HPMT
High Precision Machining Tools





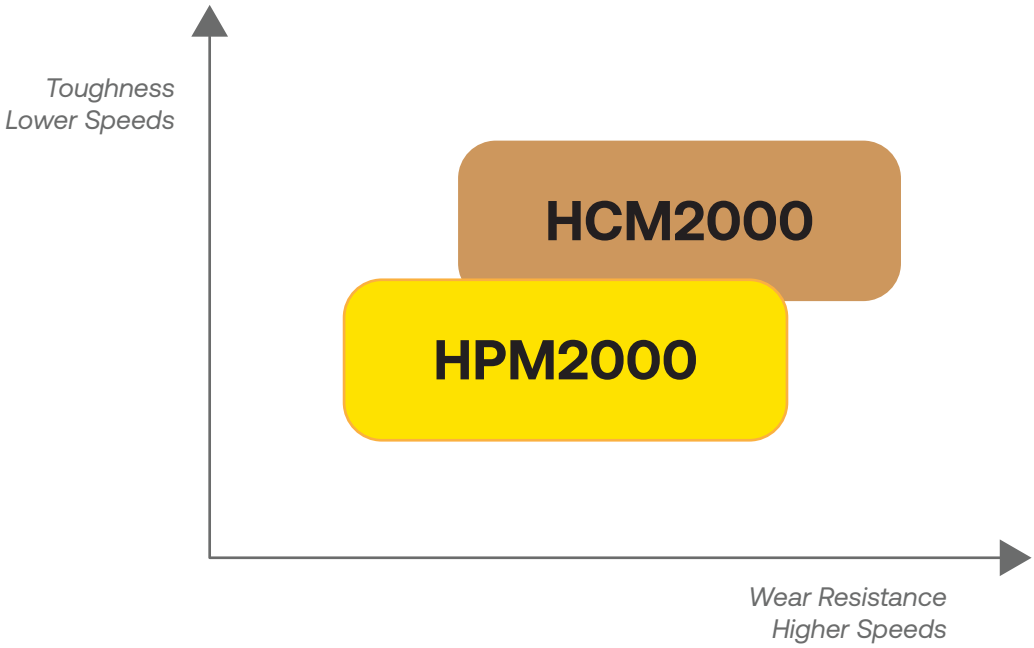


STAINLESS STEELS TURNING INSERTS

www.hpmt-industries.com

M

Grades Description



HCM2000: Built for Demanding Stainless Steel Machining

Engineered with a CVD Multilayer TiCN-Al_2O_3-TiN coating and advanced surface treatment, this grade delivers reduced cutting resistance and minimizes built up edge. Its durable construction ensures reliable performance in challenging and interrupted stainless steel turning operations.



SMOOTH, EFFICIENT CUTTING

Advanced surface treatment lowers friction for cleaner cuts and improved chip flow.

LONG-LASTING WEAR RESISTANCE

Engineered to withstand heat and abrasion, ensuring stable performance over time.

HANDLES INTERRUPTED TURNING WITH EASE

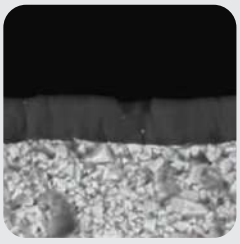
Maintains edge stability and resists chipping during demanding or unstable machining cycles.

RELIABLE UNDER TOUGH CONDITIONS

Maintains edge integrity and stability during interrupted and high-demand turning.

HPM2000: Optimized for Reliable Stainless Steel Semi-Finishing

This grade is specially developed for stainless steel turning, featuring a PVD AlTiN coating that offers strong adhesion and excellent chemical resistance. Its ultrafine WC substrate ensures stable and consistent performance providing excellent wear resistance.



MINIMIZES BUILT-UP EDGE

Reduces material adhesion on the cutting surface, ensuring smooth operation and consistent performance.

PRECISION IN SEMI-FINISHING

Delivers accurate dimensional control and superior surface quality in stainless steel.

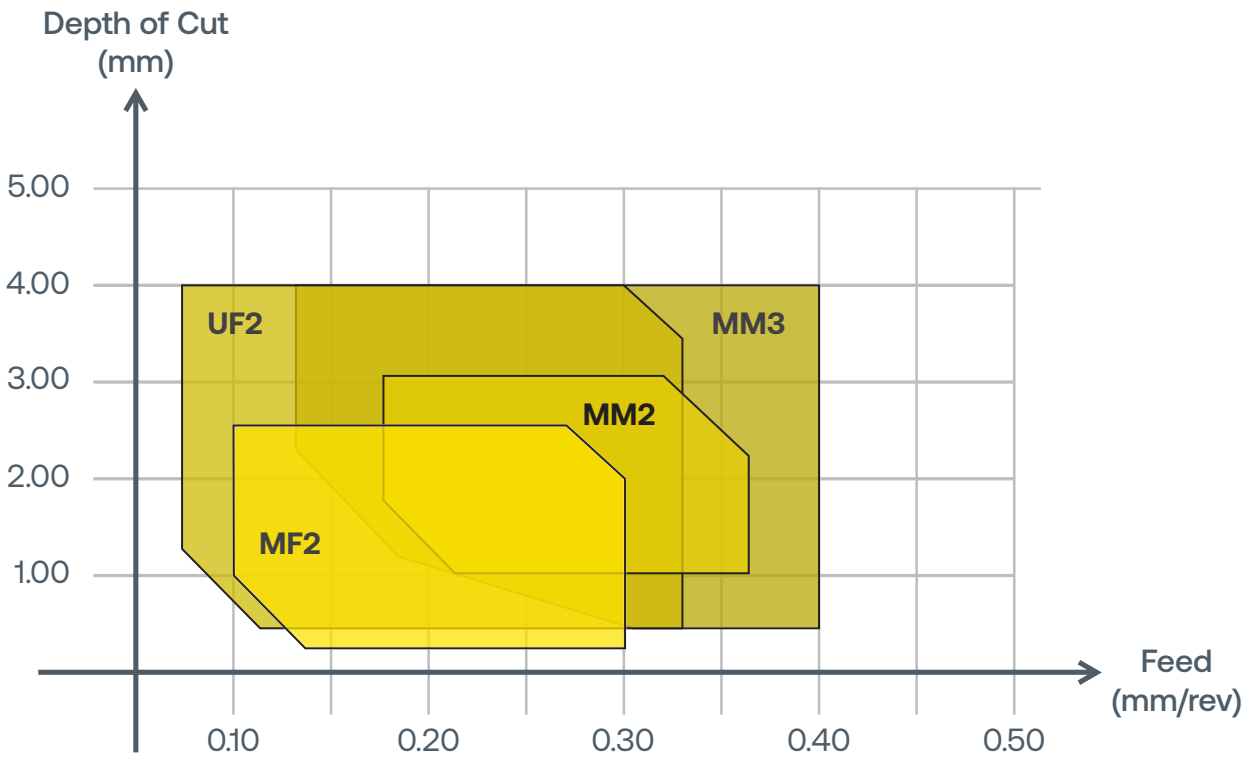
ENHANCES PRECISION, EFFICIENCY, & TOOL LIFE

Delivers accurate results, improves productivity, and extends tool longevity.

Stainless Steels Turning Chipbreakers

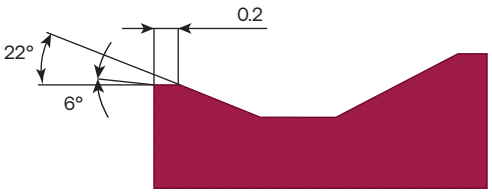
HPMT

M Stainless Steels



Chipbreakers

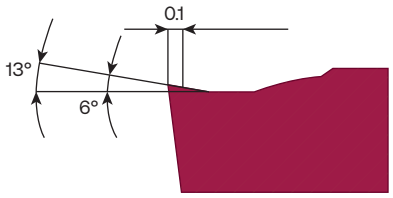
MM3



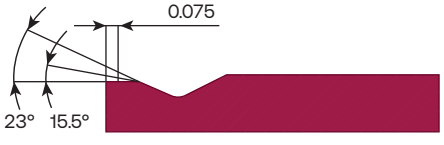


UF2





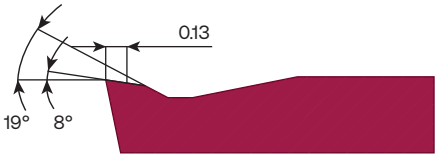
MM2





MF2





Geometries

CCMT



HPMT DESIGNATION	Corner (mm)	HPM2000	HCM2000	MM3	UF2	MM2	MF2
CCMT060204-UF2 HPM2000	0.4	●			●		
CCMT060208-UF2 HPM2000	0.8	●			●		
CCMT09T302-MF2 HCM2000	0.2		●				●
CCMT09T304-MF2 HCM2000	0.4		●				●
CCMT09T304-UF2 HPM2000	0.4	●			●		
CCMT09T308-UF2 HPM2000	0.8	●			●		
CCMT09T308-MF2 HCM2000	0.8		●				●
CCMT120404-UF2 HPM2000	0.4	●			●		
CCMT120404-MF2 HCM2000	0.4		●				●
CCMT120408-MF2 HCM2000	0.8		●				●
CCMT120408-UF2 HPM2000	0.8	●			●		
CCMT120412-UF2 HPM2000	1.2	●			●		
CCMT120412-MF2 HCM2000	1.2		●				●

CNMG



HPMT DESIGNATION	Corner (mm)	HPM2000	HCM2000	MM3	UF2	MM2	MF2
CNMG120404-MM2 HCM2000	0.4		●			●	
CNMG120404-MM3 HPM2000	0.4	●		●			
CNMG120408-MM3 HPM2000	0.8	●		●			
CNMG120408-MM2 HCM2000	0.8		●			●	
CNMG120412-MM2 HCM2000	1.2		●			●	
CNMG120412-MM3 HPM2000	1.2	●		●			
CNMG160608-MM2 HCM2000	0.8		●			●	
CNMG160612-MM2 HCM2000	1.2		●			●	
CNMG160616-MM2 HCM2000	1.6		●			●	
CNMG190616-MM2 HCM2000	1.6		●			●	

DCMT



HPMT DESIGNATION	Corner (mm)	HPM2000	HCM2000	MM3	UF2	MM2	MF2
DCMT070204-UF2 HPM2000	0.4	●			●		
DCMT070208-UF2 HPM2000	0.8	●			●		
DCMT11T304-UF2 HPM2000	0.4	●			●		
DCMT11T308-UF2 HPM2000	0.8	●			●		

Geometries

HPMT



DNMG

HPMT DESIGNATION	Corner (mm)	HPM2000	HCM2000	MM3	UF2	MM2	MF2
DNMG110404-MM2 HCM2000	0.4		●			●	
DNMG110408-MM2 HCM2000	0.8		●			●	
DNMG150404-MM3 HPM2000	0.4	●		●			
DNMG150404-MM2 HCM2000	0.4		●			●	
DNMG150408-MM3 HPM2000	0.8	●		●			
DNMG150408-MM2 HCM2000	0.8		●			●	
DNMG150412-MM3 HPM2000	1.2	●		●			
DNMG150604-MM2 HCM2000	0.4		●			●	
DNMG150608-MM2 HCM2000	0.8		●			●	
DNMG150612-MM2 HCM2000	1.2		●			●	



SCMT

HPMT DESIGNATION	Corner (mm)	HPM2000	HCM2000	MM3	UF2	MM2	MF2
SCMT09T304-UF2 HPM2000	0.4	●			●		
SCMT09T304-MF2 HCM2000	0.4		●				●
SCMT09T308-MF2 HCM2000	0.8		●				●
SCMT120404-MF2 HCM2000	0.4		●				●
SCMT120408-UF2 HPM2000	0.8	●			●		
SCMT120408-MF2 HCM2000	0.8		●				●



SNMG

HPMT DESIGNATION	Corner (mm)	HPM2000	HCM2000	MM3	UF2	MM2	MF2
SNMG120404-MM3 HPM2000	0.4	●		●			
SNMG120404-MM2 HCM2000	0.4		●			●	
SNMG120408-MM3 HPM2000	0.8	●		●			
SNMG120408-MM2 HCM2000	0.8		●			●	
SNMG120412-MM3 HPM2000	1.2	●		●			
SNMG120412-MM2 HCM2000	1.2		●			●	
SNMG120416-MM2 HCM2000	1.6		●			●	
SNMG150616-MM2 HCM2000	1.6		●			●	
SNMG190612-MM2 HCM2000	1.2		●			●	
SNMG190616-MM2 HCM2000	1.6		●			●	



TCMT

HPMT DESIGNATION	Corner (mm)	HPM2000	HCM2000	MM3	UF2	MM2	MF2
TCMT110204-UF2 HPM2000	0.4	●			●		
TCMT110208-UF2 HPM2000	0.8	●			●		
TCMT16T304-UF2 HPM2000	0.4	●			●		
TCMT16T308-UF2 HPM2000	0.8	●			●		

Geometries

TNMG



HPMT DESIGNATION	Corner (mm)	HPM2000	HCM2000	MM3	UF2	MM2	MF2
TNMG160402-MM3 HPM2000	0.2	●		●			
TNMG160404-MM3 HPM2000	0.4	●		●			
TNMG160404-MM2 HCM2000	0.4		●			●	
TNMG160408-MM3 HPM2000	0.8	●		●			
TNMG160408-MM2 HCM2000	0.8		●			●	
TNMG160412-MM3 HPM2000	1.2	●		●			
TNMG160412-MM2 HCM2000	1.2		●			●	
TNMG220408-MM2 HCM2000	0.8		●			●	

VBMT



HPMT DESIGNATION	Corner (mm)	HPM2000	HCM2000	MM3	UF2	MM2	MF2
VBMT160404-UF2 HPM2000	0.4	●			●		
VBMT160404-MF2 HCM2000	0.4		●				●
VBMT160408-MF2 HCM2000	0.8		●				●

VNMG



HPMT DESIGNATION	Corner (mm)	HPM2000	HCM2000	MM3	UF2	MM2	MF2
VNMG160404-MM2 HCM2000	0.4		●			●	
VNMG160404-MM3 HPM2000	0.8	●		●			
VNMG160408-MM2 HCM2000	0.4		●			●	
VNMG160408-MM3 HPM2000	0.8	●		●			

WNMG



HPMT DESIGNATION	Corner (mm)	HPM2000	HCM2000	MM3	UF2	MM2	MF2
WNMG060404-MM2 HCM2000	0.4		●			●	
WNMG060408-MM2 HCM2000	0.8		●			●	
WNMG080404-MM3 HPM2000	0.4	●		●			
WNMG080404-MM2 HCM2000	0.4		●			●	
WNMG080408-MM2 HCM2000	0.8		●			●	
WNMG080408-MM3 HPM2000	0.8	●		●			
WNMG080412-MM2 HCM2000	1.2		●			●	
WNMG080412-MM3 HPM2000	1.2	●		●			

Recommended Cutting Speeds

HPMT

			Cutting Speed (Vc)							
			HPM2000				HCM2000			
			m/min		SFM		m/min		SFM	
			min	max	min	max	min	max	min	max
P	Carbon Steels	125 HB	160	260	520	850	150	290	490	950
		190 HB	140	230	460	750	130	250	430	820
		250 HB	130	210	430	690	120	230	390	750
	Alloy Steels (<5% alloying elements)	180 HB	130	220	430	720	120	240	390	790
		230 HB	110	190	360	620	110	210	360	690
		280HB	110	180	360	590	100	200	330	660
		350 HB	100	160	330	520	90	180	300	590
	Tool Steels (>5% alloying elements)	220 HB	80	140	260	460	80	150	260	490
		280 HB	80	130	260	430	70	140	230	460
		320 HB	50	90	160	300	50	100	160	330
		350 HB	50	80	160	260	50	90	160	300
K	Grey, Malleable, CGI Cast Irons	125 HB	170	280	560	920	160	310	520	1020
		190 HB	150	250	490	820	140	280	460	920
		250 HB	130	220	430	720	120	240	390	790
	Nodular, ADI Cast Irons	180 HB	120	200	390	660	110	220	360	720
		230 HB	110	180	360	590	100	200	330	660
		280HB	100	170	330	560	100	190	330	620
		350 HB	80	140	260	460	80	150	260	490
H	Tool Steels, White Cast Irons	45 HRC	40	60	130	200	-	-	-	-
		55 HRC	20	40	70	130	-	-	-	-
M	Stainless Steel, High Machinability	200 HB	160	230	520	750	130	250	430	820
		300 HB	130	200	430	660	110	220	360	720
	Stainless Steel, Low Machinability	280 HB	80	150	260	490	90	170	300	560
		45 HRC	70	120	230	390	70	130	230	430
N	Aluminium Wrought Alloys, Si <9%	90HB	200	400	660	1310	220	440	720	1440
	Aluminium-Cast Alloys, Si >9%	130HB	200	400	660	1310	220	440	720	1440
	Copper Alloys	110HB	200	400	660	1310	220	440	720	1440
S	Titanium Alloys	200 HB	45	65	150	210	40	70	130	230
		350 HB	25	45	80	150	30	50	100	160
	Nickel Alloys	250 HB	25	45	80	150	30	50	100	160
		350 HB	20	40	70	130	20	40	70	130
	Cobalt Alloys	320 HB	30	70	100	230	40	80	130	260
		55 HRC	15	30	50	100	20	30	70	100

Parameter	Metric Formula	Metric Unit	American Formula	American Unit
Cutting Speed	$V_c = \frac{D_m \times \pi \times n}{1000}$	m/min	$V_c = \frac{D_m \times n}{382}$	SFM
Rotation	$n = \frac{V_c \times 1000}{D_m \times \pi}$	RPM	$n = \frac{V_c \times 12}{D_m \times \pi}$	RPM
Cutting Time	$T_c = \frac{l_m}{f_n \times n}$	min	$T_c = \frac{l_m}{f_n \times n}$	min
Surface Roughness	$R_{max} = \frac{f_n^2}{r_\varepsilon} \times 125$	µm	$R_{max} = \frac{f_n^2}{r_\varepsilon} \times 4921.26$	µin
Metarial Removal Rate	MRR = Ap x fn x Vc	cm^3/min	MRR = Ap x fn x Vc x 12	in^3/min

Symbol	Designation	Metric Unit	American Unit
D_m	Machining Diameter	mm	in
f_n	Feed per Revolution	mm/rev	IPR
l_m	Machining Length	mm	in
r	Nose Radius	mm	in

Technical Formulas

Recommended Feeds

HPMT

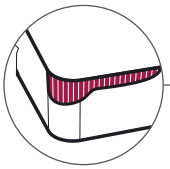
			UF2				MM3			
			Feed mm/rev		inch/rev		Feed mm/rev		inch/rev	
			min	max	min	max	min	max	min	max
P	Carbon Steels	125 HB	0.13	0.32	0.005	0.013	0.29	0.40	0.011	0.016
		190 HB	0.12	0.30	0.005	0.012	0.27	0.37	0.011	0.015
		250 HB	0.12	0.29	0.005	0.011	0.26	0.36	0.010	0.014
	Alloy Steels (<5% alloying elements)	180 HB	0.12	0.29	0.005	0.012	0.27	0.37	0.011	0.014
		230 HB	0.11	0.28	0.005	0.011	0.26	0.35	0.010	0.014
		280HB	0.11	0.27	0.004	0.011	0.25	0.34	0.010	0.013
		350 HB	0.11	0.26	0.004	0.010	0.24	0.32	0.009	0.013
	Tool Steels (>5% alloying elements)	220 HB	0.10	0.25	0.004	0.010	0.23	0.31	0.009	0.012
		280 HB	0.10	0.24	0.004	0.009	0.22	0.30	0.009	0.012
		320 HB	0.09	0.22	0.004	0.009	0.21	0.27	0.008	0.011
		350 HB	0.09	0.21	0.004	0.008	0.20	0.26	0.008	0.010
K	Grey, Malleable, CGI Cast Irons	125 HB	0.13	0.33	0.005	0.013	0.30	0.41	0.012	0.016
		190 HB	0.13	0.31	0.005	0.012	0.28	0.39	0.011	0.015
		250 HB	0.12	0.29	0.005	0.012	0.27	0.37	0.011	0.014
	Nodular, ADI Cast Irons	180 HB	0.11	0.28	0.005	0.011	0.26	0.35	0.010	0.014
		230 HB	0.11	0.27	0.004	0.011	0.25	0.34	0.010	0.013
		280HB	0.11	0.26	0.004	0.010	0.24	0.33	0.010	0.013
		350 HB	0.10	0.25	0.004	0.010	0.23	0.31	0.009	0.012
H	Tool Steels, White Cast Irons	45 HRC	0.08	0.19	0.003	0.008	0.19	0.24	0.007	0.010
		55 HRC	0.08	0.18	0.003	0.007	0.18	0.23	0.007	0.009
M	Stainless Steel, High Machinability	200 HB	0.17	0.29	0.007	0.011	0.22	0.36	0.009	0.014
		300 HB	0.14	0.26	0.006	0.010	0.18	0.32	0.007	0.013
	Stainless Steel, Low Machinability	280 HB	0.14	0.26	0.006	0.010	0.18	0.32	0.007	0.013
		45 HRC	0.13	0.22	0.005	0.009	0.16	0.28	0.006	0.011
N	Aluminium Wrought Alloys, Si <9%	90HB	0.17	0.29	0.007	0.011	0.22	0.36	0.009	0.014
	Aluminium-Cast Alloys, Si >9%	130HB	0.17	0.29	0.007	0.011	0.22	0.36	0.009	0.014
	Copper Alloys	110HB	0.17	0.29	0.007	0.011	0.22	0.36	0.009	0.014
S	Titanium Alloys	200 HB	0.13	0.26	0.005	0.010	0.16	0.32	0.006	0.013
		350 HB	0.12	0.18	0.005	0.007	0.14	0.22	0.006	0.009
	Nickel Alloys	250 HB	0.13	0.22	0.005	0.009	0.16	0.28	0.006	0.011
		350 HB	0.12	0.18	0.005	0.007	0.14	0.22	0.006	0.009
	Cobalt Alloys	320 HB	0.13	0.22	0.005	0.009	0.16	0.28	0.006	0.011
		55 HRC	0.10	0.18	0.004	0.007	0.13	0.22	0.005	0.009

Recommended Feeds

HPMT

			MF2				MM2			
			Feed mm/rev		inch/rev		Feed mm/rev		inch/rev	
			min	max	min	max	min	max	min	max
P	Carbon Steels	125 HB	0.22	0.30	0.009	0.012	0.26	0.33	0.010	0.013
		190 HB	0.21	0.28	0.008	0.011	0.24	0.31	0.009	0.012
		250 HB	0.20	0.27	0.008	0.011	0.23	0.29	0.009	0.012
	Alloy Steels (<5% alloying elements)	180 HB	0.21	0.28	0.008	0.011	0.24	0.30	0.009	0.012
		230 HB	0.20	0.26	0.008	0.010	0.23	0.29	0.009	0.011
		280HB	0.19	0.25	0.008	0.010	0.22	0.28	0.009	0.011
		350 HB	0.18	0.24	0.007	0.009	0.21	0.26	0.008	0.010
	Tool Steels (>5% alloying elements)	220 HB	0.18	0.23	0.007	0.009	0.21	0.26	0.008	0.010
		280 HB	0.17	0.22	0.007	0.009	0.20	0.24	0.008	0.010
		320 HB	0.16	0.20	0.006	0.008	0.18	0.22	0.007	0.009
		350 HB	0.16	0.20	0.006	0.008	0.18	0.22	0.007	0.009
K	Grey, Malleable, CGI Cast Irons	125 HB	0.23	0.31	0.009	0.012	0.26	0.34	0.010	0.014
		190 HB	0.22	0.29	0.009	0.012	0.25	0.32	0.010	0.013
		250 HB	0.21	0.28	0.008	0.011	0.24	0.30	0.009	0.012
	Nodular, ADI Cast Irons	180 HB	0.20	0.26	0.008	0.010	0.23	0.29	0.009	0.011
		230 HB	0.19	0.25	0.008	0.010	0.22	0.28	0.009	0.011
		280HB	0.19	0.25	0.007	0.010	0.22	0.27	0.009	0.011
		350 HB	0.18	0.23	0.007	0.009	0.21	0.26	0.008	0.010
H	Tool Steels, White Cast Irons	45 HRC	0.15	0.18	0.006	0.007	0.17	0.20	0.007	0.008
		55 HRC	0.14	0.17	0.006	0.007	0.16	0.19	0.006	0.007
M	Stainless Steel, High Machinability	200 HB	0.16	0.27	0.006	0.011	0.18	0.30	0.007	0.012
		300 HB	0.13	0.24	0.005	0.009	0.14	0.26	0.006	0.010
	Stainless Steel, Low Machinability	280 HB	0.13	0.24	0.005	0.009	0.14	0.26	0.006	0.010
		45 HRC	0.12	0.21	0.005	0.008	0.13	0.23	0.005	0.009
N	Aluminium Wrought Alloys, Si <9%	90HB	0.16	0.27	0.006	0.011	0.18	0.30	0.007	0.012
	Aluminium-Cast Alloys, Si >9%	130HB	0.16	0.27	0.006	0.011	0.18	0.30	0.007	0.012
	Copper Alloys	110HB	0.16	0.27	0.006	0.011	0.18	0.30	0.007	0.012
S	Titanium Alloys	200 HB	0.12	0.24	0.005	0.009	0.13	0.26	0.005	0.010
		350 HB	0.11	0.17	0.004	0.007	0.12	0.18	0.005	0.007
	Nickel Alloys	250 HB	0.12	0.21	0.005	0.008	0.13	0.23	0.005	0.009
		350 HB	0.11	0.17	0.004	0.007	0.12	0.18	0.005	0.007
	Cobalt Alloys	320 HB	0.12	0.21	0.005	0.008	0.13	0.23	0.005	0.009
		55 HRC	0.10	0.17	0.004	0.007	0.10	0.18	0.004	0.007

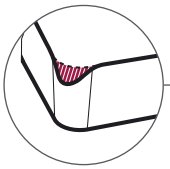
Troubleshooting



Flank Wear

Occurs from abrasion by hard particles, reducing the tool's flank surface.

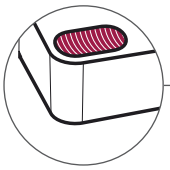
Solutions :
Lower cutting speed or use a harder grade.



Plastic Deformation

Tool material yields under excessive thermal and mechanical stress.

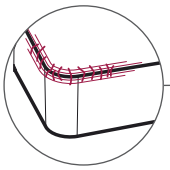
Solutions :
Opt for a harder grade, reduce cutting speed, or lower feed rate.



Crater Wear

Affects the tool's rake face, caused by high-speed abrasion and diffusion between the tool and workpiece.

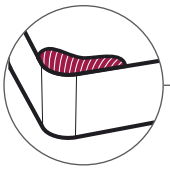
Solutions :
Decrease cutting speed, improve coolant flow, or switch to a harder grade.



Thermal Cracks

Caused by rapid temperature changes during interrupted cuts, worsened by improper coolant us

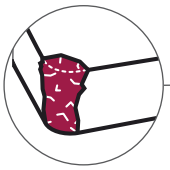
Solutions :
Use a tougher grade, direct coolant properly, reduce speed, or turn off coolant.



Built-up Edge (BUE)

Material from the workpiece sticks to the cutting tool due to pressure welding, common with sticky materials at low speeds.

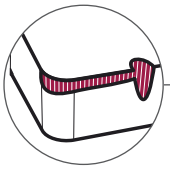
Solutions :
Adjust cutting speed to the optimal range, alter feed rate, or select a sharper chipbreaker.



Edge Chipping / Breakage

Results from excessive mechanical stress, possible from high feed rates, deep cuts, or improper tool setup.

Solutions :
Ensure parameters are correct, check toolholder and shim, use the appropriate tool. If breakage persists, retry with a new edge and diagnose before failure.



Notch Wear

Localized damage along the depth-of-cut line from adhesive and abrasive wear, typical in machining stainless steels and superalloys.

Solutions :
Vary depth of cut, use conical passes, or choose a harder grade or sharper chipbreaker.

Frequently Asked Questions

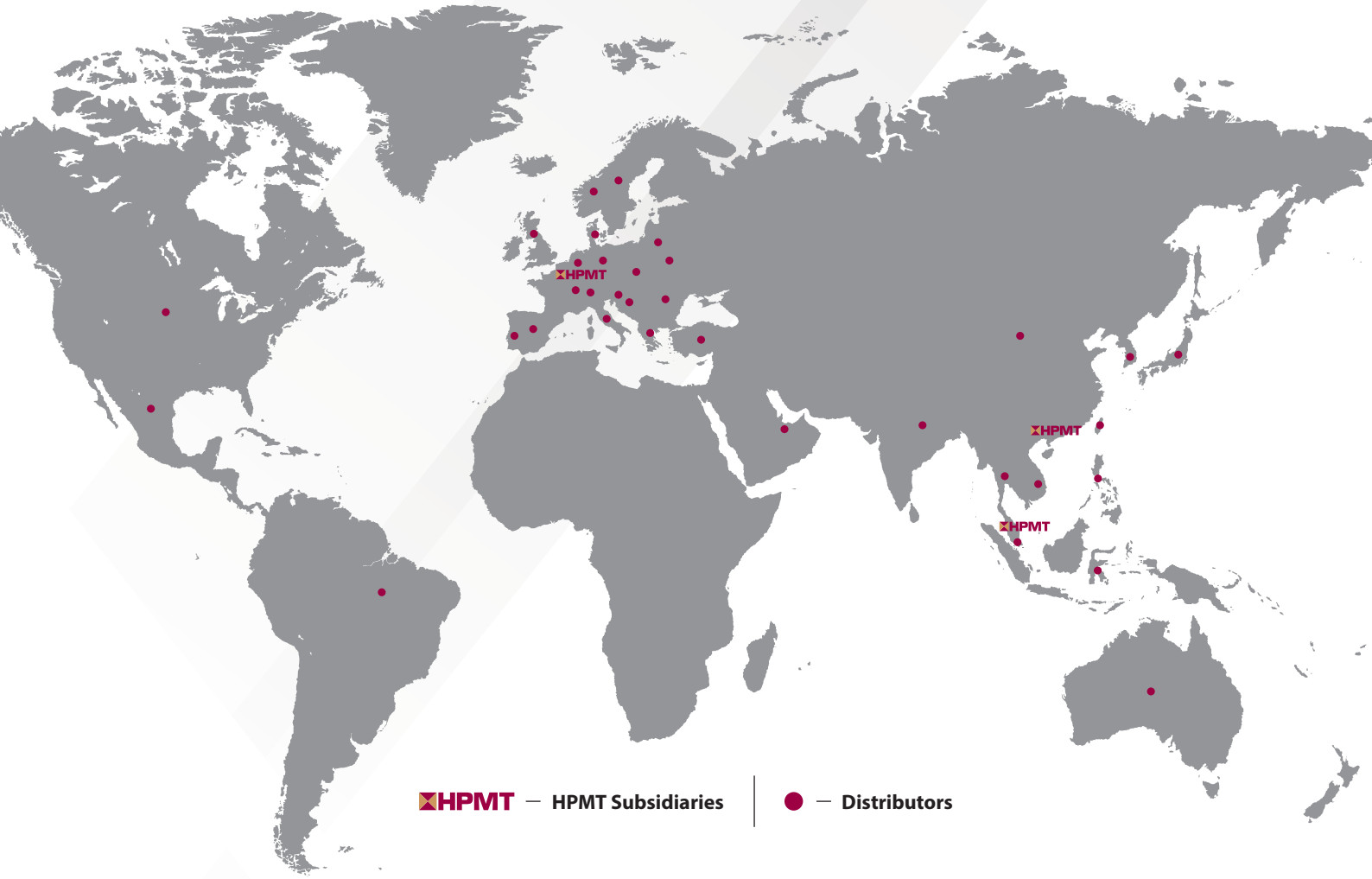
WHY IS HPMT EXPANDING INTO THE CARBIDE INSERTS BUSINESS?
We are expanding to offer you a complete range of tooling solutions. As tools get larger, using indexable carbide inserts becomes more efficient and sustainable. A wider range of products allows us to offer more tailored and innovative solutions to meet your specific needs. It also enables us to achieve economies of scope in production, R&D, sales, and marketing, which can improve our efficiency and lead to better pricing and service for you.

WHAT ADVANTAGES DO I GAIN FROM SOURCING TOOLS FROM A SINGLE SUPPLIER LIKE HPMT?
By consolidating your tooling needs with us, you streamline the procurement process and cut down on administrative tasks, which enhances supplier communication. Increased efficiency and potential cost savings arise from bulk purchasing and streamlined logistics. Consolidating services under one roof reduces complexity and improves the management of your supply chain.

WILL THE QUALITY OF HPMT'S CARBIDE INSERTS MATCH YOUR SOLID CARBIDE TOOLS?
Absolutely. We are committed to delivering the same high-quality standards across all our products. Our carbide inserts undergo rigorous testing to ensure they meet the performance and reliability you expect from HPMT.

HOW WILL HPMT SUPPORT ME DURING THIS TRANSITION TO INCLUDE CARBIDE INSERTS?
We are here to provide full support, including technical assistance, product training, and after-sales service, to ensure you seamlessly integrate our carbide inserts into your operations.

DOES THIS MOVE MEAN HPMT IS SHIFTING FOCUS AWAY FROM SOLID CARBIDE TOOLS?
Not at all. We remain dedicated to our solid carbide tools while enhancing our offerings to include carbide inserts. Our goal is to provide a comprehensive tooling solution that covers all your machining needs.



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