Corner Radius Head - 4F)

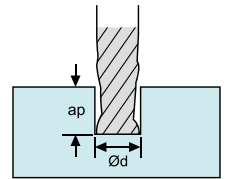
Shoulder Milling $L/D \leq 3$ (Reference L/D ratio table, reduce vc, fz and ae value)

Material	Pre-Hardened Steels NAK80 CENA1				Hardened Steels SKD61,SKD11				Hardened Steels SKD11,SKH51			
Hardness	HRC 35~45				HRC 40~55				HRC 55~65			
VC	90 ~ 150(m/min)				80 ~ 120 (m/min)				70 ~ 100 (m/min)			
Dia	RPM	fz (mm/tooth)	ap (mm)	ae (mm)	RPM	fz (mm/tooth)	ap (mm)	ae (mm)	RPM	fz (mm/tooth)	ap (mm)	ae (mm)
10mm	3820	0.05	8.0	2.0	3190	0.05	8.0	1.5	2390	0.05	8.0	1.0
12mm	3190	0.05	9.6	2.4	2650	0.05	9.6	1.8	2000	0.05	9.6	1.2
16mm	2390	0.06	12.8	3.2	2000	0.06	12.8	2.4	1500	0.06	12.8	1.6
20mm	1910	0.06	16.0	4.0	1600	0.06	16.0	3.0	1190	0.06	16.0	2.0



Slot Milling $L/D \leq 3$ (Reference L/D ratio table, reduce vc and fz value)

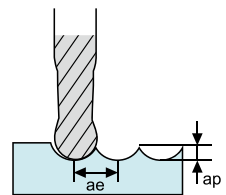
Material	Pre-Hardened Steels NAK80 CENA1			Hardened Steels SKD61,SKD11			Hardened Steels SKD11,SKH51		
Hardness	HRC 35~45			HRC 40~55			HRC 55~65		
VC	60 ~ 100(m/min)			50 ~ 90 (m/min)			40 ~ 80 (m/min)		
Dia	RPM	fz (mm/tooth)	ap (mm)	RPM	fz (mm/tooth)	ap (mm)	RPM	fz (mm/tooth)	ap (mm)
10mm	2550	0.02	4.0	2390	0.02	4.0	1900	0.02	4.0
12mm	2120	0.02	4.8	2000	0.02	4.8	1590	0.02	4.8
16mm	1590	0.03	6.4	1490	0.03	6.4	1190	0.03	6.4
20mm	1275	0.03	8.0	1190	0.03	8.0	950	0.03	8.0



EHBWH2 (Ball Nose Head - 2F)

$L/D \leq 3$ (Reference L/D ratio table, reduce vc and fz value)

Material	Pre-Hardened Steels NAK80 CENA1				Hardened Steels SKD61,SKD11				Hardened Steels SKD11,SKH51			
Hardness	HRC 35~45				HRC 40~55				HRC 55~65			
VC	100 ~ 190(m/min)				90 ~ 160 (m/min)				70 ~ 140 (m/min)			
Dia	RPM	fz (mm/tooth)	ap (mm)	ae (mm)	RPM	fz (mm/tooth)	ap (mm)	ae (mm)	RPM	fz (mm/tooth)	ap (mm)	ae (mm)
10mm	4620	0.1	0.7	2	3980	0.05	0.4	1.5	3345	0.02	0.2	1.0
12mm	3850	0.1	0.84	2.4	3320	0.05	0.5	1.8	2790	0.02	0.2	1.2
16mm	2885	0.15	1.12	3.2	2485	0.075	0.64	2.4	2090	0.03	0.3	1.6
20mm	2300	0.2	1.4	4.0	2000	0.1	0.8	3.0	1670	0.04	0.4	2.0



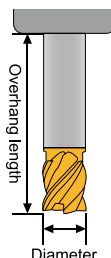
How to set cutting conditions on different overhang length

The recommended cutting condition is depended by the L/D factor.

L/D ratio table :

L/D	VC (m/min)	fz (mm/t)	ae (mm)
2 ~ 3	100%	100%	100%
4 ~ 5	70%	80%	50%
6 ~ 7	50%	70%	30%
8 ~ 9	40%	60%	20%

※ L/D = Overhang length / Diameter



EX :

Tool : $\varnothing d=12\text{mm}$ Square Head
Overhang length : 50mm
 $L/D : 50/12 = 4.16$
Material HRC : 35 ~ 45
Application : Shoulder Milling

Cutting condition is recommended as :

$Vc = 120 \times 70\% = 84 \text{ m/min}$
 $fz = 0.05 \times 80\% = 0.04 \text{ mm/t}$
 $ap = 9.6 \text{ mm}$
 $\text{max } ae = 2.4 \times 50\% = 1.2 \text{ mm}$

Install the Head

How to install the Head



1. Screw the adapter to the holder and clean



2. Screw the Head to the adapter

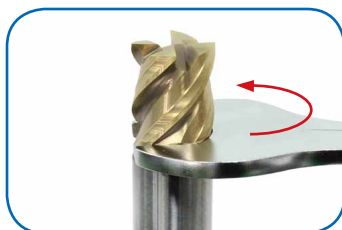


3. Use the spanner to screw the Head



4. Complete installation

How to uninstall the Head



When uninstall the head, please push the spanner lightly for avoiding the neck broken

Recommended Torque

Suitable Head Endmill Diameter	Recommended Clamping Torque (N · m)
10mm	10
12mm	10
16mm	15
20mm	20

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