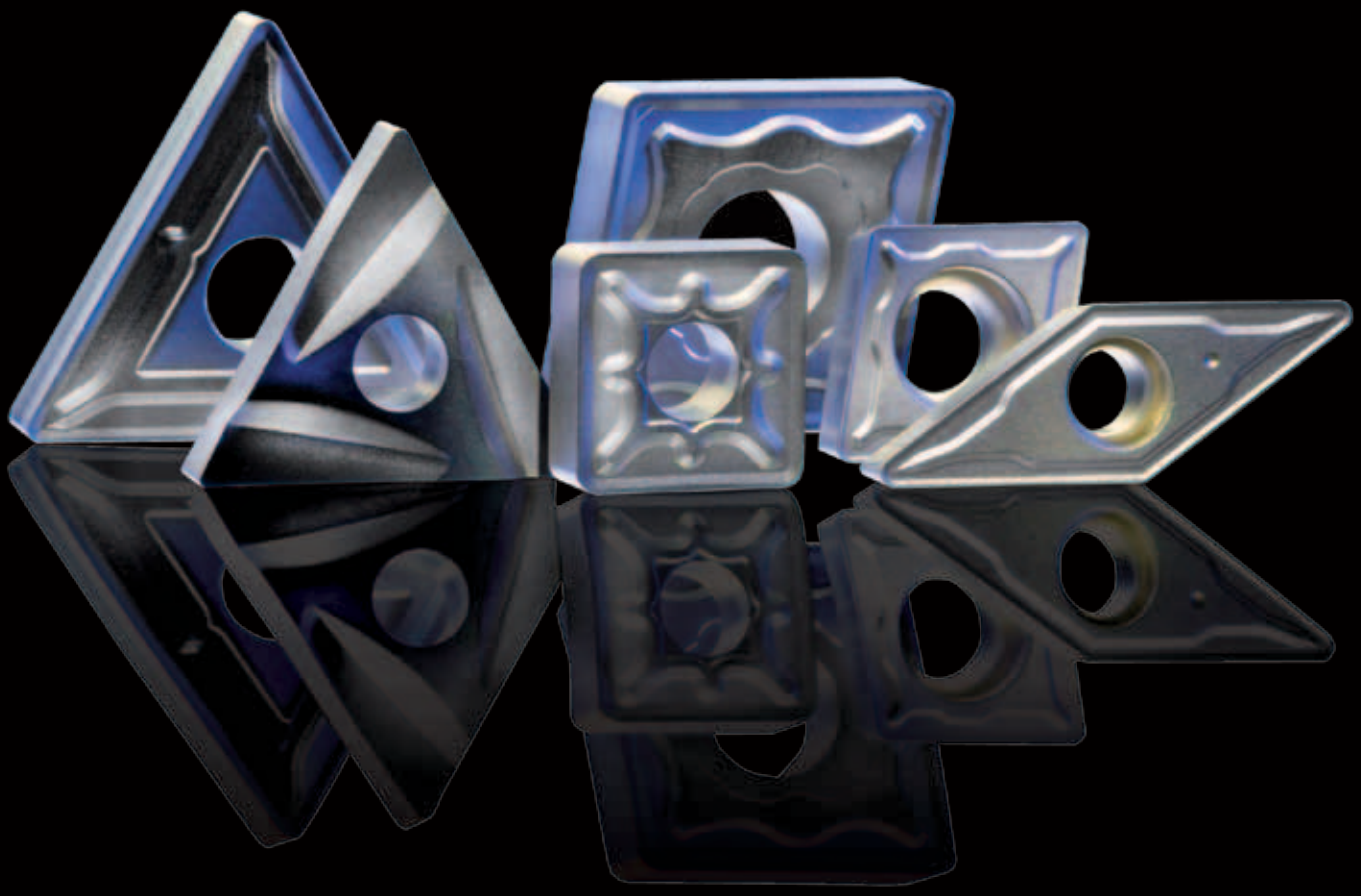
VP9605 with MICROFORM TECHNOLOGY

It's Simple. The Toughest Cutting Edge.



NEW TURNING GRADE FOR DIFFICULT-TO-MACHINE MATERIALS

LESS SCRAP. LESS FAILURE. LESS STRESS.

MAKE US PROVE IT

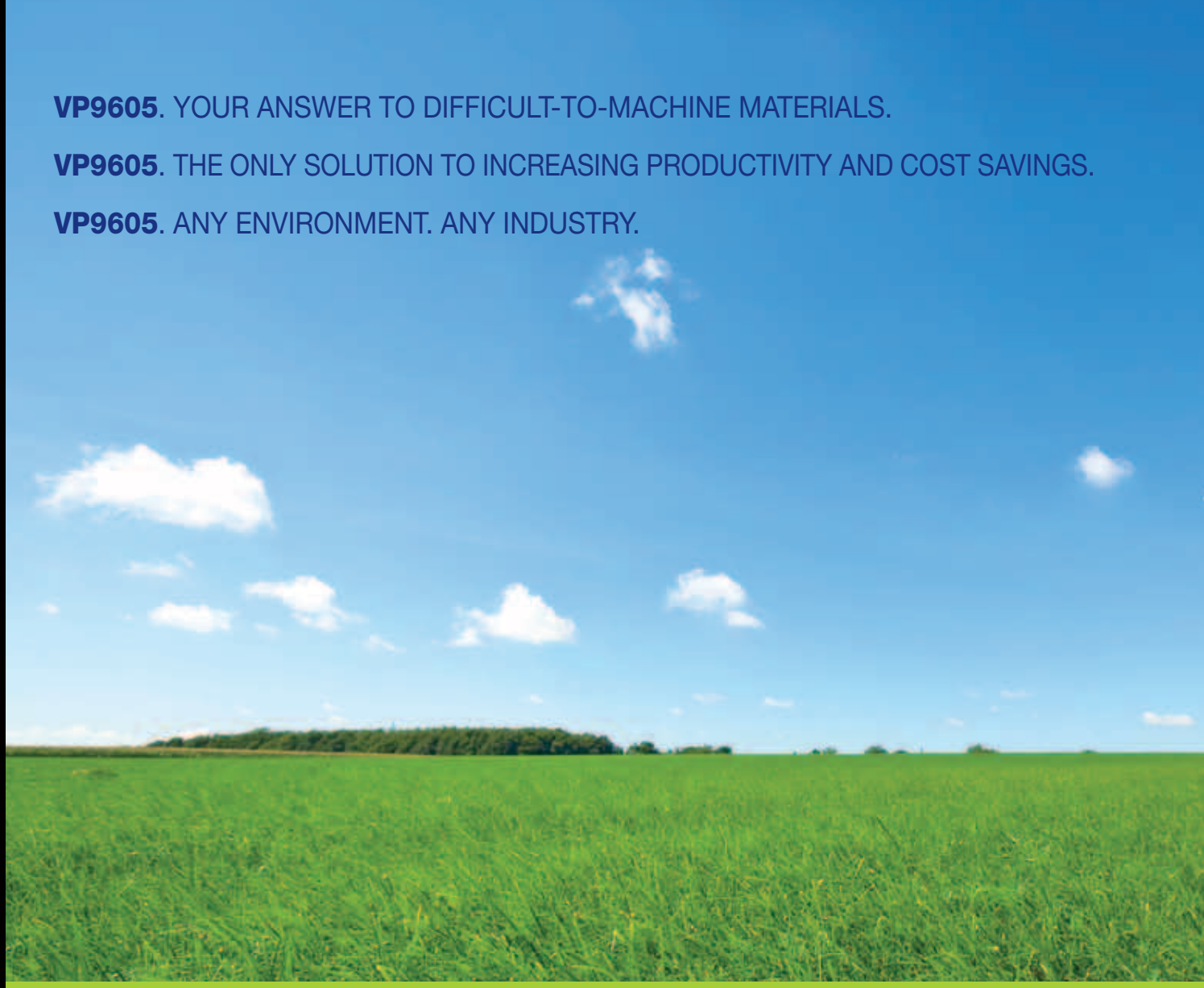
Valenite®

WE NEVER STOP...

VP9605. YOUR ANSWER TO DIFFICULT-TO-MACHINE MATERIALS.

VP9605. THE ONLY SOLUTION TO INCREASING PRODUCTIVITY AND COST SAVINGS.

VP9605. ANY ENVIRONMENT. ANY INDUSTRY.



INDUSTRY CHALLENGES

Alternative transportation… Energy exploration… Demanding environments… Emerging markets… are all increasing the need for the use of advanced materials in the manufacturing process. Whatever your demand is, VP9605 is the solution.

Whether an existing supplier or entering new markets, quickly respond to market trends and high-cost machining operations with Valenite's versatile new turning grade.

Difficult-to-machine? *We see an opportunity-to-machine.*

VP9605

INDUSTRIES

AUTOMOTIVE

DIE & MOLD

OIL/GAS

AEROSPACE

POWER GENERATION

OFF HIGHWAY

MEDICAL

MARINE

DEMANDING ENVIRONMENTS

- Corrosive applications
- Continuous duty cycles
- Elevated temperatures and pressures
- High precision – microns
- Zero tolerance for failure

PROFILE OF DIFFICULT-TO-MACHINE MATERIALS

- Low modulus of elasticity
- Low thermal conductivity transfers more heat to the tool
- High chemical reactivity leads to chips welded to the tool
- Work hardening of the work piece
- Segmented chips increase cutting forces
- Increased cycle times and loss in production time due to frequent tool changes
- Higher insert and tool expenses
- High potential for catastrophic failure resulting in scrap parts

TRANSFORM WITH MICROFORM™!

What is MicroForm?
A special carbide grade technology of powder preparation and sintering, providing the capability to direct-press inserts with a superior uniform micrograin structure.

The Result?
An extremely hard carbide grade with an exceptionally homogeneous grain structure free of inclusions and cubic carbides, a potential source of crack propagation which leads to chipping.

VP9605 WITH MICROFORM IS UNBEATABLE!

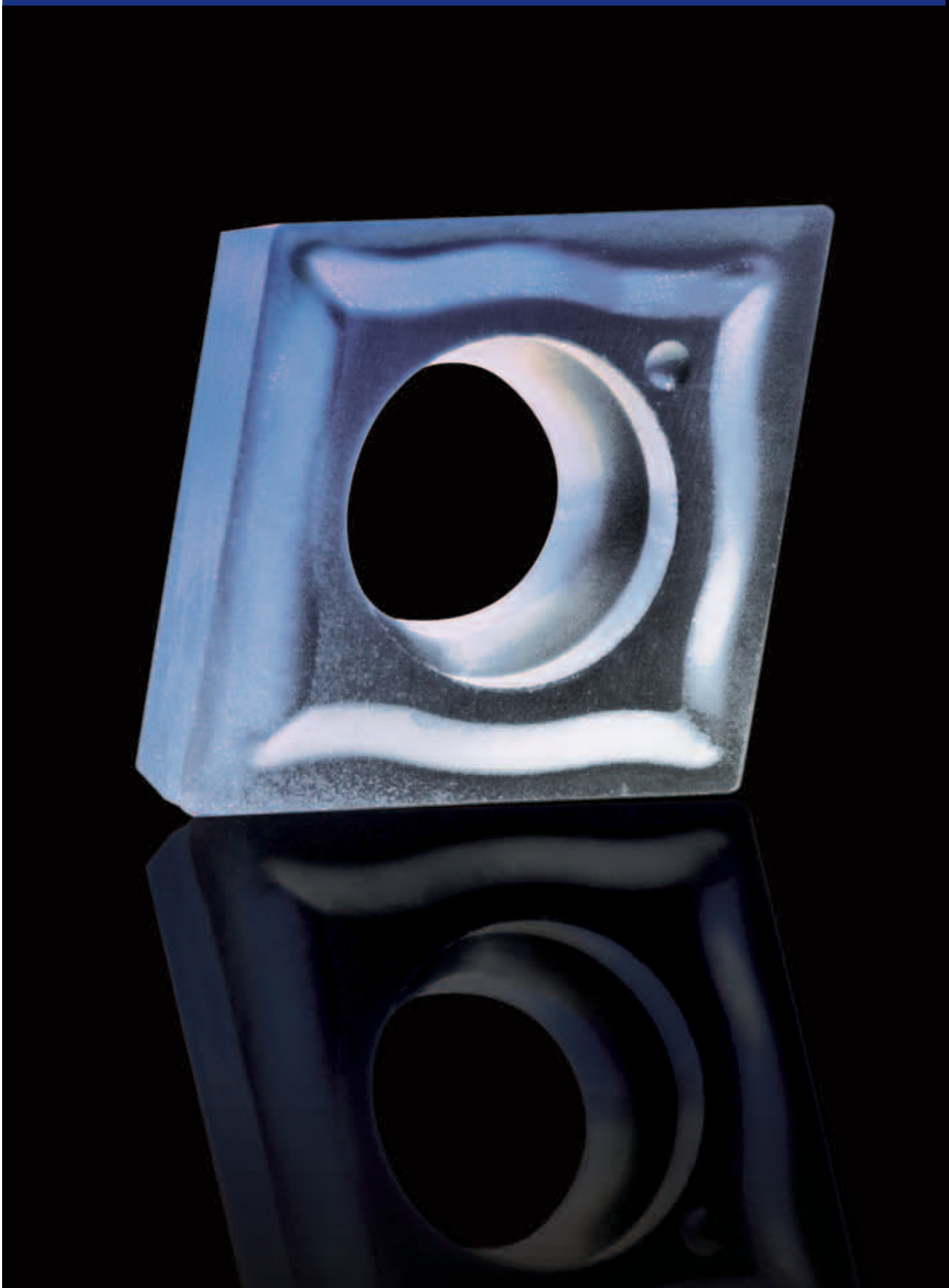
APPLICATIONS

✓ SEMI-FINISHING
✓ FINISHING

MATERIALS

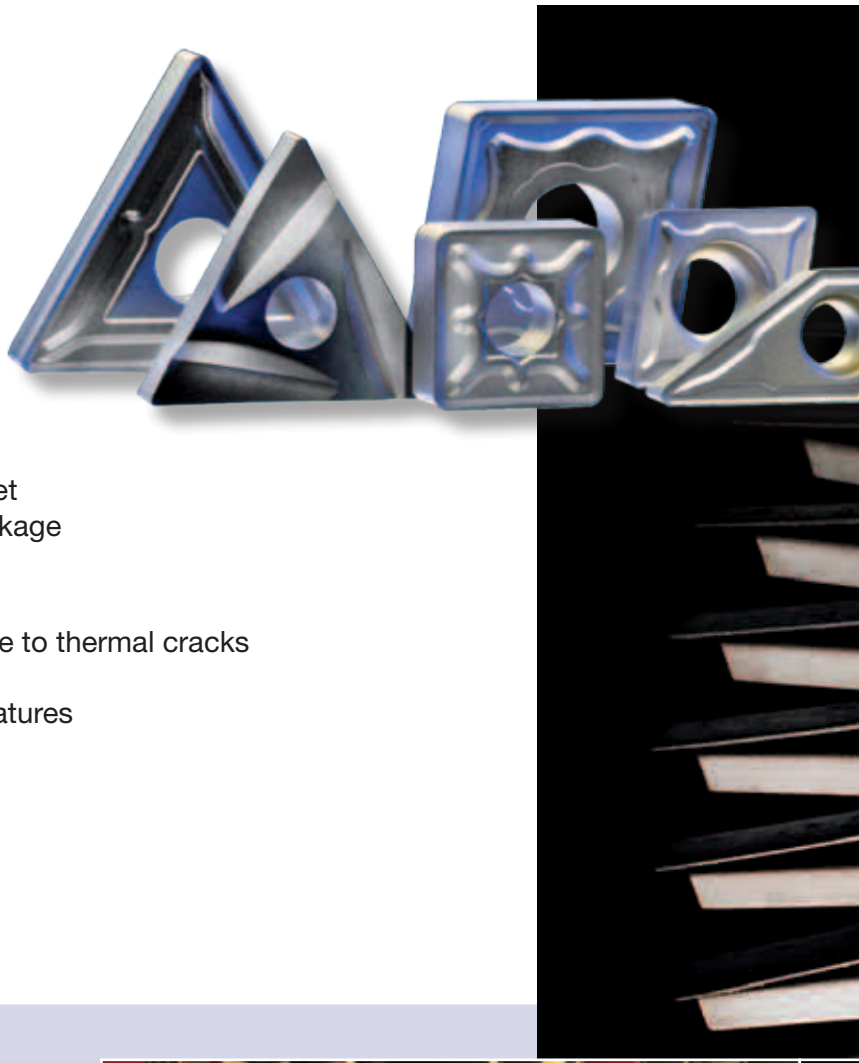
✓ NICKEL-BASED ALLOYS
✓ COBALT-BASED ALLOYS
✓ HEAT-RESISTANT SUPER ALLOYS
✓ HIGH-STRENGTH STAINLESS STEELS
✓ TITANIUM ALLOYS
✓ NON-FERROUS AND ALUMINIUM ALLOYS
✓ BI-METAL MACHINING

VP9605



VP9605

HARDER • TOUGHER
STRONGER • SHARPER



VP9605 Properties:

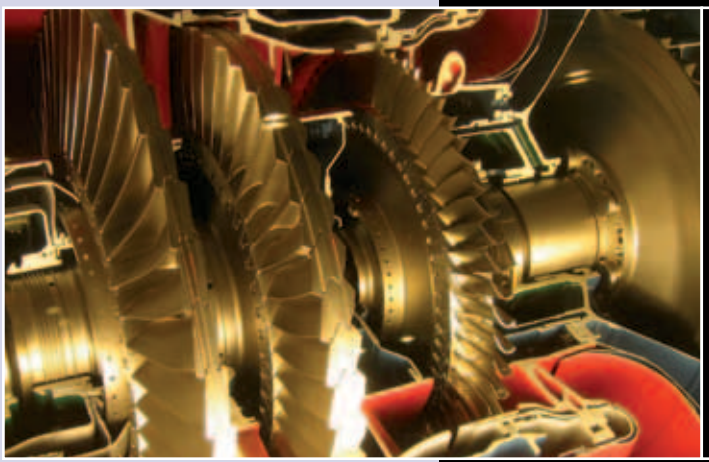
Harder
- Very hard: ≈ 2000 Hv
- Very hard TiAlN PVD coating

Tougher
- Cobalt content is high enough to get a normal wear pattern without breakage

Stronger
- Uniform structure ➜ High resistance to thermal cracks
- Excellent hot hardness
- Maintains hardness at high temperatures

Sharper
- Very fine grain size < 1.0 µm

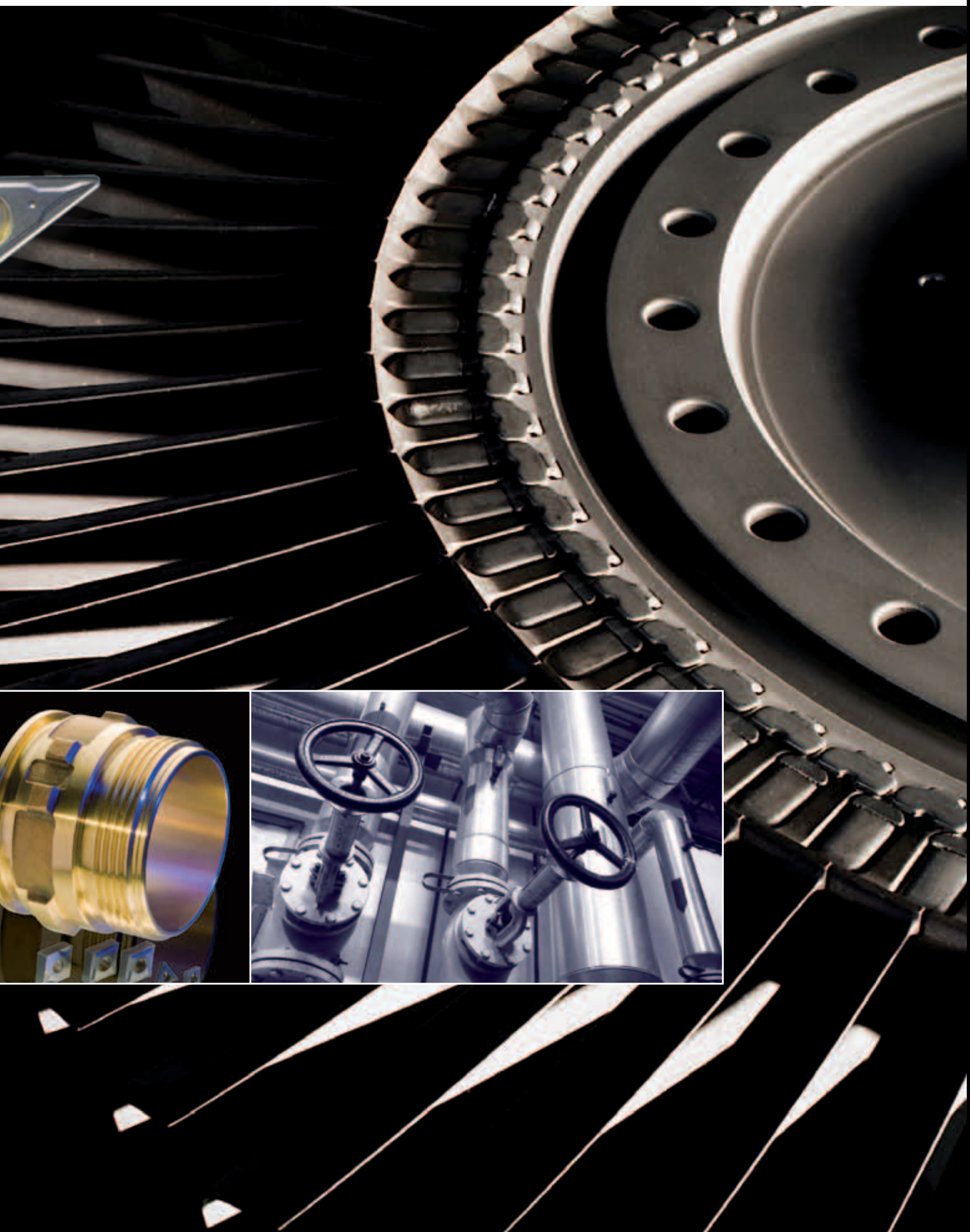
SECURE YOUR EDGE...
WITH MICROFORM!



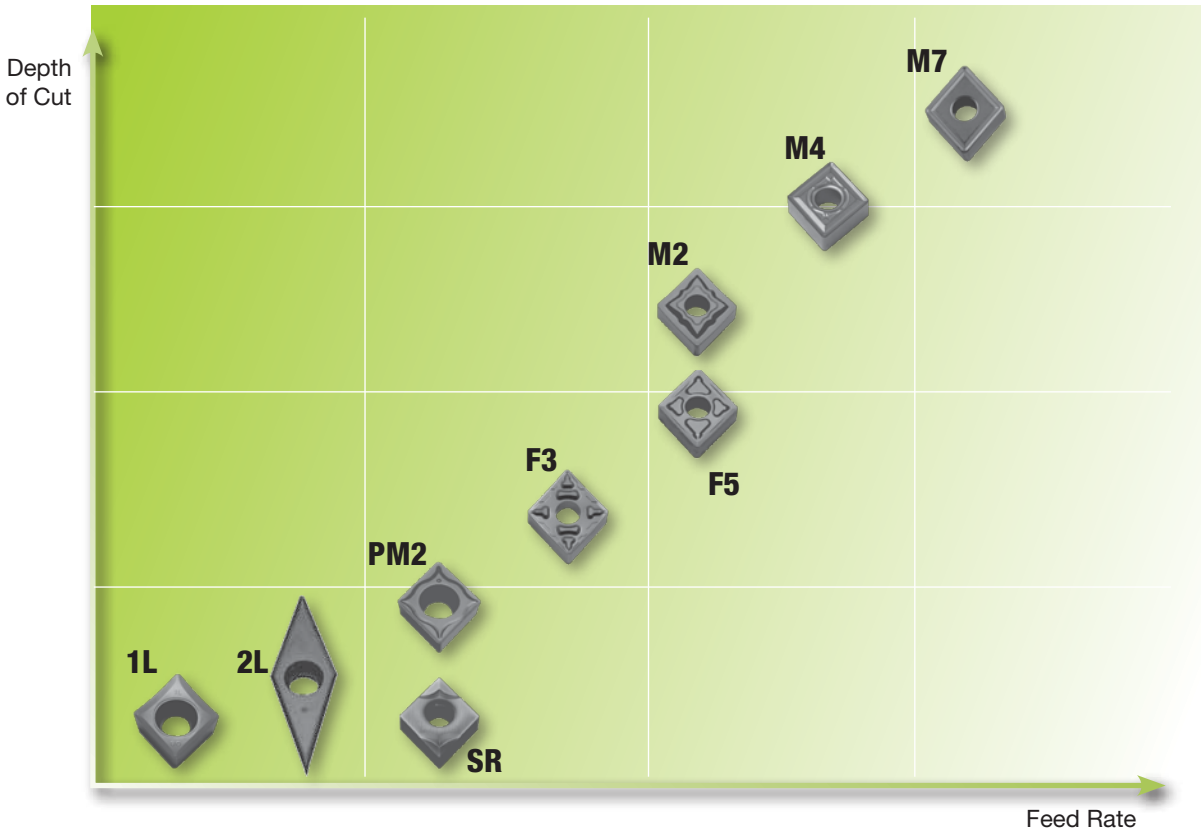
MicroForm is the most versatile, submicron turning grade for difficult-to-machine materials.

- High strength and improved wear resistance
- Innovative substrate combined with an oxidation-resistant, AlTiN-base coating ensures greater thermal stability
- Maintains sharp edge conditions in work hardening materials

VP9605



CHIPBREAKER GUIDE



CUTTING DATA

Stainless Steels

		Operation	DOC mm (inch)	Feed mm/rev (inch/rev)	Cutting Speed v_c / Chipbreaker Designation					
					Ferritic & Martensitic		Austenitic		pH & Duplex	
					v_c m/min (SFM)	Geometries 1st 2nd	v_c m/min (SFM)	Geometries 1st 2nd	v_c m/min (SFM)	Geometries 1st 2nd
VP9605	Negative geometry	GP	1.9-3.8	0.18-0.3	-	-	40-120	M7 - M4	40-90	M7 - M4
			(.075-.150)	(.007-.012)	-	-	(130-400)		(130-300)	
		F	0.25-1.3	0.05-0.13	-	-	40-130	M2 - F3	40-100	M2 - F3
			(.010-.050)	(.002-.005)	-	-	(130-430)		(130-330)	
	Positive geometry	GP	0.25-2.5	0.13-0.3	-	-	40-100	PM2	40-90	PM2
			(.010-1.00)	(.005-.012)	-	-	(130-330)		(130-300)	
		F	0.25-2.5	0.13-0.3	-	-	40-130	1L - 2L	40-100	1L - 2L
			(.010-1.00)	(.005-.012)	-	-	(130-430)		(130-330)	

High Temp Alloys

		Operation	DOC mm (inch)	Feed mm/rev (inch/rev)	Cutting Speed v_c / Chipbreaker Designation							
					Iron Base Alloys A286 Discalloy, Incoloy®		Nickel Base Alloys Monel™, Hastelloy®, Inconel®, Waspaloy®		Cobalt Base Alloys Haynes®, Stellite		Titanium Alloys 6Al4V	
					v_c m/min (SFM)	Geometries 1st 2nd	v_c m/min (SFM)	Geometries 1st 2nd	v_c m/min (SFM)	Geometries 1st 2nd	v_c m/min (SFM)	Geometries 1st 2nd
VP9605	Negative geometry	GP	0.38-1.50	0.1-0.25	100	F5 - M2	60	M2 - F5	50	Flat Top	100	F5 - M2
			(.015-.060)	(.004-.010)	(330)		(200)		(165)		(330)	
		F	0.13-0.6	0.05-0.13	110	SR - M2	70	SR - M2	60	Flat Top	110	SR - M2
			(.005-.025)	(.002-.005)	(365)		(230)		(200)		(365)	
	Positive geometry	GP	0.25-1.0	0.1-0.2	100	PM2	60	1L - 2L	50	PM2	100	1L - 2L
			(.010-.040)	(.004-.008)	(330)		(200)		(165)		(330)	
		F	0.13-1.3	0.08-0.2	110	1L - 2L	70	1L - 2L	60	1L - 2L	110	1L - 2L
			(.005-.050)	(.003-.008)	(365)		(230)		(200)		(365)	

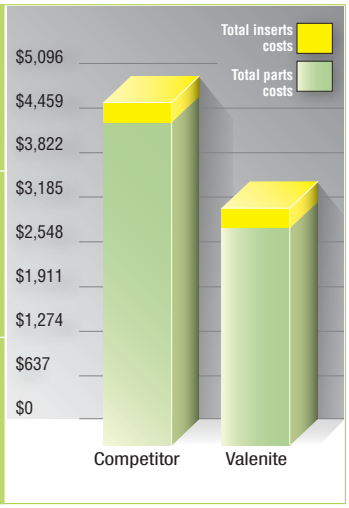
Hardened Materials

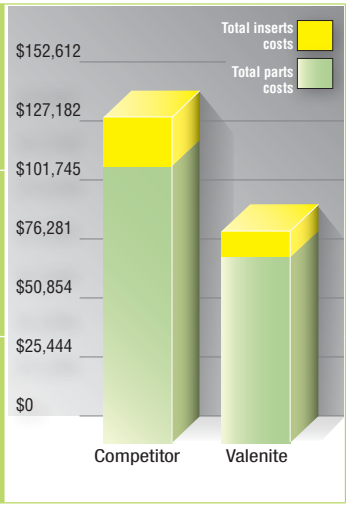
		Operation	DOC mm (inch)	Feed mm/rev (inch/rev)	Cutting Speed v_c / Chipbreaker Designation					
					Alloy Steels 40 - 50 Rc		Alloy Steels 50 - 62 Rc		Tool & Die Steels 50 - 60 Rc	
					v_c m/min (SFM)	Geometries 1st 2nd	v_c m/min (SFM)	Geometries 1st 2nd	v_c m/min (SFM)	Geometries 1st 2nd
VP9605	Negative geometry	F	0.13-1.0	0.05-0.2	70-110	Flat Top	60-90	Flat Top	50-80	Flat Top
			(.005-.080)	(.002-.008)	(230-365)		(200-300)		(165-265)	
	Positive geometry	F	0.13-1.0	0.05-0.2	70-110	PM2	60-90	PM2	50-80	PM2
			(.005-.080)	(.002-.008)	(230-365)		(200-300)		(165-265)	

GP = General Purpose
F = Finishing

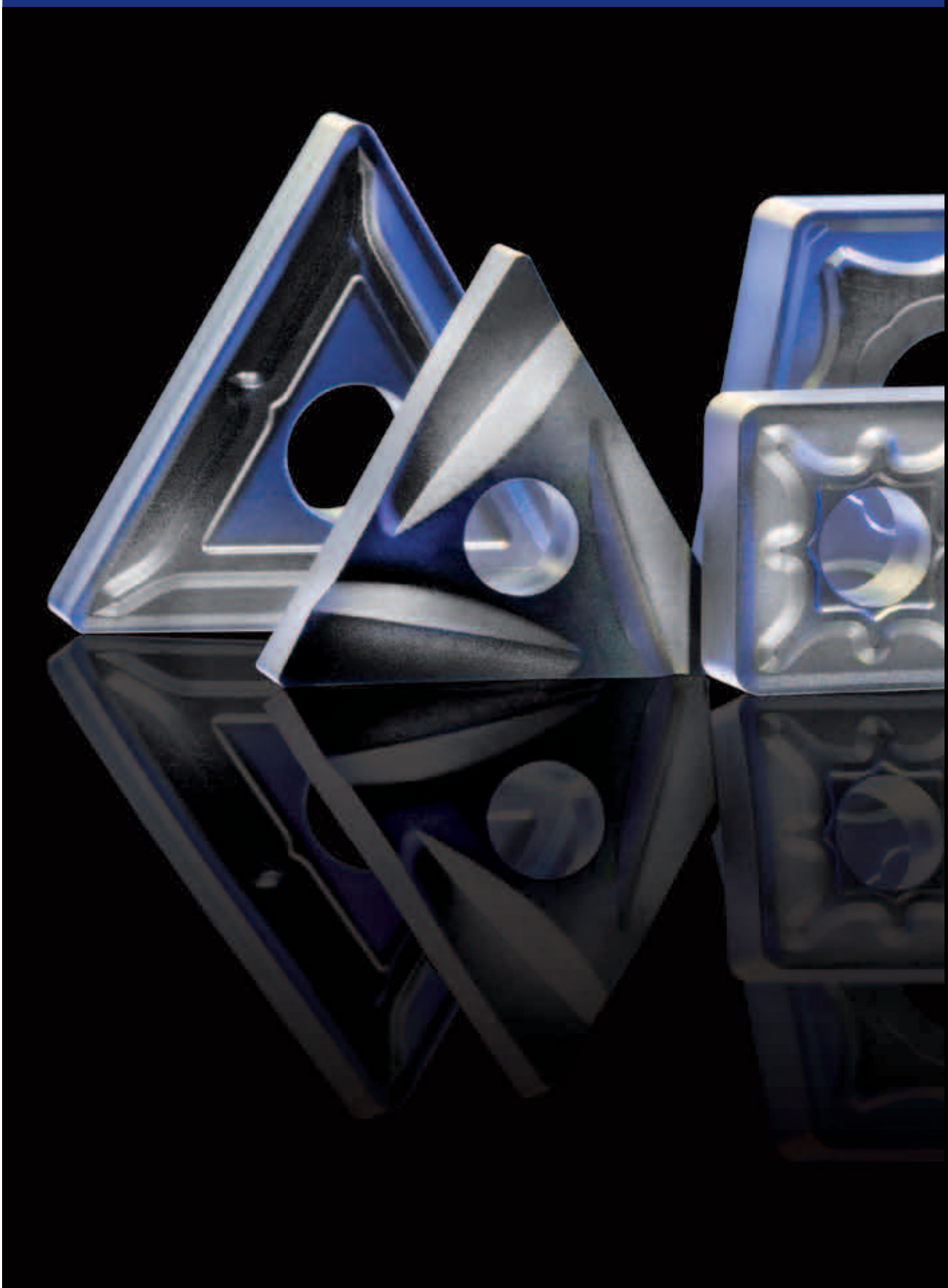
VP9605

TEST RESULTS

	Depth of Cut	Feed Rate	Total Time	Material	Number of Parts Produced	Production Cost	Production Cost Savings
	(inch)		(h)			($)	
VP9605	**0.09**	**0.009**	**21**	Inconel	100	**2,984.71**	
Competitor	0.04	0.006	33			4,506.31	
Improvement	**125%**	**50%**	**36%**			**34%**	

	Speed	Total Time	Material	Number of Parts Produced	Production Cost	Production Cost Savings
	(SFM)	(h)			($)	
VP9605	**327**	**1000**	TA6V	200,000	**78,152.86**	
Competitor	262	1700			128,012.41	
Improvement	**25%**	**41%**			**39%**	

VP9605



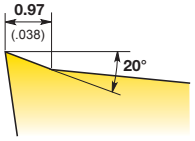
APPLICATION GUIDE

Valenite®

APPLICATION GUIDE

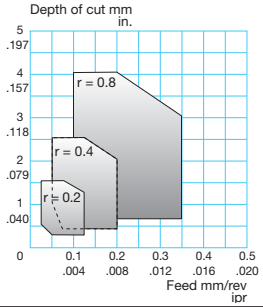
Geometry	Chipbreaker Profile mm (in.)	Applications	Description

1L



- High positive angle
- Low cutting forces, good chip control
- Finishing to roughing on aluminum
- Finishing on high temp alloys

M N S



Continuous cutting | Run-out | Light | Medium | High

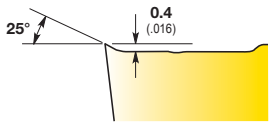
1L

Main application area:

Depth of cut:.....a_p = 0.1 - 4.0 mm (.004 - .160 inch)

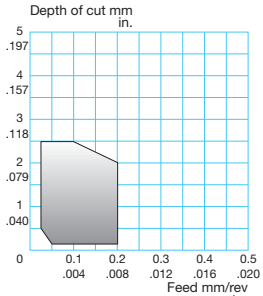
Feed:.....f = 0.04 - 0.35 mm/rev (.002 - .014 ipr)

2L



- High positive angle
- Low cutting forces, good chip control
- Finishing on high temp alloys

M N S



Continuous cutting | Run-out | Light | Medium | High

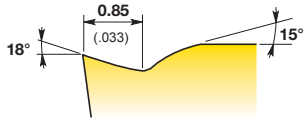
2L

Main application area:

Depth of cut:.....a_p = 0.1 - 2.5 mm (.004 - .010 inch)

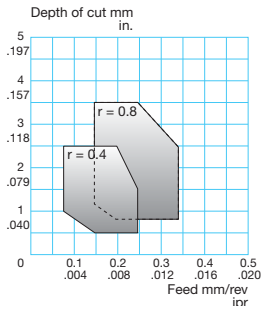
Feed:.....f = 0.02 - 0.2 mm/rev (.0008 - .008 ipr)

PM2



- Finishing / semi-finishing applications
- Positive cutting edge for reduced forces
- Broad chip-control application range
- Excellent profiling capability

P M



Continuous cutting | Run-out | Light | Medium | High

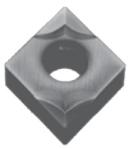
PM2

Main application area:

Depth of cut:.....a_p = 0.5 - 3.5 mm (.020 - .140 inch)

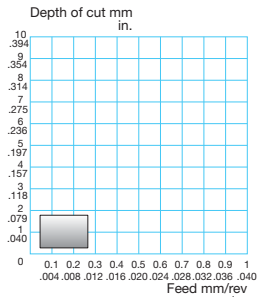
Feed:.....f = 0.08 - 0.34 mm/rev (.003 - .013 ipr)

SR



- Finishing application
- High positive cutting angle
- First choice on high-temp and stainless material
- Produces excellent surface finishes

M S



Continuous cutting | Run-out | Light | Medium | High

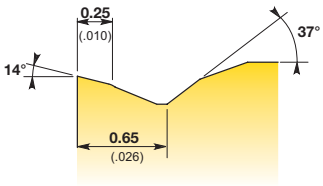
SR

Main application area:

Depth of cut:.....a_p = 0.10 - 1.52 mm (.004 - .060 inch)

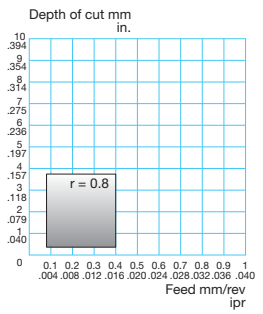
Feed:.....f = 0.05 - 0.25 mm/rev (.002 - .010 ipr)

F3



- Semi-finishing application
- Medium positive cutting angle
- Excellent profiling capability

P M



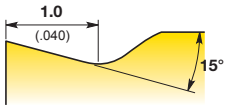
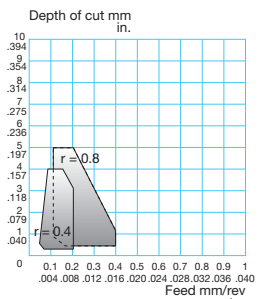
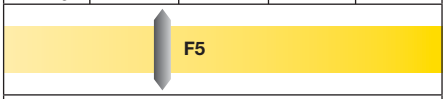
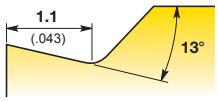
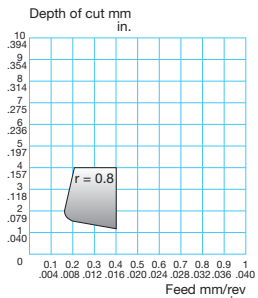
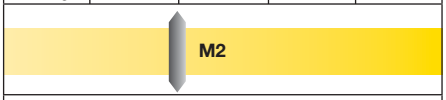
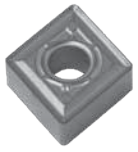
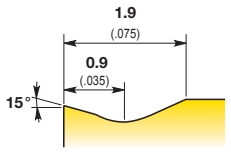
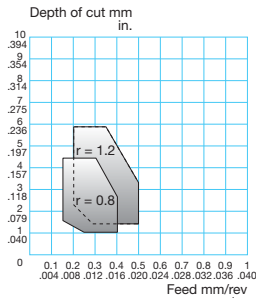
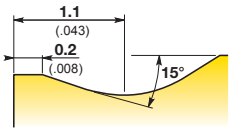
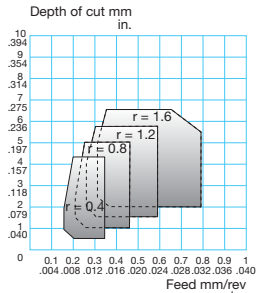
Continuous cutting | Run-out | Light | Medium | High

F3

Main application area:

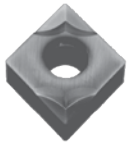
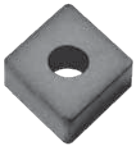
Depth of cut:.....a_p = 0.3 - 3.8 mm (.012 - .150 inch)

Feed:.....f = 0.08 - 0.4 mm/rev (.003 - .016 ipr)

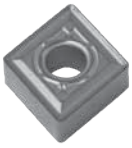
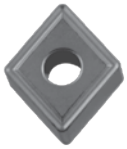
Geometry	Chipbreaker Profile mm (in.)	Applications	Description
F5 	 • Finishing to medium machining • High positive cutting angle • Low cutting forces - ideal for soft materials, work hardening materials	P M S 	Continuous cutting · Run-out · Light · Medium · High  **Main application area:** Depth of cut:.....a_p = 0.3 - 5.0 mm (.012 - .200 inch) Feed:.....f = 0.05 - 0.4 mm/rev (.002 - .016 ipr)
M2 	 • Semi-finishing to light roughing • High positive cutting angle • Low cutting forces - ideal for soft materials, work hardening materials	P M S 	Continuous cutting · Run-out · Light · Medium · High  **Main application area:** Depth of cut:.....a_p = 0.4 - 4.0 mm (.016 - .160 inch) Feed:.....f = 0.1 - 0.4 mm/rev (.004 - .016 ipr)
M4 	 • Multi-purpose geometry for machining of sticky materials	M S 	Continuous cutting · Run-out · Light · Medium · High  **Main application area:** Depth of cut:.....a_p = 1 - 6 mm (.039 - .235 inch) Feed:.....f = 0.15 - 0.5 mm/rev (.006 - .020 ipr)
M7 	 • Medium to light roughing • Smooth chipbreaker for soft materials • Neutral land for a good resistance	P M S 	Continuous cutting · Run-out · Light · Medium · High  **Main application area:** Depth of cut:.....a_p = 0.8 - 6.5 mm (.031 - .260 inch) Feed:.....f = 0.15 - 0.8 mm/rev (.006 - .031 ipr)

PRODUCT OFFERING

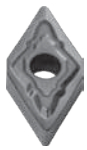
PRODUCT OFFERING

Chipbreaker Style	ANSI Article Number	ANSI Size (inch)			EDP#	ISO Size (mm)			ISO Article Number
		I.C.	Thickness	Radius	9605	I.C.	Thickness	Radius	
CCGT 1L 	CCGT 21.50.5 1L	.250	.102	.008	19058	6.35	2.58	0.2	CCGT 060202-1L
	CCGT 21.51 1L	.250	.102	.016	19059	6.35	2.58	0.4	CCGT 060204-1L
	CCGT 2.520.5 1L	.312	.125	.008	19060	7.94	3.18	0.2	CCGT 080302-1L
	CCGT 2.521 1L	.312	.125	.016	19061	7.94	3.18	0.4	CCGT 080304-1L
	CCGT 32.50.5 1L	.375	.156	.008	19062	9.52	3.97	0.2	CCGT 09T302-1L
	CCGT 32.51 1L	.375	.156	.016	19063	9.52	3.97	0.4	CCGT 09T304-1L
	CCGT 32.52 1L	.375	.156	.031	19064	9.52	3.97	0.8	CCGT 09T308-1L
	CCGT 432 1L	.500	.187	.031	19065	12.70	4.76	0.8	CCGT 120408-1L
CCGT PM2 	CCGT 21.51 PM2	.250	.094	.016	19139	6.35	2.38	0.4	CCGT 060204-PM2
	CCGT 21.52 PM2	.250	.094	.031	19140	6.35	2.38	0.8	CCGT 060208-PM2
	CCGT 32.51 PM2	.375	.156	.016	19141	9.52	3.97	0.4	CCGT 09T304-PM2
	CCGT 32.52 PM2	.375	.156	.031	19142	9.52	3.97	0.8	CCGT 09T308-PM2
CNGP SR 	CNGP 43.007 SR	.500	.187	.008	19143	12.70	4.76	0.2	CNGG 120402-SR
	CNGP 431 SR	.500	.187	.016	19144	12.70	4.76	0.4	CNGG 120404-SR
	CNGP 432 SR	.500	.187	.031	19145	12.70	4.76	0.8	CNGG 120408-SR
CNMA 	CNMA 432	.500	.187	.031	19067	12.70	4.76	0.8	CNMA 120408
	CNMA 433	.500	.187	.047	19068	12.70	4.76	1.2	CNMA 120412
	CNMA 543	.625	.250	.047	19069	15.87	6.35	1.2	CNMA 160612
	CNMA 544	.625	.250	.062	19070	15.87	6.35	1.6	CNMA 160616
	CNMA 643	.750	.250	.047	19071	19.05	6.35	1.2	CNMA 190612
	CNMA 644	.750	.250	.062	19072	19.05	6.35	1.6	CNMA 190616
CNMG F3 	CNMG 431 F3	.500	.187	.016	19146	12.70	4.76	0.4	CNMG 120404-F3
	CNMG 432 F3	.500	.187	.031	19147	12.70	4.76	0.8	CNMG 120408-F3
	CNMG 433 F3	.500	.187	.047	19148	12.70	4.76	1.2	CNMG 120412-F3

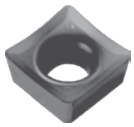
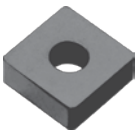
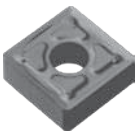
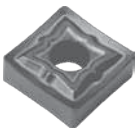
PRODUCT OFFERING

Chipbreaker Style	ANSI Article Number	ANSI Size (inch)			EDP#	ISO Size (mm)			ISO Article Number
		I.C.	Thickness	Radius	9605	I.C.	Thickness	Radius	
CNMG F5 	CNMG 431-F5	.500	.187	.016	19073	12.70	4.76	0.4	CNMG 120404-F5
	CNMG 432-F5	.500	.187	.031	19075	12.70	4.76	0.8	CNMG 120408-F5
CNMG M4 	CNMG 432 M4	.500	.187	.031	19077	12.70	4.76	0.8	CNMG 120408-M4
	CNMG 433 M4	.500	.187	.047	19079	12.70	4.76	1.2	CNMG 120412-M4
CNMG M7 	CNMG 432 M7	.500	.187	.031	19078	12.70	4.76	0.8	CNMG 120408-M7
	CNMG 433 M7	.500	.187	.047	19080	12.70	4.76	1.2	CNMG 120412-M7
CNMP M2 	CNMP 431-M2	.500	.187	.016	19074	12.70	4.76	0.4	CNMG 120404-M2
	CNMP 432-M2	.500	.187	.031	19076	12.70	4.76	0.8	CNMG 120408-M2
CPGT PM2 	CPGT 21.51 PM2	.250	.094	.016	19149	6.35	2.38	0.4	CPGT 060204-PM2
	CPGT 21.52 PM2	.250	.094	.031	19150	6.35	2.38	0.8	CPGT 060208-PM2
	CPGT 32.51 PM2	.375	.156	.016	19151	9.52	3.97	0.4	CPGT 09T304-PM2
DCGT 1L 	DCGT 21.50.5 1L	.250	.102	.008	19081	6.35	2.58	0.2	DCGT 070202-1L
	DCGT 21.51 1L	.250	.102	.016	19082	6.35	2.58	0.4	DCGT 070204-1L
	DCGT 32.50.5 1L	.375	.166	.008	19083	9.52	4.22	0.2	DCGT 11T302-1L
	DCGT 32.51 1L	.375	.166	.016	19084	9.52	4.22	0.4	DCGT 11T304-1L
	DCGT 32.52 1L	.375	.166	.031	19085	9.52	4.22	0.8	DCGT 11T308-1L

PRODUCT OFFERING

Chipbreaker Style	ANSI Article Number	ANSI Size (inch)			EDP#	ISO Size (mm)			ISO Article Number
		I.C.	Thickness	Radius	9605	I.C.	Thickness	Radius	
DCGT PM2 	DCGT 32.51 PM2	.375	.156	.016	19152	9.52	3.97	0.4	DCGT 11T304-PM2
	DCGT 32.52 PM2	.375	.156	.031	19153	9.52	3.97	0.8	DCGT 11T308-PM2
DNGP SR 	DNGP 33.007 SR	.375	.187	.008	19154	9.52	4.76	0.2	DNGG 110402-SR
	DNGP 331 SR	.375	.187	.016	19155	9.52	4.76	0.4	DNGG 110404-SR
	DNGP 43.007 SR	.500	.187	.008	19156	12.70	4.76	0.2	DNGG 150402-SR
	DNGP 431 SR	.500	.187	.016	19157	12.70	4.76	0.4	DNGG 150404-SR
DNMA 	DNMA 431	.500	.187	.016	19086	12.70	4.76	0.4	DNMA 150404
	DNMA 432	.500	.187	.031	19087	12.70	4.76	0.8	DNMA 150408
	DNMA 433	.500	.187	.047	19088	12.70	4.76	1.2	DNMA 150412
	DNMA 441	.500	.250	.016	19089	12.70	6.35	0.4	DNMA 150604
	DNMA 442	.500	.250	.031	19090	12.70	6.35	0.8	DNMA 150608
	DNMA 443	.500	.250	.047	19091	12.70	6.35	1.2	DNMA 150612
DNMG F5 	DNMG 432-F5	.500	.187	.031	19092	12.70	4.76	0.8	DNMG 150408-F5
	DNMG 441-F5	.500	.250	.016	19094	12.70	6.35	0.4	DNMG 150604-F5
	DNMG 442-F5	.500	.250	.031	19097	12.70	6.35	0.8	DNMG 150608-F5
DNMG M4 	DNMG 442 M4	.500	.250	.031	19099	12.70	6.35	0.8	DNMG 150608-M4
DNMP M2 	DNMP 432-M2	.500	.187	.031	19093	12.70	4.76	0.8	DNMG 150408-M2
	DNMP 442-M2	.500	.250	.031	19098	12.70	6.35	0.8	DNMG 150608-M2

PRODUCT OFFERING

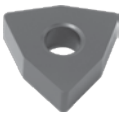
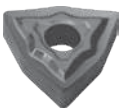
Chipbreaker Style	ANSI Article Number	ANSI Size (inch)			EDP#	ISO Size (mm)			ISO Article Number
		I.C.	Thickness	Radius	9605	I.C.	Thickness	Radius	
SCGT 1L 	SCGT 32.51 1L	.375	.166	.016	19100	9.52	4.22	0.4	SCGT 09T304-1L
	SCGT 32.52 1L	.375	.166	.031	19101	9.52	4.22	0.8	SCGT 09T308-1L
SCGT PM2 	SCGT 32.52 PM2	.375	.156	.031	19158	9.52	3.97	0.8	SCGT 09T308-PM2
	SCGT 432 PM2	.500	.187	.031	19159	12.70	4.76	0.8	SCGT 120408-PM2
SNMA 	SNMA 432	.500	.187	.031	19102	12.70	4.76	0.8	SNMA 120408
	SNMA 433	.500	.187	.047	19103	12.70	4.76	1.2	SNMA 120412
	SNMA 543	.625	.250	.047	19104	15.87	6.35	1.2	SNMA 150612
	SNMA 544	.625	.250	.062	19105	15.87	6.35	1.6	SNMA 150616
	SNMA 643	.750	.250	.047	19106	19.05	6.35	1.2	SNMA 190612
	SNMA 644	.750	.250	.062	19107	19.05	6.35	1.6	SNMA 190616
SNMG F5 	SNMG 432-F5	.500	.187	.031	19108	12.70	4.76	0.8	SNMG 120408-F5
SNMP M2 	SNMP 432-M2	.500	.187	.031	19109	12.70	4.76	0.8	SNMG 120408-M2
TCGT 1L 	TCGT 21.50.5 1L	.250	.102	.008	19110	6.35	2.58	0.2	TCGT 110202-1L
	TCGT 21.51 1L	.250	.102	.016	19111	6.35	2.58	0.4	TCGT 110204-1L
	TCGT 32.51 1L	.375	.166	.016	19112	9.52	4.22	0.4	TCGT 16T304-1L
	TCGT 32.52 1L	.375	.166	.031	19113	9.52	4.22	0.8	TCGT 16T308-1L

VP9605

PRODUCT OFFERING

Chipbreaker Style	ANSI Article Number	ANSI Size (inch)			EDP#	ISO Size (mm)			ISO Article Number
		I.C.	Thickness	Radius	9605	I.C.	Thickness	Radius	
TCGT PM2 	TCGT 21.51 PM2	.250	.094	.016	19160	6.35	2.38	0.4	TCGT 110204-PM2
	TCGT 21.52 PM2	.250	.094	.031	19161	6.35	2.38	0.8	TCGT 110208-PM2
	TCGT 32.51 PM2	.375	.156	.016	19162	9.52	3.97	0.4	TCGT 16T304-PM2
TNMA 	TNMA 322	.375	.125	.031	19114	9.52	3.18	0.8	TNMA 160308
	TNMA 332	.375	.187	.031	19115	9.52	4.76	0.8	TNMA 160408
	TNMA 432	.500	.187	.031	19116	12.70	4.76	0.8	TNMA 220408
TNMG F5 	TNMG 331-F5	.375	.187	.016	19117	9.52	4.76	0.4	TNMG 160404-F5
	TNMG 332-F5	.375	.187	.031	19118	9.52	4.76	0.8	TNMG 160408-F5
TNMP M2 	TNMP 332-M2	.375	.187	.031	19119	9.52	4.76	0.8	TNMG 160408-M2
TPGT PM2 	TPGT 1.81.51 PM2	.219	.094	.016	19163	5.56	2.38	0.4	TPGT 090204-PM2
	TPGT 21.52 PM2	.250	.094	.031	19164	6.35	2.38	0.8	TPGT 110208-PM2
VCGT 1L 	VCGT 1.51.50.5 1L	.156	.102	.008	19120	3.97	2.58	0.2	VCGT 070202-1L
	VCGT 1.51.51 1L	.156	.102	.016	19121	3.97	2.58	0.4	VCGT 070204-1L
	VCGT 21.50.5 1L	.250	.102	.008	19122	6.35	2.58	0.2	VCGT 110202-1L
	VCGT 21.51 1L	.250	.102	.016	19123	6.35	2.58	0.4	VCGT 110204-1L
	VCGT 2.520.5 1L	.312	.135	.008	19124	7.94	3.43	0.2	VCGT 130302-1L
	VCGT 2.521 1L	.312	.135	.016	19126	7.94	3.43	0.4	VCGT 130304-1L
	VCGT 2.522 1L	.312	.135	.031	19128	7.94	3.43	0.8	VCGT 130308-1L
	VCGT 331 1L	.375	.197	.016	19130	9.52	5.01	0.4	VCGT 160404-1L
	VCGT 332 1L	.375	.197	.031	19131	9.52	5.01	0.8	VCGT 160408-1L
	VCGT 333 1L	.375	.197	.047	19132	9.52	5.01	1.2	VCGT 160412-1L

PRODUCT OFFERING

Chipbreaker Style	ANSI Article Number	ANSI Size (inch)			EDP#	ISO Size (mm)			ISO Article Number
		I.C.	Thickness	Radius	9605	I.C.	Thickness	Radius	
VCGT 2L 	VCGT 2.520.5 2L	.312	.125	.008	19125	7.94	3.18	0.2	VCGT 130302-2L
	VCGT 2.521 2L	.312	.125	.016	19127	7.94	3.18	0.4	VCGT 130304-2L
	VCGT 2.522 2L	.312	.125	.031	19129	7.94	3.18	0.8	VCGT 130308-2L
VNGP SR 	VNGP 33.007 SR	.375	.187	.008	19165	9.52	4.76	0.2	VNGG 160402-SR
	VNGP 331 SR	.375	.187	.016	19166	9.52	4.76	0.4	VNGG 160404-SR
WNMA 	WNMA 432	.500	.187	.031	19133	12.70	4.76	0.8	WNMA 080408
WNMG F5 	WNMG 431-F5	.500	.187	.016	19136	12.70	4.76	0.4	WNMG 080404-F5
	WNMG 432-F5	.500	.187	.031	19137	12.70	4.76	0.8	WNMG 080408-F5
WNMP M2 	WNMP 331-M2	.375	.187	.016	19134	9.52	4.76	0.4	WNMG 060404-M2
	WNMP 332-M2	.375	.187	.031	19135	9.52	4.76	0.8	WNMG 060408-M2
	WNMP 432-M2	.500	.187	.031	19138	12.70	4.76	0.8	WNMG 080408-M2

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