



TUNG FLEX
TUNGALOY



MILLLINE

Tungaloy Report No. 419-E

www.tungaloy.com

**Versatile solution with ease
of handling** and reduced
tool changing time



A close-up photograph of a metal turning process. A black lathe tool with a silver-colored cutting edge is positioned against a rotating metal workpiece. The workpiece has a complex, multi-faceted shape with a central hole. The tool is cutting a groove into the workpiece, and several small, curled metal chips are visible at the cutting point. The background is a plain, light-colored surface.

S M10-L130-C20
3194758



TUNG FLEX
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Variety of modular heads
available for various milling
applications.

TUNGFLEX

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Various types of modular heads can be combined with different shanks and holders for multiple application needs.



Cutter heads

DOFEED

HXN03

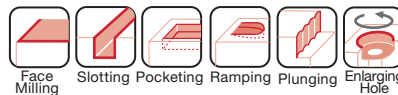


P. 6~

15°~17°
1 mm

● High productivity, high feed cutters

- 4 cutting edge insert with optimised geometry for high feed machining
- Inclination and large rake angles reduce cutting force



TUNGREC

HPO07, 11



P. 9~

HJ
10° 90°
0.8 mm 7 mm, 11 mm

● High precision shoulder milling cutter

- Helical cutting edges and high rake angles provide smooth cutting
- 4 types of chipbreakers for a wide range of applications



RADIUSMILL

HWD07



P. 14~

R
3.5 mm

● Radius cutter, applicable for profiling

- Multi-functional tool for a wide range of application
- Highly versatile grade AH120, suitable for machining of a wide variety of materials



FIXRMILL

HRP10, 12



P. 16~

R
5, 6 mm

● Steel machining

- Multi-functional tool especially for three dimensional machining application
- Unique antirotation system for FIX insert location and higher clamping rigidity
- Unique grade AH4035 for martensitic stainless



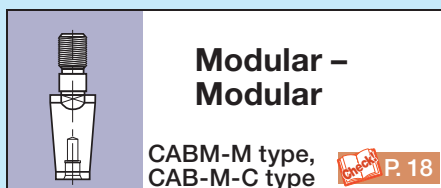


Steel shank series

P. 18~

TungFlex system

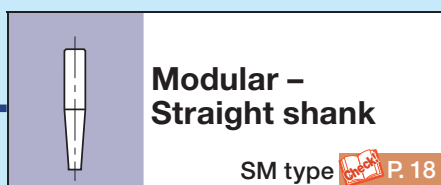
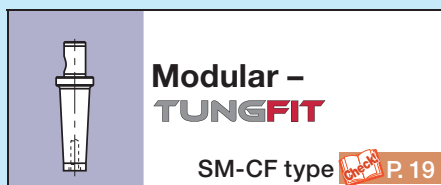
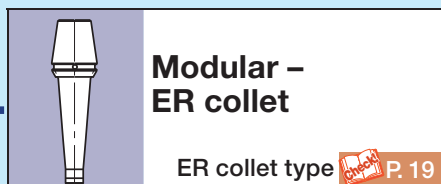
Extensions, Reducers



- Extend the overhang length
- Coupling for connecting different thread of shank and head

TungFlex system

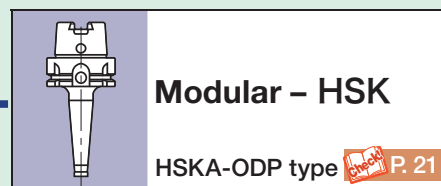
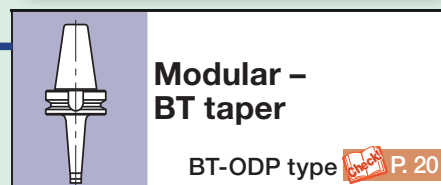
Steel shank series



Holders, Arbors

P. 20~

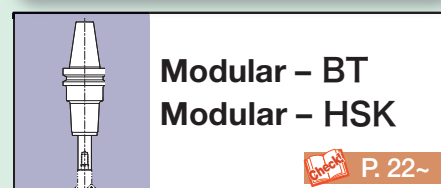
TungFlex system



- Cutter heads can be directly connected to holders, increasing rigidity
- Reduces tool changing time
- DIN 69871 or CAT tapers are available

RED screw arbors

(Manufactured by MST corporation)



- Integrated arbor with highly rigid carbide shank
- Suitable for machining with long overhang

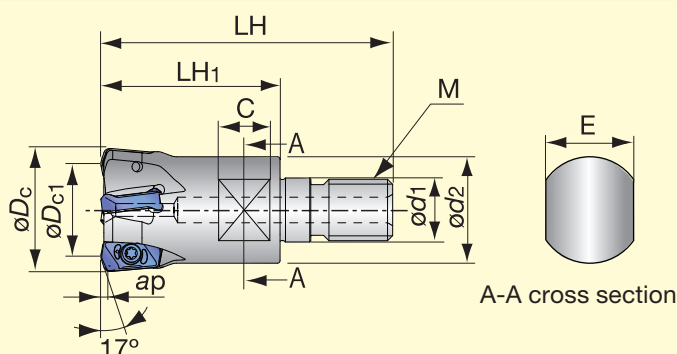
TungHold series

Applicable for wide variety of chucks and holders, such as ER collet chucks, TungFit holders, milling chucks, and hydraulic holders.

Milling chucks from other manufactures

DOFEED HXN03 type

Cutter



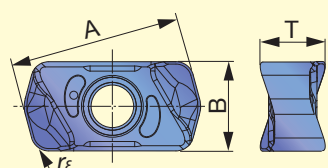
Max. ap = 1.0 mm

Parts

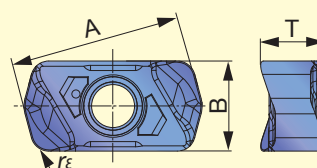
Descriptions	Parts Cat. No.
Clamping screw	CSPB-2.5
Wrench	IP-8D

Cat. No.	Stock	No. of Inserts	Dimensions (mm)									Weight (kg)	Air hole	Applicable Insert
			ϕD_c	ϕD_{c1}	LH	LH1	C	E	$\phi d1$	$\phi d2$	M			
HXN03R016MM08-02	●	2	16	9.5	42	25	8	10	8.5	12.8	M8	0.03	with	LNMU0303ZER-M□
HXN03R018MM08-02	●	2	18	11.5	42	25	8	10	8.5	14.5	M8	0.04	with	LNMU0303ZER-M□
New HXN03R020MM10-03	●	3	20	13.5	49	30	10	15	10.5	17.8	M10	0.06	with	LNMU0303ZER-M□
HXN03R020MM10-04	●	4	20	13.5	49	30	10	15	10.5	17.8	M10	0.06	with	LNMU0303ZER-M□
New HXN03R022MM10-03	●	3	22	15.5	49	30	10	15	10.5	17.8	M10	0.06	with	LNMU0303ZER-M□
HXN03R022MM10-04	●	4	22	15.5	49	30	10	15	10.5	17.8	M10	0.07	with	LNMU0303ZER-M□
New HXN03R025MM12-04	●	4	25	18.5	57	35	10	17	12.5	20.8	M12	0.10	with	LNMU0303ZER-M□
HXN03R025MM12-05	●	5	25	18.5	57	35	10	17	12.5	20.8	M12	0.11	with	LNMU0303ZER-M□
New HXN03R028MM12-04	●	4	28	21.5	57	35	10	17	12.5	23.0	M12	0.12	with	LNMU0303ZER-M□
HXN03R028MM12-05	●	5	28	21.5	57	35	10	17	12.5	23.0	M12	0.12	with	LNMU0303ZER-M□
New HXN03R030MM16-04	●	4	30	23.5	63	40	12	22	17.0	28.8	M16	0.19	with	LNMU0303ZER-M□
HXN03R030MM16-05	●	5	30	23.5	63	40	12	22	17.0	28.8	M16	0.20	with	LNMU0303ZER-M□
New HXN03R032MM16-05	●	5	32	25.5	63	40	12	22	17.0	28.8	M16	0.20	with	LNMU0303ZER-M□
HXN03R032MM16-06	●	6	32	25.5	63	40	12	22	17.0	28.8	M16	0.21	with	LNMU0303ZER-M□

Inserts



MJ (for general purpose)

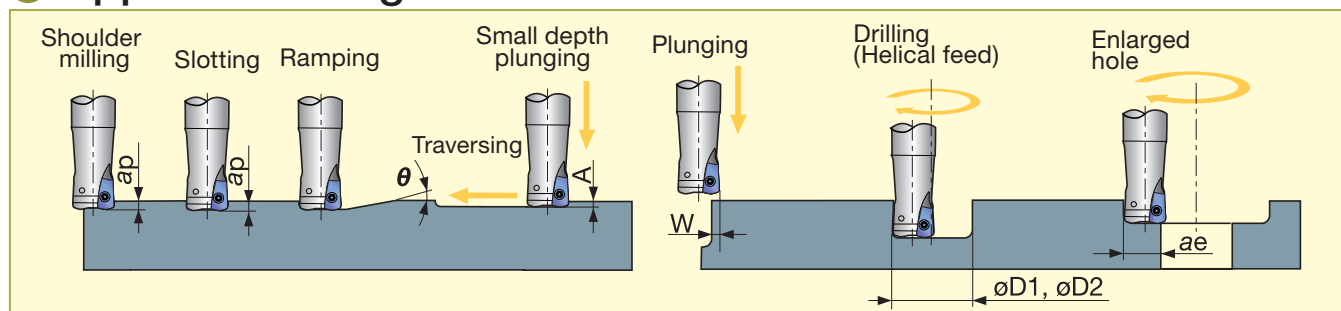


ML (for low cutting force)

Cat. No.	Accuracy	Honing	Grades			Dimensions (mm)				Applicable Cutter
			Coated							
			AH725	AH3035	AH130	A	B	T	r_{ϵ}	
LNMU0303ZER-ML	M	with	●	●	●	11.6	6	4.3	1.2	HXN03R...
LNMU0303ZER-MJ	M	with	●	●	●	11.6	6	4.3	1.2	HXN03R...

● : Stocked items

Application range



Cat. No.	Tool dia. ϕD_c (mm)	Max. depth of cut a_p (mm)	Max. ramping angle θ	Max. plunging depth A (mm)	Max. cutting width in plunging W (mm)	Min. machinable hole dia. $\phi D1$ (mm)	Max. machinable hole dia. $\phi D2$ (mm)	Max. cutting width in enlarged hole a_e (mm)
HXN03R016MM08-...	$\phi 16$	1	2.1°	0.3	3.5	22	30	12.5
HXN03R018MM08-...	$\phi 18$	1	1.7°	0.3	3.5	26	34	14.5
HXN03R020MM10-...	$\phi 20$	1	1.4°	0.3	3.5	30	38	16.5
HXN03R022MM10-...	$\phi 22$	1	1.2°	0.3	3.5	34	42	18.5
HXN03R025MM12-...	$\phi 25$	1	1.0°	0.3	3.5	40	48	21.5
HXN03R028MM12-...	$\phi 28$	1	0.8°	0.3	3.5	46	54	24.5
HXN03R030MM16-...	$\phi 30$	1	0.7°	0.3	3.5	50	58	26.5
HXN03R032MM16-...	$\phi 32$	1	0.7°	0.3	3.5	54	62	28.5

Standard cutting conditions

ISO	Workpiece material	Hardness	Priority	Grades	Chip-breaker	Cutting Speed V_c (m/min)	Feed per tooth: f_z (mm/t)		
							Tool dia: ϕD_c (mm)		Plunging
P	Carbon steels S45C, S55C etc. C45, C55 etc.	< 300HB	First choice	AH725	MJ	100 - 300	0.5 - 1.2	0.5 - 1.5	0.1
		< 300HB	For low cutting force	AH725	ML	100 - 300	0.5 - 0.7	0.5 - 1.0	0.1
		< 300HB	For impact resistance	AH3035	MJ	100 - 300	0.5 - 1.2	0.5 - 1.5	0.1
	Alloy steels SCM440, SCR415 etc. 42CrMo4, 17Cr3 etc.	< 300HB	First choice	AH725	MJ	100 - 200	0.5 - 1.2	0.5 - 1.5	0.1
		< 300HB	For low cutting force	AH725	ML	100 - 200	0.5 - 0.7	0.5 - 1.0	0.1
		< 300HB	For impact resistance	AH3035	MJ	100 - 200	0.5 - 1.2	0.5 - 1.5	0.1
M	Prehardened steels NAK80, PX5 etc.	30 - 40HRC	-	AH3035	ML	100 - 200	0.5 - 0.7	0.5 - 1.0	0.1
		30 - 40HRC	-	AH3035	ML	100 - 200	0.5 - 0.7	0.5 - 1.0	0.1
K	Grey cast irons FC250, FC300 / GG25, GGG30 etc.	< 200HB	First choice	AH130	ML	100 - 150	0.3 - 0.5	0.3 - 0.7	0.08
		< 200HB	For impact resistance	AH130	MJ	100 - 150	0.3 - 0.8	0.3 - 0.8	0.08
S	Ductile cast irons FCD400 / GGG40 etc.	150 - 250HB	First choice	AH725	MJ	100 - 300	0.5 - 1.2	0.5 - 1.5	0.1
		150 - 250HB	For low cutting force	AH725	ML	100 - 300	0.5 - 0.7	0.5 - 1.0	0.1
	Titanium alloy Ti-6Al-4V etc.	150 - 250HB	First choice	AH725	MJ	80 - 200	0.5 - 1.2	0.5 - 1.5	0.1
		150 - 250HB	For low cutting force	AH725	ML	80 - 200	0.5 - 0.7	0.5 - 1.0	0.1
H	Hardened steels	< 40HRC	For wear resistance	AH725	ML	30 - 60	0.3 - 0.5	0.3 - 0.7	0.08
		< 40HRC	For impact resistance	AH130	ML	30 - 60	0.3 - 0.5	0.3 - 0.7	0.08
		< 40HRC	For wear resistance	AH725	MJ	20 - 50	0.1 - 0.2	0.1 - 0.3	0.05
		< 40HRC	For impact resistance	AH130	ML	20 - 50	0.1 - 0.2	0.1 - 0.3	0.05
H	Hardened steels	SKD61 X40CrMoV5-1 etc.	40 - 50HRC	-	AH3035	MJ	80 - 130	0.1 - 0.2	0.1 - 0.3
		SKD11 X153CrMoV12 etc.	50 - 60HRC	-	AH3035	MJ	50 - 70	0.03 - 0.05	0.03 - 0.07

The above table shows the conditions for standard short length shanks. When using long shank with heads reduce the cutting conditions or opt for coarse pitch cutters as applicable.

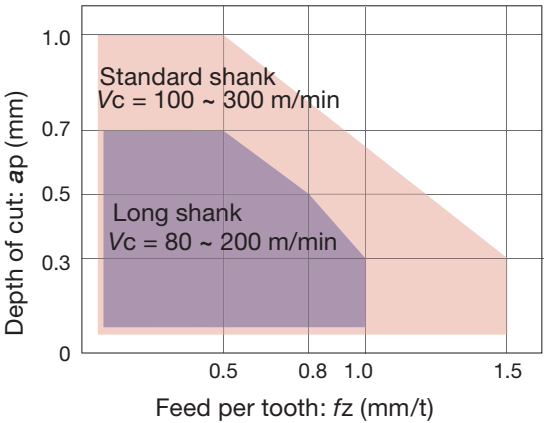
Cutting conditions are generally limited by the rigidity and power of the machine and the rigidity of the workpiece. When setting the conditions, start from half of the values of the standard cutting conditions and then increase the value gradually while making sure the machine is running normally.

DOFEED HXN03 type

Cautionary points in use

The use of a standard or long shank

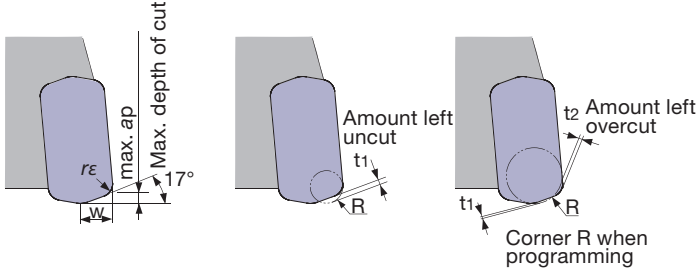
When using a long shank with head. please lower the cutting conditions (V_c , f_z , a_p) to 70% of the maximum conditions for the standard shank.



Tool dia.: $\phi D_c = \phi 16 \sim 35$ mm Standard shank: $L/D \leq 3$
Workpiece: S55C / C55 (200HB) Long shank: $L/D = 4$
L/D ratio of overhang

Tool geometry on programming

When programming for CAM, the tool should be considered as a radius cutter. Usually, the corner radius should be set as $R = 1.5$ mm. If a larger radius is used, overcutting will occur. The following table shows the amount left uncut (t_1) and overcut (t_2).



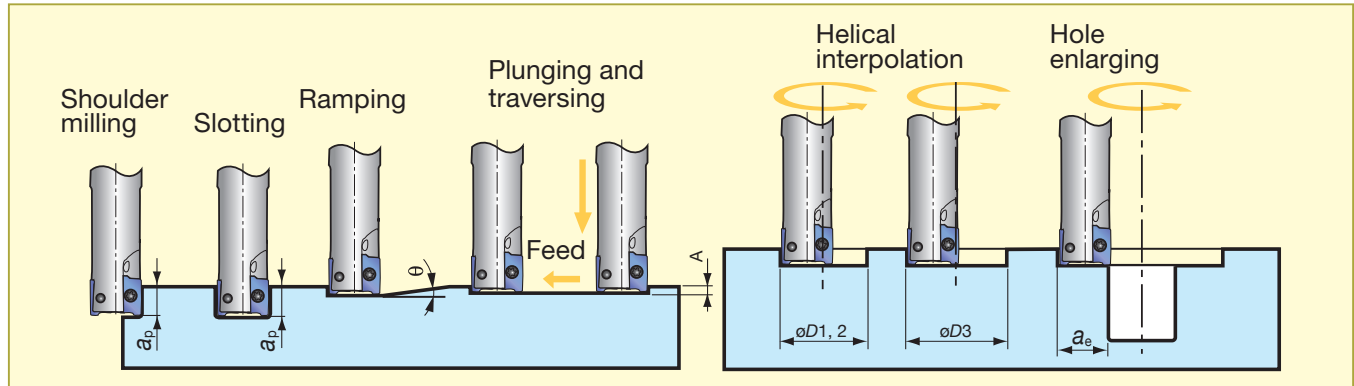
Max. depth of cut max a_p (mm)	Corner radius r_ϵ (mm)	W (mm)	Corner R when programming	Amount left uncut t_1 (mm)	Amount left overcut t_2 (mm)
1.0	1.2	3.0	1.0	0.6	-
			1.5	0.5	-
			2.0	0.25	0.08
			2.5	0.14	0.26

Each value in table is calculated theoretically at the maximum condition.



TUNGREC HPO07 type

Application range



Cat. No.	Tool- ϕ ϕD_c (mm)	Max. depth of cut a_p (mm)			Max. ramping angle θ	Max. plunging A (mm)	Min. machining $\phi D1$ (mm)	Max. machining $\phi D2$ (mm)	*Max. machining $\phi D3$ (mm)	Max. cutting width in enlarging a_e (mm)
		MJ	HJ	AJ						
HPO07R012MM...	$\phi 12$	7	0.8	6.4	8°	0.5	16	23	20.5	11.5
HPO07R016MM...	$\phi 16$	7	0.8	6.4	5°	0.5	24	31	28.5	15.5
HPO07R020MM...	$\phi 20$	7	0.8	6.4	3.5°	0.5	32	39	36.5	19.5
HPO07R025MM...	$\phi 25$	7	0.8	6.4	2.5°	0.5	42	49	46.5	24.5

*Flat bottom hole

Notes: Corner r_f for dimensions of $\phi D1$, $\phi D2$, and $\phi D3$: $r_f = 0.4$.

Standard cutting conditions

ISO	Workpiece material	Hardness HB	Grades	Cutting Speed V_c (m/min)	Feed per tooth: f_z (mm/t)		
					MJ	HJ	AJ
P	Low carbon steels (S15C / C15E4 etc.)	< 200	AH725	90 - 200	0.05 - 0.1	0.4 - 0.9	-
	High carbon steels and alloyed steels (S55C / C55, SCM440 / 42CrMo4 etc.)	200 - 300	AH725	90 - 150	0.05 - 0.1	0.4 - 0.9	-
	Tool steels (SKD11 / X153CrMoV12 etc.)	150 - 300	AH725	80 - 120	0.05 - 0.1	0.4 - 0.9	-
M	Stainless steels (SUS304 / X5CrNi18-9 etc.)	-	AH140	90 - 150	0.05 - 0.1	0.4 - 0.9	-
K	Grey cast irons (FC250 / 250 etc.)	150 - 250	AH725	100 - 180	0.05 - 0.1	0.4 - 0.9	-
	Ductile cast irons (FCD450 / 450-10S etc.)	150 - 250	AH725	80 - 150	0.05 - 0.1	0.4 - 0.9	-
N	Aluminium alloys (Si < 13%)	-	KS15F	300 - 1000	-	-	0.08 - 0.2
	Aluminium alloys (Si $\geq$ 13%)	-	KS15F	100 - 200	-	-	0.08 - 0.2
S	Titanium alloys (Ti-6Al-4V etc.)	-	AH725	20 - 50	0.05 - 0.1	0.4 - 0.9	-
	Heat resistant alloys (Inconel718 etc.)	-	AH725	20 - 35	0.05 - 0.08	0.2 - 0.6	-

- To remove excessive chip accumulation use an air blast.
- To avoid build up edge on the cutting edges (aluminium machining), use a water soluble coolant.
- When cutting an interrupted surface or a casted skin, the feed per tooth (f_z) should be reduced to the lower recommended value shown in the above table.

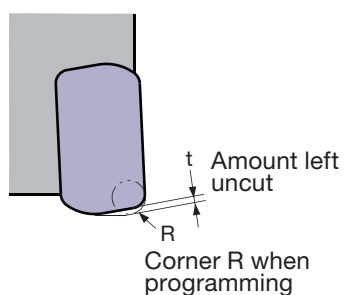
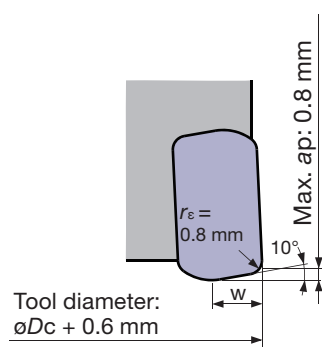
- Cutting conditions are limited by machine power, work piece rigidity, and spindle output. When the cutting width, depth, or overhang length is large, set V_c and f_z to the lower recommended values and check the machine power and vibration.

■ Cautionary points when using HJ inserts

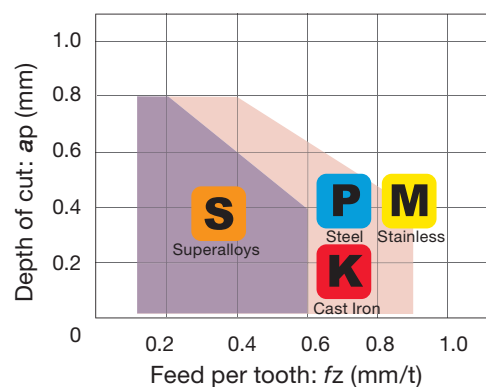
HJ type inserts are designed for high feed machining.

Please note the following when using HJ inserts:

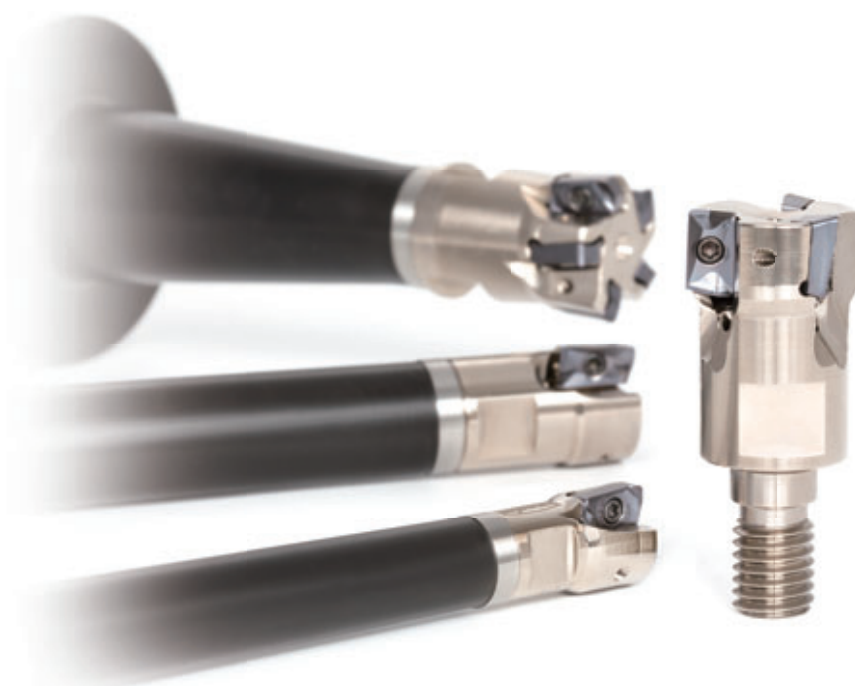
1. The shape of HJ insert differs from that of other inserts (MJ, AJ). However the same insert pocket can be used.
2. When using HJ inserts, all the inserts on the cutter body must be HJ type. Do not use other types of inserts (MJ and AJ types) with HJ inserts on the same cutter body.
3. When using CAD/CAM, please program it as a radius cutter. The table below shows the corner R when programming and the uncut area (t).
4. With HJ inserts, the tool diameter increases by 0.6 mm over the diameter ϕD_c shown in the table.



**TungRec 07 type HJ inserts
Standard conditions**

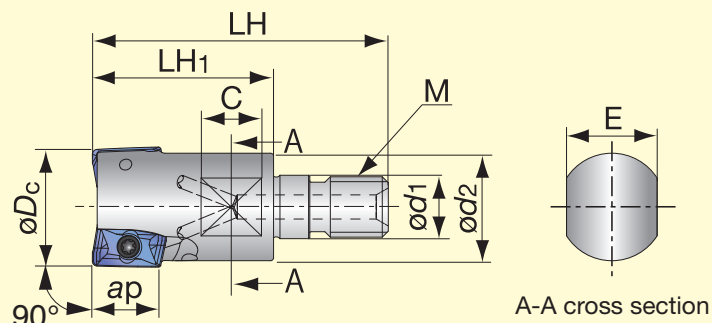


Max. depth of cut max ap (mm)	Main cutting edge length W (mm)	Corner R when programming	Amount left uncut t (mm)
0.8	3.0	R 0.5	0.4
		R 1.0	0.3



TUNGREC HPO11 type

● Cutter



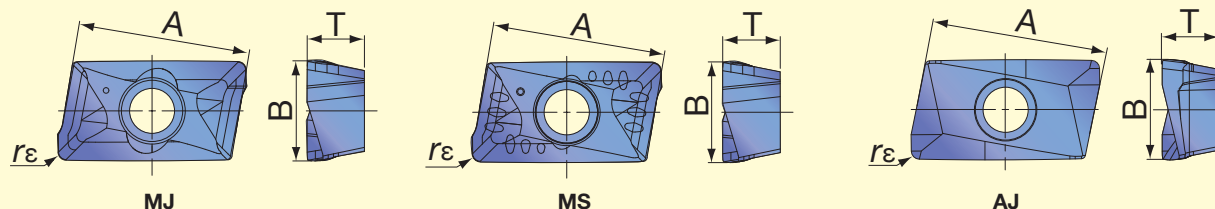
Max. ap = 10.6 mm

■ Parts

Descriptions	Parts Cat. No.	
Clamping screw	HPO11R020	HPO11R025, HPO11R032
	CSPB-2.5S	CSPB-2.5
Wrench	IP-8D	

Cat. No.	Stock	No. of Inserts	Dimensions (mm)								Weight (kg)	Air hole	Applicable Insert
			øDc	LH	LH1	C	E	ød1	ød2	M			
HPO11R020MM10-02	●	2	20	49	30	10	15	10.5	17.8	M10	0.06	with	AS□T11T3...
HPO11R025MM12-03	●	3	25	57	35	10	17	12.5	20.8	M12	0.10	with	AS□T11T3...
HPO11R032MM16-03	●	3	32	63	40	12	22	17.0	28.8	M16	0.20	with	AS□T11T3...

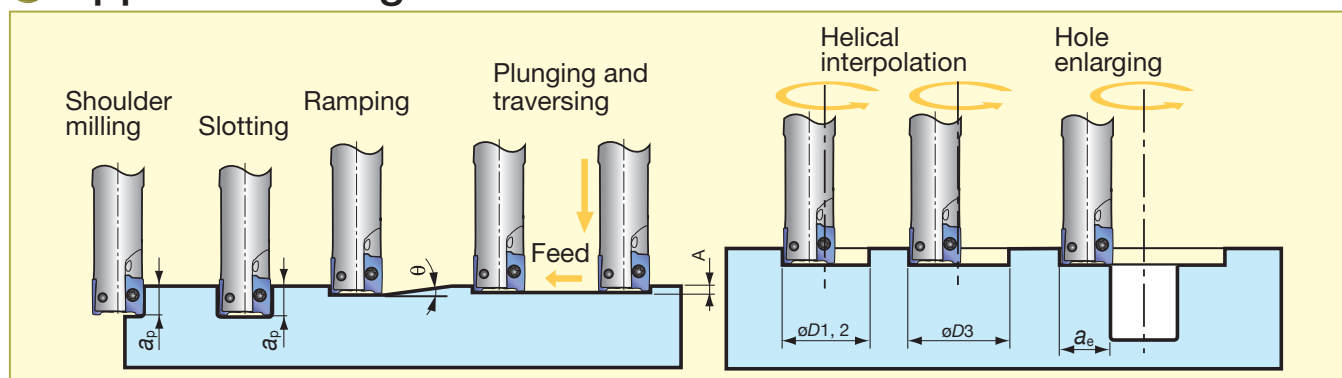
● Inserts



Cat. No.	Accuracy	Honing	Grades									Dimensions (mm)				Cutter
			Coated						DLC coated	Cermet	Uncoated	A	B	T	rε	
			AH725	AH120	AH130	AH140	T3130	T1115	DS1100	NS740	KS05F					
ASMT11T304PDPR-MJ	M	with	●	●			●	●		●		11.6	6.7	3.7	0.4	HPO11R..
ASMT11T308PDPR-MJ	M	with	●	●			●	●		●		11.6	6.7	3.7	0.8	HPO11R..
ASMT11T312PDPR-MJ	M	with	●	●			●					11.6	6.7	3.7	1.2	HPO11R..
ASMT11T316PDPR-MJ	M	with	●	●			●			●		11.6	6.7	3.7	1.6	HPO11R..
ASMT11T320PDPR-MJ	M	with		●								11.6	6.7	3.7	2.0	HPO11R..
ASMT11T330PDPR-MJ	M	with		●								11.6	6.7	3.7	3.0	HPO11R..
ASMT11T304PDPR-MS	M	with			●	●						11.6	6.7	3.7	0.4	HPO11R..
ASGT11T304PDRF-AJ	G	with							●		●	11.6	6.7	3.7	0.4	HPO11R..
ASGT11T308PDRF-AJ	G	with							●		●	11.6	6.7	3.7	0.8	HPO11R..

● : Stocked items

Application range



Cat. No.	Tool- ϕ ϕD_c (mm) MJ	Max. depth of cut a_p (mm)	Max. ramping angle θ	Max. plunging A (mm)	Min. machining $\phi D1$ (mm)	Max. machining $\phi D2$ (mm)	*Max. machining $\phi D3$ (mm)	Max. cutting width in enlarging a_e (mm)
HPO11R020MM10-02	$\phi 20$	10.6	3.0°	0.5	28	39	37	19.5
HPO11R025MM12-03	$\phi 25$	10.6	2.0°	0.5	38	49	47	24.5
HPO11R032MM16-03	$\phi 32$	10.6	1.5°	0.5	52	63	61	31.5

Values in above table are inapplicable when using $r\epsilon = 0.4$ insert.

* $\phi D2$: Small portion will remain uncut.

$\phi D3$: For flat bottom hole

Standard cutting conditions

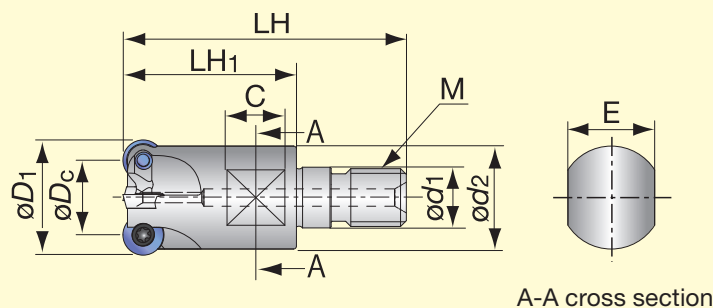
ISO	Workpiece material	Brinell hardness HB	Priority	Grade	Cutting speed V_c (m/min)	Feed per tooth: f_z (mm/t)		
						MJ	MS	AJ
P	Low carbon steels (S15C / C15E4 etc.)	< 200	First choice	AH725	100 - 250	0.1 - 0.2	-	-
		< 200	For wear resistance	T3130	100 - 250	0.1 - 0.2	-	-
		< 200	For surface appearance	NS740	100 - 250	0.05 - 0.15	-	-
	High carbon steels and alloyed steels (S55C / C55, SCM440 / 42CrMo4 etc.)	200 - 300	First choice	AH725	100 - 200	0.1 - 0.15	-	-
		200 - 300	For wear resistance	T3130	100 - 200	0.1 - 0.15	-	-
		200 - 300	For surface appearance	NS740	100 - 200	0.05 - 0.12	-	-
M	Tool steels (SKD11 / X153CrMoV12 etc.)	150 - 300	First choice	AH725	100 - 150	0.1 - 0.15	-	-
		150 - 300	For wear resistance	T3130	100 - 150	0.1 - 0.15	-	-
M	Stainless steels (SUS304 / X5CrNi18-9 etc.)	-	-	AH130	80 - 200	-	0.08 - 0.2	-
K	Grey cast irons (FC250 / 250 etc.)	150 - 250	First choice	AH120	100 - 250	0.12 - 0.2	-	-
		150 - 250	For wear resistance	T1115	100 - 250	0.12 - 0.2	-	-
	Ductile cast irons (FCD450 / 450-10S etc.)	150 - 250	First choice	AH120	80 - 200	0.12 - 0.2	-	-
		150 - 250	For wear resistance	T1115	80 - 200	0.12 - 0.2	-	-
N	Aluminium alloys (Si < 13%)	-	-	DS1100	300 - 1000	-	-	0.05 - 0.2
	Aluminium alloys (Si $\geq$ 13%)	-	-	DS1100	100 - 200	-	-	0.05 - 0.2
	Copper alloys	-	-	KS05F	200 - 500	-	-	0.05 - 0.2
S	Titanium alloys (Ti-6Al-4V etc.)	-	-	AH130	20 - 60	-	0.08 - 0.15	-
	Heat resistant alloys (Inconel718 etc.)	-	-	AH725	20 - 40	0.08 - 0.13	-	-

- To remove excessive chip accumulation use an air blast.
- Use water soluble coolant to avoid build up edge on cutting edges (aluminium machining).
- When cutting an interrupted surface or a casted skin, the feed per tooth (f_z) should be reduced to the lower recommended value shown in the above table.

- Cutting conditions are limited by machine power, work piece rigidity, and spindle output. When the cutting width, depth, or overhang length is large, set V_c and f_z to the lower recommended values and check the machine power and vibration.

RADIUSMILL HWD07 type

Cutter



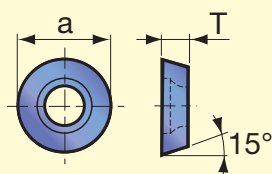
Max. ap = 3.5 mm

Parts

Descriptions	Parts Cat. No.
Clamping screw	CSTB-2.5S
Wrench	T-8D

Cat. No.	Stock	No. of Inserts	Dimensions (mm)									Weight (kg)	Air hole	Applicable Insert
			øD1	øDC	LH	LH1	C	E	ød1	ød2	M			
HWD07R015MM08-03	●	3	15	8	42	25	8	10	8.5	12.8	M8	0.03	with	RDMW0702M0
HWD07R020MM10-04	●	4	20	13	49	30	10	15	10.5	17.8	M10	0.06	with	RDMW0702M0
HWD07R025MM12-05	●	5	25	18	57	35	10	17	12.5	20.8	M12	0.10	with	RDMW0702M0
HWD07R030MM16-05	●	5	30	23	63	40	12	22	17.0	28.8	M16	0.20	with	RDMW0702M0

Inserts

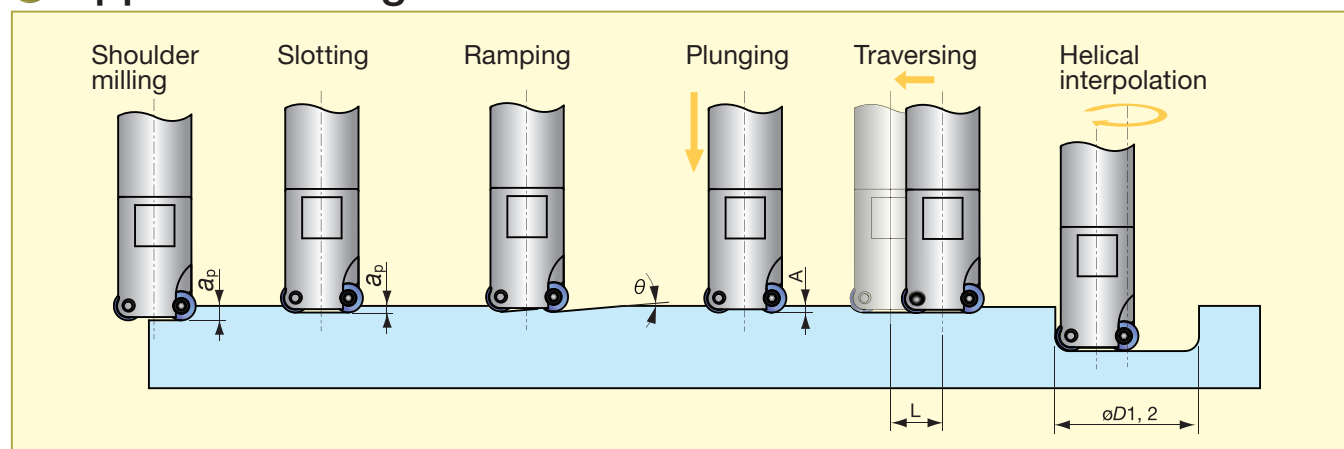


Cat. No.	Accuracy	Honing	Grades	Dimensions (mm)		Applicable Cutter
			Coated	a	T	
RDMW0702M0	M	with	●	7.0	2.38	HWD07R...

● : Stocked items



● Application range



Cat. No.	Tool- ϕ ϕD_c (mm)	Max. depth of cut a_p (mm)	Max. ramping angle θ	Max. plunging A (mm)	Machining length for removing uncut portion L (mm)	Max. machining ϕD_1 (mm)	*Max. machining ϕD_2 (mm)
HWD07R015MM08-03	15	3.5	25°	2	$\phi D_c - 6$	23	28
HWD07R020MM10-04	20	3.5	11°	2	$\phi D_c - 6$	33	38
HWD07R025MM12-05	25	3.5	7°	2	$\phi D_c - 6$	43	48
HWD07R030MM16-05	30	3.5	5.5°	2	$\phi D_c - 6$	53	58

*For flat bottom hole

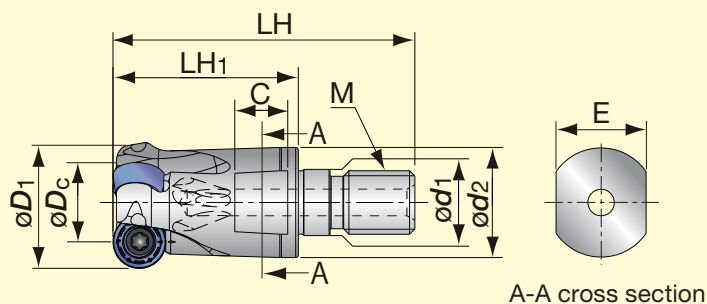
● Standard cutting conditions

ISO	Workpiece material	Hardness	Grade	Cutting speed V_c (m/min)	Feed per tooth f_z (mm/t)	Max. depth of cut: a_p (mm)	
						$\phi 15 - \phi 20$	$\phi 25 - \phi 30$
	Carbon steels (S15C, SS400 etc.)	< 300HB	AH120	200 - 500	0.15 - 0.45	0.7	1.0
P	Carbon steels, alloyed steels (S55C, SCM440 etc.)	< 300HB	AH120	120 - 350	0.15 - 0.35	0.7	1.0
	Tool steels (SKD61 etc.)	< 300HB	AH120	100 - 300	0.1 - 0.3	0.7	1.0
K	Grey cast irons (FC250, FC300 / GG25, GG30 etc.)	150 - 250HB	AH120	200 - 500	0.2 - 0.5	0.7	1.0
	Ductile cast irons (FCD400 / GGG40 etc.)	150 - 250HB	AH120	160 - 400	0.2 - 0.5	0.7	1.0
H	Hard materials steels	< 40HRC	AH120	70 - 200	0.1 - 0.25	0.7	1.0

FIXRMILL

HRP10, 12 type

Cutter



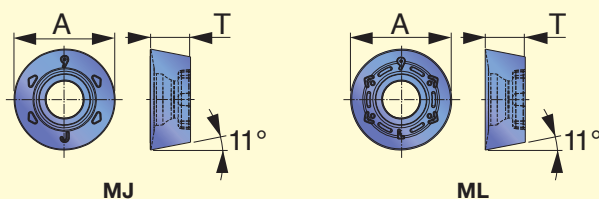
HRP10: Max. ap = 5 mm
HRP12: Max. ap = 6 mm

Parts

Description	Parts Cat. No.	
Applicable cutter	HRP10R...	HRP12R...
Clamping screw	CSPB-3.5S	CSTR-4L100
Wrench	Bit	BLD IP15/S7
	Grip	H-TBS

Cat. No.	Stock	No. of Inserts	Dimensions (mm)									Weight (kg)	Air hole	Applicable Insert
			øD1	øDc	LH	LH1	C	E	ød1	ød2	M			
HRP10R020MM10-02	●	2	20	10	49	30	10	15	10.5	17.8	M10	0.1	with	RPMT10T3EN-M*
HRP10R025MM12-02	●	2	25	15	57	35	10	17	12.5	20.8	M12	0.1	with	RPMT10T3EN-M*
HRP10R032MM16-04	●	4	32	22	63	40	12	22	17.0	28.8	M16	0.2	with	RPMT10T3EN-M*
HRP12R025MM12-02	★	2	25	13	57	35	10	17	12.5	20.8	M12	0.2	with	RPMT1204EN-M*
HRP12R032MM16-03	●	3	32	20	63	40	12	22	17.0	28.8	M16	0.2	with	RPMT1204EN-M*

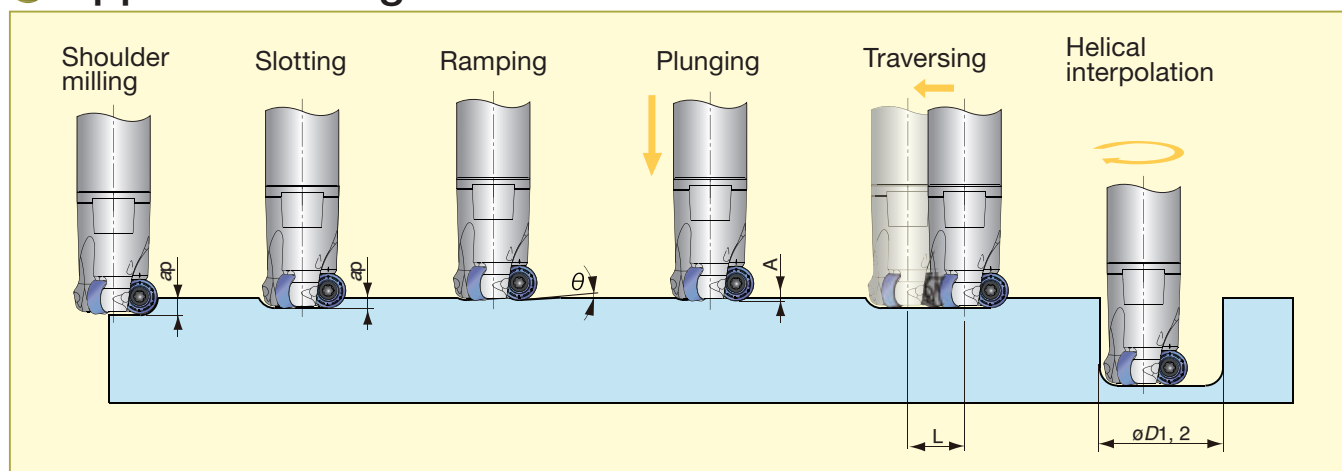
Inserts



Cat. No.	Accuracy	Honing	Grades			Dimensions (mm)		Applicable Cutter
			Coated					
			AH725	AH4035	AH130	A	T	
RPMT10T3EN-MJ	M	with	●	●	●	10	3.97	HRP10R...
RPMT10T3EN-ML	M	with	●	●	●	10	3.97	HRP10R...
RPMT1204EN-MJ	M	with	●	●	●	12	4.76	HRP12R...
RPMT1204EN-ML	M	with	●	●	●	12	4.76	HRP12R...

● : Stocked items
★ : Available in 2014

● Application range



Cat. No.	Tool- ϕ ϕD_c (mm)	Max. depth of cut a_p (mm)	Max. ramping angle θ	Max. plunging A (mm)	Machining length for removing uncut portion L (mm)	Min. machining $\phi D1$ (mm)	*Max. machining $\phi D2$ (mm)
HRP10R020MM10-02	20	5	2.2°	0.3	12	27	40
HRP10R025MM12-02	25	5	3.4°	0.7	16	35	50
HRP12R025MM12-02	25	6	4.4°	0.7	14	33	50
HRP10R032MM16-04	32	5	8°	2.5	23	46	64
HRP12R032MM16-03	32	6	8°	2	21	55	64

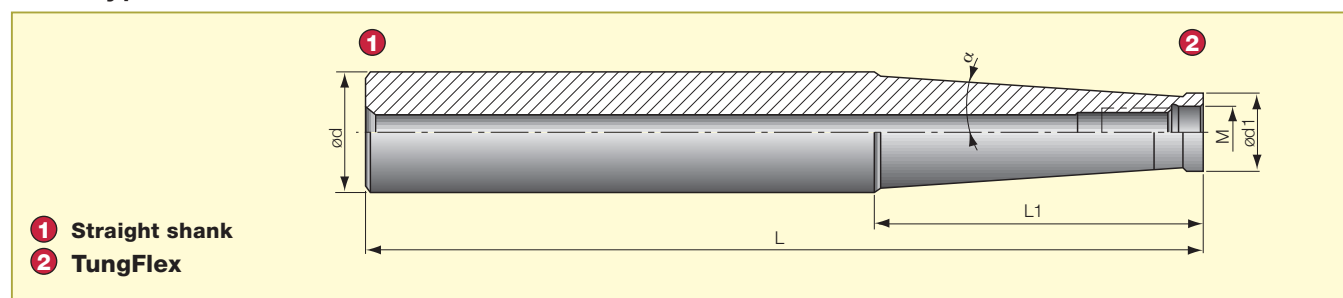
*For flat bottom hole

● Standard cutting conditions

ISO	Workpiece material	Hardness	Priority	Grade	Chip-breaker	Cutting speed V_c (m/min)	Feed per tooth f_z (mm/t)
P	Carbon steels (S15C, SS400 etc.)	< HB300	First choice	AH725	MJ	120 - 250	0.3 - 0.7
		< HB300	Toughness	AH130	MJ	120 - 250	0.3 - 0.7
	Carbon steels, alloyed steels (S55C, SCM440 etc.)	< HB300	First choice	AH725	MJ	100 - 250	0.2 - 0.6
		< HB300	Toughness	AH130	MJ	100 - 250	0.2 - 0.6
	Tool steels (SKD61 etc.)	< HB300	-	AH725	ML	80 - 180	0.2 - 0.4
M	Austenitic Stainless steels (SUS304 / X5CrNi18-9 etc.)	-	First choice	AH130	ML	100 - 250	0.2 - 0.6
		-	Toughness	AH130	MJ	100 - 250	0.2 - 0.6
	Martensitic Stainless steels (SUS420J / X20Cr13 etc.)	-	First choice	AH4035	ML	100 - 300	0.2 - 0.6
		-	Toughness	AH4035	MJ	100 - 300	0.2 - 0.6
K	Grey cast irons (FC250, FC300 / GG25, GG30 etc.)	150 - 250HB	-	AH725	ML	120 - 250	0.3 - 0.7
	Ductile cast irons (FCD400 / GGG40 etc.)	150 - 250HB	--	AH725	ML	100 - 200	0.3 - 0.7
H	Hard materials steels	< 40HRC		AH725	MJ	60 - 140	0.1 - 0.3
		50 - 60HRC	-	AH725	MJ	20 - 60	0.05 - 0.2

TUNGFLEX Steel shank series

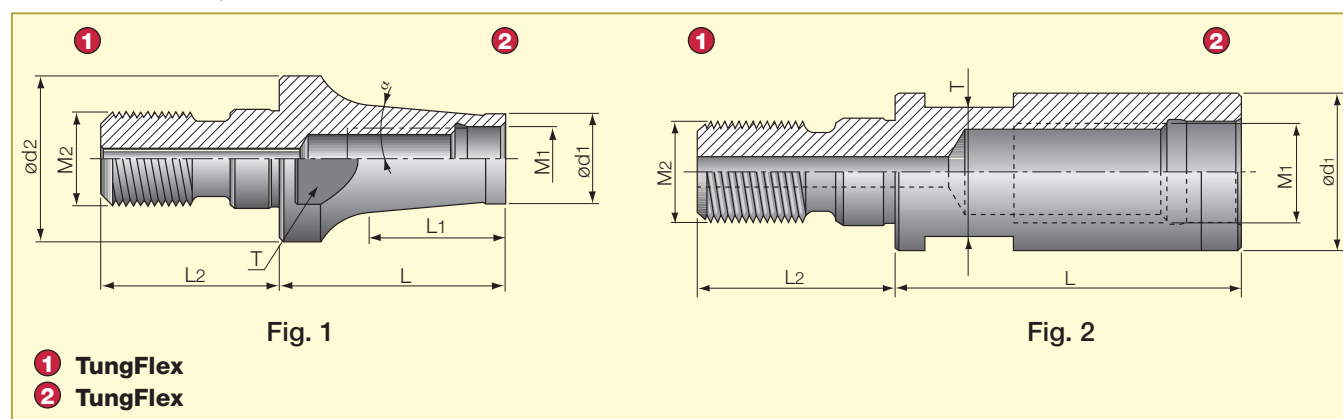
SM type



Cat. No.	Stock	Dimensions (mm)						Shank type
		L	L ₁	ød	ød ₁	M	α	
SM06-L60C10		60	20.0	10.0	9.7	M6	0°	Straight
SM06-L105-C12		105	60.0	12.0	9.7	M6	1.2°	Straight
SM06-L125-C16		125	60.0	16.0	9.7	M6	3.3°	Straight
SM08-L73C16	●	73	25.0	16.0	13.0	M8	0°	Straight
SM08-L128-C16	●	128	80.0	16.0	13.0	M8	0.9°	Straight
SM08-L170-C20	●	170	66.8	20.0	13.0	M8	3.3°	Straight
SM10-L80-C20	●	80	30.0	20.0	18.0	M10	0°	Straight
SM10-L130-C20	●	130	80.0	20.0	18.0	M10	0.6°	Straight
SM10-L200-C25	●	200	57.2	25.0	19.0	M10	3.3°	Straight
SM12-L86-C25	●	86	30.0	25.0	21.0	M12	5.1°	Straight
SM12-L200-C32	●	200	78.0	32.0	21.0	M12	4.4°	Straight
SM16-L95-C32	●	95	35.0	32.0	29.0	M16	1.7°	Straight
SM16-L230-C32	●	230	50.0	32.0	29.0	M16	1.8°	Straight

Note: All of the shanks have coolant holes.

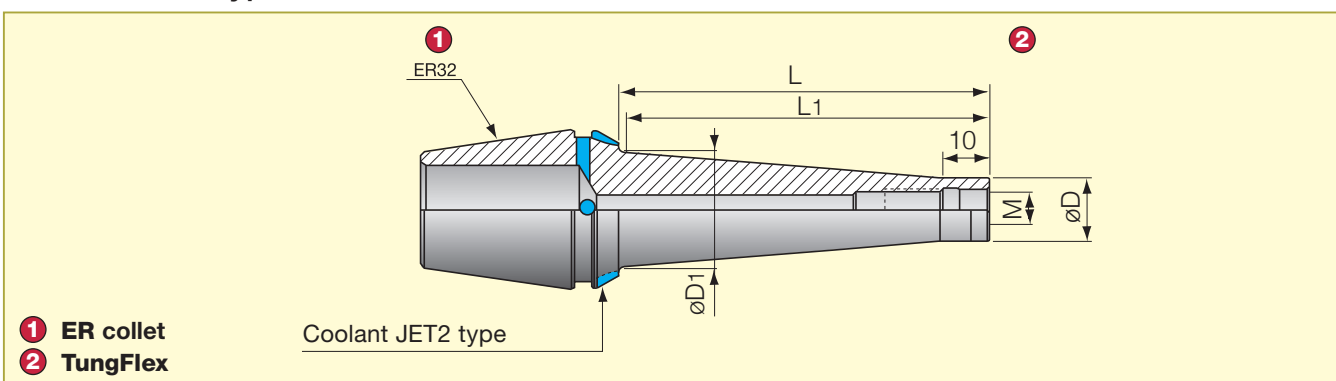
CAB M-M, CAB-M-C type



Cat. No.	Stock	Dimensions (mm)								
		M1	ød ₁	L	L ₁	M2	ød ₂	L ₂	T	Fig.
CABM06M06-C ⁽¹⁾		M6	9.8	25	-	M6	-	14.5	8.00	2
CABM06M08		M6	9.7	30	24.8	M8	13	17.5	9.50	1
CABM08M08-C ⁽¹⁾		M8	13.0	30	-	M8	-	17.5	9.60	2
CABM08M10		M8	13.0	40	33.4	M10	18	20.0	15.00	1
CABM10M10-C ⁽¹⁾		M10	18.0	35	-	M10	-	20.0	15.00	2
CABM10M10/15.8-C ⁽¹⁾		M10	15.8	35	-	M10	-	20.0	12.75	2
CABM10M12		M10	18.0	45	36.4	M12	21	22.0	17.00	1
CABM12M12-C ⁽¹⁾		M12	21.0	40	-	M12	-	22.0	17.00	2
CABM12M16		M12	21.0	50	42.5	M16	29	25.0	25.00	1
CABM16M16-C ⁽¹⁾		M16	29.0	40	-	M16	-	25.0	25.00	2

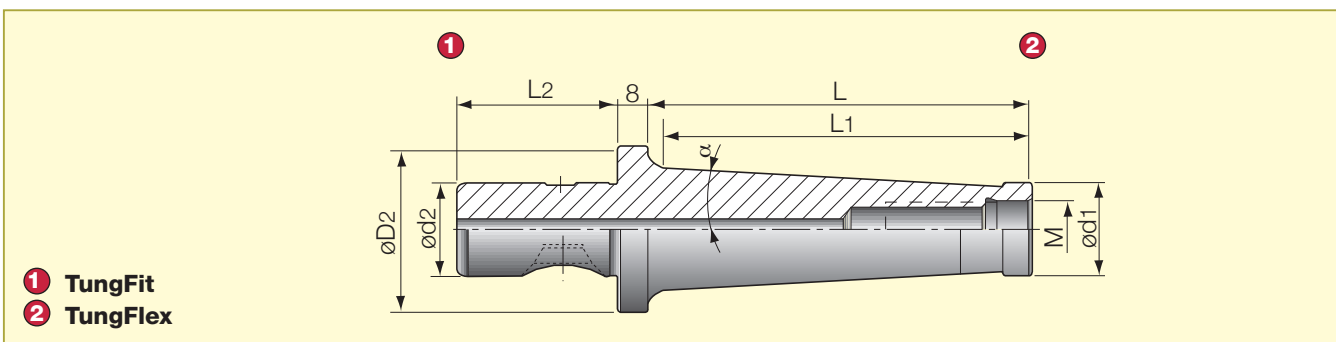
⁽¹⁾ With coolant holes.

ER collet type



Cat. No.	Stock	Dimensions (mm)				
		M	øD	øD1	L	L1
ER32ODPM8X25		M8	13.1	15	25	22
ER32ODPM8X50		M8	13.1	23	50	49
ER32ODPM8X75		M8	13.1	23	75	74
ER32ODPM10X25		M10	18.0	20	25	23
ER32ODPM10X50		M10	18.0	24	50	49
ER32ODPM12X25		M12	21.0	24	25	24
ER32ODPM12X50		M12	21.0	24	50	49

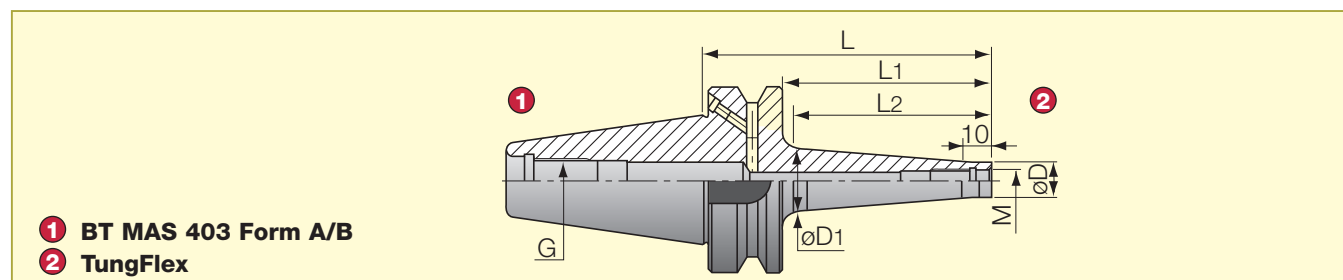
S M-CF type



Cat. No.	Stock	Dimensions (mm)							
		L	L1	ød1	M	ød2	øD2	L2	α
SM12-L85/3.30-CF4		93	81.3	21	M12	25	44	42	4.4°
SM16-L130/5.11-CF4		138	126.8	29	M16	25	44	42	2.6°
SM12-L140/5.50-CF4		148	139.1	21	M12	25	44	42	4.4°
SM16-L170/6.70-CF4		178	168.6	29	M16	25	44	42	2.0°

TUNGFLEX Arbor / Holder

BT-ODP type



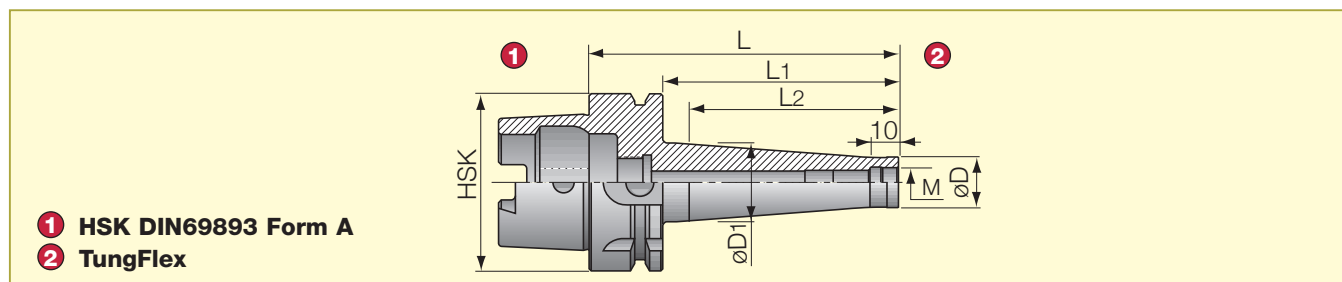
Cat. No.	Stock	Dimensions (mm)						
		M	øD	øD1	L	L1	L2	G
BT40ODP6X66		M6	9.8	13.0	66	39	30	M16
BT40ODP6X106		M6	9.8	23.0	106	79	70	M16
BT40ODP8X66	●	M8	13.0	15.0	66	39	30	M16
BT40ODP8X106		M8	13.0	23.0	106	79	70	M16
BT40ODP10X66	●	M10	18.0	20.0	66	39	30	M16
BT40ODP10X106		M10	18.0	28.0	106	79	70	M16
BT40ODP12X66	●	M12	21.0	24.0	66	39	30	M16
BT40ODP12X106		M12	21.0	31.0	106	79	70	M16
BT40ODP16X66	●	M16	29.0	28.6	66	39	-	M16
BT40ODP16X106		M16	29.0	34.0	106	79	70	M16
BT50ODP12X94		M12	23.0	30.0	94	56	50	M24
BT50ODP12X144 ⁽¹⁾		M12	23.0	40.0	144	106	100	M24
BT50ODP12X194 ⁽¹⁾		M12	23.0	40.0	194	156	150	M24
BT50ODP12X244 ⁽¹⁾		M12	23.0	46.0	244	206	200	M24
BT50ODP16X94 ⁽¹⁾		M16	29.0	34.0	94	56	50	M24
BT50ODP16X144 ⁽¹⁾		M16	29.0	40.0	144	106	100	M24
BT50ODP16X194 ⁽¹⁾		M16	29.0	55.0	194	156	150	M24
BT50ODP16X244 ⁽¹⁾		M16	29.0	60.0	244	206	200	M24

⁽¹⁾ Balanced to G6.3 at max. n : 12,000 min⁻¹



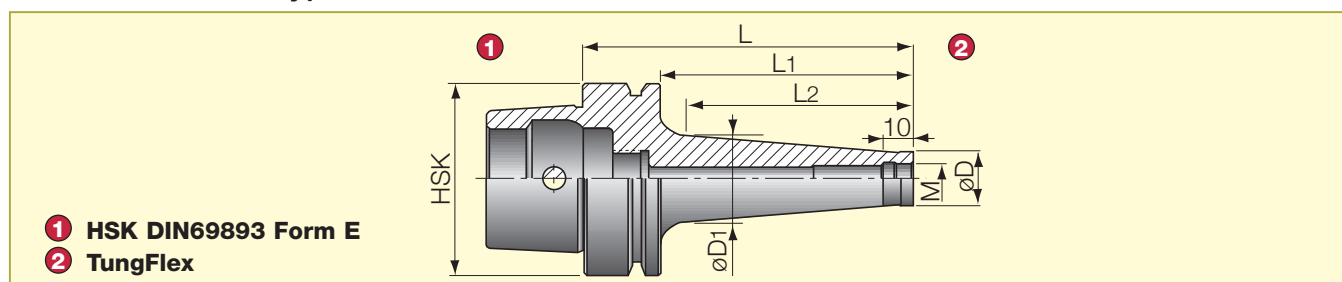
● : Stocked items

HSK A-ODP type



Cat. No.	Stock	Dimensions (mm)						
		HSK	M	øD	øD1	L	L1	L2
HSKA63ODP6X59		63	M6	9.70	10.0	59	33	25
HSKA63ODP6X109		63	M6	9.80	23.0	109	83	75
HSKA63ODP8X 59	●	63	M8	13.1	15.0	59	33	25
HSKA63ODP8X109		63	M8	13.1	23.0	109	83	75
HSKA63ODP10X59	●	63	M10	18.0	20.0	59	33	25
HSKA63ODP10X109		63	M10	18.0	28.0	109	83	75
HSKA63ODP12X59	●	63	M12	21.0	24.0	59	33	25
HSKA63ODP12X109		63	M12	21.0	31.0	109	83	75
HSKA63ODP16X59	●	63	M16	29.0	34.0	59	33	25
HSKA63ODP16X109		63	M16	29.0	34.0	109	83	75
HSKA100ODP12X87		100	M12	23.0	30.0	87	58	50
HSKA100ODP12X137		100	M12	23.0	30.0	137	108	100
HSKA100ODP12X187		100	M12	23.0	40.0	187	158	150
HSKA100ODP12X237		100	M12	23.0	46.0	237	208	200
HSKA100ODP16X87		100	M16	29.0	31.5	87	58	50
HSKA100ODP16X137		100	M16	29.0	41.5	137	108	100
HSKA100ODP16X187		100	M16	29.0	55.0	187	158	150
HSKA100ODP16X237		100	M16	29.0	55.0	237	208	200

HSK E-ODP type



Cat. No.	Stock	Dimensions (mm)						
		HSK	M	øD	øD1	L	L1	L2
HSKE40ODP10X53		40	M10	18	20	53	33	25
HSKE40ODP10X103		40	M10	18	28	103	83	75
HSKE40ODP12X53		40	M12	21	24	53	33	25
HSKE40ODP12X103		40	M12	21	31	103	83	75
HSKE50ODP10X59		50	M10	18	20	59	33	25
HSKE50ODP10X109		50	M10	18	28	109	83	75
HSKE50ODP12X59		50	M12	21	24	59	33	25
HSKE50ODP12X109		50	M12	21	31	109	83	75
HSKE50ODP16X59		50	M16	29	34	59	33	25
HSKE50ODP16X109		50	M16	29	34	109	83	75
HSKE63ODP10X59		63	M10	18	20	59	33	25
HSKE63ODP10X109		63	M10	18	28	109	83	75
HSKE63ODP12X59		63	M12	21	24	59	33	25
HSKE63ODP12X109		63	M12	21	31	109	83	75
HSKE63ODP16X59		63	M16	29	34	59	33	25
HSKE63ODP16X109		63	M16	29	34	109	83	75

RED screw arbor

(Manufactured by MST corporation)

- Integrated arbors with carbide shank
- Optimum design with high rigidity using cemented carbide
- Slipping of shank at high torque is arrested, due to integrated structure of shank with the arbor.
- Chatter free stable machining is possible even at long overhang.

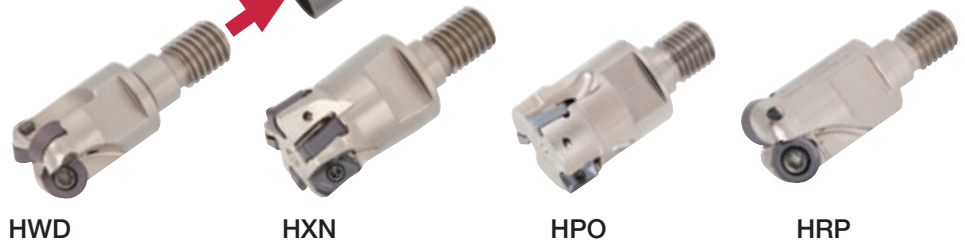


Provides the highest performance of indexable head tools

Arbors for indexable cutter heads

Integrated arbors with carbide shank

All types of cutter heads can be connected



HWD

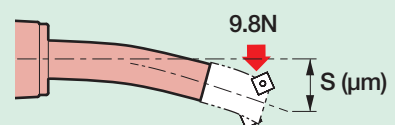
HXN

HPO

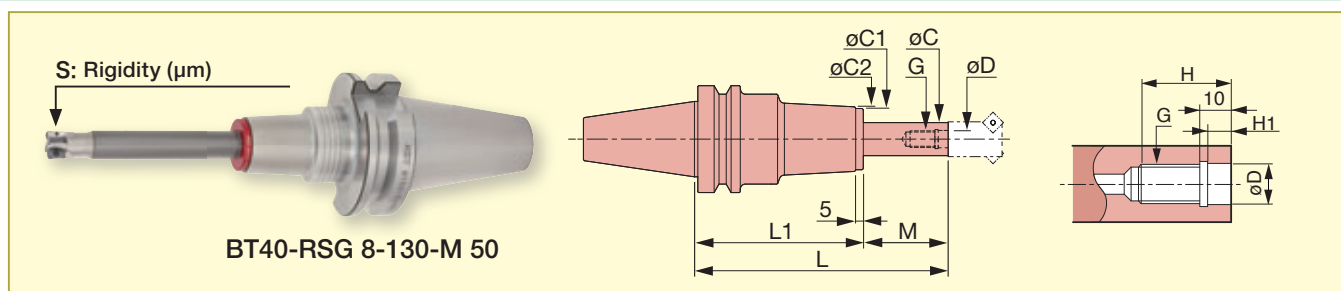
HRP

“S” Index of rigidity

“S” shows the deflection value at the top of tool when working 9.8N load. Smaller value means higher rigidity.

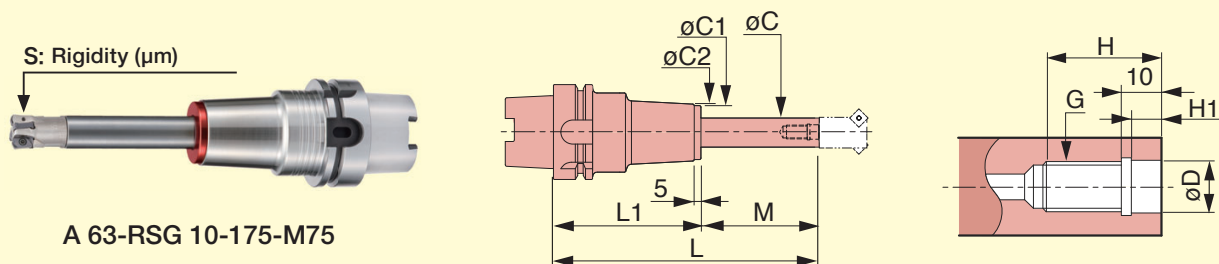


Manufactured by: **MST** corporation



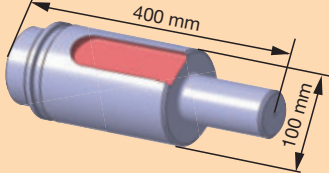
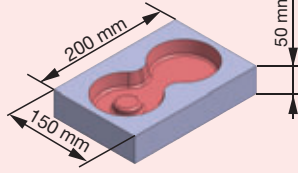
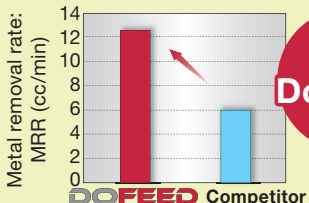
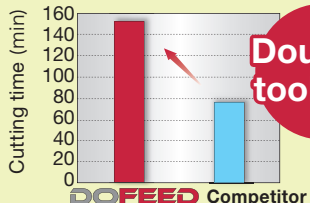
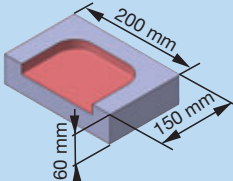
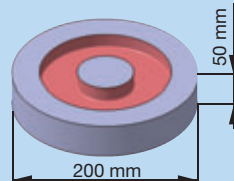
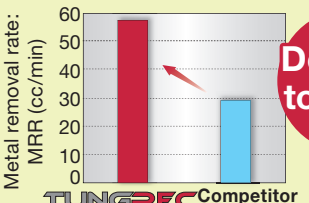
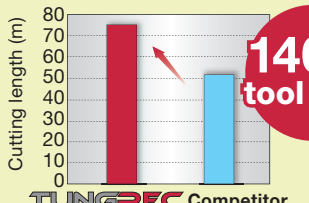
Cat. No.	G	Dimensions (mm)									Rigidity S (μm)	Weight (kg)
		øD	H	H1	øC	L	M	L1	øC1	øC2		
BT40-RSG 8-105-M 25	M8	8.5	18	6.5	15	105	25	80	30	32	0.6	1.4
BT40-RSG 8-135-M 25	M8	8.5	18	6.5	15	135	25	110	30	32	0.7	1.8
BT40-RSG 8-130-M 50	M8	8.5	18	6.5	15	130	50	80	30	32	1.5	1.4
BT40-RSG 8-160-M 50	M8	8.5	18	6.5	15	160	50	110	30	32	1.7	1.8
BT40-RSG 8-155-M 75	M8	8.5	18	6.5	15	155	75	80	30	32	3.1	1.5
BT40-RSG 8-185-M 75	M8	8.5	18	6.5	15	185	75	110	30	32	3.4	1.9
BT40-RSG 8-165-M 85	M8	8.5	18	6.5	15	165	85	80	30	32	4.0	1.5
BT40-RSG 10-125-M 25	M10	10.5	22	6.5	19	125	25	100	36	38	0.4	1.8
BT40-RSG 10-155-M 25	M10	10.5	22	6.5	19	155	25	130	36	38	0.5	2.2
BT40-RSG 10-150-M 50	M10	10.5	22	6.5	19	150	50	100	36	38	0.9	1.9
BT40-RSG 10-180-M 50	M10	10.5	22	6.5	19	180	50	130	36	38	1.0	2.3
BT40-RSG 10-175-M 75	M10	10.5	22	6.5	19	175	75	100	36	38	1.6	2.0
BT40-RSG 10-205-M 75	M10	10.5	22	6.5	19	205	75	130	36	38	1.8	2.4
BT40-RSG 10-200-M100	M10	10.5	22	6.5	19	200	100	100	36	38	2.8	2.0
BT40-RSG 10-230-M100	M10	10.5	22	6.5	19	230	100	130	36	38	3.0	2.4
BT40-RSG 12-125-M 25	M12	12.5	22	6	24	125	25	100	43	45	0.3	2.0
BT40-RSG 12-155-M 25	M12	12.5	22	6	24	155	25	130	43	45	0.4	2.4
BT40-RSG 12-150-M 50	M12	12.5	22	6	24	150	50	100	43	45	0.5	2.1
BT40-RSG 12-180-M 50	M12	12.5	22	6	24	180	50	130	43	45	0.7	2.5
BT40-RSG 12-175-M 75	M12	12.5	22	6	24	175	75	100	43	45	0.9	2.3
BT40-RSG 12-205-M 75	M12	12.5	22	6	24	205	75	130	43	45	1.1	2.7
BT40-RSG 12-200-M100	M12	12.5	22	6	24	200	100	100	43	45	1.4	2.4
BT40-RSG 12-230-M100	M12	12.5	22	6	24	230	100	130	43	45	1.6	2.8
BT50-RSG 8-120-M 25	M8	8.5	18	6.5	15	120	25	95	30	32	0.6	4.0
BT50-RSG 8-150-M 25	M8	8.5	18	6.5	15	150	25	125	30	32	0.7	4.3
BT50-RSG 8-145-M 50	M8	8.5	18	6.5	15	145	50	95	30	32	1.5	4.0
BT50-RSG 8-175-M 50	M8	8.5	18	6.5	15	175	50	125	30	32	1.7	4.3
BT50-RSG 8-170-M 75	M8	8.5	18	6.5	15	170	75	95	30	32	3.0	4.1
BT50-RSG 8-200-M 75	M8	8.5	18	6.5	15	200	75	125	30	32	3.3	4.4
BT50-RSG 8-180-M 85	M8	8.5	18	6.5	15	180	85	95	30	32	3.9	4.1
BT50-RSG 10-140-M 25	M10	10.5	22	6.5	19	140	25	115	36	38	0.4	4.3
BT50-RSG 10-170-M 25	M10	10.5	22	6.5	19	170	25	145	36	38	0.5	4.6
BT50-RSG 10-165-M 50	M10	10.5	22	6.5	19	165	50	115	36	38	0.8	4.4
BT50-RSG 10-195-M 50	M10	10.5	22	6.5	19	195	50	145	36	38	0.9	4.7
BT50-RSG 10-190-M 75	M10	10.5	22	6.5	19	190	75	115	36	38	1.6	4.5
BT50-RSG 10-220-M 75	M10	10.5	22	6.5	19	220	75	145	36	38	1.7	4.8
BT50-RSG 10-215-M100	M10	10.5	22	6.5	19	215	100	115	36	38	2.7	4.5
BT50-RSG 10-245-M100	M10	10.5	22	6.5	19	245	100	145	36	38	2.9	4.8
BT50-RSG 12-140-M 25	M12	12.5	22	6	24	140	25	115	43	45	0.2	4.6
BT50-RSG 12-170-M 25	M12	12.5	22	6	24	170	25	145	43	45	0.3	5.0
BT50-RSG 12-165-M 50	M12	12.5	22	6	24	165	50	115	43	45	0.5	4.7
BT50-RSG 12-195-M 50	M12	12.5	22	6	24	195	50	145	43	45	0.6	5.1
BT50-RSG 12-190-M 75	M12	12.5	22	6	24	190	75	115	43	45	0.8	4.9
BT50-RSG 12-220-M 75	M12	12.5	22	6	24	220	75	145	43	45	1.0	5.3
BT50-RSG 12-215-M100	M12	12.5	22	6	24	215	100	115	43	45	1.3	5.0
BT50-RSG 12-245-M100	M12	12.5	22	6	24	245	100	145	43	45	1.5	5.4
BT50-RSG 12-240-M125	M12	12.5	22	6	24	240	125	115	43	45	2.0	5.2
BT50-RSG 16-140-M 25	M16	17	25	6	29	140	25	115	52	54	0.2	5.4
BT50-RSG 16-165-M 50	M16	17	25	6	29	165	50	115	52	54	0.3	5.6
BT50-RSG 16-190-M 75	M16	17	25	6	29	190	75	115	52	54	0.5	5.8
BT50-RSG 16-215-M100	M16	17	25	6	29	215	100	115	52	54	0.7	6.0
BT50-RSG 16-240-M125	M16	17	25	6	29	240	125	115	52	54	1.1	6.2

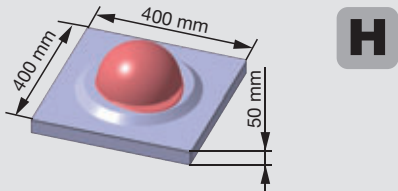
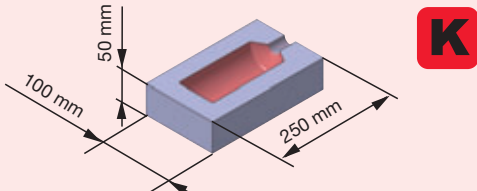
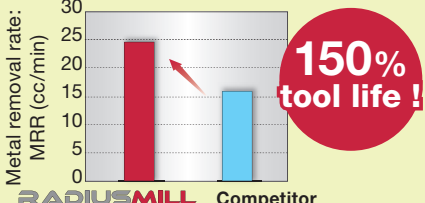
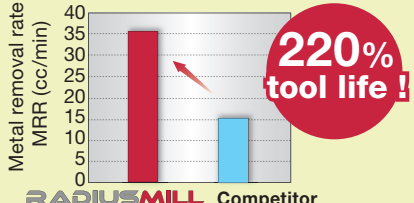
RED screw arbor



Cat. No.	G	Dimensions (mm)									Rigidity S (µm)	Weight (kg)
		øD	H	H1	øC	L	M	L1	øC1	øC2		
A 63-RSG 8-105-M25	M 8	8.5	18	6.5	15	105	25	80	30	32	0.6	1.3
A 63-RSG 8-135-M25	M 8	8.5	18	6.5	15	135	25	110	30	32	0.7	1.4
A 63-RSG 8-130-M50	M 8	8.5	18	6.5	15	130	50	80	30	32	1.5	1.3
A 63-RSG 8-160-M50	M 8	8.5	18	6.5	15	160	50	110	30	32	1.7	1.4
A 63-RSG 8-155-M75	M 8	8.5	18	6.5	15	155	75	80	30	32	3.1	1.4
A 63-RSG 8-185-M75	M 8	8.5	18	6.5	15	185	75	110	30	32	3.4	1.5
A 63-RSG 10-125-M25	M10	10.5	22	6.5	19	125	25	100	36	38	0.4	1.6
A 63-RSG 10-155-M25	M10	10.5	22	6.5	19	155	25	130	36	38	0.5	1.9
A 63-RSG 10-150-M50	M10	10.5	22	6.5	19	150	50	100	36	38	0.8	1.7
A 63-RSG 10-180-M50	M10	10.5	22	6.5	19	180	50	130	36	38	1.0	2.0
A 63-RSG 10-175-M75	M10	10.5	22	6.5	19	175	75	100	36	38	1.6	1.8
A 63-RSG 10-205-M75	M10	10.5	22	6.5	19	205	75	130	36	38	1.8	2.1
A 63-RSG 10-200-M100	M10	10.5	22	6.5	19	200	100	100	36	38	2.7	1.8
A 63-RSG 10-230-M100	M10	10.5	22	6.5	19	230	100	130	36	38	2.9	2.1
A 63-RSG 12-125-M25	M12	12.5	22	6	24	125	25	100	43	45	0.3	1.9
A 63-RSG 12-155-M25	M12	12.5	22	6	24	155	25	130	43	45	0.4	2.3
A 63-RSG 12-150-M50	M12	12.5	22	6	24	150	50	100	43	45	0.5	2.0
A 63-RSG 12-180-M50	M12	12.5	22	6	24	180	50	130	43	45	0.6	2.4
A 63-RSG 12-175-M75	M12	12.5	22	6	24	175	75	100	43	45	0.9	2.2
A 63-RSG 12-205-M75	M12	12.5	22	6	24	205	75	130	43	45	1.0	2.6
A 63-RSG 12-200-M100	M12	12.5	22	6	24	200	100	100	43	45	1.4	2.3
A 63-RSG 12-230-M100	M12	12.5	22	6	24	230	100	130	43	45	1.6	2.7
A100-RSG 8-120-M25	M 8	8.5	18	6.5	15	120	25	95	30	32	0.6	2.6
A100-RSG 8-150-M25	M 8	8.5	18	6.5	15	150	25	125	30	32	0.8	2.9
A100-RSG 8-145-M50	M 8	8.5	18	6.5	15	145	50	95	30	32	1.5	2.6
A100-RSG 8-175-M50	M 8	8.5	18	6.5	15	175	50	125	30	32	1.7	2.9
A100-RSG 8-170-M75	M 8	8.5	18	6.5	15	170	75	95	30	32	3.1	2.7
A100-RSG 8-200-M75	M 8	8.5	18	6.5	15	200	75	125	30	32	3.4	3.0
A100-RSG 10-140-M25	M10	10.5	22	6.5	19	140	25	115	36	38	0.4	3.1
A100-RSG 10-170-M25	M10	10.5	22	6.5	19	170	25	145	36	38	0.5	3.5
A100-RSG 10-165-M50	M10	10.5	22	6.5	19	165	50	115	36	38	0.8	3.2
A100-RSG 10-195-M50	M10	10.5	22	6.5	19	195	50	145	36	38	1.0	3.6
A100-RSG 10-190-M75	M10	10.5	22	6.5	19	190	75	115	36	38	1.6	3.3
A100-RSG 10-220-M75	M10	10.5	22	6.5	19	220	75	145	36	38	1.8	3.7
A100-RSG 10-215-M100	M10	10.5	22	6.5	19	215	100	115	36	38	2.7	3.3
A100-RSG 10-245-M100	M10	10.5	22	6.5	19	245	100	145	36	38	2.9	3.7
A100-RSG 12-140-M25	M12	12.5	22	6	24	140	25	115	43	45	0.3	3.4
A100-RSG 12-170-M25	M12	12.5	22	6	24	170	25	145	43	45	0.4	3.7
A100-RSG 12-165-M50	M12	12.5	22	6	24	165	50	115	43	45	0.5	3.5
A100-RSG 12-195-M50	M12	12.5	22	6	24	195	50	145	43	45	0.6	3.8
A100-RSG 12-190-M75	M12	12.5	22	6	24	190	75	115	43	45	0.8	3.7
A100-RSG 12-220-M75	M12	12.5	22	6	24	220	75	145	43	45	1.0	4.0
A100-RSG 12-215-M100	M12	12.5	22	6	24	215	100	115	43	45	1.4	3.8
A100-RSG 12-245-M100	M12	12.5	22	6	24	245	100	145	43	45	1.6	4.1
A100-RSG 12-240-M125	M12	12.5	22	6	24	240	125	115	43	45	2.1	4.0
A100-RSG 16-140-M25	M16	17	25	6	29	140	25	115	52	54	0.2	4.1
A100-RSG 16-165-M50	M16	17	25	6	29	165	50	115	52	54	0.3	4.3
A100-RSG 16-190-M75	M16	17	25	6	29	190	75	115	52	54	0.5	4.5
A100-RSG 16-215-M100	M16	17	25	6	29	215	100	115	52	54	0.8	4.7
A100-RSG 16-240-M125	M16	17	25	6	29	240	125	115	52	54	1.1	4.9

Practical examples

Workpiece type		Shaft	Die & mould
Cutter		HXN03R032MM16-06 ($\phi 32$, $z = 6$)	HXN03R020MM10-04 ($\phi 20$, $z = 4$)
Insert		LNMU0303ZER-ML	LNMU0303ZER-MJ
Grade		AH130	AH725
Workpiece material		Inconel 625	FCD600 / GGG60
			
Cutting conditions	Cutting speed: V_c (m/min)	35	190
	Feed per tooth: f_z (mm/t)	0.45	0.4
	Depth of cut: a_p (mm)	0.44	0.3
	Width of cut: a_e (mm)	30	9
	Method of machining	Slot milling	Pocket milling
	Coolant	Wet	Dry (air)
	Machine	Vertical M/C, BT50	Vertical M/C, BT40
Results		 DoFeed cutter provides double productivity. AH130 grade with high chipping resistance drastically prolongs the tool life.	 Due to the lower cutting forces, DoFeed cutter can increase productivity 4 times higher. AH725 grade can effectively reduce sudden fracture, achieving double tool life.
Workpiece type		Mould for injection	Machine part
Cutter		HPO07R020MM10-05 ($\phi 20$, $z = 5$)	HPO11R025MM12-03 ($\phi 25$, $z = 3$)
Insert		AOMT070208PDPR-HJ	ASMT11T308PDPR-MJ
Grade		AH725	AH120
Workpiece material		NAK50	S55C / C55
			
Cutting conditions	Cutting speed: V_c (m/min)	120	150
	Feed per tooth: f_z (mm/t)	0.4	0.1
	Depth of cut: a_p (mm)	0.5	6.0
	Width of cut: a_e (mm)	20	10
	Method of machining	Pocket milling	Square shoulder milling
	Coolant	Dry (air)	Dry (air)
	Machine	Vertical M/C, BT40	Vertical M/C, BT50
Results		 The combination of HJ insert and high density cutter drastically improves productivity. Lower cutting forces reduce chattering.	 MJ insert with lower cutting force effectively reduces chattering and chipping on edges, prolonging the tool life.

Workpiece type		Mould for pressing	Mould for casting
Cutter		HWD07R030MM16-05 ($\phi 30$, $z = 5$)	HWD07R015MM08-03 ($\phi 15$, $z = 3$)
Insert		RDMW0702M0	RDMW0702M0
Grade		AH120	AH120
Workpiece material		SKD11 / X153CrMoV12	FC250 / GG25
			
Cutting conditions	Cutting speed: V_c (m/min)	80	250
	Feed per tooth: f_z (mm/t)	0.2	0.3
	Depth of cut: a_p (mm)	0.8	0.5
	Width of cut: a_e (mm)	25	15
	Method of machining	Profiling	Pocket milling
	Coolant	Wet	Wet
	Machine	Vertical M/C, BT40	Vertical M/C, BT40
Results		 Due to lower cutting force, high density cutter can be applied, drastically improving productivity.	 AH120 grade, with high wear resistance, allows high cutting speed $V_c = 250$ m/min, improving productivity and tool life.





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