

ASR Pico Turbo Metric Series

High Feed Cutting (HFC) & High Hardness Cutting (HHC)



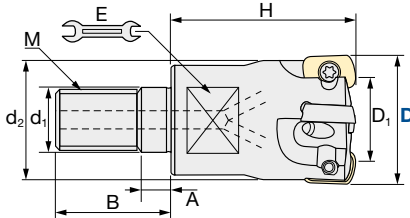
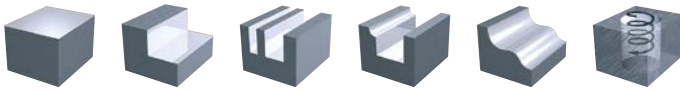
D16 mm ~ D66 mm

- ***Modular & Bore Types***
- ***Insert Radius: R8***
- ***CAM Radius: R2***



ASR | Pico – Turbo Metric Series – Modular Type

Q max	Jet	▽	HRC	No. of Teeth
High Efficient	Air Hole	Roughing	60	2 ~ 6

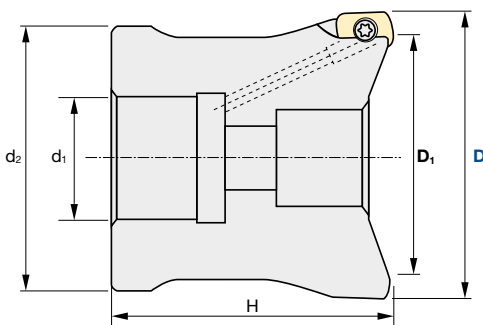
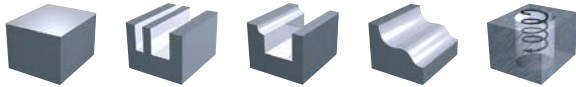


Diameter Holder only [mm]	CAM Radius:	Fastening Torque [Nm]
0/-0.2mm	2.0mm	1.1 Nm

Modular Type													
ID Code	Item Code	Flutes	D	D ₁	H	d ₁	M	d ₂	A	B	C	E	Inserts
FH529	ASRM-2016R-2	2	16	6.2	25	8.5	M8	13	5.5	17	10	10	EPNW0603TN-8 EPMT0603TN-8 EPMT0603EN-8LF
FH530	ASRM-2020R-3	3	20	10.2	30	10.5	M10	18	6	19	10	15	
FH531	ASRM-2025R-4	4	25	15.2	35	12.5	M12	21	7	22	10	17	
FH532	ASRM-2032R-5	5	32	22.2	40	17	M16	29	7	23	12	22	
FH533	ASRM-2040R-6	6	40	30.2	40	17	M16	29	7	23	12	22	

ASR | Pico – Turbo Metric Series – Bore Type

Q max	Jet	▽	HRC	No. of Teeth
High Efficient	Air Hole	Roughing	60	6 ~ 8



Diameter Holder only [mm]	CAM Radius:	Fastening Torque [Nm]
0/-0.2mm	2.0mm	1.1 Nm

Bore Type								
ID Code	Item Code	Flutes	D	D ₁	H	d ₁	d ₂	Inserts
FH537	ASR-2042RM-6	6	42	32.2	40	16	32	EPNW0603TN-8
FH538	ASR-2052RM-7	7	52	42.2	50	22	47	EPMT0603TN-8
FH539	ASR-2066RM-8	8	66	56.2	50	27	60	EPMT0603EN-8LF

Cutting Conditions | Schnittwerte | Condizioni di taglio | Condiciones de Corte | Conditions de coupe | Valores de corte:

D 16 (Z2) – D 66 (Z8): Page 4–5

ASR | Pico – Turbo Metric Series – Inserts

Target Hardness of Workpiece									R	Insert Shape
Inserts	Grade									
	GX2140	JM4060	JS4060	TB6045	JP4020	TB6020	TB6005	JP4005		
Item Code	ID Code									
EPNW0603TN-8	WF235								2	Fig.1
EPNW0603TN-8		WF236								
EPNW0603TN-8								WF237		
EPNW0603TN-8							WF641			
EPNW0603TN-8					WF642					
EPNW0603TN-8				WF643						
EPNW0603TN-8					WF208				2	Fig.2
EPNW0603TN-8			WF209							
EPMT0603TN-8					WF206					
EPMT0603TN-8			WF207							
EPMT0603TN-8	WF232									
EPMT0603TN-8		WF233								
EPMT0603TN-8								WF234	2	Fig.3
EPMT0603EN-8LF*		WF231								

Soft

Hard

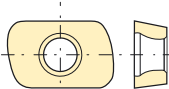


Fig.1: EPNW Standard Shape

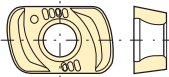


Fig.2: EPMT with Breaker

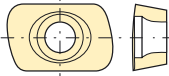


Fig. 3: EPMT-LF Spiral shape
(low cutting force)

GX2140

JM4060

JS4060

TB6045

JP4020

TB 6020 - 6005

JP4005

CVD · For heavy roughing of mild steels | Recommended for dry cutting

PVD · For stainless steels & carbon steels < 35HRC

PVD · For carbon steels < 35HRC

PVD · General steels for 30~40 HRC / Recommended for dry cutting

JP4020

TB 6020 - 6005

JP4005

PVD · For pre-hardened steels 40~55 HRC

PVD · Hybrid Coating

PVD · For hardened steels > 50 HRC

* LF = Low Force

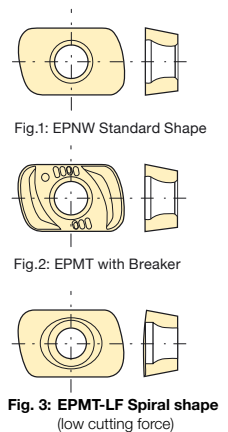
CAM Radius

* LF = Low Force

CAM Radius

GX2140	CVD · For heavy roughing of mild steels Recommended for dry cutting
JM4060	PVD · For stainless steels & carbon steels < 35HRC
JS4060	PVD · For carbon steels < 35HRC
TB6045	PVD · General steels for 30–40 HRC / Recommended for dry cutting

JP4020	PVD · For pre-hardened steels 40–55 HRC
TB 6020 - 6005	PVD · Hybrid Coating
JP4005	PVD · For hardened steels > 50 HRC



Grades Overview: Page 6

Item Info: Grades & Insert Shape

GX2140: CVD coating for heavy roughing of mild steel ($\leq 35\text{HRC}$)

Smooth surface of coating: Better adhesion resistance
Thicker Al_2O_3 layer: Better heat resistance
Nano-Ti(C.N): Better wear resistance
Tougher substrate: Better crack resistance

JM4060: For stainless steel

Advanced PVD technology makes higher adherence

- best form for stainless steel
- better wear & chipping resistance

Combination with tougher substrate makes

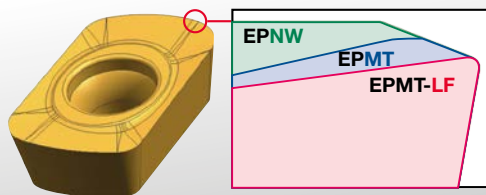
- higher heat resistance
- better chipping resistance



JP4005: For high-hardened material ($\geq 50\text{HRC}$)

Ultra micro grain & higher-adhesive coating

PICO LF Type (Fig. 3) Low Force

- sharper than standard chip breaker
- better for sticky material



Parts	Clamp Screw		Wrench	
				
	ID-Code	Item-Code	ID-Code	Item-Code
	ET175	250-141(A)	ET13	104-T8

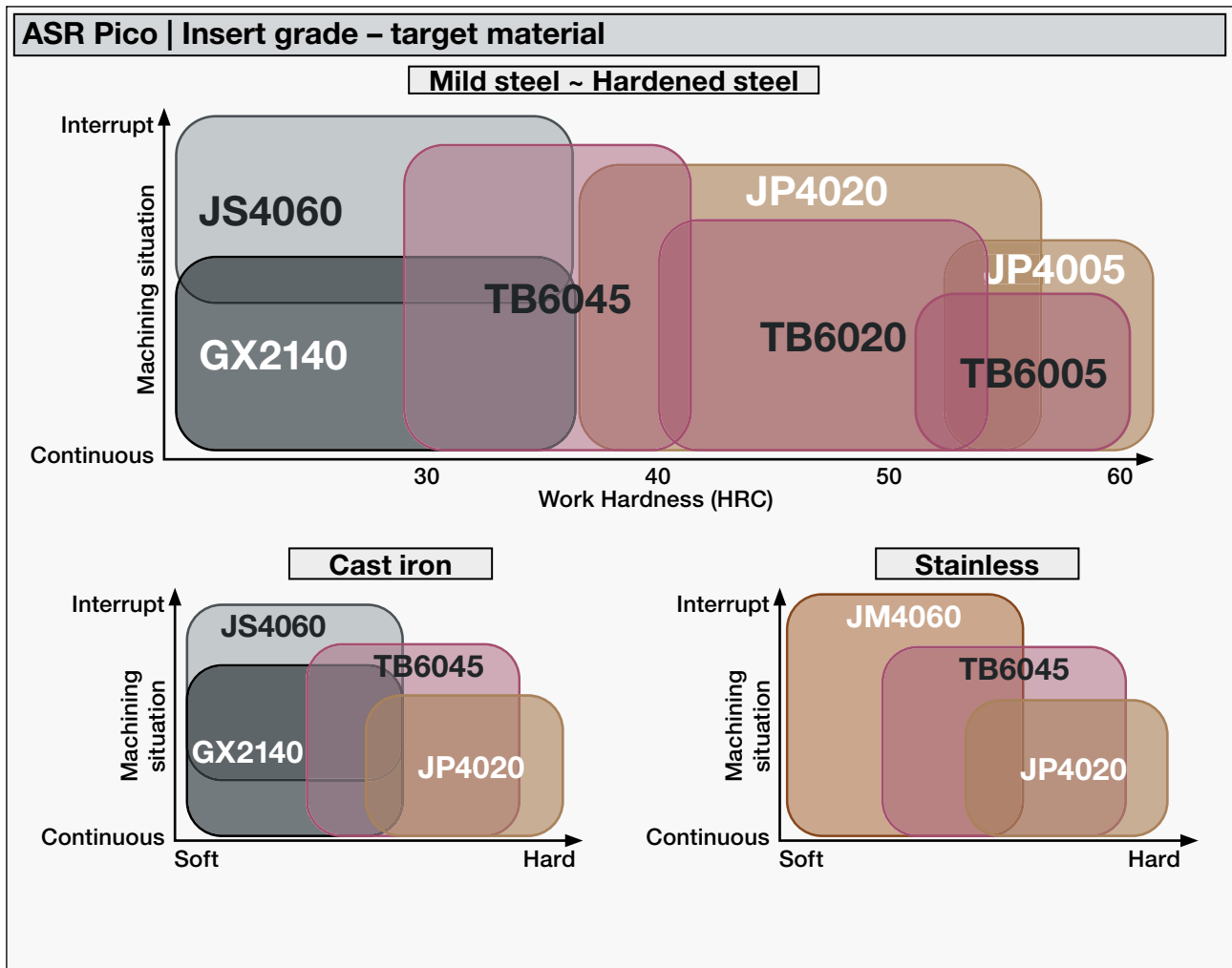
ASR | Pico – Recommended Cutting Conditions

Work piece material	Recommend grade & Target hardness (HRC)	Emulsion	Mist	Air	Parameter	D 16 (Z2)					D 20 (Z3)					D 25 (Z4)				
						< 3D					< 3D					< 3D				
						General	High Speed	3D-5D	5D-7D	> 7D	General	High Speed	3D-5D	5D-7D	> 7D	General	High Speed	3D-5D	5D-7D	> 7D
I Carbon-Steel					V_c (m/min)	90	180	130	130	90	90	180	130	130	90	90	180	130	130	90
	GX2140				n (min ⁻¹)	1790	3580	2590	2590	1790	1430	2860	2070	2070	1430	1150	2290	1660	1660	1150
	JS4060				f_z feed/tooth	0.8	1.4	0.8	0.8	0.8	1	1.6	1	1	1	1	1.6	1	1	1
	TB6045				V_f (mm/min)	2860	10030	4140	4140	2860	4300	13750	6210	6210	4300	4580	14670	6620	6620	4580
					a_p (mm)	0.8	0.6	0.6	0.5	0.4	1	0.5	0.8	0.6	0.4	1	0.5	0.8	0.6	0.4
					a_e (mm)	12	12	12	12	12	15	15	15	15	15	20	20	20	20	20
II Alloy-Steel <30HRC					Q (cm ³ /min)	27	72	30	25	14	65	103	75	56	26	92	147	106	79	37
					V_c (m/min)	90	180	130	130	90	90	180	130	130	90	90	180	130	130	90
	GX2140				n (min ⁻¹)	1790	3580	2590	2590	1790	1430	2860	2070	2070	1430	1150	2290	1660	1660	1150
	JS4060				f_z feed/tooth	0.8	1.4	0.8	0.8	0.8	1	1.6	1	1	1	1	1.6	1	1	1
	TB6045				V_f (mm/min)	2860	10030	4140	4140	2860	4300	13750	6210	6210	4300	4580	14670	6620	6620	4580
					a_p (mm)	0.8	0.6	0.6	0.5	0.4	1	0.5	0.8	0.6	0.4	1	0.5	0.8	0.6	0.4
III Alloy-Steel Tool-Steel 30-40HRC					a_e (mm)	12	12	12	12	12	15	15	15	15	15	20	20	20	20	20
					Q (cm ³ /min)	27	72	30	25	14	65	103	75	56	26	92	147	106	79	37
	GX2140				V_c (m/min)	90	180	130	130	90	90	180	130	130	90	90	180	130	130	90
	JS4060				n (min ⁻¹)	1790	3580	2590	2590	1790	1430	2860	2070	2070	1430	1150	2290	1660	1660	1150
	TB6045				f_z feed/tooth	0.8	1.4	0.8	0.8	0.8	1	1.6	1	1	1	1	1.6	1	1	1
					V_f (mm/min)	2860	10030	4140	4140	2860	4300	13750	6210	6210	4300	4580	14670	6620	6620	4580
IV Pre-Hardened Steel Tool-Steel 40-50HRC					a_p (mm)	0.6	0.4	0.5	0.4	0.3	0.8	0.4	0.6	0.5	0.35	0.8	0.4	0.6	0.5	0.35
					a_e (mm)	12	12	12	12	12	15	15	15	15	15	20	20	20	20	20
					Q (cm ³ /min)	21	48	25	20	10	52	83	56	47	23	73	117	79	66	32
	GX2140				V_c (m/min)	90	130	90	90	90	90	130	90	90	90	90	130	90	90	90
	TB6020				n (min ⁻¹)	1790	2590	1790	1790	1790	1430	2070	1430	1430	1430	1150	1660	1150	1150	1150
	JP4020				f_z feed/tooth	0.6	1.2	0.8	0.8	0.8	0.8	1.4	0.8	0.8	0.8	0.8	1.4	0.8	0.8	0.8
V Pre-Hardened Steel Tool-Steel 50-55HRC					V_f (mm/min)	2150	6210	2860	2860	2860	3440	8690	3440	3440	3440	3670	9270	3670	3670	3670
	TB6045				a_p (mm)	0.5	0.35	0.4	0.3	0.2	0.6	0.35	0.5	0.4	0.25	0.6	0.35	0.5	0.4	0.25
					a_e (mm)	12	12	12	12	12	15	15	15	15	15	20	20	20	20	20
					Q (cm ³ /min)	13	26	14	10	7	31	46	26	21	13	44	65	37	29	18
	GX2140				V_c (m/min)	80	120	80	80	80	80	120	80	80	80	80	120	80	80	80
	TB6020				n (min ⁻¹)	1590	2390	1590	1590	1590	1270	1910	1270	1270	1270	1020	1530	1020	1020	1020
VI Pre-Hardened Steel Tool-Steel >55HRC					f_z feed/tooth	0.5	1	0.6	0.6	0.6	0.6	1	0.6	0.6	0.6	0.6	1	0.6	0.6	0.6
	JP4020				V_f (mm/min)	1590	4770	1910	1910	1910	2290	5730	2290	2290	2290	2440	6110	2440	2440	2440
	TB6045				a_p (mm)	0.4	0.25	0.35	0.25	0.15	0.4	0.25	0.35	0.25	0.15	0.4	0.25	0.35	0.25	0.15
					a_e (mm)	12	12	12	12	12	15	15	15	15	15	20	20	20	20	20
					Q (cm ³ /min)	8	14	8	6	3	14	21	12	9	5	20	31	17	12	7
					V_c (m/min)	65	90	65	65	65	65	90	65	65	65	65	90	65	65	65
VII Stainless steel					n (min ⁻¹)	1290	1790	1290	1290	1290	1030	1430	1030	1030	1030	830	1150	830	830	830
	JP4005				f_z feed/tooth	0.5	0.8	0.5	0.5	0.5	0.5	0.8	0.5	0.5	0.5	0.5	0.8	0.5	0.5	0.5
	TB6005				V_f (mm/min)	1290	2860	1290	1290	1290	1550	3440	1550	1550	1550	1660	3670	1660	1660	1660
					a_p (mm)	0.4	0.25	0.35	0.25	0.15	0.4	0.25	0.35	0.25	0.15	0.4	0.25	0.35	0.25	0.15
					a_e (mm)	12	12	12	12	12	15	15	15	15	15	20	20	20	20	20
					Q (cm ³ /min)	6	9	5	4	2	9	13	8	6	3	13	18	12	8	5
VIII Cast-Iron GG GGG					V_c (m/min)	90	160	120	100	90	90	160	120	100	90	90	160	120	100	90
	JM4060				n (min ⁻¹)	1790	3180	2390	1990	1790	1430	2550	1910	1590	1430	1150	2040	1530	1270	1150
	JP4020				f_z feed/tooth	0.6	1	0.6	0.6	0.6	0.6	1	0.6	0.6	0.6	0.6	1	0.6	0.6	0.6
					V_f (mm/min)	2150	6370	2860	2390	2150	2580	7640	3440	2860	2580	2750	8150	3670	3060	2750
					a_p (mm)	0.8	0.5	0.6	0.5	0.4	0.8	0.5	0.6	0.5	0.4	0.8	0.5	0.6	0.5	0.4
					a_e (mm)	12	12	12	12	12	15	15	15	15	15	20	20	20	20	20
IX Cast-Iron GG GGG					Q (cm ³ /min)	21	38	21	14	10	31	57	31	21	15	44	82	44	31	22
					V_c (m/min)	90	180	130	130	90	90	180	130	130	90	90	180	130	130	90
	TB6020				n (min ⁻¹)	1790	3580	2590	2590	1790	1430	2860	2070	2070	1430	1150	2290	1660	1660	1150
	JP4020				f_z feed/tooth	1.2	1.6	1.2	1.2	1.2	1.4	1.8	1.4	1.4	1.4	1.4	1.8	1.4	1.4	1.4
	TB6045				V_f (mm/min)	4300	11460	6210	6210	4300	6020	15470	8690	8690	6020	6420	16500	9270	9270	6420
	GX2140				a_p (mm)	1	0.8	0.8	0.6	0.5	1.25	1	0.8	0.6	0.4	1.25	1	0.8	0.6	0.4
					a_e (mm)	12	12	12	12	12	15	15	15	15	15	20	20	20	20	20
					Q (cm ³ /min)	52	110	60	45	26	113	232	104	78	36	161	330	148	111	51

ASR | Pico – Recommended Cutting Conditions

D32 (Z5)					D40 (Z6)					D42 (Z6)					D52 (Z7)		D66 (Z8)	
< 3D		3D-5D	5D-7D	> 7D	< 3D		3D-5D	5D-7D	> 7D	< 3D		3D-5D	5D-7D	> 7D	< 3D		< 3D	
General	High Speed				General	High Speed				General	High Speed				General	High Speed	General	High Speed
90	180	130	130	90	90	180	130	130	90	90	180	130	130	90	90	180	90	180
900	1790	1290	1290	900	720	1430	1030	1030	720	680	1360	990	990	680	550	1100	430	870
1	1.6	1	1	1	1	1.6	1	1	1	1	1.6	1	1	1	1	1.6	1	1.6
4480	14320	6470	6470	4480	4300	13750	6210	6210	4300	4090	13100	5910	5910	4090	3860	12340	3470	11110
1	0.5	0.8	0.6	0.4	1	0.5	0.8	0.6	0.4	1	0.5	0.8	0.6	0.4	1	0.5	1	0.5
24	24	24	24	24	30	30	30	30	30	32	32	32	32	32	40	40	50	50
108	172	124	93	43	129	206	149	112	52	131	210	151	113	52	154	247	174	278
90	180	130	130	90	90	180	130	130	90	90	180	130	130	90	90	180	90	180
900	1790	1290	1290	900	720	1430	1030	1030	720	680	1360	990	990	680	550	1100	430	870
1	1.6	1	1	1	1	1.6	1	1	1	1	1.6	1	1	1	1	1.6	1	1.6
4480	14320	6470	6470	4480	4300	13750	6210	6210	4300	4090	13100	5910	5910	4090	3860	12340	3470	11110
0.8	0.4	0.6	0.5	0.35	0.8	0.4	0.6	0.5	0.35	0.8	0.4	0.6	0.5	0.35	0.8	0.4	0.8	0.4
24	24	24	24	24	30	30	30	30	30	32	32	32	32	32	40	40	50	50
86	137	93	78	38	103	165	112	93	45	105	168	113	95	46	124	197	139	222
90	130	90	90	90	90	130	90	90	90	90	130	90	90	90	90	130	90	130
900	1290	900	900	900	720	1030	720	720	720	680	990	680	680	680	800	430	630	630
0.8	1.4	0.8	0.8	0.8	0.8	1.4	0.8	0.8	0.8	0.8	1.4	0.8	0.8	0.8	0.8	1.4	0.8	1.4
3580	9050	3580	3580	3580	3440	8690	3440	3440	3440	3270	8280	3270	3270	3270	3090	7800	2780	7020
0.6	0.35	0.5	0.4	0.25	0.6	0.35	0.5	0.4	0.25	0.6	0.35	0.5	0.4	0.25	0.6	0.35	0.6	0.35
24	24	24	24	24	30	30	30	30	30	32	32	32	32	32	40	40	50	50
52	76	43	34	21	62	91	52	41	26	63	93	52	42	26	74	109	83	123
80	120	80	80	80	80	120	80	80	80	80	120	80	80	80	80	120	80	120
800	1190	800	800	800	640	950	640	640	640	610	910	610	610	610	490	730	390	580
0.6	1	0.6	0.6	0.6	0.6	1	0.6	0.6	0.6	0.6	1	0.6	0.6	0.6	0.6	1	0.6	1
2390	5970	2390	2390	2390	2290	5730	2290	2290	2290	2180	5460	2180	2180	2180	2060	5140	1850	4630
0.4	0.25	0.35	0.25	0.15	0.4	0.25	0.35	0.25	0.15	0.4	0.25	0.35	0.25	0.15	0.4	0.25	0.4	0.25
24	24	24	24	24	30	30	30	30	30	32	32	32	32	32	40	40	50	50
23	36	20	14	9	27	43	24	17	10	28	44	24	17	10	33	51	37	58
65	90	65	65	65	65	90	65	65	65	65	90	65	65	65	65	90	65	90
650	900	650	650	650	520	720	520	520	520	490	680	490	490	490	400	550	310	430
0.5	0.8	0.5	0.5	0.5	0.5	0.8	0.5	0.5	0.5	0.5	0.8	0.5	0.5	0.5	0.5	0.8	0.5	0.8
1620	3580	1620	1620	1620	1550	3440	1550	1550	1550	1480	3270	1480	1480	1480	1390	3090	1250	2780
0.4	0.25	0.35	0.25	0.15	0.4	0.25	0.35	0.25	0.15	0.4	0.25	0.35	0.25	0.15	0.4	0.25	0.4	0.25
24	24	24	24	24	30	30	30	30	30	32	32	32	32	32	40	40	50	50
16	21	14	10	6	19	26	16	12	7	19	26	17	12	7	22	31	25	35
90	160	120	100	90	90	160	120	100	90	90	160	120	100	90	90	160	90	160
900	1590	1190	990	900	720	1270	950	800	720	680	1210	910	760	680	550	980	430	770
0.6	1	0.6	0.6	0.6	0.6	1	0.6	0.6	0.6	0.6	1	0.6	0.6	0.6	0.6	1	0.6	1
2690	7960	3580	2980	2690	2580	7640	3440	2860	2580	2460	7280	3270	2730	2460	2310	6860	2080	6170
0.8	0.5	0.6	0.5	0.4	0.8	0.5	0.6	0.5	0.4	0.8	0.5	0.6	0.5	0.4	0.8	0.5	0.8	0.5
24	24	24	24	24	30	30	30	30	30	32	32	32	32	32	40	40	50	50
52	96	52	36	26	62	115	62	43	31	63	116	63	44	31	74	137	83	154
90	180	130	130	90	90	180	130	130	90	90	180	130	130	90	90	180	90	180
900	1790	1290	1290	900	720	1430	1030	1030	720	680	1360	990	990	680	550	1100	430	870
1.4	1.8	1.4	1.4	1.4	1.4	1.8	1.4	1.4	1.4	1.4	1.8	1.4	1.4	1.4	1.4	1.8	1.4	1.8
6270	16110	9050	9050	6270	6020	15470	8690	8690	6020	5730	14730	8280	8280	5730	5400	13880	4860	12500
1.25	1	0.8	0.6	0.4	1.25	1	0.8	0.6	0.4	1.25	1	0.8	0.6	0.4	1.25	1	1.25	1
24	24	24	24	24	30	30	30	30	30	32	32	32	32	32	40	40	50	50
188	387	174	130	60	226	464	209	156	72	229	471	212	159	73	270	555	304	625

ASR | Pico – Turbo Metric Series – Modular / Bore Type

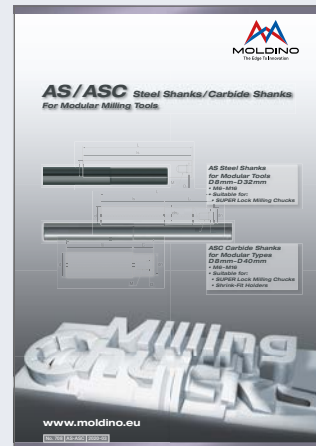


➔ For more information about Modular Tools and available Shanks please check our brochures:

Indexable Modular No. 328.x



AS/ASC Shanks No. 708



Always up to date: Please check our P50 QuickFinder



Attentions on Safety

1. Cautions regarding handling

- (1) When removing the tool from its case (packaging), be careful that the tool does not pop out or is dropped. Be particularly careful regarding contact with the tool flutes.
- (2) When handling tools with sharp cutting flutes, be careful not to touch the cutting flutes directly with your bare hands.

2. Cautions regarding mounting

- (1) Before use, check the outside appearance of the tool for scratches, cracks, etc. and that it is firmly mounted in the collet chuck, etc.
- (2) When preparing for use, be sure that the inserts are firmly mounted in place and that they are firmly mounted on the arbor, etc.
- (3) If abnormal chattering, etc. occurs during use, stop the machine immediately and remove the cause of the chattering.

3. Cautions during use

- (1) Before use, confirm the dimensions and direction of rotation of the tool and milling work material.
- (2) The numerical values in the standard cutting conditions table should be used as criteria when starting new work. The cutting conditions should be adjusted as appropriate when the cutting depth is large, the rigidity of the machine being used is low, or according to the conditions of the work material.
- (3) Cutting tools are made of a hard material. During use, they may break and fly off. In addition, cutting chips may also fly off. Since there is a danger of injury to workers, fire, or eye damage from such flying pieces, a safety cover should be attached when work is performed and safety equipment such as safety goggles should be worn to create a safe environment for work.
- (4) There is a risk of fire or inflammation due to sparks, heat due to breakage, and cutting chips. Do not use where there is a risk of fire or explosion. Please caution of fire while using oil base coolant, fire prevention is necessary.
- (5) Do not use the tool for any purpose other than that for which it is intended.

4. Cautions regarding regrinding

- (1) If regrinding is not performed at the proper time, there is a risk of the tool breaking. Replace the tool with one in good condition, or perform regrinding.
- (2) Grinding dust will be created when regrinding a tool. When regrinding, be sure to attach a safety cover over the work area and wear safety clothes such as safety goggles, etc.
- (3) This product contains the specified chemical substance cobalt and its inorganic compounds. When performing regrinding or similar processing, be sure to handle the processing in accordance with the local laws and regulations regarding prevention of hazards due to specified chemical substances.

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