



Exchangeable Head End Mill

Vol 1

OSG PHOENIX[®] PXSH



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PHOENIX® PXM

PHOENIX® PXM is an exchangeable head mill series for superior surface finish and precision in a variety of applications.



For more information use your phone to scan the QR code to the right and visit: osgtool.com/pxm



List Numbers

NEW! 78PXSH - PHOENIX® PXSH Heads (Inch & Metric)
 78PXSE - PHOENIX® PXSE Heads (Inch & Metric)
 78PXSE-O - PHOENIX® PXSE Heads (Inch & Metric)
 78PXVC - PHOENIX® PXVC Heads (Inch & Metric)
 78PXSM - PHOENIX® PXSM Heads (Inch & Metric)
 78PXNL - PHOENIX® PXNL Heads (Inch & Metric)
 78PXNL-O - PHOENIX® PXNL Heads (Inch & Metric)
 78PXNH - PHOENIX® PXNH Heads (Inch & Metric)
 78PXNH-O - PHOENIX® PXNH Heads (Inch & Metric)
 78PXRE - PHOENIX® PXRE Heads (Inch & Metric)

78PXDR - PHOENIX® PXDR Heads (Inch & Metric)
 78PXBE - PHOENIX® PXBE Heads (Inch & Metric)
 78PXBE-O - PHOENIX® PXBE Heads (Inch & Metric)
 78PXBH - PHOENIX® PXBH Heads (Inch & Metric)
 52300 - PHOENIX® PXM SA/TPA (Inch)
 52319 - PHOENIX® PXM SA/TPA Coolant-Through (Inch)
 78108 - PHOENIX® PXM SS/TP (Metric)
 78035 - PHOENIX® PXM SS/TP Coolant-Through (Metric)
 78340 - PHOENIX® PXMC (Metric)
 78-8H - PHOENIX® PXM Accessories

Primary Applications

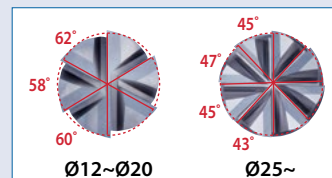
- Ideal for side milling and profile operations in a variety of materials including carbon steel, alloy steel, stainless steel, die steel and hardened steels.
- For high speed finishing in hardened steels.

Features & Product Solutions

AE-H Specification Adopted to PXM

Design

- Cutting edge geometry enables stable machining of high hardness steels
- Unequal flute spacing suppresses chatter during machining



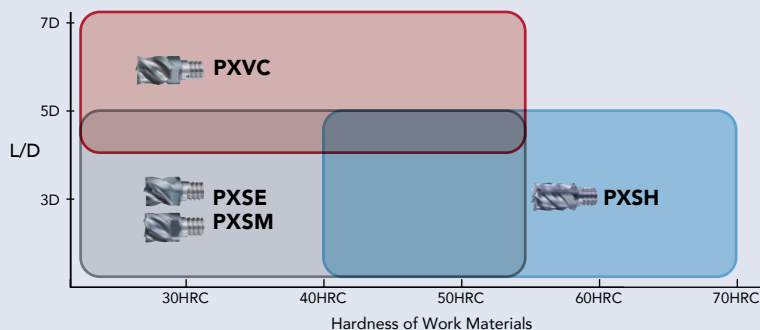
1xD Length of Cut

- Increased machining efficiency

DUROREY Coating

- Outstanding performance in high hardness steels due to its excellent toughness, high heat resistance and wear resistance.

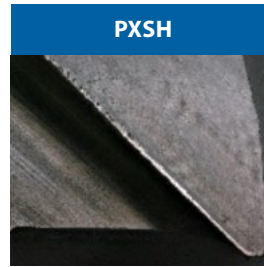
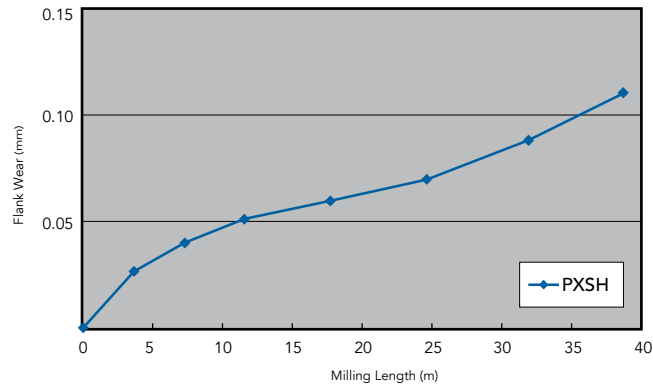
OSG PHOENIX® PXM Application Map for Steels



Stable & Durable in High Hardness Steel

SKH51 Tool Steel (65 HRC)

Tool	PXMZ-C16SS16-S100
Insert (Grade)	PXSH160C16-06R000 (XP6703)
Size	Ø16mm (6 Flutes)
Work Material	SKH51 (65 HRC)
Cutting Speed	196 SFM (1190 RPM)
Feed	26.9 IPM (0.004 ipt)
Depth of Cut	Aa = 0.567 in, Ar = 0.012 in
Milling Method	Side Milling
Overhang	48mm (L/D=3)
Coolant	Air
Machine	Vertical Machining Center

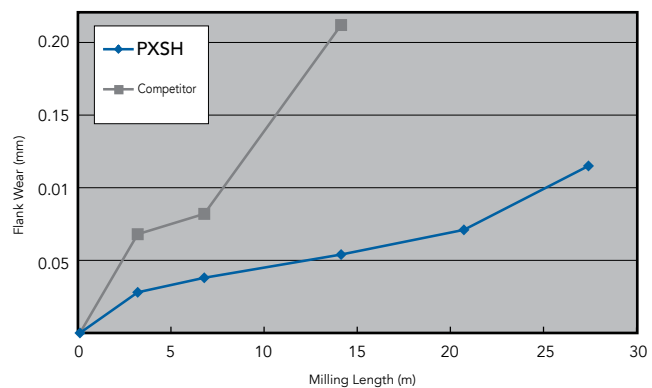


Wear condition of the cutting edge after milling 38.5m

Stable Wear Transition in High-Speed Machining

SKD11 Tool Steel (60 HRC)

Tool	PXMZ-C16SS16-S090CS
Insert (Grade)	PXSH160C16-06R000 (XP6703)
Size	Ø16mm (6 Flutes)
Work Material	SKD11 (60 HRC)
Cutting Speed	344 SFM (2090 RPM)
Feed	44.5 IPM (0.004 ipt)
Depth of Cut	Aa = 0.567 in, Ar = 0.009 in
Milling Method	Side Milling
Overhang	64mm (L/D=4)
Coolant	Air
Machine	Vertical Machining Center



Wear Condition of the Cutting Edge



List 78PXSH

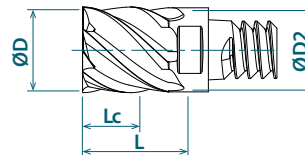
PXSH Exchangeable Heads (Inch & Metric) - Multiple Flutes, Square

NEW



SPEED
FEED
P11

Accessories: p10



EDP No.	Type	Designation	Head Dia.		No. of Flutes	Length of Cut		Overall Length		Flange Dia.		Helix Angle	Grade	Status
			D			Lc		L		D2				
			(mm)	(inch)		(mm)	(inch)	(mm)	(inch)	(mm)	(inch)			
52312000	PXSH	PXSH0500AC12-06R000	-	0.500	6	-	0.500	-	0.748	-	0.488	43°	XP6703	●
52312001		PXSH0625AC16-06R000	-	0.625	6	-	0.625	-	0.921	-	0.614	43°	XP6703	●
52312002		PXSH0750AC20-06R000	-	0.750	6	-	0.750	-	1.035	-	0.736	43°	XP6703	●
52312003		PXSH1000AC25-08R000	-	1.000	8	-	1.000	-	1.398	-	0.961	43°	XP6703	○
7830380		PXSH120C12-06R000	12	-	6	12	-	18	-	11.7	-	43°	XP6703	●
7830381		PXSH160C16-06R000	16	-	6	16	-	23.5	-	15.7	-	43°	XP6703	●
7830382		PXSH200C20-06R000	20	-	6	20	-	27.5	-	19.6	-	43°	XP6703	●
7830383		PXSH250C25-08R000	25	-	8	25	-	35	-	24	-	43°	XP6703	▲

Packed: 1 pc.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.

PXI



List 52300

PXM SA/TPA (inch)



Straight Shank

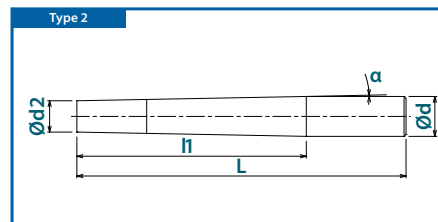
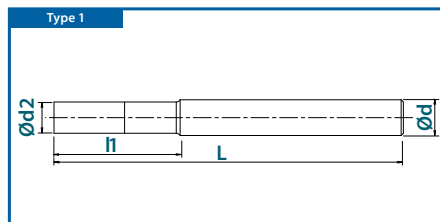


Tapered Shank

EDP No.	Body Type	Designation	Type	Neck Dia. (inch)	Shank Dia. (inch)	Taper	Overall Length (inch)	Neck Length (inch)	Applicable Head (inch)
				d2	d	α°	L	l1	
52300024	Cylindrical Shank Steel	PXMZ-C10SA0375-S300	1	0.366	0.375	-	3.000	1.000	0.375
52300000		PXMZ-C12SA0500-S400	1	0.488	0.500	-	4.000	0.750	0.500
52300001		PXMZ-C12TPA0750-S600	2	0.488	0.750	5°	6.000	2.000	0.625
52300002		PXMZ-C16SA0625-S400	1	0.613	0.625	-	4.000	1.000	
52300003		PXMZ-C16TPA1000-S650	2	0.613	1.000	5°	6.500	2.000	0.750
52300004		PXMZ-C20SA0750-S500	1	0.736	0.750	-	5.000	1.250	
52300005		PXMZ-C20TPA1250-S700	2	0.736	1.250	5°	7.000	2.750	1.000
52300006		PXMZ-C25SA1000-S550	1	0.960	1.000	-	5.500	1.500	
52300025		PXMZ-C32SA1250-S600	1	1.094	1.250	-	6.000	2.500	1.250
52300026	Cylindrical Shank Carbide	PXMZ-C10SA0375-S300CS	1	0.366	0.375	-	3.000	1.000	0.375
52300027		PXMZ-C10SA0375-L400CS	1	0.366	0.375	-	4.000	1.750	
52300028		PXMZ-C10TPA0500-LL500CS	2	0.366	0.375	1.4°	5.000	2.750	
52300007		PXMZ-C12SA0500-S300CS	1	0.488	0.500	-	3.000	1.000	0.500
52300008		PXMZ-C12SA0500-L400CS	1	0.488	0.500	-	4.000	1.750	
52300009		PXMZ-C12SA0500-L450CS	1	0.488	0.500	-	4.500	2.500	
52300010		PXMZ-C12TPA0625-LL550CS	2	0.488	0.625	1.5°	5.500	3.250	0.625
52300011		PXMZ-C16SA0625-S350CS	1	0.613	0.625	-	3.500	1.500	
52300012		PXMZ-C16SA0625-L550CS	1	0.613	0.625	-	5.500	2.500	
52300013		PXMZ-C16SA0625-L600CS	1	0.613	0.625	-	6.000	3.250	0.750
52300014		PXMZ-C16TPA0750-LL650CS	2	0.613	0.750	1.5°	6.500	4.500	
52300015		PXMZ-C20SA0750-S350CS	1	0.736	0.750	-	3.500	1.500	
52300016		PXMZ-C20SA0750-L600CS	1	0.736	0.750	-	6.000	3.000	1.000
52300017		PXMZ-C20SA0750-L700CS	1	0.736	0.750	-	7.000	4.250	
52300018		PXMZ-C20TPA1000-LL800CS	2	0.736	1.000	1.5°	8.000	5.500	
52300019		PXMZ-C25SA1000-L800CS	1	0.960	1.000	-	8.000	3.750	1.250
52300029		PXMZ-C32SA1250-L1000CS	1	1.094	1.250	-	10.000	6.500	

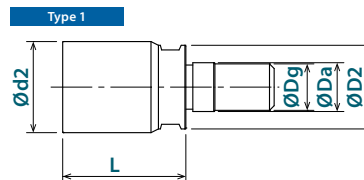
Packed: 1 pc.

Note: Wrench included with body.



List 52300

PXM SF Joint (Inch)

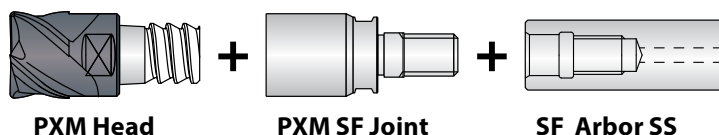


EDP No.	Body Type	Designation	Type	Neck Dia. (Inch)	Pilot Dia. (Inch)	Thread Dia. (mm)	Flange Dia. (Inch)	Overall Length (Inch)	Spanner Wrench	Applicable Head (inch)
				d2	Da	Dg	D2	L		
52300020	PXMJ (Joint)	PXMJ-AC12SF06	1	0.488	0.256	M6	0.433	0.709	PXMP8-10	0.500
52300021		PXMJ-AC16SF08		0.613	0.335	M8	0.571	0.858	PXMP13-16	0.625
52300022		PXMJ-AC20SF10		0.736	0.413	M10	0.707	1.043	PXMP13-16	0.750
52300023		PXMJ-AC25SF12		0.960	0.492	M12	0.905	1.338	PXMP21	1.000

Packed: 1 pc.

Note: Wrench included with body.

Note: PXM heads can be mounted to PHOENIX® SF Arbors by attaching the PXM SF Joint.



List 78018

PXM SS/TP (Metric)



Straight Shank



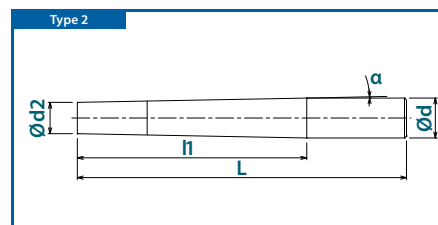
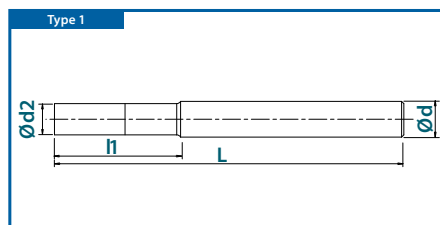
Tapered Shank

EDP No.	Body Type	Designation	Type	Neck Dia. (mm)	Shank Dia. (mm)	Taper	Overall Length (mm)	Neck Length (mm)	Applicable Head (mm)
				d2	d	α°	L	l1	
48174021	Cylindrical Shank Steel	PXMZ-C10SS10-S075	1	9.8	10	-	75	12	10
48174001		PXMZ-C12SS12-S100	1	11.7	12	-	100	19	12
48174002		PXMZ-C12TP20-S145	2	11.7	20	5°	145	47.4	16
48174003		PXMZ-C16SS16-S100	1	15.7	16	-	100	23.4	
48174004		PXMZ-C16TP25-S155	2	15.7	25	5°	155	53.1	20
48174005		PXMZ-C20SS20-S120	1	19.6	20	-	120	28.8	
48174006		PXMZ-C20TP32-S170	2	19.6	32	5°	170	70.8	25
48174007		PXMZ-C25SS25-S140	1	24	25	-	140	36	
48174022		PXMZ-C32SS32-S160	1	28	32	-	160	33	32
48174025	Cylindrical Shank Carbide	PXMZ-C10SS10-S075CS	1	9.8	10	-	75	17.3	10
48174023		PXMZ-C10SS10-L100CS	1	9.8	10	-	100	37.3	
48174026		PXMZ-C10TP12-LL130CS	2	9.8	10	0.9°	130	67	12
48174008		PXMZ-C12SS12-S075CS	1	11.7	12	-	75	25	
48174009		PXMZ-C12SS12-L100CS	1	11.7	12	-	100	46.3	16
48174010		PXMZ-C12SS12-L115CS	1	11.7	12	-	115	65	
48174011		PXMZ-C12TP16-LL135CS	2	11.7	16	1.5°	135	85	20
48174012		PXMZ-C16SS16-S090CS	1	15.7	16	-	90	40	
48174013		PXMZ-C16SS16-L130CS	1	15.7	16	-	130	62	25
48174014		PXMZ-C16SS16-L135CS	1	15.7	16	-	135	85	
48174015		PXMZ-C16TP20-LL165CS	2	15.7	20	1.5°	165	115	32
48174016		PXMZ-C20SS20-S090CS	1	19.6	20	-	90	40	
48174017		PXMZ-C20SS20-L150CS	1	19.6	20	-	150	79.3	
48174018		PXMZ-C20SS20-L180CS	1	19.6	20	-	180	110	
48174019		PXMZ-C20TP25-LL200CS	2	19.6	25	1.5°	200	140	
48174020		PXMZ-C25SS25-L200CS	1	24	25	-	200	98	
48174024		PXMZ-C32SS32-L250CS	1	28	32	-	250	115.2	

Packed: 1 pc.

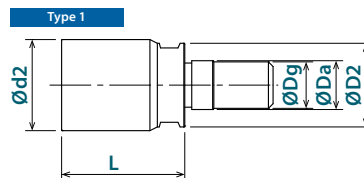
Note: Wrench included with body.

PXT



List 78018

PXM SF Joint (Metric)



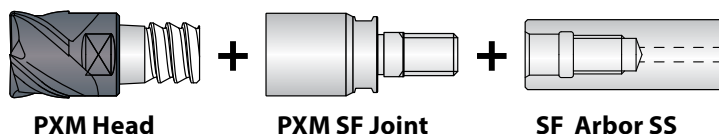
EDP No.	Body Type	Designation	Type	Neck Dia. (mm)	Pilot Dia. (mm)	Thread Dia. (mm)	Flange Dia. (mm)	Overall Length (mm)	Spanner Wrench	Applicable Head
				d2	Da	Dg	D2	L		
7801893	PXMJ (Joint)	PXMJ-C12SF06	1	11.7	6.5	M6	11.0	18	PXMP8-10	12
7801894		PXMJ-C16SF08		15.7	8.5	M8	14.5	21.8	PXMP13-16	16
7801895		PXMJ-C20SF10		19.6	10.5	M10	18	26.5	PXMP13-16	20
7801896		PXMJ-C25SF12		24	12.5	M12	23	34	PXMP21	25

Packed: 1 pc.

Note: Wrench included with body.

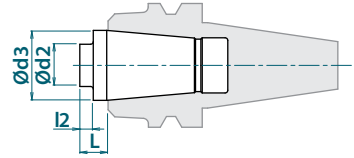
Note: PXM heads can be mounted to PHOENIX® SF Arbors by attaching the PXM SF Joint.

PXT



List 78340

PXMC (Metric)



EDP No.	Body Type	Designation	Neck Dia. (mm)	Body Dia. (mm)	Projection Length (mm)	Neck Length (mm)	Applicable Head (mm)
			d2	d3	L	l2	
7834001	Extra-Short	PXMC-C1205	11.7	26	10.5	5	12
7834002		PXMC-C1605	15.7	26	10.5	5	16
7834003		PXMC-C2005	19.6	26	10.5	5	20
7834004		PXMC-C2505	24	26	10.5	5	25
7834011	Short	PXMC-C1230	11.7	26	35.5	30	12
7834012		PXMC-C1630	15.7	26	35.5	30	16
7834013		PXMC-C2030	19.6	26	35.5	30	20
7834014		PXMC-C2530	24	26	35.5	30	25

Packed: 1 pc.

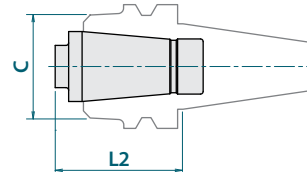
Note: The PXMC collet is compatible with the HYPRO Shrink Collet System.

Note: Wrench sold separately.

PXT

HY-PRO® Shrink

2 Piece Base Holders



EDP No.	Body Type	Designation	Nose Diameter (mm)	Gage Length (mm)	
			C	L2	
				Extra-Short	Short
9910002	CAT40	CT40-SLK12-45	40.9	45.5	70.5
8910000	BT30	BT30-SLK12-35 - 45 Deg.	38	45.5	70.5
8910001		BT30-SLK12-35 - 60 Deg.	38	45.5	70.5
8910002	BT40	BT40-SLK12-45	38	55.5	80.5
8910003		BT40-SLK12-75	38	85.5	110.5
9910005	HSK-E50	HSK-E50-SLK12-75	38	85.5	110.5
8910005	HSK-A63	HSK-A63-SLK12-75	38	85.5	110.5
8910006		HSK-A63-SLK12-135	38	145.5	170.5

Packed: 1 pc.

HTE

List 7808H

PXM Accessories

Appearance	EDP No.	Designation	Applicable Head		Recommended Tightening
			(inch)	(mm)	
 Spanner Wrench	7801890	PXMP8-10	0.500	12	12.0 Nm
	7801891	PXMP13-16	0.625	16	30.0 Nm
			0.750	20	50.0 Nm
	7801892	PXMP21	1.000	25	60.0 Nm
	7801897	PXMP24	1.250	32	60.0 Nm

Packed: Wrench = 1 pc.



Cutting Conditions (PXSH)

Side milling (L/D≤4)

Hardness		Up to 45 HRC		45-55 HRC		55-62 HRC		62-66 HRC		66-70 HRC	
Work Material		Hardened Steels Prehardened Steels		Hardened Steel		Hardened Steel		Hardened Steel		Hardened Steel	
Depth of Cut		Aa=1.0D Ar=0.05D (1mm max)		Aa=1.0D Ar=0.03D (1mm max)		Aa=1.0D Ar=0.02D (0.5mm max)					
Mill Dia.		Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)
(in)	(mm)										
-	12	3180	90.2	2390	67.7	1860	37.0	1590	27.2	1330	20.1
1/2	-	3010	85.4	2260	64.0	1760	35.0	1500	26.7	1260	19.0
5/8	-	2410	90.9	1800	68.1	1400	36.9	1200	27.4	1010	20.3
-	16	2390	90.2	1790	67.7	1390	36.6	1190	27.2	1000	20.1
3/4	-	2000	94.4	1500	71.0	1170	38.6	1010	28.6	840	21.1
-	20	1910	90.2	1430	67.7	1110	36.6	960	27.2	800	20.1
-	25	1530	96.5	1150	72.4	890	39.4	760	28.7	640	20.1
1	-	1510	95.2	1130	71.1	880	38.9	750	28.3	630	19.8

1. Use a rigid and precise machine and holder.
2. When chattering occurs, reduce the speed and feed simultaneously.
3. Please adjust the cutting condition when the overhang length is longer.
4. Please consider the overhang length as the total length of replaceable head and overhang length of shank holder.
5. Use an air blow or a suitable cutting fluid with high smoke retardant properties.

Side milling (L/D≤4)

Hardness		Up to 45 HRC		45-55 HRC		55-62 HRC		62-66 HRC		66-70 HRC	
Work Material		Hardened Steels Prehardened Steels		Hardened Steel		Hardened Steel		Hardened Steel		Hardened Steel	
Depth of Cut		Aa=1.0D Ar=0.03D (1mm max)		Aa=1.0D Ar=0.02D (1mm max)		Aa=0.7D Ar=0.02D (0.5mm max)					
Mill Dia.		Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)
(in)	(mm)										
-	12	2260	64.2	1730	49.2	1330	18.9	1190	13.4	930	7.9
1/2	-	2140	60.8	1640	46.6	1260	17.9	1130	12.7	880	7.5
5/8	-	1700	64.2	1300	49.2	1010	19.1	910	13.9	710	8.0
-	16	1690	63.8	1290	48.8	1000	18.9	900	13.8	700	7.9
3/4	-	1420	67.1	1090	51.6	840	19.5	760	14.6	590	8.3
-	20	1350	63.8	1040	49.2	800	18.9	720	13.8	560	7.9
-	25	1080	68.1	830	52.4	640	28.3	570	21.6	450	14.2
1	-	1060	66.8	820	51.8	630	23.4	560	21.2	440	13.9

1. Use a rigid and precise machine and holder.
2. When chattering occurs, reduce the speed and feed simultaneously.
3. Please adjust the cutting condition when the overhang length is longer.
4. Please consider the overhang length as the total length of replaceable head and overhang length of shank holder.
5. Use an air blow or a suitable cutting fluid with high smoke retardant properties.

Side milling (L/D≤4)

Hardness		Up to 45 HRC		45-55 HRC		55-62 HRC		62-66 HRC		66-70 HRC	
Work Material		Hardened Steels Prehardened Steels		Hardened Steel		Hardened Steel		Hardened Steel		Hardened Steel	
Depth of Cut		Aa=1.0D Ar=0.05D (1mm max)		Aa=1.0D Ar=0.03D (1mm max)		Aa=0.7D Ar=0.015D (0.5mm max)		Aa=0.7D Ar=0.01D (0.5mm max)			
Mill Dia.		Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)
(in)	(mm)										
-	12	4510	102.4	3980	90.1	2790	44.5	2390	33.8	1860	23.6
1/2	-	4260	96.7	3760	85.1	2640	42.1	2260	31.9	1760	22.3
5/8	-	3410	103.3	3020	91	2110	44.9	1800	33.9	1400	23.8
-	16	3380	102.4	2990	90.1	2090	44.5	1790	33.8	1390	23.6
3/4	-	2850	107.7	2510	94.6	1750	46.6	1500	35.4	1170	24.9
-	20	2710	102.4	2390	90.1	1670	44.5	1430	33.8	1110	23.6
-	25	2170	109.4	1910	96.1	1340	47.6	1150	36.2	890	25.2
1	-	2140	107.9	1880	94.6	1320	46.9	1130	35.6	880	24.9

1. Use a rigid and precise machine and holder.
2. When chattering occurs, reduce the speed and feed simultaneously.
3. Please adjust the cutting condition when the overhang length is longer.
4. Please consider the overhang length as the total length of replaceable head and overhang length of shank holder.
5. Use an air blow or a suitable cutting fluid with high smoke retardant properties.



shaping your dreams

 Safe use of cutting tools

- Use safety cover, safety glasses and safety shoes during operation.
- Do not touch cutting edges with bare hands.
- Do not touch cutting chips with bare hands. Chips will be hot after cutting.
- Stop cutting when the tool becomes dull.
- Stop cutting operation immediately if you hear any abnormal cutting sounds.
- Do not modify tools.
- Please use appropriate tools for the operation. Check dimensions to ensure proper selection.

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