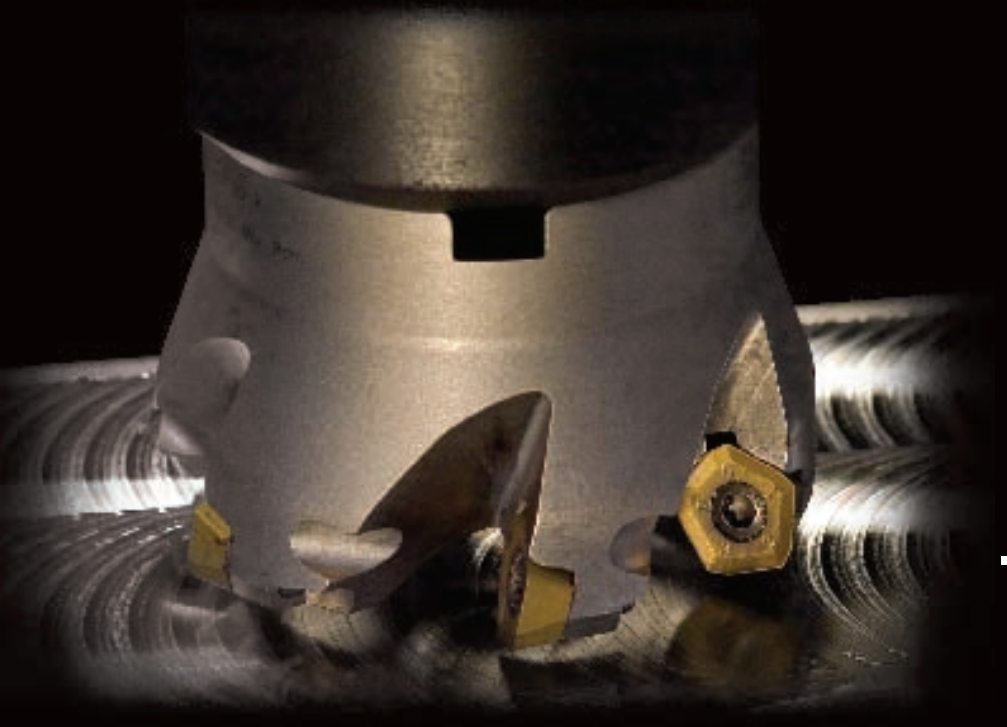
WE NEVER STOP...

Milling



WALTER VALENITE

Valenite®

Dear Valued Customer,

WE NEVER STOP...

Working
to keep you on the cutting edge of technology, productivity, cost savings and service with new tools and dedicated people.

Supporting
you to stay competitive in today's global marketplace. We never stop finding ways to build the most effective relationships.

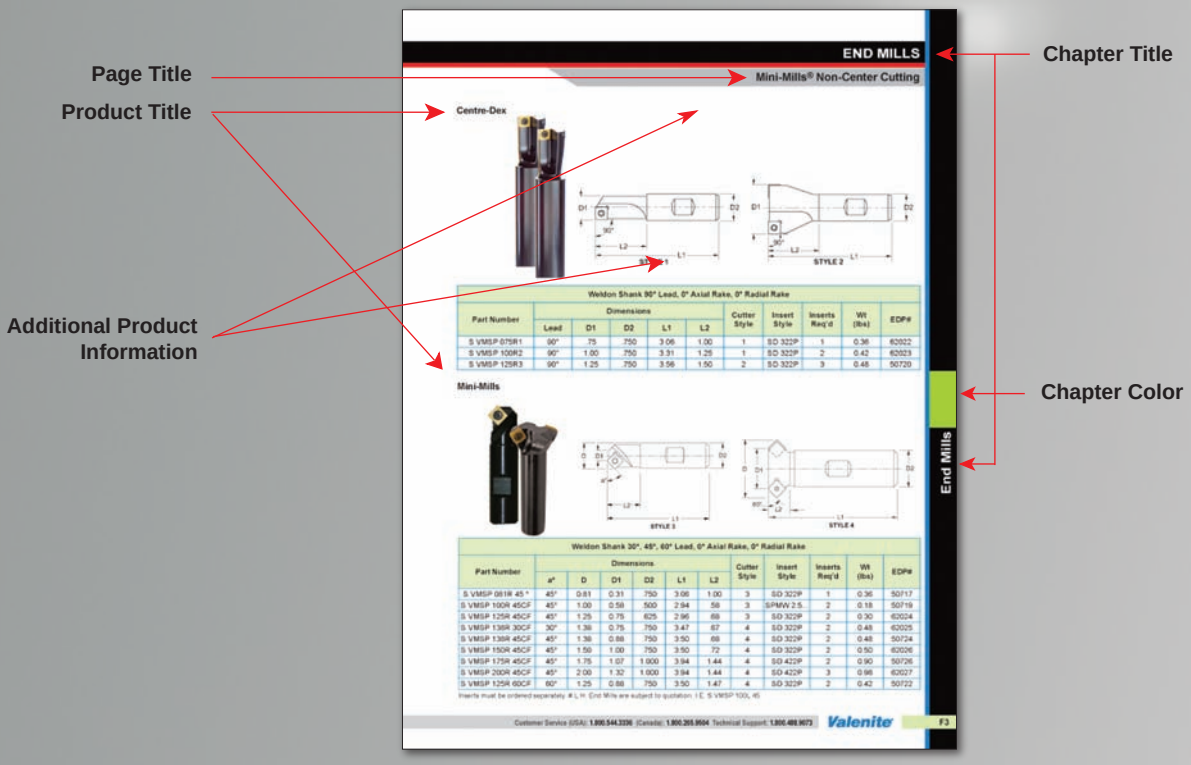
Developing
by always increasing our product range.

ValMILL®

We never stop making things easier for you...

This catalog has been organized into 11 chapters and each chapter is identified by a different color.

Example: End Mills = Green Chapter Color



ValMILL®

Table of Contents

ValPro®

ValPro®

Quick Selection. Cutting Perfection.

Valenite has always been known for the timely, personalized support we bring our customers, and for precision cutting tools engineered to meet your most challenging applications. Now we're bringing you an easier way to select the right Valenite cutting tools for each of your unique applications.

ValPro is a comprehensive, application-based tool selection system designed for milling, drilling, turning, grooving, threading, boring and advanced material cutting tools. ValPro is the industry standard for accurate selection of the precise tool for your precise application.

The ValPro approach includes easy-to-understand application information, so you get the right tool for your job. ValPro provides a step-by-step process for selecting the right tool, size, geometry and operating parameters. Below is our color-coded identification system which helps you match our tools to your workpiece.

ValMILL is Valenite's growing family of high-performance milling solutions specifically designed to address the modern challenges of today's contemporary milling operations. The ValMILL family includes:

ValMILL400 • Precision Finishing Ball Nose End Mills

ValMILL440 • Roughing Ball Nose End Mills

ValMILL490 • Square Shoulder, Square Insert Face Mills

ValMILL500 • Button Insert Copy Mills

ValMILL520 • Feed Mill, Drill Mill

ValMILL555 • Five (#5) Cutting Edges, Face Mill

ValMILL556 • High Feed Face Mill/End Mill

ValMILL590 • Square Shoulder, Rectangular Insert Milling Cutters

Steels 	Carbon Steels, Alloy Steels and Tool Steels
Stainless Steels 	Ferritic, Martensitic, Austenitic and Ph Stainless Steels
Cast Irons 	Gray Irons, Nodular Irons, Malleable Irons
High Temperature Alloys 	Nickel-Base Alloys, Cobalt-Base Alloys, Titanium Alloys
Aluminum/ Non-Ferrous 	Aluminum and Copper Alloys, Non-Ferrous Materials
Hardened Steels 	Tool and Die Steels, Alloy Steels Hardened To >45rc

Application	Product							
Slotting								
	V350 Section: B	VST Section: B	VS2C Section: B	VGM Section: B				
Channel								
	V440 Section: C	V590 Section: E	V595 Section: E					
Contour								
	V400 Section: C	V440 Section: C	V500 Section: C	V590 Section: E	V595 Section: E			
Pocket								
	V440 Section: C	V500 Section: C	V520 Section: D	V556 Section: G	V590 Section: E	V595 Section: E		
Ramp								
	V440 Section: C	V500 Section: C	V556 Section: G	V590 Section: E	V595 Section: E			
Plunge								
	V490 Section: E	V520 Section: D	V556 Section: G	Centre-Dex Section: F				
Drill								
	V440 Section: C	V520 Section: D	Centre-Dex Section: F					
High Feed								
	V556 Section: G							
Face								
	V490 Section: E	V500 Section: C	V555 Section: G	V590 Section: E	MasterMill Section: G	MasterMill HVA Section: G	QC Mill Section: G	V057 Mill Section: G
End								
	V590 Section: E	V595 Section: E						

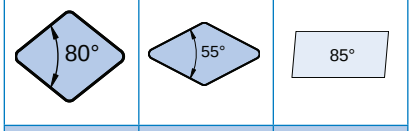
= Primary Application

= Supplemental Application

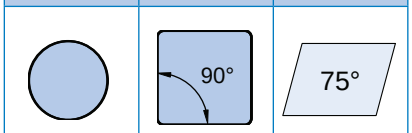
Insert Designation

ValMILL®

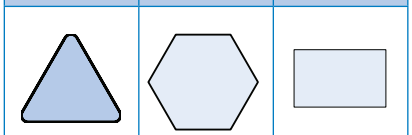
1 Shape



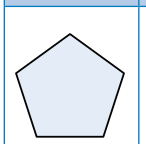
C D A



R S E

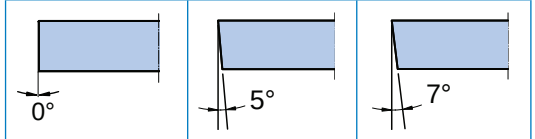


T H L

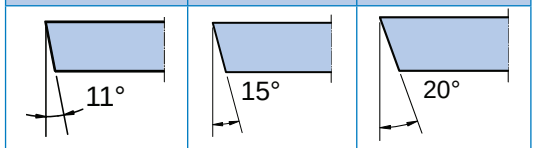


P

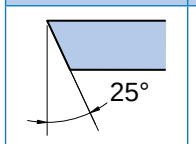
2 Clearance Angle



N B C

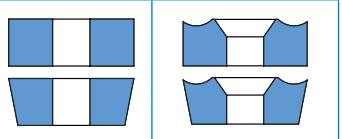


P D E

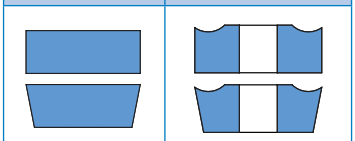


F

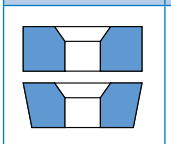
4 Type



A T



N M



W

C P E W 3 09 2.5 T3

1 2 3 4 5 6

3 Tolerance

	IC	T	M
A	± 0.001	± 0.001	± 0.002
C	± 0.0005	± 0.001	± 0.0005
E	± 0.005	± 0.001	± 0.001
F	± 0.0005	± 0.001	± 0.0002
G	± 0.001	± 0.005	± 0.001
H	± 0.0005	± 0.0001	± 0.0005
K	0.002-0.006	± 0.001	± 0.0005
M	± 0.005	± 0.005	± 0.008

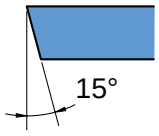
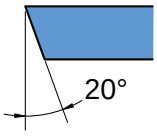
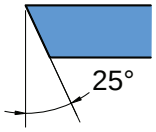
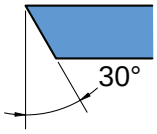
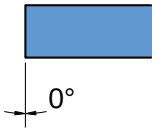
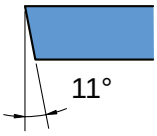
5 I.C. and Cutting Edge Length

I.C.			C	D	R	S	T	V	W
									
Symbol	inch	mm	L	L	d	L	L	L	L
1.2	.156	3.97	S4	04	03	03	06	-	-
1.5	.187	4.76	04	05	04	04	08	08	S3
1.8	.219	5.56	05	06	05	05	09	09	03
2	.250	6.35	06	07	06	06	11	11	04
2.5	.313	7.94	08	09	07	07	13	13	05
3	.375	9.52	09	11	09	09	16	16	06
4	.500	12.70	12	15	12	12	22	22	08
5	.625	15.88	16	19	15	15	27	27	10
6	.750	19.05	19	23	19	19	33	33	13
8	1.000	25.40	25	31	25	25	44	44	17

6 Thickness

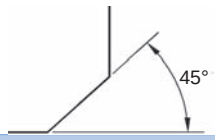
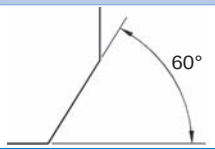
	inch	mm
1.5	3/32	02
2	1/8	03
2.5	5/32	T3
3	3/16	04
4	1/4	06
5	5/16	07

7	Nose Radius	
	inch	Metric
0	0.004	0.01
0.5	0.008	0.02
1	0.015	0.04
2	0.031	0.08
3	0.046	0.12
4	0.063	0.16
6	0.094	0.24

9	Relief Angle	
		
D	E	
		
F	G	
		
N	P	

11	Hand/Special Feature
L	Left Hand
R	Right Hand
N	Neutral

2 08 7	P 8	D 9	F 10	R 11	F 12

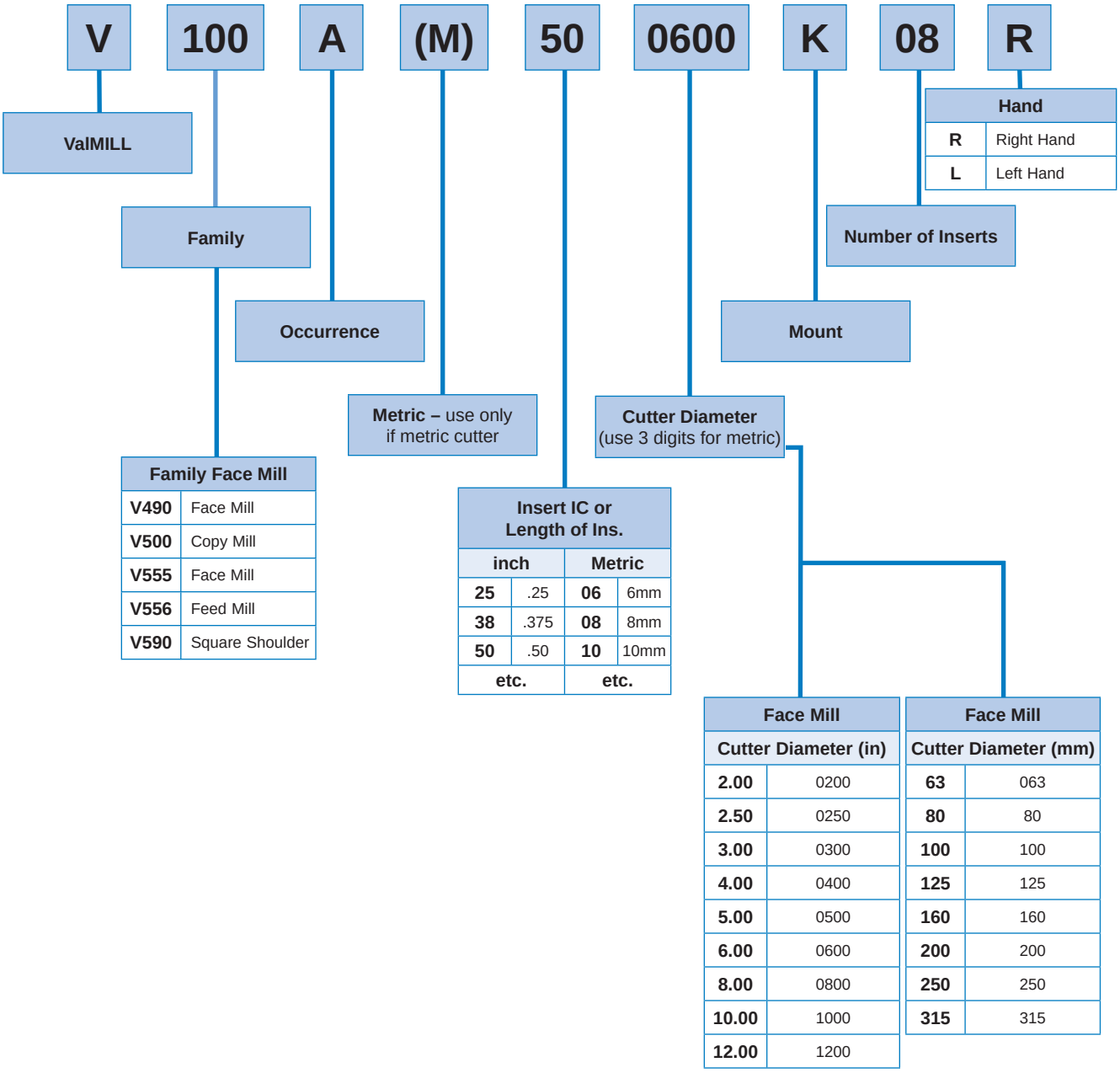
8	Lead Angle
	
A	
	
D	
	
E	

10	Land & Hone Designation & Sizes			
	Land (inch)	Hone (inch)	Land (Metric)	Hone (Metric)
F	No Land, No Hone Up-Sharp			
E	N/A	0.0005 - 0.0015	N/A	0.012 - 0.04
T-Land				
T1	0.005 x 15°	N/A	0.13 x 15°	N/A
T3	0.003 x 20°	N/A	0.08 x 20°	N/A
T5	0.005 x 25°	N/A	0.13 x 25°	N/A
T6	0.006 x 30°	N/A	0.15 x 30°	N/A
T7 (T)	0.008 x 20°	N/A	0.20 x 20°	N/A
T-Land & Hone				
S1	0.005 x 15°	0.0005 - 0.0015	0.13 x 15°	0.012 - 0.04
S3	0.003 x 20°	0.0005 - 0.0015	0.08 x 20°	0.012 - 0.04
S5	0.005 x 25°	0.0005 - 0.0015	0.13 x 25°	0.012 - 0.04
S7 (S)	0.008 x 20°	0.0005 - 0.0015	0.20 x 20°	0.012 - 0.04

12	PCD/CBN Tip Configuration
F	Tipped. Up Sharp
H	Full Edge

Face Mills Designation

ValMILL®



ValMILL®

End Mills Designation

V	100	A	(M)	50	038	W	A	36

ValMILL

Family

Family End Mills	
V400	Ball Nose Finisher
V440	Ball Nose Rougher
V500	Copy Mill
V520	Drill Mill
V556	Feed Mill
V590	Square Shoulder
V595	Long Edge Square Shoulder

Occurrence

C	Not through coolant

Metric – use only if metric cutter

Insert IC or Length of Ins.

inch		Metric	
25	.25	06	6mm
38	.375	08	8mm
50	.50	10	10mm
etc.		etc.	

Cutter Diameter (use 2 digits for metric)

Shank

W	Weldon
C	Cylindrical

Shank Diameter

Inch		Metric	
A	.500	H	12
B	.625	J	16
C	.750	K	20
D	1.000	L	25
E	1.250	M	32
F	1.500	N	10
G	2.000	-	-

Length of Cutter

36	3.6"
110	110mm

Length of Cutter

inch	
09	0.93
10	1.00
12	1.20
15	1.47
17	1.72
18	1.81
21	2.12
22	2.22
30	3.00
35	3.50
40	4.00
45	4.50
50	5.00

Length of Cutter

mm	
09	0.93
10	1.00
12	1.20
15	1.47
17	1.72
18	1.81
21	2.12
22	2.22
30	3.00
35	3.50
40	4.00
45	4.50
50	5.00

End Mill

Cutter Diameter (in)	
0.375	038
0.500	050
0.625	062
0.750	075
1.000	100
1.250	125
1.500	150
2.000	200

End Mill

Cutter Diameter (mm)	
8	08
10	10
12	12
16	16
20	20
25	25
32	32
40	40
50	50
63	63

Hand

R	Right Hand
L	Left Hand

End Mill

Cutter Diameter (mm)	
W	Weldon
C	Cylindrical

PRODUCT INFORMATION

Milling Grades & Speeds

ValMILL®

Material		Hardness	SFM (m/min.)									
			PVD				CVD				Un-coated	PCD
			VP1020	VP5020	VP5040	VP5045	VP5135	VP5142	VP1120	VP1130	VPUK20	VPD720
Steels P	Free Machining & Low Carbon	120-170 BHN	-	800-1100 (240-330)	700-900 (210-270)	500-800 (150-240)	600-800 (180-240)	500-800 (150-240)	-	-	-	-
	Medium & High Carbon	180-220 BHN	-	600-800 (180-240)	500-600 (150-180)	350-600 (105-180)	400-600 (120-180)	350-600 (105-180)	-	-	-	-
	Alloy & Easy To Machine Tool Steels	200-240 BHN	-	500-700 (150-210)	400-550 (120-165)	300-450 (90-135)	350-450 (105-135)	300-450 (90-135)	-	-	-	-
	Tool & Die Steels	220-260 BHN	-	350-500 (105-150)	300-400 (90-120)	200-350 (60-105)	250-350 (75-105)	200-350 (60-105)	-	-	-	-
Stainless Steels M	Ferritic & Martensitic	180-240 BHN	-	500-700 (150-210)	400-550 (120-165)	300-500 (90-150)	350-500 (105-150)	300-500 (90-150)	-	-	-	-
	Austenitic	140-180 BHN	-	400-600 (120-180)	350-500 (105-150)	250-450 (75-135)	300-450 (90-135)	250-450 (75-135)	-	-	-	-
	PH & Duplex	220-260 BHN	-	350-500 (105-150)	300-400 (90-120)	200-350 (60-105)	250-350 (75-105)	200-350 (60-105)	-	-	-	-
Cast Irons K	Gray Cast Iron	180-260 BHN	400-700 (120-215)	600-700 (180-210)	-	-	-	-	800-1000 (240-300)	600-900 (200-300)	250-400 (75-130)	Bi-Metal <1500 (<450)
		220-260 BHN	350-600 (110-180)	500-600 (150-180)	-	-	-	-	700-800 (210-240)	500-700 (150-210)	200-300 (60-90)	Bi-Metal <1500 (<450)
	Ductile Iron	140-180 BHN	350-600 (110-180)	500-600 (150-180)	-	-	-	-	700-800 (210-240)	500-700 (150-210)	225-350 (65-105)	-
		220-260 BHN	350-500 (110-150)	400-500 (120-150)	-	-	-	-	500-700 (150-210)	400-600 (130-200)	200-300 (60-90)	-
High Temperature Alloys S	Iron Based Alloys	-	-	225-250 (65-75)	225-250 (65-75)	175-225 (55-65)	200-225 (60-65)	-	-	-	150-200 (45-60)	-
	Nickel & Cobalt Base Alloys Hastelloy, Inconel, Stellite	-	-	150-175 (45-55)	125-150 (35-45)	125-150 (35-45)	125-150 (35-45)	-	-	-	75-100 (25-30)	-
	Titanium Alloys 6al-v4	-	-	225-275 (65-85)	200-250 (60-75)	150-200 (45-60)	150-200 (45-60)	-	-	-	100-150 (30-45)	-
Aluminum & Non-Ferrous Materials N	Aluminum < 7% Si	-	-	1500-3000 (450-900)	-	-	-	-	-	-	1000-2000 (300-600)	2000-15,000 (600-4500)
	Aluminum 7% - 12% Si	-	-	1250-2500 (375-750)	-	-	-	-	-	-	800-1750 (240-525)	1500-10,000 (450-3000)
	Aluminum > 12% Si	-	-	800-1500 (240-450)	-	-	-	-	-	-	500-1000 (150-300)	1000- 3000 (300-900)
	Non-Ferrous	-	-	600-1400 (180-420)	-	-	-	-	-	-	400-1000 (120-300)	1000- 3000 (300-900)

Always refer to maximum RPM for every cutter prior to running recommended speeds.
Ensure cutter and inserts are in proper working order and are secure to avoid potential injury.

ValMILL®

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V350 Slotting Cutters

ValMILL®

Highly versatile, quality comprehensive product offering for all your narrow width slotting applications.

Cutters

- Integral hub design for easy mounting and stacking.
- Hardened insert seats for longer useful cutter life.

Inserts

- Enhanced edge strength for greater reliability.
- PVD coated grades for longer tool life.

Specifications

- **Applications**: Parting-off, internal & external slotting, gang milling, and roughing gear blanks.
- **Cutter Diameters**: 3.00” to 10.00”
- **Slot Widths**: .084” to .243”
- **Geometry**: Positive
- **Workpiece Materials**: Steel, stainless steel, cast iron, high temperature alloys, aluminum, and non-ferrous materials.

How to Select Inserts

Find the seat size of the cutter:

Slot Width W	Max DOC L	Part Number	Dimensions (inches)					Inserts/ Cutter	Seat Size	Max RPM	EDP/Order Number
			D	D1	A	B	C				

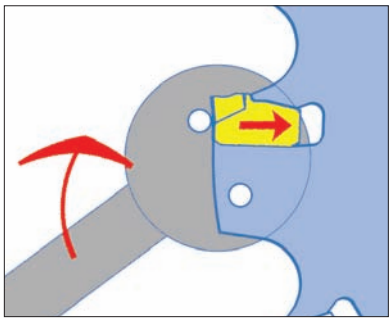
Match the insert seat size to select the proper insert

VSG 3.10 N 20-SC

Insert Indexing

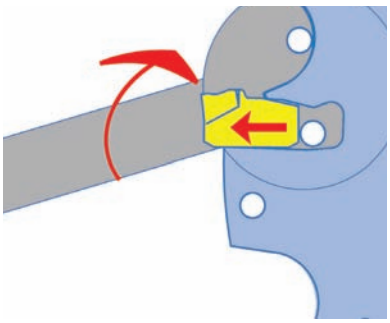
Placing Insert:

Locate key in bottom hole and in front of the insert as shown. Pull up on handle to set insert.



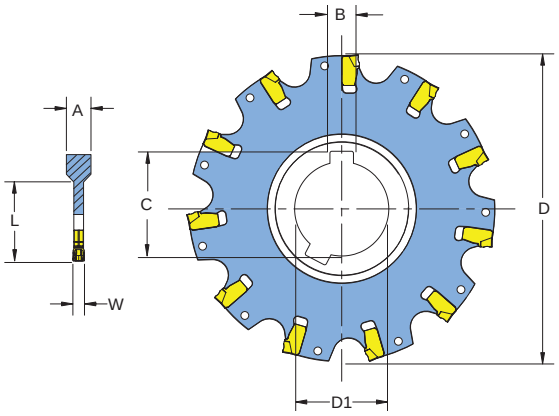
Extracting Inserts:

Locate key behind the insert and above the insert against the cutter body as shown. Not in the lower hole. Pull up carefully to extract insert.



ValMILL®

V350 Slotting Cutters



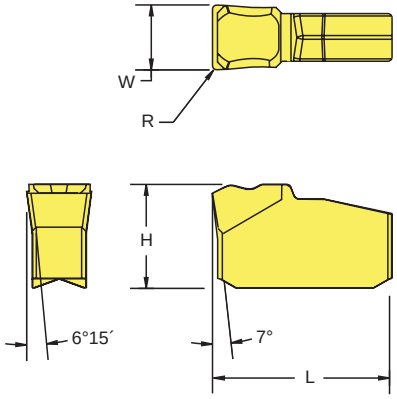
Slot Width W	Max DOC L	Part Number	Dimensions					Inserts/ Cutter	Seat Size	Max RPM	EDP#
			D	D1	A	B	C				
.084	0.659	V350 A 08 30 B 08	3.0	1.00	0.315	0.250	1.110	8	20	1000	62438
.084	0.982	V350 A 08 40 C 10	4.0	1.25	0.315	0.312	1.400	10	20	800	62439
.104	1.390	V350 B 12 50 D 11	5.0	1.50	0.315	0.385	1.680	11	25	640	62456
.104	1.890	V350 B 12 60 D 14	6.0	1.50	0.315	0.375	1.680	14	25	500	62457
.125	0.670	V350 A 12 30 B 07	3.0	1.00	0.315	0.250	1.110	7	30	1000	62440
.125	0.993	V350 A 12 40 C 09	4.0	1.25	0.315	0.312	1.400	9	30	800	62441
.125	1.375	V350 A 12 50 D 11	5.0	1.50	0.315	0.375	1.680	11	30	640	62442
.125	1.875	V350 A 12 60 D 14	6.0	1.50	0.315	0.375	1.680	14	30	500	62443
.125	2.560	V350 A 12 80 E 18	8.0	2.00	0.315	0.500	2.200	18	30	400	62444
.164	1.000	V350 A 16 40 C 08	4.0	1.25	0.315	0.312	1.400	8	40	800	62445
.164	1.382	V350 A 16 50 D 10	5.0	1.50	0.315	0.375	1.680	10	40	640	62446
.164	1.882	V350 A 16 60 D 13	6.0	1.50	0.315	0.375	1.680	13	40	500	62447
.164	2.567	V350 A 16 80 E 17	8.0	2.00	0.315	0.500	2.200	17	40	400	62448
.204	0.989	V350 A 20 40 C 08	4.0	1.25	0.394	0.312	1.400	8	50	640	62449
.204	1.371	V350 A 20 50 D 10	5.0	1.50	0.394	0.375	1.680	10	50	510	62450
.204	1.871	V350 A 20 60 D 13	6.0	1.50	0.394	0.375	1.680	13	50	400	62451
.204	2.556	V350 A 20 80 E 17	8.0	2.00	0.394	0.500	2.200	17	50	320	62452
.243	1.860	V350 A 24 60 D 12	6.0	1.50	0.472	0.375	1.680	12	60	400	62454
.243	2.545	V350 A 24 80 E 16	8.0	2.00	0.472	0.500	1.680	16	60	320	62455
.243	3.545	V350 A 24 10 E 19	10.0	2.00	0.472	0.500	2.200	19	60	250	62453

Spare Parts		
Insert Size	Insert Key	
	Part Number	EDP#
20	VP 5680 056 02	58504
25, 30, 40, 50	VP 5680 056 01	58503
60	VP 5680 056 03	58505

Insert key supplied with cutter

VSG-SC Inserts

ValMILL®



Part Number	Dimensions (inches)					Seat Size	EDP# Grade	
	W (mm)	W (in)	R	L	H		VP5815	VP5845
VSG 2.06 N 20 - SC	2.06	.081	.007	.315	.164	20	12823	1282
VSG 2.60 N 25 - SC	2.60	.102	.008	.394	.217	25	12826	12827
VSG 3.10 N 30 - SC	3.10	.123	.012	.394	.220	30	12832	12833
VSG 4.12 N 40 - SC	4.12	.162	.012	.504	.282	40	12837	12838
VSG 5.14 N 50 - SC	5.14	.202	.015	.504	.289	50	12843	12844
VSG 6.12 N 60 - SC	6.12	.241	.015	.602	.347	60	12849	12850

Complementary Insert Styles

GG

General Purpose

PG

Precision Width

LG

Light Feed

RG

Full Radius

For complementary insert styles that can be used with the ValMILL V350 Series Cutters, see the Valenite Turning Catalog no. 27.02.232.

ValMILL®

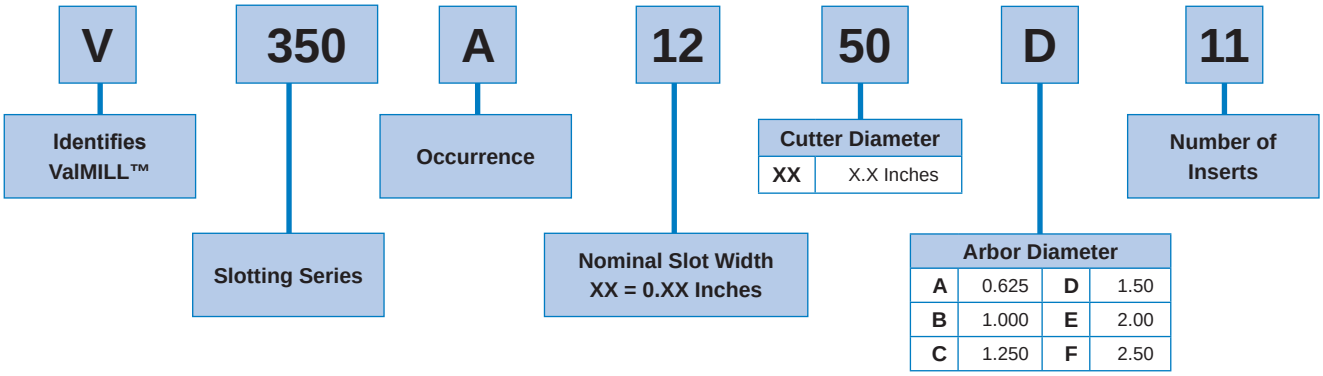
V350 Insert Application

Material		Hardness	Insert Seat Size	Maximum Chip Thickness (Operating Range)	SFM / Grade	
					Coated Grades	
					VP5815	VP5845
Steels P	Free Machining & Low Carbon Steels	120 - 170 Bhn	20, 25, 30, 40, 50, 60	.002 (.001 - .003) .003 (.001 - .005)	800 - 700 700 - 600	750 - 650 650 - 500
	Medium & High Carbon Steels	180 - 220 Bhn	20, 25, 30, 40, 50, 60	.002 (.001 - .003) .003 (.001 - .005)	750 - 650 650 - 550	750 - 650 650 - 500
	Alloy Steels & Easy-To-Machine Tool Steels	200 - 240 Bhn	20, 25, 30, 40, 50, 60	.002 (.001 - .003) .003 (.001 - .005)	600 - 500 500 - 400	550 - 450 450 - 350
	Tool & Die Steels	220 - 260 Bhn	20, 25, 30, 40, 50, 60	.002 (.001 - .003) .003 (.001 - .005)	450 - 350 350 - 300	400 - 300 300 - 250
Stainless Steels M	Ferritic & Martensitic Stainless Steels	180 - 240 Bhn	20, 25, 30, 40, 50, 60	.002 (.001 - .003) .003 (.001 - .005)	600 - 500 500 - 400	550 - 450 450 - 350
	Austenitic Stainless Steels	40 - 180 Bhn	20, 25, 30, 40, 50, 60	.002 (.001 - .003) .003 (.001 - .005)	550 - 450 450 - 350	500 - 400 400 - 350
	Ph & Duplex Stainless Steels	220 - 260 Bhn	20, 25, 30, 40, 50, 60	.002 (.001 - .003) .003 (.001 - .005)	400 - 300 300 - 250	350 - 250 250 - 200
Cast Irons K	Gray Cast Irons	180 - 220 Bhn	20, 25, 30, 40, 50, 60	.002 (.001 - .003) .003 (.001 - .005)	700 - 550 550 - 450	-
	Gray Cast Irons	220 - 260 Bhn	20, 25, 30, 40, 50, 60	.002 (.001 - .003) .003 (.001 - .005)	550 - 400 400 - 300	-
	Ductile & Malleable Cast Irons	140 - 180 Bhn	20, 25, 30, 40, 50, 60	.002 (.001 - .003) .003 (.001 - .005)	500 - 350 350 - 300	-
	Ductile & Malleable Cast Irons	220 - 260 Bhn	20, 25, 30, 40, 50, 60	.002 (.001 - .003) .003 (.001 - .005)	400 - 300 300 - 225	-
High Temperature Alloys S	Iron & Nickel Based Alloys Monel, Hastelloy, Inconel, Waspaloy	-	20, 25, 30, 40, 50, 60	.002 (.001 - .003) .003 (.001 - .005)	200 - 150 150 - 100	175 - 125 150 - 100
	Cobalt Based Alloys Haynes Stellite	-	20, 25, 30, 40, 50, 60	.002 (.001 - .003) .003 (.001 - .005)	175 - 125 150 - 100	150 - 125 125 - 80
	Titanium Alloys 6Al-4V	-	20, 25, 30, 40, 50, 60	.002 (.001 - .003) .003 (.001 - .005)	300 - 250 250 - 200	250 - 200 200 - 150
Aluminum & Non-Ferrous Materials N	Aluminum Alloys < 7% Silicon	-	20, 25, 30, 40, 50, 60	.002 (.001 - .003) .003 (.001 - .005)	800 - 700 600 - 500	-
	Aluminum Alloys 7% - 12% Silicon	-	20, 25, 30, 40, 50, 60	.002 (.001 - .003) .003 (.001 - .005)	800 - 700 600 - 500	-
	Aluminum Alloys 12% - 18% Silicon	-	20, 25, 30, 40, 50, 60	.002 (.001 - .003) .003 (.001 - .005)	700 - 600 650 - 550	-
	Copper Alloys	-	20, 25, 30, 40, 50, 60	.002 (.001 - .003) .003 (.001 - .005)	800 - 700 600 - 500	-

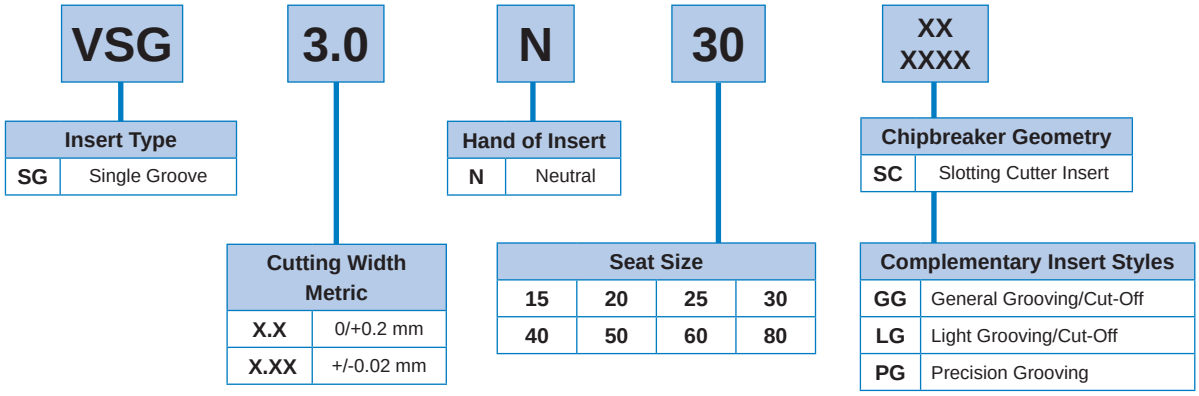
V350 Series Designation

ValMILL®

Slotting Cutters



Insert Identification System

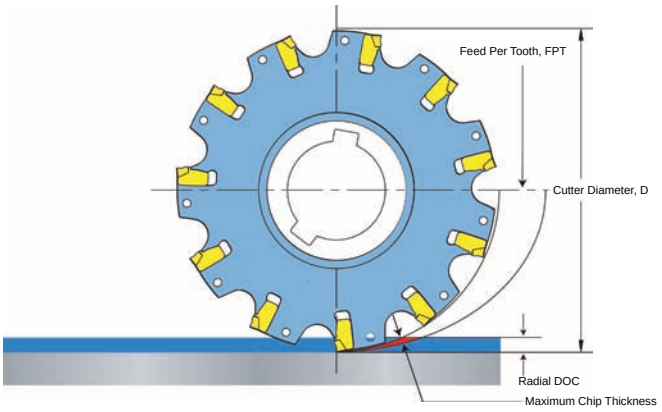


Adjustment of Feed Per Tooth

The Radial DOC in slotting operations is typically less than 1/2 the cutter diameter. As a result, the actual chip thickness is less than the nominal feed per tooth.

When the Radial DOC is a small portion of the cutter diameter, the chip thinning that occurs significantly affects performance.

If no adjustment is made, chatter and vibration may occur and tool life will be adversely affected.



Correction Factor, CF						
Radial DOC	Cutter Diameter, D					
	3.0	4.0	5.0	6.0	8.0	10.0
0.050	3.90	4.50	5.02	5.50	6.34	7.09
0.100	2.78	3.20	3.57	3.90	4.50	5.02
0.250	1.81	2.06	2.29	2.50	2.87	3.20
0.500	13.4	1.51	1.66	1.81	2.06	2.29
0.750		1.28	1.40	1.51	1.71	1.90
1.000			1.25	1.34	1.51	1.66
1.250			1.15	1.23	1.37	1.51
1.500				1.15	1.28	1.40
1.750				1.10	1.21	1.32
2.000					1.15	1.25
2.500					1.08	1.15
3.000						1.09
3.500						1.04

The table at the left provides a correction factor, CF to quickly calculate the adjusted feed rate for a desired chip thickness.

As an alternative to the table, feed per tooth, (FPT) can be calculated for any Radial DOC and any Cutter Diameter, (D) using the following formula.

$$FPT = \frac{1/2\ (D / \text{Radial DOC})}{\sqrt{(D / \text{Radial DOC}) - 1}} \times \text{Maximum Chip Thickness}$$

Calculate the Feed per Tooth (FPT)

1) Find the recommended Maximum Chip Thickness for your operation in the Application Guide on the opposite page.
2) Find the Correction Factor, (CF) based on the Radial DOC and Cutter Diameter, (D) in the table above.
3) Calculate the adjusted Feed Rate Per Tooth, (FPT) using the formula:
FPT = Maximum Chip Thickness x CF

Calculate the RPM

1) Find the recommended SFM for your material and operation in the Application Guide on the opposite page.
2) Calculate the RPM for your Cutter Diameter, D
RPM = .262 x SFM x D
3) Find the maximum RPM for your cutter on page B3. If the calculated RPM exceeds the minimum, reduce the RPM.

Calculate the Table Feed, IPM

Where N is the number of teeth in the cutter

IPM = FPT x RPM x N

Example

Calculate the adjusted feed per tooth for a 5 inch diameter cutter for a .250 inch Radial DOC to produce a .003 chip thickness.

1) Find the CF at the intersection of the 5 inch Cutter diameter column and the .250 inch Radial DOC row
CF = 2.29
2) Calculate the adjusted feed per tooth
FPT = .003 x 2.29
FPT = .007

VST Slotting Cutter

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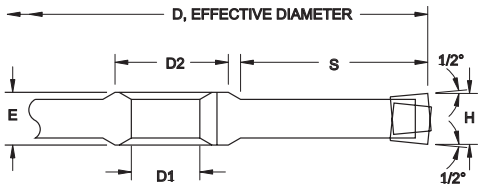


53 Series VAL U MILL 1° Lead											
Part Number	Adj. Cutter Width H	Dimensions				S Max Slot Depth	Inserts Req'd	Insert Style	Key Way	Wt (lbs.)	EDP#
		D	D1	D2	E (± .001)						
VST 04 2 08 25 31	.250 - .312	4.00	1.250	-	.250	1.00	8	SPE2...	5/16	0.80	50920
VST 05 2 08 25 31	.250 - .312	5.00	1.250	-	.250	1.50	8	SPE2...	5/16	1.34	50922
VST 06 2 12 25 31	.250 - .312	6.00	1.500	-	.250	1.81	12	SPE2...	3/8	1.78	62077
VST 08 2 18 25 31	.250 .312	8.00	1.500	-	.250	2.81	18	SPE2...	3/8	3.16	50930
VST 04 3 08 38 44	.380 - .440	4.00	1.250	1.75	.380	1.00	8	SPE3...	5/16	1.14	62075
VST 05 3 08 38 44	.380 - .440	5.00	1.250	1.75	.380	1.50	8	SPE3...	5/16	1.37	50924
VST 05 3 08 48 54	.480 - .540	5.00	1.250	1.75	.500	1.50	8	SPE3...	5/16	2.04	62078
VST 06 3 12 48 54	.480 - .540	6.00	1.500	2.12	.500	1.81	12	SPE3...	3/8	3.00	62078
VST 08 3 16 48 54	.480 - .540	8.00	1.500	2.12	.500	2.81	16	SPE3...	3/8	5.66	62081
VST 08 4 16 60 66	.605 - .665	8.00	1.500	2.12	.625	2.81	16	SPE4...	3/8	6.80	50932
VST 08 4 16 73 79	.730 - .790	8.00	1.500	2.12	.750	2.81	16	SPE4...	3/8	8.34	62082
VST 08 5 16 98 106	.980 - 1.062	8.00	1.500	2.12	1.000	2.81	16	SPE5...	3/8	10.66	62083
VST 12 5 24 98 106	.980 - 1.062	12.00	2.000	2.75	1.000	4.50	24	SPE5...	1/2	-	-

1. Chip splitter insert is recommended for cutting steel in this width range.
2. These cutters require equal quantities of R.H. and L.H. wedges.
3. Note: Add 3 after cutter number for 3/16" thick insert option (no charge). Example: VST 06 4 12 73 793. This option is available only for the 1/2 I.C. square insert. The wedge for the 3/16" thick insert option is No. W91.1.4.
4. Inserts SPE422. SPE424. and SPE433 may be used with .605 - .665 & .730 - .790 width cutters. Cutters are open pocket design. Inserts must be set when indexing or replacing. Cutter supplied with two keyways for stacking. Cutters are shipped complete with wedge and wedge screws less inserts. Special widths, diameters and pitches quoted on request.

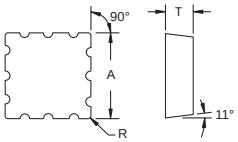
   Inserts in cutters can be set to a specific width at an additional charge. Matched diameters can be supplied at an additional charge. Inserts must be ordered separately.

Spare Parts					
Insert Size	Wedge		Wedge Screw		Torque (in/lbs)
	Part#	EDP#	Part#	EDP#	
SPE2...	W53.25, W53.25L	50491/50492	LS90	52902	14
SPE3...	W85.0	50505	LS91	52903	24.5
SPE422	W9113	50510	LS92	52904	45.5
SPE4...	W9114	50511	LS92	52904	45.5
SPE5...	W82.2	50504	LS93	52905	105

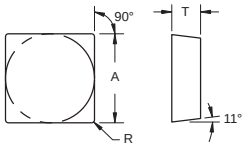
Note: Valenite recommends the use of PT745 antiseize lubricant (EDP# 50050) on insert screw threads and head.

ValMILL®

VST Slotting Cutter 53 Series VAL-U-MIL Inserts



SPE...

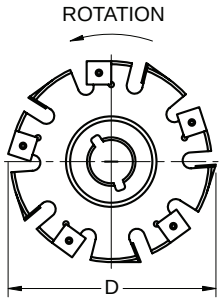


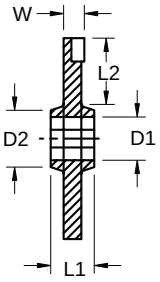
SPE...

Part Number	Dimensions			Grades						ISO Part Number
	A	T	R	VP5020	VP5142	VP5045	1120	1130	Q130	
SPEX 221 1H	0.250	0.125	0.015	-	-	23201	-	-	-	SPEX 060304 1H
SPE 322	0.375	0.125	0.031	-	-	23203	-	-	-	SPEN 090308
SPE 322 1H	0.375	0.125	0.031	23150	-	23204	-	-	-	SPEN 090308 1H
SPE 422	0.500	0.125	0.031	-	-	23294	-	-	-	SPEN 120308
SPE 422 1H	0.500	0.125	0.031	23151	22949	23295	-	-	-	SPEN 120308 1H
SPE 424	0.500	0.125	0.063	-	-	23296	-	-	-	SPEN 120316
SPE 432	0.500	0.187	0.031	-	-	-	-	22839	-	SPEN 120408
SPE 433	0.500	0.187	0.046	-	-	23297	-	22840	-	SPEN 120412
SPE 433 1H	0.500	0.187	0.046	-	22950	23207	22310	-	-	SPEN 120412 1H
SPE 434	0.500	0.187	0.063	-	-	23298	-	-	-	SPEN 120416
SPE 434 E	0.500	0.187	0.063	-	-	-	-	-	41240	SPEN 120416 E
SPE 533	0.625	0.187	0.046	-	22951	23209	-	-	-	SPEN 150412
SPE 533 1H	0.625	0.187	0.046	-	22952	23210	-	-	-	SPEN 150412 1H
SPE 534	0.625	0.187	0.063	-	-	23211	-	-	-	SPEN 150416

VS2C Slotting Cutters With On Edge Inserts

ValMILL®

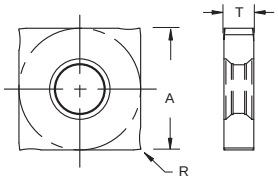




Part Number	Dimensions						Inserts Req'd	Insert	Wt (lbs)	EDP#
	D	D1	D2	L1	L2	W				
VS2C 4187 5B125	4.00	1.250	1.75	.500	1.00	.188	10	SNCX 1103 2C	0.76	62088
VS2C 4250 5B125	4.00	1.250	1.75	.500	1.00	.250	10	SNCX 11T3 2C	0.88	62089
VS2C 6187 8B150	6.00	1.500	2.12	.500	1.80	.188	16	SNCX 1103 2C	1.58	50942
VS2C 6250 8B150	6.00	1.500	2.12	.500	1.80	.250	16	SNCX 11T3 2C	1.47	50944
VS2C 8250 10B150	8.00	1.500	2.12	.500	2.80	.250	20	SNCX 11T3 2C	3.08	62090

Spare Parts					
Insert	Torx Wrench		Lock Screw		Torque (in/lbs)
	Part#	EDP#	Part#	EDP#	
SNCX 1103 2C	T 7 Torx Wrench	50101	PT 590T	52296	10.5
SNCX 11T3 2C	T 7 Torx Wrench	50101	PT 591T	52297	10.5
*SNCX 1205 2C	T 15 Torx Wrench	50087	PT 593T	52299	35
*SNCX 1203 2C	T 15 Torx Wrench	50087	PT 593T	52299	35

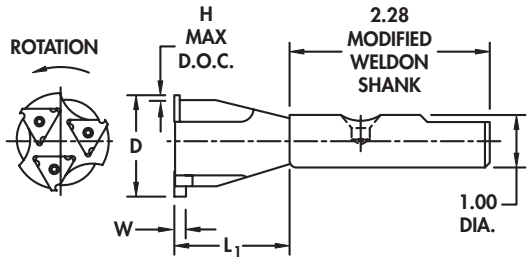
*Note: Valenite recommends the use of PT745 antiseize lubricant (EDP# 50050) on insert screw threads and head.



SNCX

VS2C Slotting Cutter Inserts			
Part Number	Available Grade	EDP #	ISO Number
SNCX 11 03 2C	VP5045	23587	SNCX 1103 2C
SNCX 11 03 2C	VP5045	23586	SNCX 11T3 2C
*SNCX 12 05 2C	VP5045	23588	SNCX 1205 2C

*Inserts for special cutters.

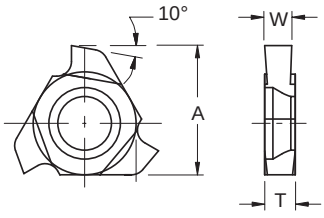


Part Number	Dimensions			Insert Req'd	EDP#
	D,Eff. Diameter	L1	H, Max. D.O.C.		
VGM150 NG2 100W	1.500	2.09	.11	3	62094

Note: Special width inserts (W) are available on a quotation basis. Support under inserts must be altered when "W" on insert is less than .094".

Spare Parts					
Insert	Torx Wrench		Lock Screw		Torque (in/lbs)
	Part#	EDP#	Part#	EDP#	
TGEB 3.52NGML...	T 20 Torx Wrench	50091	PT 546T	52290	70

Note: Valenite recommends the use of PT745 antiseize lubricant (EDP# 50050) on insert screw threads and head.



TGEB

VGM Groove / Slotting End Mill Inserts						
Part Number	Available Grade	VP5045	A	T	W	ISO Number
TGEB 3.52 NGM L094	VP5045	23595	.437	.125	.094	TGEB 3.52 NGM L094
TGEB 3.52 NGM L125	VP5045	23596	.437	.125	.125	TGEB 3.52 NGM L125

Application Guide

ValMILL®

Material		Hardness	SFM (m/min.)						
			PVD			CVD			
			VP5020	VP5040	VP5045	VP5135	VP5142	VP1120	VP1130
Steels P	Free Machining & Low Carbon	120-170 BHN	800-1100 (240-330)	700-900 (210-270)	200-800 (60-240)	600-800 (180-240)	500-800 (150-240)	-	-
	Medium & High Carbon	180-220 BHN	600-800 (180-240)	500-600 (150-180)	200-500 (60-150)	400-600 (120-180)	350-600 (105-180)	-	-
	Alloy & Easy To Machine Tool Steels	200-240 BHN	500-700 (150-210)	400-550 (120-165)	200-500 (60-150)	350-450 (105-135)	300-450 (90-135)	-	-
	Tool & Die Steels	220-260 BHN	350-500 (105-150)	300-400 (90-120)	200-350 (60-105)	250-350 (75-105)	200-350 (60-105)	-	-
Stainless Steels M	Ferritic & Martensitic	180-240 BHN	500-700 (150-210)	400-550 (120-165)	200-550 (60-165)	350-500 (105-150)	300-500 (90-150)	-	-
	Austenitic	140-180 BHN	400-600 (120-180)	350-500 (105-150)	200-500 (60-150)	300-450 (90-135)	250-450 (75-135)	-	-
	Ph & Duplex	220-260 BHN	350-500 (105-150)	300-400 (90-120)	200-400 (60-120)	250-350 (75-105)	200-350 (60-105)	-	-
Cast Irons K	Gray Cast Iron	180-260 BHN	600-700 (180-210)	-	-	-	-	800-1000 (240-300)	600-900 (200-300)
		220-260 BHN	500-600 (150-180)	-	-	-	-	700-800 (210-240)	500-700 (150-210)
	Ductile Iron	140-180 BHN	500-600 (150-180)	-	-	-	-	700-800 (210-240)	500-700 (150-210)
		220-260 BHN	400-500 (120-150)	-	-	-	-	500-700 (150-210)	400-600 (120-180)
High Temperature Alloys S	Iron Based Alloys	-	225-250 (65-75)	225-250 (65-75)	175-225 (55-65)	200-225 (60-65)	-	-	-
	Nickel & Cobalt Base Alloys Hastelloy, Inconel, Stellite	-	150-175 (45-55)	125-150 (35-45)	125-150 (35-45)	125-150 (35-45)	-	-	-
	Titanium Alloys 6al-v4	-	225-275 (65-85)	200-250 (60-75)	150-200 (45-60)	150-200 (45-60)	-	-	-
Aluminum & Non-Ferrous Materials N	Aluminum < 7% Si	-	1500-3000 (450-900)	-	-	-	-	-	-
	Aluminum 7% - 12% Si	-	1250-2500 (375-750)	-	-	-	-	-	-
	Aluminum > 12% Si	-	800-1500 (240-450)	-	-	-	-	-	-
	Non-Ferrous	-	600-1400 (180-420)	-	-	-	-	-	-

Starting Chip Load Recommendations

When milling with VST, VS2C, or VGM Slot/Groove Milling cutters, it is recommended to begin with no less than 0.004 (0.1 mm) average chip thickness Ct (see below). Generally average chip thickness should be between 0.004 - 0.008 (0.1-0.2 mm).

Ct Calculation: $Ct = FPT \times \sqrt{(DOC/Dia)}$

V400 Finishing Ball Nose End Mills

ValMILL®

Designed for finish contour milling in the die and mold industry and general machining.

Valenite's finishing ball nose end mill brings greater accuracy and size control to contour milling. Ultra-precision ground inserts in a highly versatile PVD coated grade VP5007 result in superior finishes and greater accuracy on a wide range of materials. Advanced insert technology combined with advanced cutter design makes the ValMILL 400 a superior performer in the die and mold industry, and a reliable producer wherever high quality machining is needed.

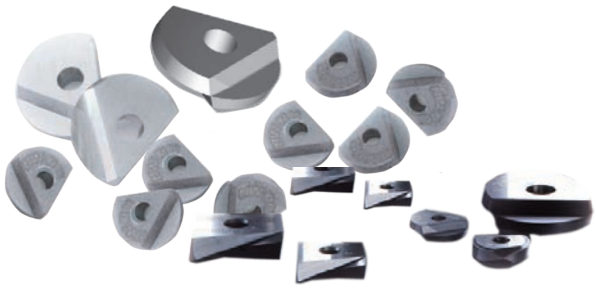
- Superior part finishes
- Greater accuracy
- True radius cutting

The Tools

- Rigid construction to reduce vibration
- Secure insert seating for accuracy, consistency, and size control
- Advanced Torx Plus® locking mechanism
- Weldon Shank

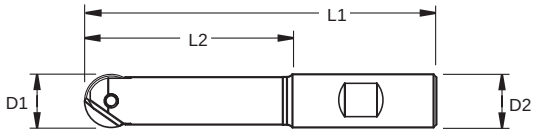
The Inserts

- Cutting diameter precision of +/– .0004 inch
- True center cutting produces true radius even at center
- Precision ground cutting edge on entire insert circumference delivers superior performance
- Two effective teeth per insert



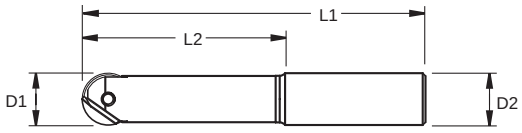
ValMILL®

V400 Single Insert Ball Nose End Mills



Weldon Shank (W)

Weldon Shank									
Part Number	Shank Style	Dimensions				Torque (in/lbs.)	Wt. (lbs.)	Max. RPM	EDP#
		D1	D2	L1	L2				
V 400 A 038 038 WA 15	W	0.375	0.500	3.29	1.51	13	0.14	40,000	50395
V 400 A 050 050 WA 21	W	0.500	0.500	3.89	2.11	23	0.17	40,000	50396
V 400 A 062 062 WB 25	W	0.625	0.625	4.55	2.48	35	0.33	36,000	50397
V 400 A 075 075 WC 29	W	0.750	0.750	4.97	2.93	54	0.52	40,000	50398
V 400 A 100 100 WD 36	W	1.000	1.000	5.83	3.55	65	1.00	37,100	50399
V 400 A 125 125 WE 42	W	1.250	1.250	6.49	4.21	230	1.68	32,500	50400

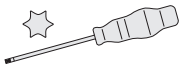


Cylindrical Shank (C)

Cylindrical Shank									
Part Number	Shank Style	Dimensions				Torque (in/lbs.)	Wt. (lbs.)	Max. RPM	EDP#
		D1	D2	L1	L2				
V 400 A 038 038 CA 15	C	0.375	0.500	6.25	1.51	13	0.14	40,000	50150
V 400 A 050 050 CB 21	C	0.500	0.625	6.25	2.11	23	0.17	40,000	50151
V 400 A 062 062 CC 25	C	0.625	0.750	7.88	2.48	35	0.33	36,000	50160
V 400 A 075 075 CD 29	C	0.750	1.000	9.75	2.93	54	0.52	40,000	50161
V 400 A 100 100 CE 36	C	1.000	1.250	9.75	3.55	65	1.00	37,100	50162
V 400 A 125 125 CE 42	C	1.250	1.250	9.75	4.21	230	1.68	32,500	50164

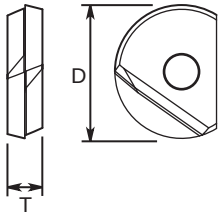
V400 Spare Parts and Inserts

ValMILL®

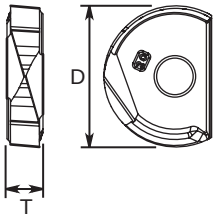


Spare Parts				
End Mill Size	Insert Screw		Driver / Wrench	
	Part #	EDP#	Part #	EDP#
0.380	DVF3429	61924	TX208PLUS	61930
0.500	DVF3430	61925	TX210PLUS	61931
0.620	DVF3431	61926	TX215PLUS	61932
0.750	DVF3432	61927	TX220PLUS	61933
1.000	DVF3433	61928	DMP3139	61922
1.250	DVF3434	61929	DMP3441	61923

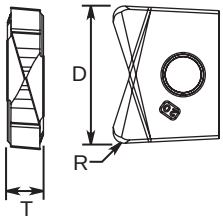
Note: Valenite recommends the use of PT745 antiseize lubricant (EDP# 50050) on insert screw threads and head.



PRECISION



ECO



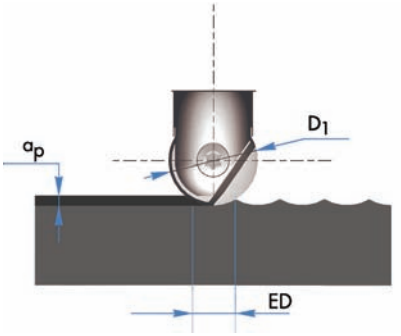
TORO

	Insert Number	Dimensions			Available Grades/EDP#	
		D	T	R	VP5007	VP5035
ECO	RG A 038 A	0.375	0.102	-	00629	00770
	RG A 050 A	0.500	0.118	-	00772	00649
	RG A 062 A	0.625	0.157	-	00879	00653
	RG A 075 A	0.750	0.197	-	00886	00655
	RG A 100 A	1.000	0.236	-	00896	00658
	RG A 125 A	1.250	0.276	-	02659	-
PRECISION	RG A 038 B	0.375	0.102	-	02654	-
	RG A 050 B	0.500	0.118	-	02655	-
	RG A 062 B	0.625	0.157	-	02656	-
	RG A 075 B	0.750	0.197	-	02657	-
	RG A 100 B	1.000	0.236	-	02658	-
	RG A 125 B	1.250	0.276	-	02659	-
TORO	RG A 038 T08	0.375	0.102	0.031	00771	-
	RG A 038 T16	0.375	0.102	0.062	00631	-
	RG A 050 T08	0.500	0.118	0.031	01212	-
	RG A 050 T16	0.500	0.118	0.062	00651	-
	RG A 075 T08	0.750	0.197	0.031	00893	-
	RG A 075 T16	0.750	0.197	0.062	00657	-
	RG A 100 T16	1.000	0.236	0.062	00660	-

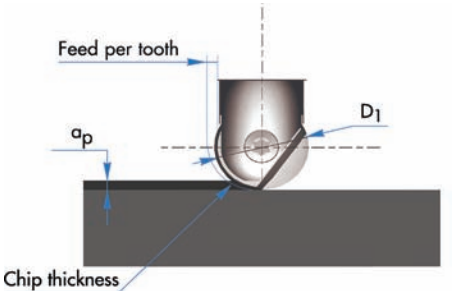
Materials		Maximum Chip Thickness Cutter Diameter .375 .500	 .625 .750	 1.00 1.25	SFM Grade VP5007	 VP5035
Steels P	Free Machining & Low Carbon Steels 120 - 170 Bhn	.008 - .016	.010 - .020	.012 - .024	400 - 600	800 - 600
	Alloy Steels & Easy-To-Machine Tool Steels 25 - 35 Rc	.006 - .016	.008 - .016	.010 - .020	300 - 500	350 - 600
	Tool Steels & Die Steels 35 - 45 Rc	.006 - .016	.008 - .016	.010 - .020	200 - 400	200 - 350
Stainless Steels M	Ferritic and Martensitic 180 - 240 Bhn	.008 - .016	.010 - .020	.012 - .024	300 - 400	350 - 500
	Austenitic 140 - 180 Bhn	.008 - .016	.010 - .020	.012 - .024	250 - 400	300 - 450
	PH & Duplex 220 - 260 Bhn	.006 - .016	.008 - .016	.010 - .020	200 - 300	200 - 400
Cast Irons K	Gray Cast Iron 180 - 220 Bhn	.008 - .016	.010 - .020	.012 - .024	400 - 750	-
	Gray Cast Iron 200 - 240 Bhn	.008 - .016	.010 - .020	.012 - .024	350 - 700	-
	Chromium Alloy Cast Iron 35 - 45 Rc	.008 - .016	.010 - .020	.012 - .024	300 - 600	-
High Temperature Alloys S	Nickel Base Alloys 25 - 35 Rc	.006 - .016	.008 - .016	.010 - .020	100 - 150	175 - 200
	Cobalt Base Alloys 25 - 35 Rc	.006 - .016	.008 - .016	.010 - .020	80 - 125	100 - 150
	Titanium Alloys 30 - 40 Rc	.008 - .016	.010 - .020	.012 - .024	125 - 200	150 - 200
Aluminum & Non-Ferrous Materials N	Aluminum Alloys < 7% Silicon	.010 - .020	.010 - .025	.010 - .030	1500 - 2500	-
	Aluminum Alloys >7% Silicon	.010 - .020	.010 - .025	.010 - .030	1000 - 1800	-
	Non-Ferrous	.010 - .020	.010 - .025	.010 - .030	800 - 1200	-
Hardened Steels H	Tool & Die Steel 45 - 50 Rc	.006 - .008	.006 - .010	.006 - .012	150 - 300	350 - 450
	Tool & Die Steel 50 - 60 Rc	.006 - .008	.006 - .010	.006 - .012	100 - 250	200 - 350

Adjustment for Effective Diameter

When the axial depth of cut, ap is 1/2 the insert diameter, the effective diameter of the cutter is equal to the cutter diameter, and the actual chip thickness is equal to the feed per tooth. The axial depth of cut, ap in normal use of the ValMILL400 cutter is significantly less than 1/2 the insert diameter. As a result:



The effective diameter is less than the cutter diameter. The table below provides the Effective Diameter (ED) for each cutter when used at a specific axial depth of cut ap.



The actual chip thickness is less than the feed per tooth (feed per rev/2). The table below provides a Feed/Tooth Multiplication Factor (F) to compensate for chip thinning.

Effective Diameter (ED)						Axial DOC ap	Feed / Tooth Multiplication Factor (F)					
Cutter Diameter (D1)							Cutter Diameter (D1)					
0.375	0.500	0.625	0.750	1.000	1.250		0.375	0.500	0.625	0.750	1.000	1.250
.121	.140	.157	.172	.199	.223	0.010	3.60	4.16	4.64	5.08	5.86	6.56
.169	.196	.220	.242	.280	.314	0.020	2.34	2.72	3.02	3.30	3.82	4.26
.203	.237	.267	.294	.341	.383	0.030	1.90	2.18	2.44	2.66	3.06	3.40
.232	.271	.306	.37	.392	.440	0.040	1.66	1.90	2.10	2.28	2.62	2.92
.275	.325	.368	.407	.475	.534	0.060	1.38	1.56	1.72	1.88	2.14	2.38
	.367	.418	.463	.543	.612	0.080		1.38	1.52	1.64	1.86	2.06
		.458	.510	.600	.678	0.100			1.38	1.48	1.68	1.86
			.550	.650	.736	0.120				1.37	1.55	1.71
				.733	.835	0.160					1.37	1.50
					.917	0.200						1.37

RPM = SFM (see guide above) / (.262 x ED)

Feed / Rev (adjusted) = Feed / Rev (see guide above) x F

ValMILL®

V440 Series Multi-Tooth Ball Nose End Mills

Ideal for die & mold and general manufacturing.

Cutters

- Robust design that is ideally suited for roughing and semi-finishing applications
- Two flute design for maximum productivity
- Additional insert provides shank protection on larger cutters

Inserts

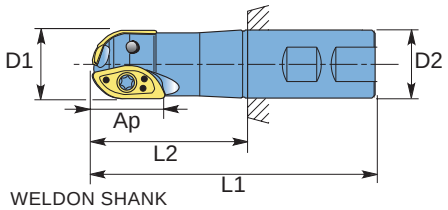
- Two indexes per insert for greater economy
- Advanced top form geometry for improved reliability
- PVD coated grade for longer tool life
- Designed to take the most punishing cuts in your most difficult-to-machine materials

Specifications

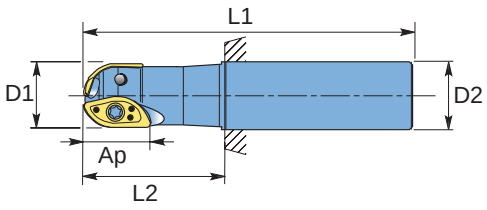
- **Operations:** Roughing & semi-finishing
- **Applications:** Contouring, peripheral cuts, slotting, drilling and cavity milling
- **Cutter Diameters:** .625” to 2.0”
- **Workpiece Materials:** Carbon & alloy steels, tool & die, steels, stainless steels, high temperature alloys

V440 Ball Nose End Mills

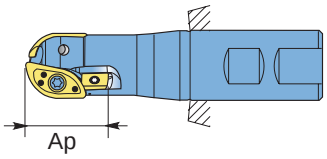
ValMILL®



WELDON SHANK



CYLINDRICAL SHANK



W/ PROTECTION INSERT

Standard Length - Weldon Shank

Part Number	Dimensions					Main Insert	No. Req'd	Protection Insert	No. Req'd	Max RPM	Wt. (lbs.)	EDP#
	D1	D2	L1	L2	Ap							
V 440 A 050 050 WC 15	0.500	0.750	3.531	1.500	0.42	YP ..	2	-	-	25,000	0.4	55344
V 440 A 062 062 WC 15	0.625	0.750	3.531	1.500	0.56	YP ..	2	-	-	25,000	0.4	62531
V 440 A 075 075 WD 20	0.750	1.000	4.281	2.000	0.67	YP ..	2	-	-	24,000	0.7	62532
V 440 A 100 100 WD 23	1.000	1.000	4.531	2.250	0.89	YP ..	2	-	-	24,000	0.9	62533
V 440 A 125 125 WE 28	1.250	1.250	5.031	2.750	1.11	YP ..	2	APMW ..	1	18,500	1.3	62534
V 440 A 150 150 WF 40	1.500	1.500	6.687	4.000	1.30	YP ..	2	APMW ..	2	8,000	3.0	62535
V 440 A 200 200 WG 50*	2.000	2.000	8.250	5.000	1.79	YP ..	2	APMW ..	2	7,000	5.4	62536

* Requires two shim seats DAN2391, supplied with cutter.

Extended Length - Weldon Shank

Part Number	Dimensions					Main Insert	No. Req'd	Protection Insert	No. Req'd	Max RPM	Wt. (lbs.)	EDP#
	D1	D2	L1	L2	Ap							
V 440 A 125 125 WE 40	1.250	1.250	6.25	4.00	1.66	YP..	2	APMW ..	1	18,500	1.7	55388
V 440 A 150 150 WF 60	1.500	1.500	8.76	6.07	2.43	YP..	2	APMW ..	2	8,000	3.5	56036
V 440 A 200 200 WG 70	2.000	2.000	10.25	7.00	2.92	YP..	2	APMW ..	2	7,000	6.3	56038

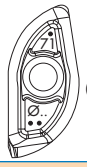
Cylindrical Shank

Part Number	Dimensions					Main Insert	No. Req'd	Protection Insert	No. Req'd	Max RPM	Wt. (lbs.)	EDP#
	D1	D2	L1	L2	Ap							
V 440 A 050 050 CC 15	0.500	0.750	7.87	1.50	0.42	YP..	2	-	-	25,000	0.9	55343
V 440 A 062 062 CC 15	0.625	0.750	7.87	1.50	0.56	YP..	2	-	-	25,000	0.9	55349
V 440 A 075 075 CD 20	0.750	1.000	7.87	2.00	0.67	YP..	2	-	-	24,000	1.5	55350
V 440 A 100 100 CD 23	1.000	1.000	7.87	2.25	0.89	YP..	2	-	-	24,000	1.6	56515
V 440 A 125 125 CE 28	1.250	1.250	9.84	2.75	1.11	YP..	2	APMW..	1	18,500	2.0	55351
V 440 A 150 150 CF 40	1.500	1.500	9.84	4.00	1.30	YP..	2	APMW..	2	8,000	4.5	55694
V 440 A 200 200 CG 50*	2.000	2.000	9.84	5.00	1.79	YP..	2	APMW..	2	7,000	6.8	56037

* Requires two shim seats DAN2391, supplied with cutter.

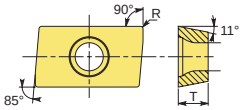
ValMILL®

V440 Spare Parts and Inserts



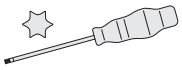
71
(ROUGH)

31
(SEMI-FINISH)

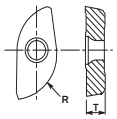


Cutter Diameter	Insert Number	Dimensions		Grade/EDP#	
		R	T	VP5040	VP5005
.0500	YP A 050 31	0.250	0.094	02447	02844
0.625	YP A 062 71	0.313	0.125	14661	
0.625	YP A 062 31	0.313	0.125	02448	02854
0.750	YP A 075 71	0.375	0.156	14662	
0.750	YP A 075 31	0.375	0.156	02449	02931
1.000	YP A 100 71	0.500	0.187	14663	
1.000	YP A 100 31	0.500	0.187	02451	02951
1.250*	YP A 125 71	0.625	0.250	14664	
1.250*	YP A 125 31	0.625	0.250	02452	02952
1.500*	YP A 150 71	0.750	0.313	14665	
1.500*	YP A 150 31	0.750	0.313	02453	02976
2.000*	YP A 200 71	1.000	0.313	14666	
2.000*	YP A 200 31	1.000	0.313	02454	03128
Protection Insert*	APMW 1604 PDTR	0.031	0.187	14660	

*Protection Insert(s) required, see Cutter Table for details.



Spare Parts				
Insert Number	Insert Screw		Driver	
	Part #	EDP#	Part #	EDP#
YP A 050...	DVF2564	62521	TX208PLUS	61930
YP A 062...	DVF2564	62521	TX208PLUS	61930
YP A 075...	DVF3455	62523	TX210PLUS	61931
YP A 100...	DVF3456	62524	TX215PLUS	61932
YP A 125...	DVF3133	62522	TX220PLUS	61933
YP A 150...	DVF2193	62520	DMP3139	61922
YP A 200...	DVF3457	62525	DMP3460	62527
APMW 1604 PDTR	DVF0089	62518	TX215PLUS	61932



Insert Number	Insert Shim Seat		Shim Screw	
	Part #	EDP#	Part #	EDP#
YP A 200 71	DAN2391	14653	DVF0089*	62518

Note: Valenite recommends the use of PT745 antiseize lubricant (EDP# 50050) on insert screw threads and head.

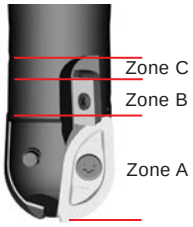
V440 Application Guide

ValMILL®

Materials		Cutter Diameter / Maximum Chip Thickness				Grade / SFM	
		0.500 - 0.625	0.750	1.000 - 1.500	2.000	VP5005	VP5040
Steels P	Free Machining & Low Carbon Steels 120 - 170 Bhn	.003 (.003 - .006)	.004 (.004 - .008)	.005 (.005 - .010)	.010 (.010 - .016)	950 - 1250	800 - 600
	Medium Carbon & High Carbon Steels 180 - 220 Bhn	.003 (.003 - .006)	.004 (.004 - .008)	.005 (.005 - .010)	.010 (.010 - .016)	650 - 850	600 - 450
	Alloy Steels & Easy-To-Machine Tool Steels 200 - 240 Bhn	.003 (.003 - .006)	.004 (.004 - .008)	.005 (.005 - .010)	.010 (.010 - .016)	375 - 500	450 - 350
	Tool Steels & Die Steels 220 - 260 Bhn	.003 (.003 - .006)	.004 (.004 - .008)	.005 (.005 - .010)	.010 (.010 - .016)	300 - 400	350 - 200
Stainless Steels M	Ferritic & Martensitic 180 - 240 Bhn	.003 (.003 - .006)	.004 (.004 - .008)	.005 (.005 - .010)	.010 (.010 - .016)	750 - 900	500 - 350
	Austenitic 140 - 180 Bhn	.003 (.003 - .006)	.004 (.004 - .008)	.005 (.005 - .010)	.010 (.010 - .016)	550 - 750	450 - 300
	PH & Duplex 220 260 Bhn	.003 (.003 - .006)	.004 (.004 - .008)	.005 (.005 - .010)	.010 (.010 - .016)	450 - 650	400 - 200
High Temperature Alloys S	Iron Base Alloys A 286, Discalloy, Incoloy	.003 (.003 - .006)	.004 (.004 - .008)	.005 (.005 - .010)	.010 (.010 - .016)	-	250 - 200
	Nickel Base Alloys - Monel, Hastelloy, Inconel, Waspaloy	.003 (.003 - .006)	.004 (.004 - .008)	.005 (.005 - .010)	.010 (.010 - .016)	150 - 200	200 - 175
	Cobalt Base Alloys - Haynes Stellite	.003 (.003 - .006)	.004 (.004 - .008)	.005 (.005 - .010)	.010 (.010 - .016)	-	150 - 100
	Titanium Alloys 6Al 4V	.003 (.003 - .006)	.004 (.004 - .008)	.005 (.005 - .010)	.010 (.010 - .016)	175 - 250	200 - 150
Aluminum & Non-Ferrous Materials N	Aluminum < 7% Silicon	.003 (.003 - .006)	.004 (.004 - .008)	.005 (.005 - .010)	.010 (.010 - .016)	2750 - 3500	-
	Aluminum > 7% Silicon	.003 (.003 - .006)	.004 (.004 - .008)	.005 (.005 - .010)	.010 (.010 - .016)	1275 - 1600	-

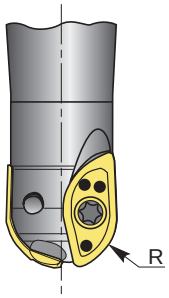
Number of Effective Teeth

The number of effective teeth depends on the axial DOC. If the axial DOC is within Zone C, there are two (2) effective teeth. When the axial DOC includes Zones A or B, there is one effective tooth and feed rate should not exceed .008 ipr.



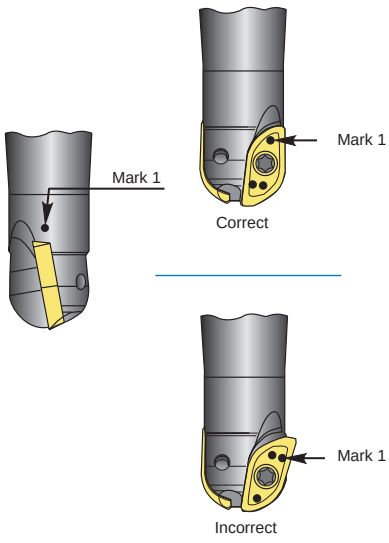
Assembled Cutter Tolerance

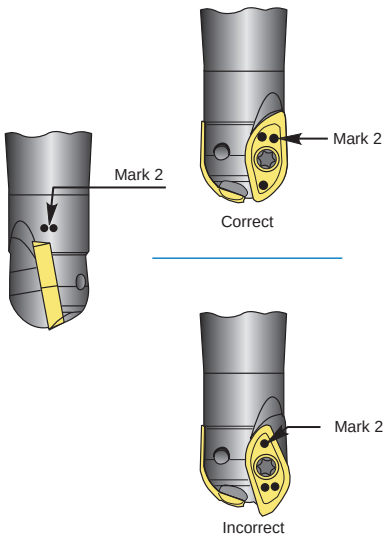
Cutter Diameter	Radius, R
0.625	0.313 +.001/-.005
0.750	0.375 +.001/-.005
1.000	0.500 +.002/-.006
1.250	0.625 +.004/-.007
1.500	0.750 +.007/-.010
2.000	1.000 +.009/-.012



Installation of Inserts

Cutter and insert marks must match. Example (· with ·) and (· · with · ·)

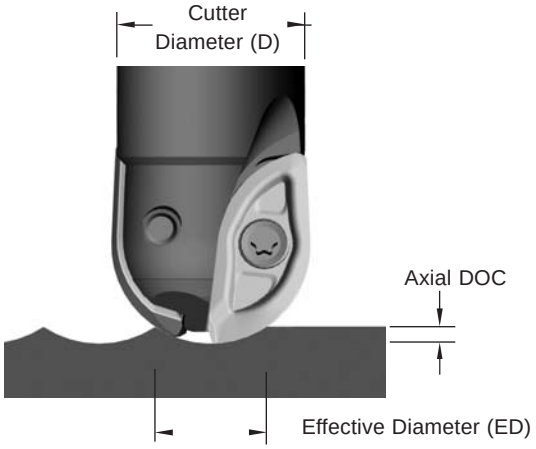




Adjustment for Effective Diameter

When the axial DOC is less than 1/2 the cutter diameter, the effective diameter is less than the nominal diameter of the cutter. The table below provides the effective diameter (ED) based on the axial DOC.

Effective Diameter (ED)						
Axial DOC	Cutter Diameter (D)					
	0.625	0.750	1.000	1.250	1.500	2.000
0.025	.245	.269	.312	.350	.384	.444
0.050	.339	.374	.436	.490	.539	.624
0.100	.458	.510	.600	.678	.748	.872
0.200	.583	.663	.800	.917	1.020	1.200
0.250	.614	.707	.866	1.000	1.120	1.323
0.375		.750	.968	1.146	1.299	1.561
0.500			1.000	1.225	1.414	1.732
0.750					1.500	1.936
1.000						2.000



Calculate the RPM

1) Find the recommended SFM for your material and operation in the Application Guide on page C5.
2) Calculate the RPM for your Effective Cutter Diameter (ED)
   RPM = (3.82 x SFM) / ED
3) Find the maximum RPM for your selected cutter. If the calculated RPM exceeds the maximum, reduce the RPM.

Example

Calculate the RPM required for an actual 700 SFM when the cutter diameter is 1.25 inches and the axial DOC is .200 inch.

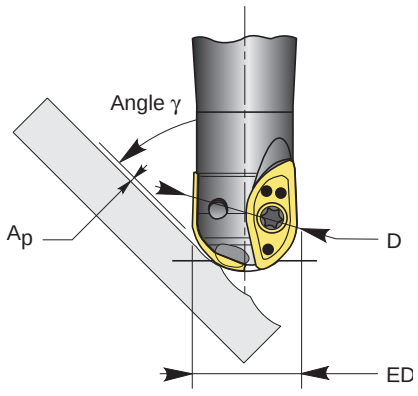
1) Find the effective diameter (ED) at the intersection of the 1.25 inch cutter diameter column and the .200 inch Axial DOC row.
   ED = .917
2) Calculate the adjusted RPM
   RPM = (3.82 x 700) / .917
   RPM = 2916

Calculate the Table Feed, IPM

Where N is the number of teeth in the cutter
IPM = FPT x RPM x N

Effective Diameter When Milling An Inclined Face

The formula below provides a close approximation of the effective cutter diameter when milling an inclined face.



ED = D x cos angle γ

Calculate the RPM

1) Determine the angle of the inclined face (γ).
2) Calculate the Effective Cutter Diameter (ED) using the formula:
   ED = cos γ x D
3) Calculate the RPM for your Effective Cutter Diameter (ED)
   RPM = (3.82 x SFM) / ED
4) Find the maximum RPM for your selected cutter. If the calculated RPM exceeds the maximum, reduce the RPM.

Example

Calculate RPM required for an actual 400 SFM when the cutter diameter is 1.00 inches and the angle of the inclined face (γ) is 40 degrees.

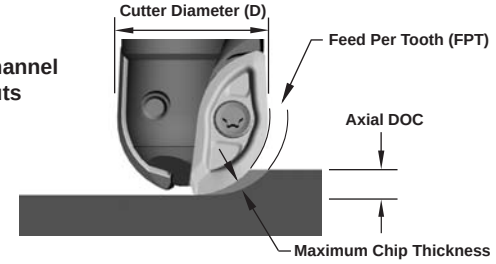
1) Calculate the Effective Cutter Diameter (ED)
   ED = cos 40 degees x 1.00 = 0.776
2) Calculate the RPM for your Effective Cutter Diameter (ED)
   RPM = (3.82 x SFM) / ED
3) **RPM = 1969**

Adjustment of Feed Per Tooth

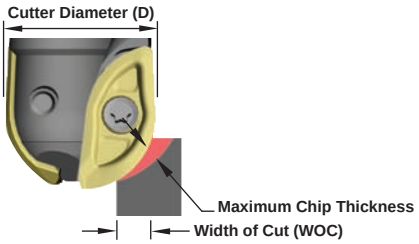
When the axial DOC or radial WOC is less than half the cutter diameter, the chip thinning that occurs can significantly affect performance. If no adjustment is made, chatter and vibration may occur.

Feed/Tooth Multiplication Factor (Cf)						
DOC/ WOC	Cutter Diameter (D)					
	0.625	0.750	1.000	1.250	1.500	2.000
0.025	2.552	2.785	3.203	3.571	3.906	4.500
0.050	1.843	2.004	2.294	2.552	2.785	3.203
0.100	1.364	1.471	1.667	1.843	2.004	2.229
0.200	1.072	1.131	1.250	1.364	1.471	1.667
0.250	1.021	1.061	1.155	1.250	1.342	1.512
0.375		1.000	1.033	1.091	1.155	1.281
0.500			1.000	1.021	1.061	1.155
0.750					1.000	1.033
1.000						1.000

Channel Cuts



Peripheral Cuts



Calculate Feed Per Tooth, FPT

1) Find the recommended Desired Chip Thickness for your operation in the Application Guide on page C5.
2) Find the Correction Factor (Cf) based on the Radial WOC and Cutter Diameter, D in the table above.
3) Calculate the adjusted Feed Rate Per Tooth (FPT) using the formula:
FPT = Desired Chip Thickness x Cf

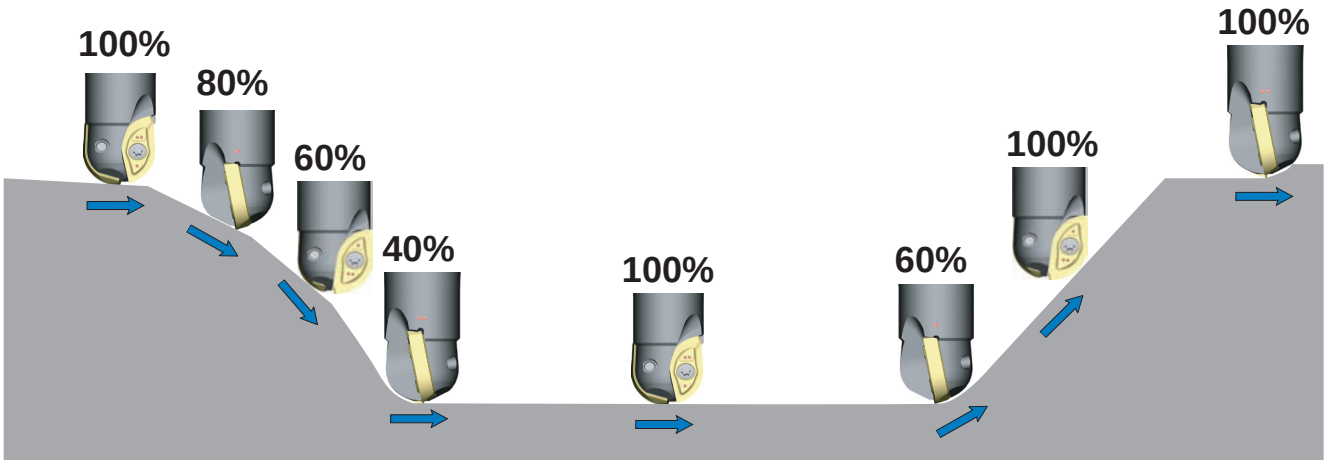
Example

Calculate the adjusted feed per tooth for a 1.25 inch diameter cutter with a .200 inch Radial WOC to produce a .004 chip thickness.

1) Find the CF at the intersection of the 1.25 inch cutter diameter column and the .200 inch radial WOC row.
CF = 1.364
2) Calculate the adjusted feed per tooth
FPT = .004 x 1.364
FPT = .006

Feed Rate Correction for Profiling

For best performance the feed rate should be reduced when profiling according to the diagram.



V500 Cutters & Copy Face Mills

ValMILL®

First choice for die & mold operations.

Excellent for contouring, peripheral cuts, helical interpolation, slotting, drilling and cavity milling.

Cutters

- Capable of feed in virtually any direction
- Two effective teeth on end mills - even on smallest diameters
- Excellent surface finishes at high feed rates and small depths of cut

Inserts

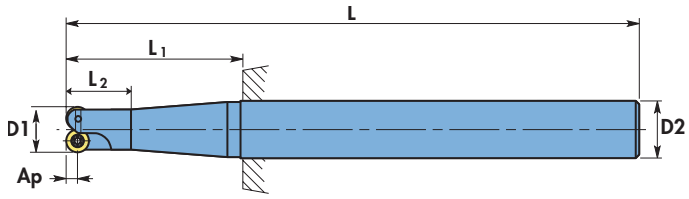
- Two coated grades for a wide range of work piece materials
- Top form geometry for optimum chip removal
- Designed to take the most punishing cuts in your most difficult to machine materials

Specifications

- **Operations**: Roughing, finishing & semi-finishing
- **Applications**: Contouring, peripheral cuts, slotting, drilling and cavity milling
- **Cutter Diameters**: End Mills .500” to 1.500”, Face Mills 2.000” to 6.00”
- **Workpiece Materials**: Carbon & alloy steels, tool & die steels, stainless steels, high temperature alloys

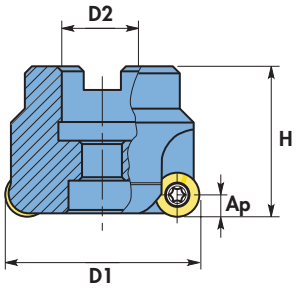
ValMILL®

V500 Cutters & Copy Face Mills



Part Number	Dimensions (inches)						No. Req'd	Insert to Use	Wt. (lbs.)	Max RPM	EDP #
	D1	D2	L	L1	L2	Ap					
V 500 A 07 050 WB 20	0.500	0.625	4.07	2.00	0.79	0.13	2	RD..07	0.28	25,000	62475
V 500 A 08 062 WC 20	0.625	0.750	4.28	2.25	0.98	0.16	2	RD..08	0.41	25,000	62476
V 500 A 10 075 WD 32	0.750	1.000	5.53	3.25	1.18	0.20	2	RD..10	0.88	25,000	62477
V 500 A 12 100 WD 32	1.000	1.000	5.53	3.25	1.18	0.24	2	RD..12	1.04	22,000	62478
V 500 A 12 100 WD 47	1.000	1.000	7.03	4.75	1.18	0.24	2	RD..12	1.33	22,000	62479
V 500 A 12 125 WD 47	1.250	1.000	7.03	4.75	0.59	0.24	2	RD..12	1.56	22,000	62480
V 500 A 12 150 WD 32	1.500	1.000	5.53	3.25	0.59	0.24	2	RD..12	1.37	22,000	62481
V 500 A 16 150 WF 47	1.500	1.500	7.44	4.75	1.57	0.31	2	RD..16	3.21	20,000	62482

Insert screw and driver included with each cutter.



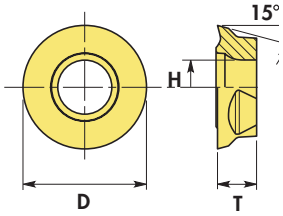
Part Number	Dimensions (inches)				No. Req'd	Insert to Use	Wt. (lbs.)	Max RPM	EDP #
	D1	D2	H	Ap					
V 500 A 16 0200 G 04R	2.000	0.750	1.500	0.31	4	RD..16	0.54	18,800	62483
V 500 A 16 0250 G 04R	2.500	0.750	1.750	0.31	4	RD..16	0.92	16,100	62484
V 500 A 16 0300 H 05R	3.000	1.000	2.000	0.31	5	RD..16	1.79	14,300	62485
V 500 A 16 0400 K 07R	4.000	1.500	2.000	0.31	7	RD..16	2.39	12,000	62486
V 500 A 16 0600 K 09R	6.000	1.500	2.375	0.31	9	RD..16	7.80	9,500	62487

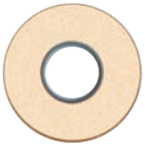
Insert screw and driver included with each cutter.

V500 Spare Parts and Inserts

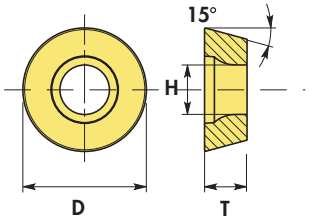
ValMILL®

RDMT-61

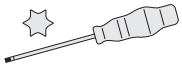




RDMW



Insert Number	Dimensions (inches)			EDP # /Grade	
	D	T	H	VP5040	VP5135
RDMT 07 T1 MO SN-61	0.275	0.078	0.098	14705	-
RDMT 08 T2 MO SN-61	0.315	0.109	0.110	14706	14707
RDMT 10 03 MO SN-F6-61	0.394	0.125	0.173	14708	14709
RDMT 12 T3 MO SN-F6-61	0.472	0.156	0.173	14710	14711
RDMT 16 04 MO SN-F6-61	0.630	0.187	0.224	14713	14714
RDMW 16 04 MO SN-F6	0.630	0.187	0.224	-	14715



Spare Parts					
Insert Number	Insert Screw**		Driver**		Torque (in/lbs)
	Part Number	EDP #	Part Number	EDP #	
RDMT 07 ...	DVF2833	62492	TX208PLUS	62930	8
RDMT 08 ...	DVF2910	62491	TX208PLUS	62930	8
RDMT 10...	DVF3503	62490	TX215PLUS	62932	35
RDMT 12...	DVF3504	62489	TX215PLUS	62932	35
RDMT 16...	DVF3020	62488	TX220PLUS	62933	54

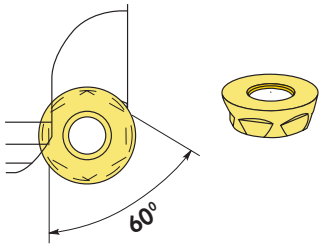
Insert screw and driver included with each cutter **Advanced TORX PLUS® locking mechanism

Technical Information

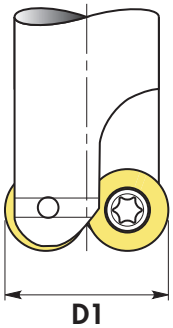
Insert Indexing

Insert diameters 10 - 16 can be indexed per a hexagonal pattern located on the back of the inserts.

This pattern immobilizes the insert during machining allowing for a controlled index to unworn areas on the insert.



Cutting Diameter Tolerance	
Insert Size	Cutting Diameter (D1)
RD..07..MO	+.0016/-.0071
RD..08..MO	+.0016/-.0071
RD..10..MO	+.0016/-.0071
RD..12..MO	+.0031/-.0087
RD..16..MO	+.0063/-.0110

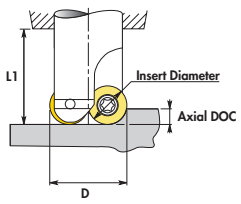


Material		Maximum Chip Thickness Cutter Diameter 0.625	0.750	1.000	1.500	2.000	Grade VP5040/ SFM
Steels P	Free Machining and Low Carbon Steels 120 – 170 Bhn	.003 (.004 - .006)	.004 (.004 - .008)	.005 (.005 - .010)	.005 (.005 - .010)	.010 (.010 - .016)	700
	Medium Carbon and High Carbon Steels 180 – 220 Bhn	.003 (.004 - .006)	.004 (.004 - .008)	.005 (.005 - .010)	.005 (.005 - .010)	.010 (.010 - .016)	500
	Alloy Steels and Easy To Machine Tool Steels 200 – 240 Bhn	.003 (.004 - .006)	.004 (.004 - .008)	.005 (.005 - .010)	.005 (.005 - .010)	.010 (.010 - .016)	350
	Tool Steels and Die Steels 220 – 260 Bhn	.003 (.004 - .006)	.004 (.004 - .008)	.005 (.005 - .010)	.005 (.005 - .010)	.010 (.010 - .016)	200
Stainless Steels M	Ferritic and Martensitic 180 – 240 Bhn	.003 (.004 - .006)	.004 (.004 - .008)	.005 (.005 - .010)	.005 (.005 - .010)	.010 (.010 - .016)	400
	Austenitic 140 – 180 Bhn	.003 (.004 - .006)	.004 (.004 - .008)	.005 (.005 - .010)	.005 (.005 - .010)	.010 (.010 - .016)	300
	PH and Duplex 220 260 Bhn	.003 (.004 - .006)	.004 (.004 - .008)	.005 (.005 - .010)	.005 (.005 - .010)	.010 (.010 - .016)	300
Cast Irons K	Gray Cast Iron 180 - 220 BHN	-	-	-	-	-	-
	Gray Cast Iron 220 - 260 BHN	-	-	-	-	-	-
	Ductile and Malleable Cast Iron 140 -180 BHN	-	-	-	-	-	-
	Ductile and Malleable Cast Iron 220-260 BHN	-	-	-	-	-	-
High Temperature Alloys S	Iron Base Alloys - A-286, Discalloy, Incoloy	.003 (.004 - .006)	.004 (.004 - .008)	.005 (.005 - .010)	.005 (.005 - .010)	.010 (.010 - .016)	225
	Nickel and Cobalt Base Alloys – Hastelloy, Inconel, Haynes Stellite	.003 (.004 - .006)	.004 (.004 - .008)	.005 (.005 - .010)	.005 (.005 - .010)	.010 (.010 - .016)	175
	Titanium Alloys 6Al-4V	.003 (.004 - .006)	.004 (.004 - .008)	.005 (.005 - .010)	.005 (.005 - .010)	.010 (.010 - .016)	125
Aluminum & Non-Ferrous Materials N	Aluminum Alloys < 7% Silicon	-	-	-	-	-	-
	Aluminum Alloys 7% - 12% Silicon	-	-	-	-	-	-
	Aluminum Alloys 12% - 18% Silicon	-	-	-	-	-	-
	Non-Ferrous	-	-	-	-	-	-

Machining Guidelines

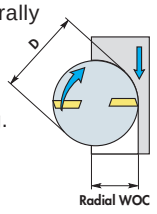
Adjustment for Chip Thinning Due to Shallow Axial DOC

When the axial DOC is less than ½ the insert diameter, the actual chip thickness is less than the feed per tooth (FPT). As the axial DOC becomes a smaller portion of the insert diameter (generally less than 25%), the chip thinning that occurs can significantly affect performance. See page C6 for the formula to calculate the feed per tooth (FPT) adjusted for chip thinning.



Adjustment for Chip Thinning Due to Narrow Radial WOC

Chip thinning also occurs when the radial width of cut is less than ½ the cutter diameter. As the radial width of cut becomes a smaller portion of the cutter diameter (generally less than 25%) the chip thinning that occurs can significantly affect performance. See page C6 for the formula to calculate the feed per tooth (FPT) adjusted for chip thinning.



Feed Rate Calculation

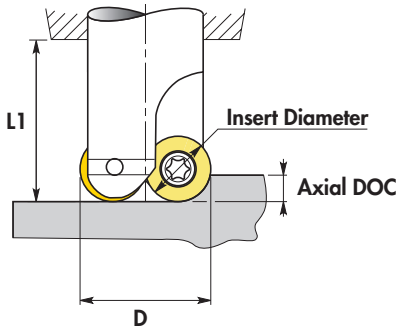
Chip thinning can occur in two ways when using V500 Copy Mills:

1. When the axial DOC is less than 1/2 the cutter diameter
2. When the radial WOC is less than 1/2 the insert diameter

The tables below provide correction factors for specific cases shown.

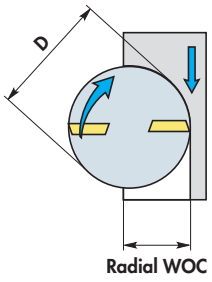
As an alternative to the tables, the formulas below allow calculation for any combination of axial DOC and radial WOC.

Axial DOC	Correction Factor (CF1)				
	Insert Size				
	07	08	10	12	16
0.010	2.67	2.85	3.18	3.47	4.00
0.025	1.74	1.85	2.05	2.23	2.56
0.050	1.30	1.37	1.50	1.62	1.85
0.100	1.04	1.07	1.15	1.22	1.37
0.150		1.00	1.03	1.07	1.17
0.200				1.01	1.07
0.250					1.02
0.300					1.00



$$CF1 = \frac{1/2\ (\text{Insert Diameter}/\text{Axial DOC})}{\sqrt{(\text{Insert Diameter}/\text{Axial Doc}) - 1}}$$

Radial WOC	Correction Factor (CF2)											
	Cutter Diameter (D)											
	0.50	0.63	0.75	1.00	1.25	1.50	2.00	2.50	3.00	4.00	5.00	6.00
0.125	1.16	1.25	1.34	1.51								
0.250	1.00	1.02	1.06	1.16	1.25	1.34	1.51	1.68	1.81	2.07	2.29	2.50
0.500				1.00	1.02	1.06	1.15	1.25	1.34	1.51	1.68	1.81
0.750						1.00	1.03	1.09	1.16	1.28	1.40	1.51
1.000							1.00	1.02	1.06	1.16	1.25	1.34
1.500									1.00	1.03	1.09	1.16
2.000										1.00	1.02	1.06
2.500											1.00	1.01
3.000												1.00



$$CF2 = \frac{1/2\ (D / \text{Radial WOC})}{\sqrt{(D / \text{Radial WOC}) - 1}}$$

Calculate the Feed per Tooth (FPT)

1) Find the recommended desired chip thickness in the application guide on page C5.
2) Find the correction factor (CF1) based on the axial DOC and insert diameter in table located above.
3) Find the correction factor (CF2) based on the radial WOC and cutter diameter in table located above.
4) Calculate the adjusted Feet Per Tooth (FPT) using the formula:

FPT = Desired Chip Thickness x CF1 x CF2

Example

Calculate the adjusted Feed per Tooth for a 2.00" diameter cutter using size 16 inserts to produce a .004" chip thickness, when the radial WOC is .250" and the axial DOC is .050".

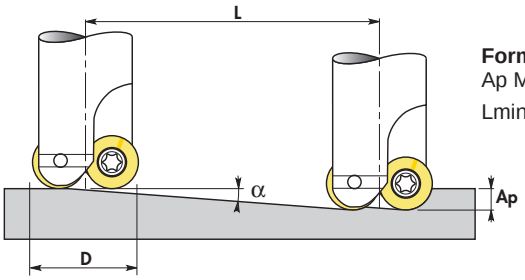
1) Find the Correction Factor (CF1) at the intersection of the .050" axial DOC row and the 16 insert size column.
   CF1 = 1.850
2) Find the Correction Factor (CF2) at the intersection of the .250" radial WOC row and the 2.00" cutter diameter column.
   CF2 = 1.512
3) Calculate the required FPT for a .004" desired chip thickness.
   FPT = .004 x 1.850 x 1.512
   FPT = .011

ValMILL®

Ramping Angles

The table below gives the maximum ramping angle based on insert size and cutter diameter.

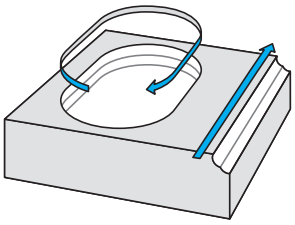
Insert Size	Cutter Diameter (D)										
	0.50	0.63	0.75	1.00	1.25	1.50	2.00	2.50	3.00	4.00	6.00
07	20º										
08		34º									
10			39º								
12				42º	19º	13º					
16						20º	6º	6º	5º	4º	2º

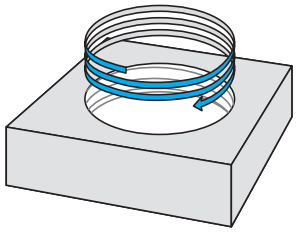


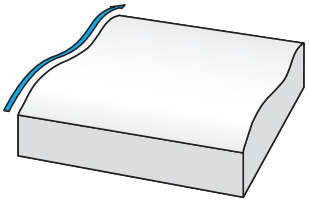
Formulas:
Ap Max = 1/2 Insert Diameter
Lmin = Ap / TAN α

Multi-Axis Operations

When roughing or semi-finishing, the V500 Copy Mill cutters are well adapted in 3-axis moving to produce cavities by cylindrical or helical interpolation.







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ValMILL®

V520 Drilling End Mills

The all-surface tool for plunging, drilling, grooving and more.

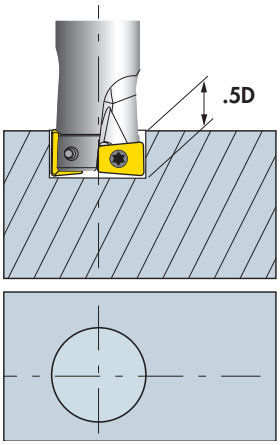
- **Multi-Function Cutter**: Center cutting capability allows drilling of holes as well as other operations such as channeling, contouring, shouldering and ramping.
- **2 Identical Inserts** - 2 Effective Teeth: Cutter designed with two identical trapezoidal inserts, allowing for two effective cutting edges when plunging and endmilling.
- **Great Strength**: Insert geometry designed for applications in high strength tool steels. Our VP5020 grade (PVD coated micrograin carbide) is highly resistant to wear and thermal shock.
- **No Interference with the Part Being Machined**: The cutting diameters of the cutters are intentionally made larger than the shank diameters.
- **Greater Rigidity with Large Overhangs**: Plunging, a milling operation along the Z-axis only, minimizes the flexing of the cutters and allows a greater overhang than can be realized with conventional milling in the X and Y axis.

Technical Information

Opening A Cavity

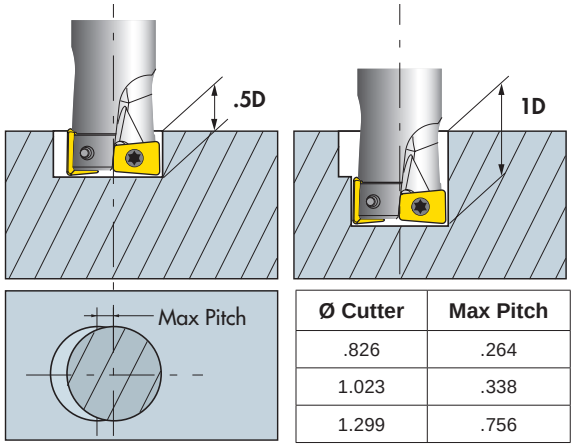
Step 1
Drilling

- Descend in Z-axis to a max depth of .5D.
- Retract to a position in Z-axis clear of the surface.



Step 2
Plunging / Drilling

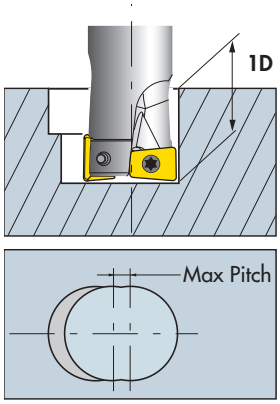
- Reposition the tool up to a max pitch shown below.
- Descend in Z-axis at drill feed a further .5D.
- Retract to a position in Z-axis clear of the surface.



Ø Cutter	Max Pitch
.826	.264
1.023	.338
1.299	.756

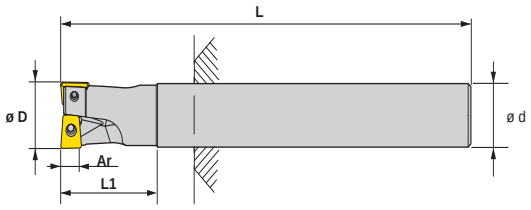
Step 3
Plunging

- Reposition tool up to a max pitch shown below.
- Descend in Z-axis at plunging feed, to a max depth of 1D.
- Retract to a position in Z-axis clear of the surface.

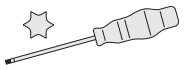


V520 Drilling End Mills

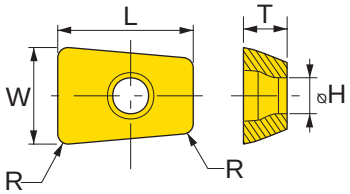
ValMILL®



Cylindrical Inch Shanks										
Part Number	Dimensions (inches)						Inserts Required	Wt (lbs.)	Max RPM	EDP#
	Insert Size	D	d	L	L1	Ar				
V520 A 10 082 CC 13	PG…10	0.826	0.750	6.30	1.38	0.23	2	0.710	11,000	62591
V520 A 13 102 CD 15	PG…13	1.023	1.000	7.87	1.57	0.31	2	1.552	9,000	62562
V520 A 16 129 CE 19	PG…16	1.299	1.250	9.84	1.97	0.39	2	3.062	7,000	62563

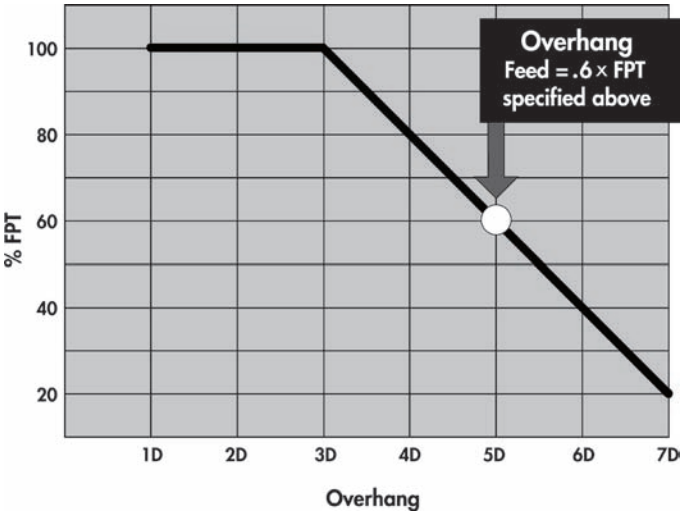


Spare Parts					
Insert Number	Insert Screw		Driver		Torque (In/lbs)
	Part Number	EDP#	Part Number	EDP#	
PG 100308N 81	DVF2564	62521	TX208PLUS	50147	20
PG 130408N 81	DVF0943	62519	TX209PLUS	62530	24
PG 160408N 81	DVF0088	62775	TX215PLUS	61932	47



Inserts							
Insert Number	Dimension (inches)						Grade/EDP#
	Cutter Dia.	L	T	R	W	H	VP5020
PG 100308N 81	0.826	0.413	0.134	0.031	0.295	0.110	17695
PG 130408N 81	1.023	0.512	0.177	0.031	0.370	0.134	17696
PG 160408N 81	1.299	0.650	0.187	0.031	0.449	0.173	17697

V520 Insert Application						
Grade VP5020		P Steel		M Stainless Steel	K Cast Iron	
		<220 Bhn Carbon Steel	Tool & Die Steel		Gray Cast Iron	Ductile & Malleable
Drilling (Overhang 5 x Dia.)	Cutting Speed (SFM)	390 - 590	260 - 390	260 - 460	390 - 650	330 - 460
	Tooth Feed (FPT)	.002	.0015	.001 - .002	.003	.0024
Plunging (Overhang 5 x Dia.)	Cutting Speed (SFM)	390 - 590	260 - 390	260 - 460	390 - 650	390 - 525
	Tooth feed (FPT)	.0012 - .0047	.0012 - .0024	.001 - .003	.003 - .007	.0016 - .0047
Conventional Milling (Overhang 3 x Dia.)	Cutting Speed (SFM)	330 - 590	195 - 390	230 - 460	390 - 650	330 - 590
	Tooth Feed (FPT)	.002 - .007	.0020 - .0047	.002 - .005	.002 - .012	.002 - .007



NOTE: The conventional milling speed and feed values are recommended for overhangs as specified. With a greater overhang, the feed values must be reduced according to the graph.

SQUARE SHOULDER MILLS

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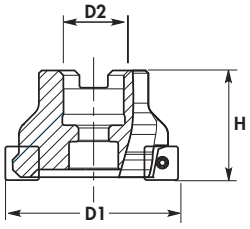
ValMILL®

V490 Square Shoulder Face Mills



Part Number	Dimensions				Insert Style	No. Req'd	Max RPM	Wt.(lbs.)	EDP#
	D1	D2	H	ar					
V490 A 15 0200 G 04R	2.00	0.750	1.500	0.625	SD..15	4	14,000	0.61	62493
V490 A 15 0250 G 05R	2.50	0.750	1.750	0.625	SD..15	5	12,000	1.04	62494
V490 A 15 0300 H 06R	3.00	1.000	2.000	0.625	SD..15	6	10,700	1.85	62495
V490 A 15 0400 K 08R	4.00	1.500	2.000	0.625	SD..15	8	8,900	3.93	62496
V490 A 15 0500 K 09R	5.00	1.500	2.375	0.625	SD..15	9	7,900	6.30	62497
V490 A 15 0600 K 10R	6.00	1.500	2.375	0.625	SD..15	10	7,100	9.52	62498

Insert screws and driver included with each cutter

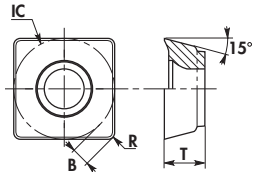
Spare Parts

Insert Number	Insert Screw**		Driver**	
	Part#	EDP#	Part#	EDP#
SD... 15	DVF2097	62499	DMP2099	62500

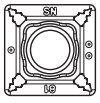
Note: Valenite recommends the use of PT745 antiseize lubricant (EDP# 50050) on insert screw threads and head.
**Advanced TORX PLUS® locking mechanism

Note: Face mills are designed to allow use of Valenite Coolant Screws. See Technical Section for application information

V490 Inserts



SDMT EN21



SDMT SN81

Insert Number	Dimensions				EDP# Grades			
	IC	T	R	B	VP5020	VP5040	VP5135	VP1120
SDMT 150608 SN81	0.625	0.25	0.031	0.116	14719	14720	14721	19595
SDMT 150608 EN21	0.625	0.25	0.031	0.116	14716	14717	14718	19594

V490 Insert Application

ValMILL®

Material		Hardness	SFM Coated Grades VP5020	VP5040	VP5135	VP1120	Desired Chip Thickness
Steels P	Free Machining and Low Carbon Steels	120 – 170 BHN	800 - 1100	700 - 900	600 - 800	-	.002 - .005 .006 - .012
	Medium Carbon and High Carbon Steels	180 – 220 BHN	600 - 800	500 - 700	400 - 600	-	.002 - .005 .006 - .012
	Alloy Steels and Easy To Machine Tool Steels	200 – 240 BHN	500 - 700	400 - 550	350 - 450	-	.002 - .005 .006 - .012
	Tool Steels and Die Steels	220 – 260 BHN	350 - 500	300 - 400	250 - 350	-	.002 - .005 .006 - .012
Stainless Steels M	Ferritic and Martensitic	180 – 240 BHN	500 - 700	400 - 550	350 - 500	-	.002 - .005 .006 - .012
	Austenitic	140 – 180 BHN	400 - 600	350 - 500	300 - 450	-	.002 - .005 .006 - .012
	PH and Duplex	220 - 260 BHN	350 - 500	300 - 400	250 - 350	-	.002 - .005 .006 - .012
Cast Irons K	Gray Cast Iron	180 - 220 BHN	600 - 700	-	-	800 - 1000	.002 - .005 .006 - .012
		220 - 260 BHN	500 - 600	-	-	700 - 800	.002 - .005 .006 - .012
	Ductile and Malleable Cast Iron	140 - 180 BHN	500 - 600	-	-	700 - 800	.002 - .005 .006 - .012
		220 - 260 BHN	400 - 500	-	-	500 - 700	.002 - .005 .006 - .012
High Temp Alloys S	Iron Base Alloys - A-286, Discalloy, Incoloy	-	225 - 250	-	200 - 225	-	.002 - .005 .006 - .012
	Nickel and Cobalt Base Alloys – Hastelloy, Inconel, Haynes Stellite	-	150 - 175	-	100 - 150	-	.002 - .005 .006 - .012
	Titanium Alloys 6Al-4V	-	200 - 225	-	-	-	.002 - .005 .006 - .012
Aluminum & Non-Ferrous Materials N	Aluminum Alloys < 7% Silicon	-	2000 - 3000 1500 - 2500	-	-	-	.002 - .005 .006 - .012
	Aluminum Alloys 7% - 12% Silicon	-	1500 - 2500 1250 - 2000	-	-	-	.002 - .005 .006 - .012
	Aluminum Alloys 12% - 18% Silicon	-	1500 - 5500 1250 - 2000	-	-	-	.002 - .005 .006 - .012
	Non-Ferrous	-	800 - 1400 600 - 1200	-	-	-	.002 - .005 .006 - .012

Operation and Insert Geometry

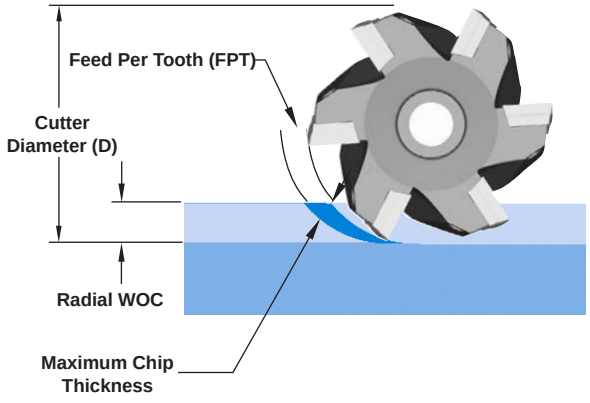
Insert Geometry	Steel			Stainless Steel			Cast Iron			Aluminum & Non-Ferrous Materials			High Temp Alloys			Feed per Tooth
	F	SF	R	F	SF	R	F	SF	R	F	SF	R	F	SF	R	
EN 21	❍	●		❍	●		❍	●		❍	●	❍	❍	●	❍	.001 - .005
SN 81		❍	●		❍	●		❍	●							.002 - .012

● Primary Operation ❍ Secondary Operation **F** = Finishing **SF** = Semi Finishing **R** = Roughing

Adjustment of Feed Per Tooth

The Radial Width of Cut (WOC) in end mill operations is frequently less than 1/2 the cutter diameter. In these applications the actual chip thickness is less than the nominal feed per tooth.

When the Radial WOC is a small portion of the cutter diameter the chip thinning that occurs significantly affects performance.



Calculate Feed Per Tooth (FPT)

1) Find the recommended desired chip thickness for your operation in the Application Guide on the opposite page.
2) Find the Correction Factor (Cf) based on the Radial WOC and Cutter Diameter in the table below.
3) Calculate the adjusted Feed Rate Per Tooth (FPT) using the formula: **FPT = Desired Chip Thickness x Cf**

Correction Factor (Cf)

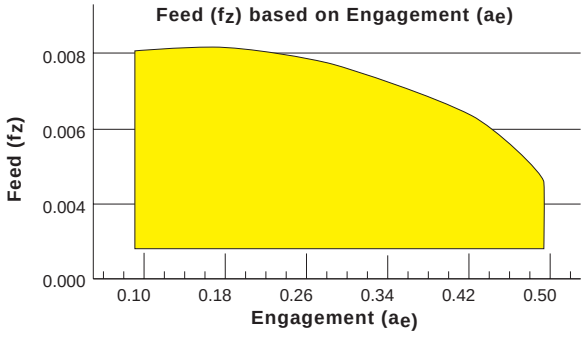
Radial WOC	Cutter Diameter (D)					
	2.0	2.5	3.0	4.0	5.0	6.0
0.25	1.512	1.667	1.809	2.066	2.290	5.004
0.50	1.150	1.250	1.342	1.512	1.667	1.809
0.75	1.030	1.091	1.155	1.281	1.400	1.512
1.00	1.000	1.021	1.061	1.155	1.250	1.342
1.50			1.000	1.033	1.091	1.155
2.00				1.000	1.021	1.061
2.50					1.000	1.014
3.00						1.000

The table at the left provides a correction factor (Cf) to quickly calculate the adjusted feed rate for a desired chip thickness.

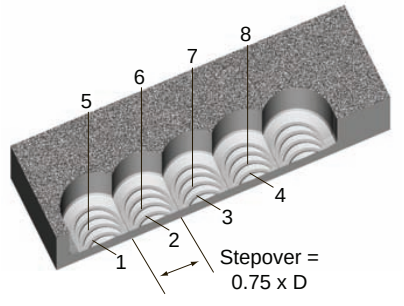
As an alternative to the table, feed per tooth (FPT) can be calculated for any Radial WOC and any Cutter Diameter (D) using the formula

$$FPT = \frac{1/2\ (D / \text{Radial WOC})}{\sqrt{(D / \text{Radial WOC})\ 1}} \times \text{Maximum Chip Thickness}$$

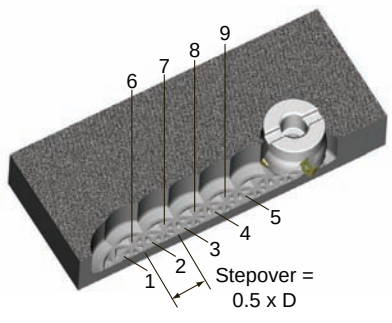
V490 Axial Feed Milling



Milling Cutter With Overhang L≤3xD



Milling Cutter With Overhang L≥3xD



SQUARE SHOULDER MILLS

V590 Single Station and V595 Long Edge

ValMILL®

Engineered for your most demanding applications.

Cutters

- Cutters are designed to generate a 90º square shoulder, minimizing secondary operations
- Large chip gullets ensure efficient chip evacuation
- V590 Series offers through-the-tool coolant

Inserts

- Positive top-form geometry inserts create lower cutting forces at higher feed rates
- Inserts are interchangeable between the V590 & V595 Series
- Insert design makes these cutters ideal for ramping and helical interpolation

Specifications

- **Geometry**: Positive/Positive
- **Applications**: Roughing, channel milling, ramping, helical interpolation, plunging
- **Cutter Diameters**:

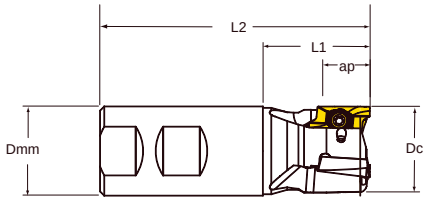
  V590 = .375” - 6.00”

  V595 = 1.00” - 2.00”

- **Workpiece Materials:** Steel, stainless steel, cast irons, high-temp alloys, aluminum and non-ferrous

ValMILL®

V590 Square Shoulder Coolant-Through End Mills

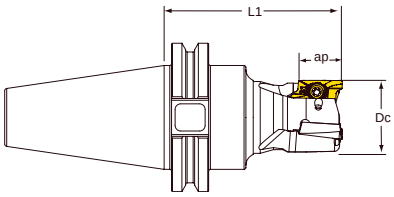


Insert Size	Part Number	Dimensions (inches)					# Inserts	Wt (lbs)	Max RPM	EDP#
		Dc	Dmm	L2	L1	ap Max				
AP07	V590A 07 038 WA 10	0.375	0.500	2.78	1.00	0.12	1	0.10	30,000	62692
	V590A 07 050 WB 10	0.500	0.625	3.07	1.00	0.12	2	0.18	30,000	62774
	V590A 07 062 WB 12	0.625	0.625	3.27	1.20	0.12	3	0.21	30,000	62693
AP10	V590 A 10 062 WB 09	0.625	0.625	3.00	0.93	0.35	2	0.19	40,000	62538
	V590 B 10 075 WC 15	0.750	0.750	3.50	1.47	0.35	3	0.30	40,000	62549
	V590 A 10 075 WC 15	0.750	0.750	3.50	1.47	0.35	2	0.33	40,000	62539
	V590 A 10 100 WD 17	1.000	1.000	4.00	1.72	0.35	3	0.61	40,000	62540
	V590 A 10 125 WE 17	1.250	1.250	4.00	1.72	0.35	5	1.17	40,000	62541
	V590 A 10 150 WE 21	1.500	1.250	4.40	2.12	0.35	5	1.38	36,500	62551
AP13	V590 A 13 100 WD 17	1.000	1.000	4.00	1.72	0.48	3	0.21	35,000	62546
	V590 A 13 125 WE 17	1.250	1.250	4.00	1.72	0.48	4	0.35	30,000	62547
	V590 A 13 150 WE 21	1.500	1.250	4.40	2.12	0.48	5	0.60	26,700	62548
AP16	V590A 16 100 WC 17	1.000	0.750	3.75	1.72	0.70	2	0.36	27,000	62852
	V590A 16 100 WD 17	1.000	1.000	4.00	1.72	0.70	2	0.63	27,000	62853
	V590A 16 100 WD 35	1.000	1.000	5.78	3.50	0.70	2	0.95	27,000	62854
	V590A 16 100 CD 35	1.000	1.000	10.00	3.50	0.70	2	1.80	27,000	62849
	V590A 16 125 WE 22	1.250	1.250	4.50	2.22	0.70	3	1.13	23,000	62858
	V590B 16 125 WE 22	1.250	1.250	4.50	2.22	0.70	2	1.18	23,000	62866
	V590A 16 125 WE 40	1.250	1.250	6.28	4.00	0.70	3	1.62	23,000	62859
	V590A 16 125 CE 40	1.250	1.250	10.00	4.00	0.70	3	2.83	23,000	62855
	V590A 16 150 WE 22	1.500	1.250	4.50	2.22	0.70	4	1.28	20,000	62863
	V590B 16 150 WE 22	1.500	1.250	4.50	2.22	0.70	3	1.32	20,000	62867
	V590A 16 150 WE 45	1.500	1.250	6.78	4.50	0.70	4	1.94	20,000	62864
	V590A 16 150 CF 45	1.500	1.500	10.00	4.50	0.70	4	4.51	20,000	62860
	V590A 16 200 WE 22	2.000	1.250	4.50	2.22	0.70	5	1.73	16,000	62865

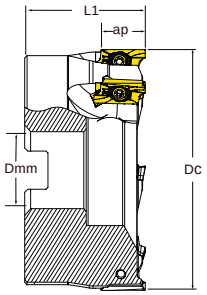
V590 End Mills assembled with inserts are designed to achieve a maximum diameter not to exceed the nominal cutter diameter.

V590 Square Shoulder End Mills

ValMILL®



Insert Size	Part Number	Dimensions (inches)				# Insert	Wt (lbs)	Max RPM	EDP#
		Dc	Shank	L1 (gage length)	ap Max				
AP16	V590A 16 100 CT40 30	1.000	CAT40	3.00	0.70	2	2.14	27,000	62850
	V590A 16 100 CT40 50	1.000	CAT40	5.00	0.70	2	2.55	27,000	62851
	V590A 16 125 CT40 30	1.250	CAT40	3.00	0.70	3	2.33	23,000	62856
	V590A 16 125 CT40 50	1.250	CAT40	5.00	0.70	3	2.95	23,000	62857
	V590A 16 150 CT40 30	1.500	CAT40	3.00	0.70	4	2.60	20,000	62861
	V590A 16 150 CT40 50	1.500	CAT40	5.00	0.70	4	3.54	20,000	62862



Insert Size	Part Number	Dimensions (inches)					# Insert	Wt (lbs)	Max RPM	EDP#
		Dc	Dmm	Mount*	L1	ap Max				
AP10	V590 A 10 0150 G 05R	1.50	0.75	G	1.50	0.35	5	0.41	36,500	62537
AP13	V590 A 13 0200 G 06R	2.00	0.75	G	1.50	0.48	6	0.70	22,400	62542
	V590 A 13 0250 G 07R	2.50	0.75	G	1.75	0.48	7	1.05	19,700	62543
	V590 A 13 0300 H 09R	3.00	1.00	H	2.00	0.48	9	2.07	17,800	62544
	V590 A 13 0400 K 10R	4.00	1.50	K	2.00	0.48	10	3.83	15,200	62545
	V590 A 13 0500 K 13R	5.00	1.50	K	2.38	0.48	13	5.66	13,400	62552
	V590 A 13 0600 K 16R	6.00	1.50	K	2.38	0.48	16	8.21	12,200	62553
AP 16	V590A 16 0200 G 03 R	2.000	0.750	G	1.50	0.70	3	0.71	16,000	62839
	V590A 16 0200 G 05 R	2.000	0.750	G	1.50	0.70	5	0.61	16,000	62840
	V590A 16 0250 G 04 R	2.500	0.750	G	1.75	0.70	4	1.17	14,000	62841
	V590A 16 0250 G 06 R	2.500	0.750	G	1.75	0.70	6	1.05	14,000	62842
	V590A 16 0300 H 05 R	3.000	1.000	H	2.00	0.70	5	2.13	13,000	62843
	V590A 16 0300 H 07 R	3.000	1.000	H	2.00	0.70	7	1.99	13,000	62844
	V590A 16 0400 K 06 R	4.000	1.500	K	2.00	0.70	6	4.09	11,000	62845
	V590A 16 0400 K 08 R	4.000	1.500	K	2.00	0.70	8	3.92	11,000	62846
	V590A 16 0500 K 09 R	5.000	1.500	K	2.38	0.70	9	6.43	10,000	62847
	V590A 16 0600 K 10 R	6.000	1.500	K	2.38	0.70	10	8.44	9,000	62848

*For detailed Mount information see J3 and J4.

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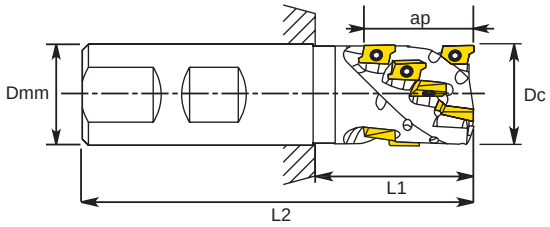
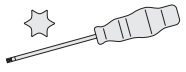
V595 Square Shoulder End Mills



Weldon Shanks											
Insert Size	Part Number	Dc	Dmm	L2	L1	ap	# Inserts	EFF Teeth	Wt (lbs)	Max RPM	EDP#
AP10	V595 A 10 100 WD 09	1.000	1.000	3.856	1.576	0.98	6	2	0.67	30,000	56405
	V595 A 10 125 WE 13	1.250	1.250	4.053	1.773	1.33	12	3	1.129	30,000	56407
	V595 A 10 150 WF 13	1.500	1.500	4.459	1.769	1.33	16	4	1.883	27,000	56408
AP13	V595 A 13 125 WE 18	1.250	1.250	4.053	1.773	1.38	6	2	1.116	22,000	56410
	V595 A 13 150 WF 18	1.500	1.500	4.853	2.163	1.81	12	3	1.936	20,000	56411
	V595 A 13 200 WG 22	2.000	2.000	5.612	2.362	2.26	16	4	4.074	16,000	56412

Cylindrical Shanks											
Insert Size	Part Number	Dc	Dmm	L2	L1	ap	# Inserts	EFF Teeth	Wt (lbs)	Max RPM	EDP#
AP10	V595 A 10 100 CD 09	1.000	1.000	4.724	1.576	0.98	6	2	0.875	30,000	56404
	V595 A 10 125 CE 13	1.250	1.250	5.118	1.773	1.33	12	3	1.512	30,000	56406

V595 Long Edge End Mills assembled with inserts are designed to achieve a maximum diameter that is slightly under the nominal diameter. Diameter can be expected to be .008" - .016" under nominal.

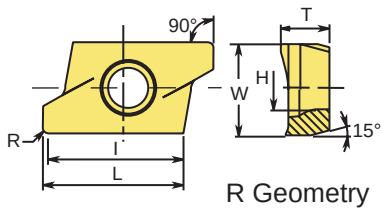


Spare Parts						
Insert Size	Reference Part Number	Insert Screw**		Driver**		Torque (in-lbs)
		Part #	EDP#	Part #	EDP#	
AP07	V590A 07 038 WA 10	DVF2655	62688	TX206PLUS	62690	4
	V590A 07 050 WB 10	DVF1642	62687			
	V590A 07 062 WB 12					
AP10	All	DVF3509	62526	TX208PLUS	61930	8
AP13	All	DVF0943	62519	TX209PLUS	62530	13
AP16	All	DVF3468	62958	TX215PLUS	61930	35

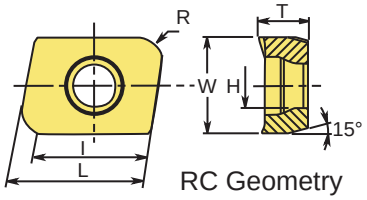
Insert screw & TORX PLUS® drive included with each cutter
**Advanced TORX PLUS® locking mechanism

V590 & V595 Inserts

ValMILL®



R Geometry



RC Geometry

Insert Size	Part Number	Dimensions (inches)						EDP#						f_z (feed/ tooth)
								Grades						
								PVD		CVD		Uncoat-ed	Cermet	
		L	I	T(s)	R(r)	W(d)	H(d1)	VP5020	VP5040	VP5135	VP1120	VPUK20	VP6020	
AP07	AP 070204ER11	0.263	0.236	0.094	0.016	0.169	0.087	19617	19618					.001 - .003
	AP 070204FR11	0.263	0.236	0.094	0.016	0.169	0.087					19621		.002 - .003
	AP 070204ER81	0.263	0.236	0.094	0.016	0.169	0.087	19619	19620					.002 - .004
AP10	AP 100304 ER81	0.385	0.371	0.134	0.016	0.250	0.114	14723	14728					.002 - .006
	AP 100304 FR11	0.385	0.370	0.134	0.016	0.250	0.114					14744		.001 - .004
	AP 100305 ER31	0.385	0.366	0.134	0.020	0.250	0.114	17929	17930					.001 - .004
	AP 100308 ER31	0.386	0.356	0.134	0.031	0.250	0.114	14724			19579			.001 - .004
	AP 100308 ER81	0.354	0.353	0.134	0.031	0.250	0.114	14725	14729					.002 - .006
	AP 100316 ERC31	0.346	0.273	0.131	0.063	0.250	0.114	17931	17932					.001 - .004
AP13	AP 130404 ER31	0.504	0.487	0.177	0.016	0.312	0.134	02501	02502					.003 - .008
	AP 130408 FR11	0.504	0.474	0.177	0.031	0.312	0.134					14745		.002 - .005
	AP 130408 ER31	0.504	0.472	0.177	0.031	0.312	0.134	14726	14730		19580			.003 - .008
	AP 130408 ER81	0.504	0.472	0.177	0.031	0.312	0.134	14727	14731	14732				.003 - .008
	AP 130412 ER31	0.504	0.497	0.177	0.047	0.312	0.134	02503	02504	02505	19581		17940	.003 - .008
	AP 130412 FR31	0.504	0.497	0.177	0.047	0.312	0.134					02506		.003 - .008
	AP 130416 ER31	0.504	0.443	0.177	0.063	0.312	0.134	02507	02508		19582			.003 - .008
	AP 130416 FR31	0.504	0.443	0.177	0.063	0.312	0.134					02509		.003 - .008
	AP 130424 ERC31	0.441	0.339	0.172	0.094	0.312	0.134	02511	02512					.003 - .006
	AP 130424 FRC31	0.441	0.339	0.172	0.094	0.312	0.134					02561		.003 - .006
	AP 130432 ERC31	0.441	0.299	0.170	0.126	0.312	0.134	02564	02566					.003 - .006
	AP 130432 FRC31	0.441	0.299	0.170	0.126	0.312	0.134					02575		.003 - .006
	AP 130448 ERC31	0.441	0.222	0.170	0.189	0.312	0.134	02576	02579					.003 - .006
	AP 130448 FRC31	0.441	0.222	0.170	0.189	0.312	0.134					02584		.003 - .006
AP16	AP 160604 FR11	0.739	0.705	0.254	0.016	0.366	0.185					19897		.004 - .011
	AP 160604 ER31	0.739	0.705	0.254	0.016	0.366	0.185	19895	19896		19894			.004 - .011
	AP 160608 FR11	0.739	0.688	0.252	0.032	0.366	0.185					19905		.004 - .011
	AP 160608 ER31	0.739	0.688	0.254	0.032	0.366	0.185	19899	19900		19898			.004 - .011
	AP 160608 ER81	0.739	0.688	0.254	0.032	0.366	0.185	19902	19903	19904	19901			.004 - .011
	AP 160612 FR31	0.739	0.670	0.252	0.047	0.366	0.185					19909		.004 - .011
	AP 160612 ER31	0.739	0.670	0.252	0.047	0.366	0.185	19907	19908		19906			.004 - .011
	AP 160612 ER81	0.739	0.670	0.252	0.047	0.366	0.185	20314	20315	20316	20313			.004 - .011
	AP 160616 FR31	0.739	0.658	0.252	0.063	0.366	0.185					19913		.004 - .011
	AP 160616 ER31	0.739	0.658	0.252	0.063	0.366	0.185	19911	19912		19910			.004 - .011
	AP 160616 ER81	0.739	0.658	0.252	0.063	0.366	0.185	20318	20319	20320	20317			.004 - .011
	AP 160620 ER31	0.739	0.643	0.252	0.079	0.366	0.185	19914						.004 - .011
	AP 160624 ER31	0.739	0.627	0.248	0.094	0.366	0.185	19915	19916					.004 - .011
	AP 160632 FRC31	0.664	0.506	0.240	0.126	0.366	0.185					19920		.004 - .011
	AP 160632 ERC31	0.664	0.506	0.240	0.126	0.366	0.185	19918	19919		19917			.004 - .011
	AP 160648 ERC31	0.655	0.435	0.235	0.189	0.366	0.185	19921	19922					.004 - .011
	AP 160664 ERC31	0.655	0.368	0.231	0.252	0.366	0.185	19923	19924					.004 - .011

ValMILL®

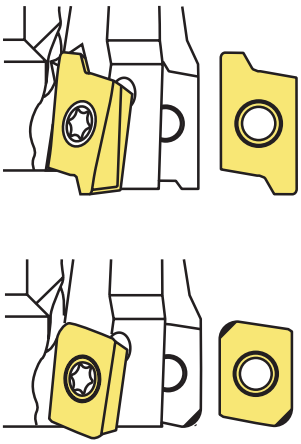
V590 & V595 Insert Application

Material		Hardness	Maximum Chip Thickness in (mm)	SFM					
				PVD Coated		CVD Coated		Uncoated	Cermet
				VP5020	VP5040	VP5135	VP1120	VPUK20	VP6020
Steels (P)	Free Machining and Low Carbon Steels	120-170 Bhn	0.002 (0.05) 0.004 (0.10)	800-1100 (240-330)	700-900 (210-270)	600-800 (180-240)	-	-	800-1100 (240-330)
	Medium Carbon and High Carbon Steels	180-220 Bhn	0.002 (0.05) 0.004 (0.10)	600-800 (180-240)	500-600 (150-180)	400-600 (120-180)	-	-	600-800 (180-240)
	Alloy Steels and Easy To Machine Tool Steels	200-240 Bhn	0.002 (0.05) 0.004 (0.10)	500-700 (150-210)	400-550 (120-165)	350-450 (105-135)	-	-	500-700 (150-210)
	Tool Steels and Die Steels	220-260 Bhn	0.002 (0.05) 0.004 (0.10)	350-500 (105-150)	300-400 (90-120)	250-350 (75-105)	-	-	350-500 (105-150)
Stainless Steels (M)	Ferritic and Martensitic	180-240 Bhn	0.002 (0.05) 0.004 (0.10)	500-700 (150-210)	400-550 (120-165)	350-500 (105-150)	-	-	-
	Austenitic	140-180 Bhn	0.002 (0.05) 0.004 (0.10)	400-600 (120-180)	350-500 (105-150)	300-450 (90-135)	-	-	-
	PH and Duplex	220-260 Bhn	0.002 (0.05) 0.004 (0.10)	350-500 (105-150)	300-400 (90-120)	250-350 (75-105)	-	-	-
Cast Irons (K)	Gray Cast Iron	180-220 Bhn	0.002 (0.05) 0.004 (0.10)	600-700 (180-210)	-	-	800-1000 (240-300)	250-400 (75-130)	600-700 (180-210)
	Gray Cast Iron	220-260 Bhn	0.002 (0.05) 0.004 (0.10)	500-600 (150-180)	-	-	700-800 (210-240)	200-300 (60-90)	500-600 (150-180)
	Ductile and Malleable Cast Iron	140-180 Bhn	0.002 (0.05) 0.004 (0.10)	500-600 (150-180)	-	-	700-800 (210-240)	225-350 (65-105)	500-600 (150-180)
	Ductile and Malleable Cast Iron	220-260 Bhn	0.002 (0.05) 0.004 (0.10)	400-500 (120-150)	-	-	500-700 (150-210)	200-300 (60-90)	400-500 (120-150)
High Temperature Alloys (S)	Iron Base Alloys - A-286, Discalloy, Incoloy		0.002 (0.05) 0.004 (0.10)	225-250 (65-75)	225-250 (65-75)	200-225 (60-65)	-	150-200 (45-60)	-
	Nickel and Cobalt Base Alloys – Hastelloy, Inconel, Haynes Stellite		0.002 (0.05) 0.004 (0.10)	150-175 (45-55)	125-150 (35-45)	125-150 (35-45)	-	75-100 (25-30)	-
	Titanium Alloys 6Al-4V		0.002 (0.05) 0.004 (0.10)	225-275 (65-85)	200-250 (60-75)	150-200 (45-60)	-	100-150 (30-45)	-
Aluminum & Non-Ferrous Materials (N)	Aluminum Alloys < 7% Silicon		0.002 (0.05) 0.004 (0.10)	1500-3000 (450-900)	-	-	-	1000-2000 (300-600)	1500-3000 (450-900)
	Aluminum Alloys 7% - 12% Silicon		0.002 (0.05) 0.004 (0.10)	1250-2500 (375-750)	-	-	-	800-1750 (240-525)	1250-2500 (375-750)
	Aluminum Alloys 12% - 18% Silicon		0.002 (0.05) 0.004 (0.10)	800-1500 (240-450)	-	-	-	500-1000 (150-300)	800-1500 (240-450)
	Non-Ferrous		0.002 (0.05) 0.004 (0.10)	600-1400 (180-420)	-	-	-	400-1000 (120-300)	600-1400 (180-420)

Cutter Modification For V590 Tools

Required modifications to the cutter body for RC31 size corner radius inserts.

For V590 using 10 and 13 mm inserts
Standard cutter body

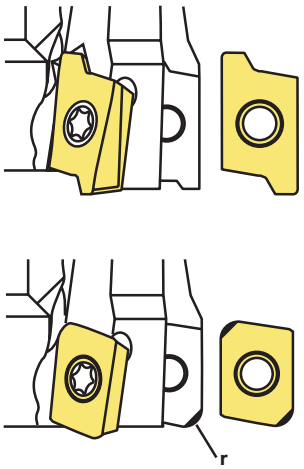


Alteration to cutter body required.

AP10 size inserts:
Break corner
(radius of the insert minus 0.02") x 45º

AP13 size inserts:
Break corner
Turn radius = insert radius minus 0.041" x 45º

For V590 using 16 mm inserts
Standard cutter body



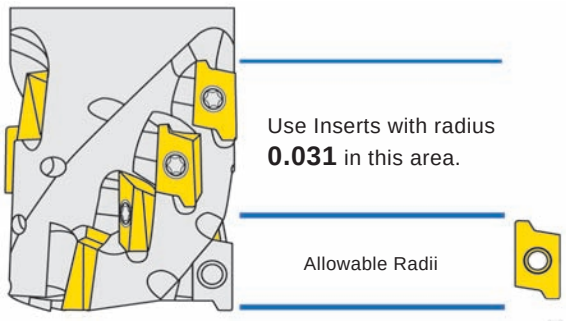
Alteration to cutter body required.

AP16 size inserts:
Turn radius (r) = insert corner radius minus 0.02"

V595 Insert Usage

For tools using using AP10... inserts
Allowable Radii = .016 - .031 - .047

For tools using using AP13... inserts
Allowable Radii = .016 - .031 - .047 - 0.63



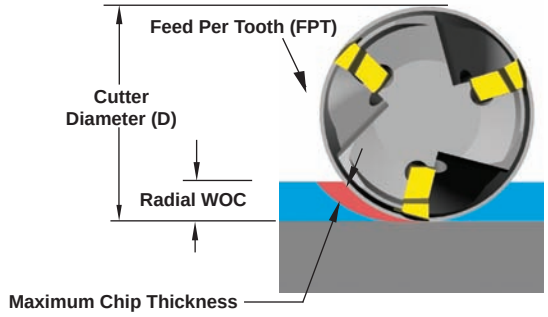
Adjustment of Feed Per Tooth

The Radial Width of Cut (WOC) in end mill operations is frequently less than 1/2 the cutter diameter. In these applications the actual chip thickness is less than the nominal feed per tooth.

When the Radial WOC is a small portion of the cutter diameter the chip thinning that occurs significantly affects performance.

Calculate the Feed per Tooth (FPT)

1) Find the recommended f_z (feed/tooth), for your operation and the insert that your're using from page E4. Use f_z as the Desired Chip Thickness.
2) Find the Correction Factor (Cf) based on the Radial WOC and Cutter Diameter in the table below.
3) Calculate the adjusted Feed Rate Per Tooth (FPT) using the formula:
Adjusted FPT = Desired Chip Thickness x Cf



Feed Correction for Width of Cut

Width of Cut (WOC)	Cutter Diameter (D)											
	0.375	0.500	0.625	0.750	1.000	1.250	1.500	2.000	3.000	4.000	5.000	6.000
0.031	1.910	2.15	2.39	2.61	3.00	3.35	3.66	4.22	5.16	5.95	6.64	7.28
0.062	1.370	1.54	1.70	1.84	2.11	2.34	2.56	2.94	3.58	4.13	4.61	5.05
0.094	1.160	1.29	1.41	1.52	1.73	1.92	2.09	2.39	2.91	3.34	3.73	4.08
0.125	1.060	1.16	1.26	1.35	1.52	1.68	1.82	2.08	2.52	2.9	3.23	3.53
0.188		1.03	1.09	1.16	1.28	1.40	1.52	1.72	2.07	2.38	2.64	2.89
0.250		1.00	1.02	1.06	1.16	1.25	1.35	1.52	1.82	2.07	2.3	2.51
0.375			1.00	1.00	1.03	1.09	1.16	1.28	1.52	1.72	1.9	2.07
0.500					1.00	1.02	1.06	1.16	1.34	1.51	1.67	1.81
0.625						1.00	1.01	1.08	1.23	1.38	1.51	1.64
0.750							1.00	1.03	1.16	1.28	1.40	1.51
1.000								1.00	1.06	1.16	1.25	1.34
1.250									1.01	1.08	1.16	1.23
1.500									1.00	1.03	1.09	1.16
1.750										1.01	1.05	1.10
2.000										1.00	1.02	1.06
2.250											1.00	1.03
2.500											1.01	1.01
2.750											1.00	1.00
3.000												1.00

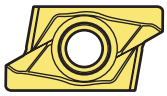
As the depth of cut (ap) increases, the feed per tooth (f_z) should decrease. See chart below for recommendations. Note: D = Cutter diameter.

Feed Correction for Depth of Cut

Insert Size	Geometry	ap			
		0.00 - 0.25 x Dc	0.25 - 0.50 x Dc	0.50 - 0.75 x Dc	0.75 - 1.00 x Dc
7 mm	All	0.003	0.002	0.002	0.001
10 mm	All	0.004	0.003	0.003	0.002
13 mm	All except RC31	0.008	0.006	0.005	0.003
	RC31	0.006	0.005	0.004	0.003
16 mm	All except RC31	0.011	0.008	0.006	0.004
	RC31	0.008	0.006	0.005	0.003

V590 & V595 Technical Guidelines

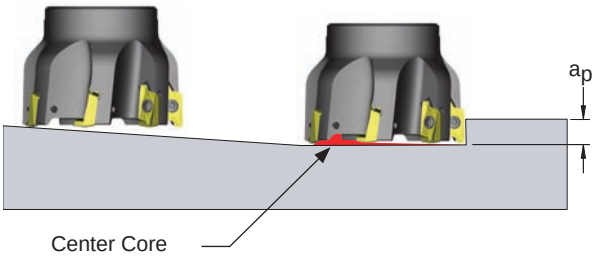
ValMILL®

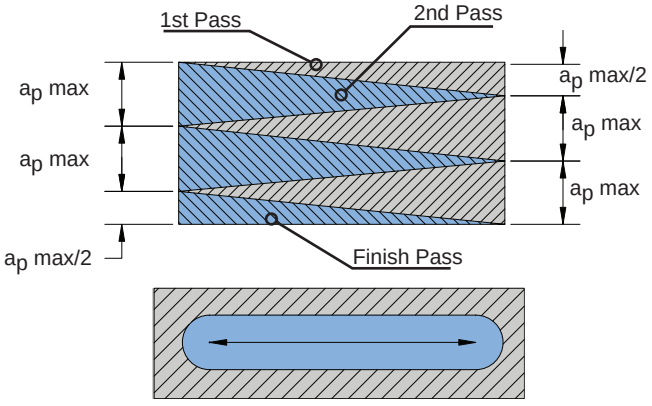
Insert Geometries		
FR11	ER31 RC31	ER81
		
Semi-Finishing and Finishing	Semi-Finishing and Finishing	Roughing and Semi-Finishing
Edge Preparations: F = Sharp, E = Hone		

Operation & Insert Geometry											
Insert Geometry	Steel		Stainless Steel		Cast Iron		Graphite Aluminum		Heat Resistant Alloys		Feed per Tooth
	F	SF, R	F	SF, R	F	SF, R	F	SF, R	F	SF, R	
FR-11								❍	●	❍	.001 - .005
ER-31/RC-31	●	❍	●	❍	●	❍	●		●	❍	.001 - .008
ER-81		❍	❍	●	❍	●	❍	●	❍	●	.002 - .012

● Primary Operation ❍ Secondary Operation **F** - Finishing **SF, R** - Semi-Finishing, Roughing

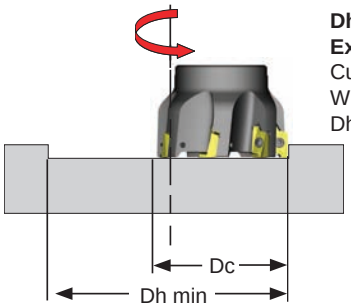
Maximum Ramp Angle														
Insert Size	ap Max.	Cutter Diameter												
		0.375	0.50	0.63	0.75	1.00	1.25	1.50	2.00	2.50	3.00	4.00	5.00	6.00
AP07	0.12	13.2º	9.5º	6.5º										
AP10	0.35			11.7º	8.3º	6.1º	4.4º	3.4º						
AP13	0.47				12.3º	8.8º	6.2º	4.7º	3.6º	2.7º	2.1º			
AP16	0.71					9.7º	6.7º	4.9º	3.7º	2.8º	2.1º	1.6º	1.3º	





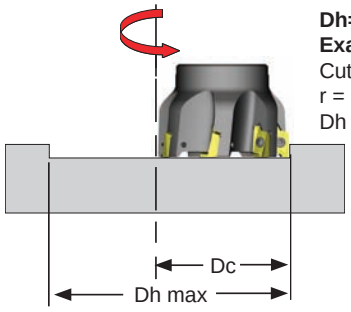
In case of multiple ramping. The first pass must not exceed ap max/2 or the maximum ramping angle established above.

Minimum Drilling Diameter



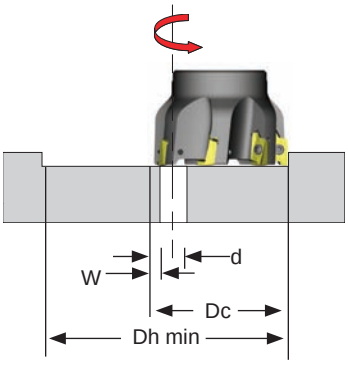
Dh=(Dc-W) x 2
Example:
Cutter Dia. Dc = 1.000
W = (see below)
Dh min = (1.000 - .102) x 2 = 1.796

Maximum Drilling Diameter



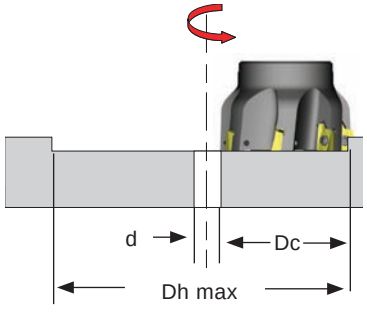
Dh=(Dc - r) x 2
Example:
Cutter Dia. Dc = 1.000
r = Insert corner radius
Dh = (1.000 - .031) x 2 = 1.938

Minimum Drilling Diameter with an Existing Hole

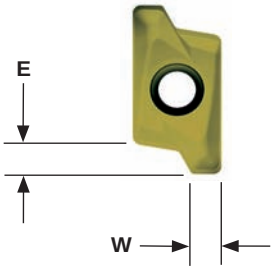


If Dc<(d/2+W)2,
then Dh = (d/2 +W)2,
Otherwise,
Dh = (Dc -(d/2+W)) x2
Example:
Cutter Diam Dc = 1.000
W = (see below)
Hole Dia = .250
Dh min = (1.000 - (.250/2 + .102)) x 2 = 1.546

Maximum Drilling Diameter with an Existing Hole



$D_h=(D_C-r)2 + d$
Example:
Cutter Dia. D_C = 1.000
Hole Dia = .250
r = Insert corner radius
Dh = (1.000 - .031) 2 + .25 = 2.188

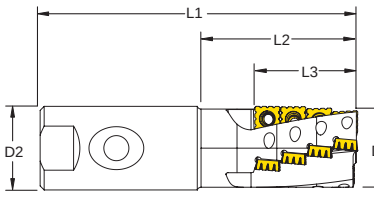


E & W Values				
Value	Insert Size			
	AP07	AP10	AP13	AP16
W	0.051	0.071	0.102	0.126
E	0.059	0.083	0.110	0.110

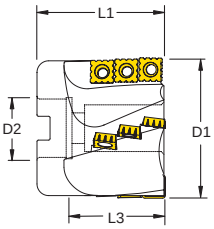
In some cases the values “E & W” must be known in order to calculate feed per revolution, drilling capability, or bore diameters when helical interpolating.

Serra Sine III

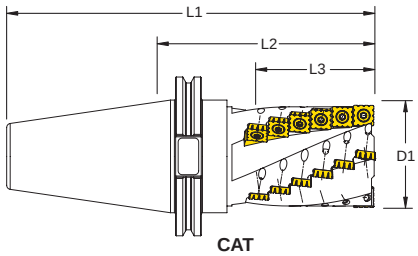
ValMILL®



WELDON



SHELL MILL



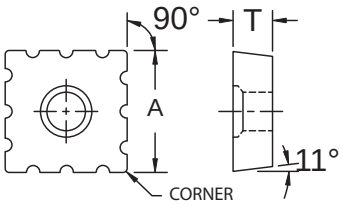
CAT

Long Edge Mills										
Part Number	Shank Style	Dimensions					Inserts Req'd	Insert Style	Wt (lbs)	EDP#
		D1	D2	L1	L2	L3				
SS3 1253R06 100W	Weldon	1.250	1.000	4.730	1.970	0.760	6	SP_W 32.5..	1.28	50794
SS3 1253R12 100W	Weldon	1.250	1.000	4.730	2.470	1.530	12	SP_W 32.5..	1.30	50795
SS3 1253R12 125W	Weldon	1.250	1.250	4.730	2.490	1.530	12	SP_W 32.5..	1.60	50796
SS3 1503R20 150W	Weldon	1.500	1.500	5.740	3.000	1.960	20	SP_W 32.5..	2.50	50797
SS3 1503R20 40CT	CAT 40	1.500	-	6.070	3.380	1.960	20	SP_W 32.5..	3.88	50798
SS3 2003R12 075F	Shell Mill G	2.000	0.750	1.980	-	1.200	12	SP_W 32.5..	1.50	50799
SS3 2003R28 150W	Weldon	2.000	1.500	6.190	3.500	2.750	28	SP_W 32.5..	4.33	50800
SS3 2003R28 200W	Weldon	2.000	2.000	6.750	3.500	2.750	28	SP_W 32.5..	5.44	50801
SS3 2003R28 50CT •	CAT 50	2.000	-	8.360	4.360	2.750	28	SP_W 32.5..	9.00	50802
SS3 2504R24 50CT •	CAT 50	2.500	-	9.000	5.000	3.130	24	SP_W 43..	10.20	50803
SS3 4004R18 150F	Shell Mill K	4.000	1.500	2.720	-	1.600	18	SP_W 43..	6.22	50809

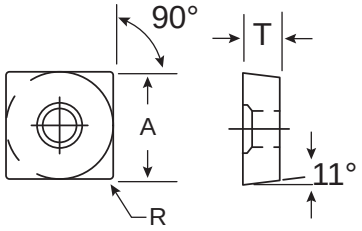
• Denotes Non-Stock

Spare Parts						
Insert Size	Cutter Diameter	Insert Screw		Torx Wrench		Torque (in lbs)
		Part#	EDP#	Part#	EDP#	
32.5	1.25	PT 559T	52292	T 15 Torx Scr Dr	50086	32
32.5	1.50 - 2.00	PT 700T	52307	T 15 Torx Scr Dr	50086	32
43.0	2.50 - 4.00	PT 546T	52290	T 20 Torx Scr Dr	50086	63

Note: Valenite recommends the use of PT745 antiseize lubricant (EDP# 50050) on insert screw threads and head.



SPEW



SPMW

Inserts							
Part Number	Steel/Stainless Steel Grades				Iron Grades		ISO Number
	PVD			CVD	PVD	CVD	
	VP5005	VP5020	VP5045	VP5142	VP1020	VP1130	
SPEW 32.5 A017A 1H	-	23146	23199	22947	24158	22837	SPEW 09T3 A017A-1H
SPEW 32.5 A017B 1H	-	23147	23200	-	-	-	SPEW 09T3 A017B-1H
SPMW 32.51	-	-	23305	-	-	22844	SPMW 09T304
SPMW 32.52	-	23159	23306	22958	-	23594	SPMW 09T308
SPMW 432	24211	23160	23227	22959	-	22845	SPMW 120408
SPEW 43A 022A 1H	-	23148	23290	-	-	-	SPEW 1204 A 022A-1H
SPEW 43A 022B 1H	-	23149	23291	-	-	-	SPEW 1204 A 022B-1H

Serra Sine III Insert Application

ValMILL®

Material		Hardness	SFM (m/min.)				
			PVD			CVD	
			VP5020	VP5045	VP1020	VP5142	VP1130
Steels P	Free Machining & Low Carbon	120-170 BHN	800-1100 (240-330)	200-800 (60-240)	-	500-800 (150-240)	-
	Medium & High Carbon	180-220 BHN	600-800 (180-240)	200-500 (60-150)	-	350-600 (105-180)	-
	Alloy & Easy To Machine Tool Steels	200-240 BHN	500-700 (150-210)	200-500 (60-150)	-	300-450 (90-135)	-
	Tool & Die Steels	220-260 BHN	350-500 (105-150)	200-350 (60-105)	-	200-350 (60-105)	-
Stainless Steels M	Ferritic & Martensitic	180-240 BHN	500-700 (150-210)	200-550 (60-165)	-	300-500 (90-150)	-
	Austenitic	140-180 BHN	400-600 (120-180)	200-500 (60-150)	-	250-450 (75-135)	-
	PH & Duplex	220-260 BHN	350-500 (105-150)	200-400 (60-120)	-	200-350 (60-105)	-
Cast Irons K	Gray Cast Iron	180-260 BHN	600-700 (180-210)	-	400-650 (90-195)	-	600-900 (200-300)
		220-260 BHN	500-600 (150-180)	-	300-500 (90-150)	-	500-700 (150-210)
	Ductile Iron	140-180 BHN	500-600 (150-180)	-	300-500 (90-150)	-	500-700 (150-210)
		220-260 BHN	400-500 (120-150)	-	500-700 (150-210)	-	400-600 (120-180)
High Temperature Alloys S	Iron Based Alloys	-	225-250 (65-75)	175-225 (55-65)	-	-	-
	Nickel & Cobalt Base Alloys Hastelloy, Inconel, Stellite	-	150-175 (45-55)	125-150 (35-45)	-	-	-
	Titanium Alloys 6al-v4	-	225-275 (65-85)	150-200 (45-60)	-	-	-
Aluminum & Non-Ferrous Materials N	Aluminum < 7% Si	-	1500-3000 (450-900)	-	-	-	-
	Aluminum 7% - 12% Si	-	1250-2500 (375-750)	-	-	-	-
	Aluminum > 12% Si	-	800-1500 (240-450)	-	-	-	-
	Non-Ferrous	-	600-1400 (180-420)	-	-	-	-

ValMILL®

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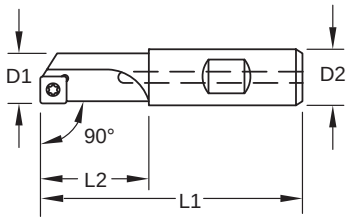
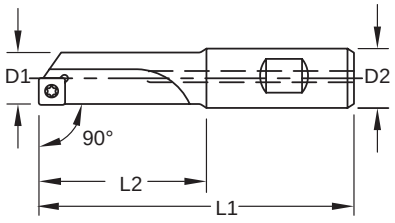
Centre-Dex® Center Cutting End Mills

ValMILL®



STYLE #1



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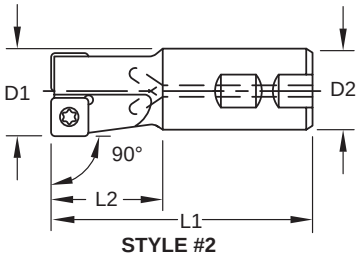

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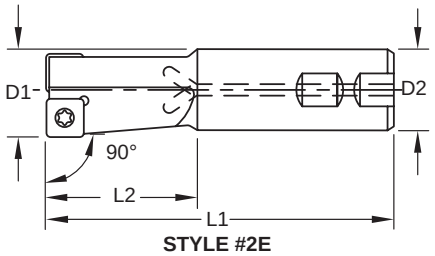


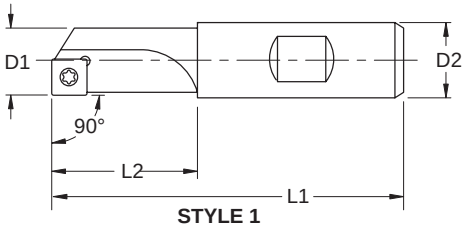
STYLE #2E

Weldon Shank, Axial Rake 0°, Radial Rake 0°										
Part Number	Dimensions				Cutter Style	Insert Style	Inserts Req'd	Torque (in lbs)	Wt. (lbs.)	EDP#
	D1	D2	L1	L2						
S VMSP 048R 90CCC	0.480	0.500	2.880	1.000	1	SECW212...	1	6	0.16	50675
S VMSP 060R 90CCC	0.605	0.625	3.310	1.250	1	SECW2515...	1	8	0.24	50676
S VMSP 073AR 90CCC	0.730	0.750	3.060	1.000	1	SD322D	1	21	0.32	50677
S VMSP 098R 90CCC	0.980	0.750	3.310	1.250	1	SD422P	1	21	0.40	50680
S VMSP 123R 90CCC	1.230	1.250	3.310	2.32	1	SD532P	1	63	0.98	50684
S VMSP 073AR 90CCEC	0.730	0.750	4.240	2.180	1E	SD322D	1	21	0.42	50678
S VMSP 150R 90CCC	1.500	1.250	1.820	1.820	2	SD422P	2	21	1.06	50689
S VMSP 100R 90CCC	1.000	0.750	3.310	1.250	2	SD322P	2	21	0.36	50681
S VMSP 112R 90CCC	1.125	0.750	3.310	1.250	2	SD322P	2	21	0.40	50683
S VMSP 125R 90CCC	1.250	1.250	3.820	1.500	2	SD422P	2	21	0.98	50685
S VMSP 138R 90CCC	1.375	1.250	3.820	1.500	2	SD422P	2	21	1.02	50688
S VMSP 175R 90CCC	1.750	1.250	3.820	1.500	2	SD532P	2	63	1.10	50692
S VMSP 200R 90CCC	2.000	1.250	3.820	1.500	2	SD532P	2	63	1.20	50694
S VMSP 100R 90CCEC	1.000	1.000	5.120	1.620	2E	SD322P	2	21	0.90	50682
S VMSP 125R 90CCEC	1.250	1.250	5.500	2.000	2E	SD422P	2	21	1.46	50686
S VMSP 150R 90CCEC	1.500	1.250	5.500	2.000	2E	SD422P	2	21	1.46	50690
S VMSP 175R 90CCEC	1.750	1.250	2.00	3.50	2E	SD532P	2	63	1.10	50693
S VMSP 200R 90CCEC	2.000	1.250	5.500	2.000	2E	SD532P	2	63	1.72	50695

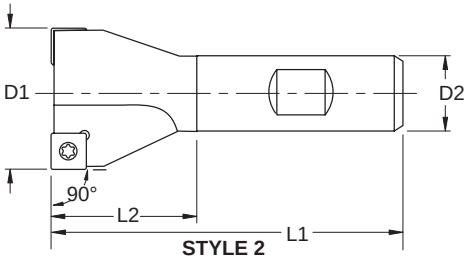
ValMILL®

Mini-Mills Non-Center Cutting

Centre-Dex



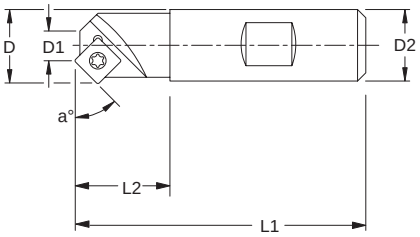
STYLE 1



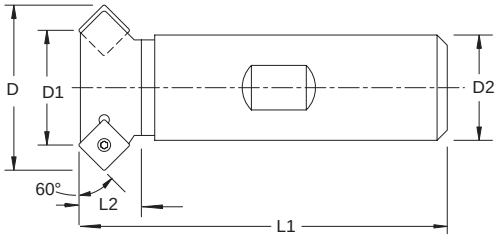
STYLE 2

Weldon Shank 90° Lead, 0° Axial Rake, 0° Radial Rake										
Part Number	Dimensions					Cutter Style	Insert Style	Inserts Req'd	Wt (lbs)	EDP#
	Lead	D1	D2	L1	L2					
S VMSP 075R1	90°	.75	.750	3.06	1.00	1	SD 322P	1	0.36	62022
S VMSP 100R2	90"	1.00	.750	3.31	1.25	1	SD 322P	2	0.42	62023
S VMSP 125R3	90°	1.25	.750	3.56	1.50	2	SD 322P	3	0.48	50720

Mini-Mills



STYLE 3



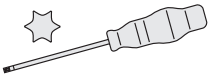
STYLE 4

Weldon Shank 30°, 45°, 60° Lead, 0° Axial Rake, 0° Radial Rake											
Part Number	Dimensions						Cutter Style	Insert Style	Inserts Req'd	Wt (lbs)	EDP#
	a°	D	D1	D2	L1	L2					
S VMSP 081R 45 *	45°	0.81	0.31	.750	3.06	1.00	3	SD 322P	1	0.36	50717
S VMSP 100R 45CF	45°	1.00	0.58	.500	2.94	.58	3	SPMW 2.5...	2	0.18	50719
S VMSP 125R 45CF	45°	1.25	0.75	.625	2.96	.68	3	SD 322P	2	0.30	62024
S VMSP 138R 30CF	30°	1.38	0.75	.750	3.47	.67	4	SD 322P	2	0.48	62025
S VMSP 138R 45CF	45°	1.38	0.88	.750	3.50	.68	4	SD 322P	2	0.48	50724
S VMSP 150R 45CF	45°	1.50	1.00	.750	3.50	.72	4	SD 322P	2	0.50	62026
S VMSP 175R 45CF	45°	1.75	1.07	1.000	3.94	1.44	4	SD 422P	2	0.90	50726
S VMSP 200R 45CF	45°	2.00	1.32	1.000	3.94	1.44	4	SD 422P	3	0.98	62027
S VMSP 125R 60CF	60°	1.25	0.88	.750	3.50	1.47	4	SD 322P	2	0.42	50722

Inserts must be ordered separately. # L.H. End Mills are subject to quotation: I.E. S VMSP 100L 45.

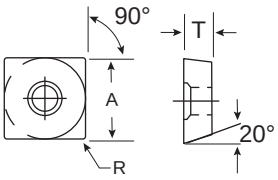
Centre-Dex® and Mini-Mills Compatible Spare Parts & Inserts

ValMILL®

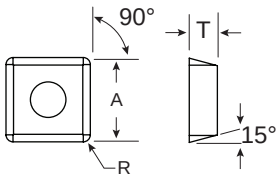


Spare Parts for Centre-Dex® and Mini-Mills					
Insert Size	Insert Screw		Torx Wrench		Torque (in lbs)
	Part#	EDP#	Part#	EDP#	
SECW 21...	PT 594T	52300	T 7 Torx Wrench	50101	6
SECW 2.5...	PT-865T	52333	T 8 Torx Wrench	50104	8
SPMW 2.5...	PT 543T	52287	T 8 Torx Wrench	50104	14
SD 3...D	PT 618T	52304	T 10 Torx Wrench	50083	21
SD 3...P	PT 317T	52261	T 10 Torx Wrench	50083	21
SD 3...P	PT 618T	52304	T 10 Torx Wrench	50083	21
SD 4...	PT 318T	52262	T 10 Torx Wrench	50083	21
SD 5...	PT 319T	52263	T 20 Torx Wrench	50091	63

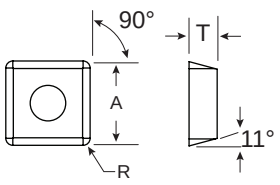
Note: Valenite recommends the use of PT445 antiseize lubricant (EDP# 50050) on insert screw threads and head.



SECW



SD...D



SD...P

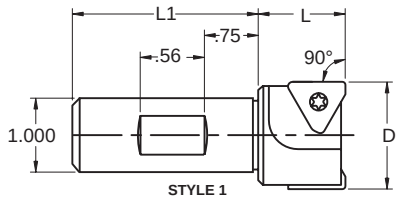
Centre-Dex® and Mini-Mills Compatible Inserts										
Part Number	Dimensions			VP5020	VP5142	VP5045	VP1120	VP1130	PCD VPD720	ISO Number
	A	T	R							
SD 322 D	0.375	0.125	0.031	-	22784	22783	-	-	-	SD 09308 D
SD 322 D 3P	0.375	0.125	0.031	-	22786	22785	-	-	-	SD 09308 D-3P
SD 322 P	0.375	0.125	0.031	22787	22808	22807	-	-	-	SD 09308 P
SD 322 P 30	0.375	0.125	0.031	-	22792	22791	-	-	-	SD 09308 P-3P
SD 322 P CM	0.375	0.125	0.031	22789	22790	-	-	22788	-	SD 09308 P-CM
SD 322 P F	0.375	0.125	0.031	-	-	-	-	-	40999	SD 09308 P F
SD 422 P	0.500	0.125	0.031	-	22797	22796	-	22795	-	SD 12308 P
SD 422 P	0.500	0.125	0.031	-	-	-	19596	-	-	SD 12308 P
SD 422 P 3P	0.500	0.125	0.031	-	22801	22800	-	-	-	SD 12308 P-3P
SD 422 P CM	0.500	0.125	0.031	-	22799	-	-	22789	-	SD 12308 P-CM
SD 422 P F	0.500	0.125	0.031	-	-	-	-	-	41000	SD 12308 P F
SD 422 P H	0.500	0.125	0.031	-	-	-	-	-	41001	SD 12308 P H
SD 532 P	0.625	0.187	0.031	22802	-	22803	-	-	-	SD 150408 P
SD 532 P 3P	0.625	0.187	0.031	-	-	22806	-	-	-	SD 150408 P-3P
SD 532 P CM	0.625	0.187	0.031	-	22805	-	-	22804	-	SD 150408 P-CM
SECW 2.51.51	0.313	0.125	0.015	-	22934	23271	-	-	-	SECW 070204
SECW 21.21	0.250	0.078	0.015	-	22933	23270	-	-	-	SECW 06T204

ValMILL®

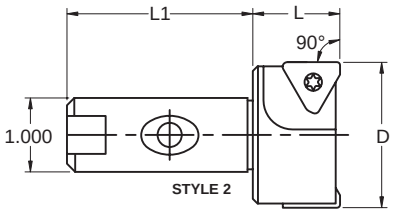
Centre-Dex® Insert Application

Material		Hardness	SFM (m/min.)					
			PVD		CVD			PCD
			VP5020	VP5045	VP5142	VP1120	VP1130	VPD720
Steels P	Free Machining & Low Carbon	120-170 BHN	800-1100 (240-330)	200-800 (60-240)	500-800 (150-240)	-	-	-
	Medium & High Carbon	180-220 BHN	600-800 (180-240)	200-500 (60-150)	350-600 (105-180)	-	-	-
	Alloy & Easy To Machine Tool Steels	200-240 BHN	500-700 (150-210)	200-500 (60-150)	300-450 (90-135)	-	-	-
	Tool & Die Steels	220-260 BHN	350-500 (105-150)	200-350 (60-105)	200-350 (60-105)	-	-	-
Stainless Steels M	Ferritic & Martensitic	180-240 BHN	500-700 (150-210)	200-550 (60-165)	300-500 (90-150)	-	-	-
	Austenitic	140-180 BHN	400-600 (120-180)	200-500 (60-150)	250-450 (75-135)	-	-	-
	PH & Duplex	220-260 BHN	350-500 (105-150)	200-400 (60-120)	200-350 (60-105)	-	-	-
Cast Irons K	Gray Cast Iron	180-260 BHN	600-700 (180-210)	-	-	800-1000 (240-300)	600-900 (200-300)	Bi-Metal <1500 (<450)
		220-260 BHN	500-600 (150-180)	-	-	700-800 (210-240)	500-700 (150-210)	Bi-Metal <1500 (<450)
	Ductile Iron	140-180 BHN	500-600 (150-180)	-	-	700-800 (210-240)	500-700 (150-210)	-
		220-260 BHN	400-500 (120-150)	-	-	500-700 (150-210)	400-600 (120-180)	-
High Temperature Alloys S	Iron Based Alloys	-	225-250 (65-75)	175-225 (55-65)	-	-	-	-
	Nickel & Cobalt Base Alloys Hastelloy, Inconel, Stellite	-	150-175 (45-55)	125-150 (35-45)	-	-	-	-
	Titanium Alloys 6al-v4	-	225-275 (65-85)	150-200 (45-60)	-	-	-	-
Aluminum & Non-Ferrous Materials N	Aluminum < 7% Si	-	1500-3000 (450-900)	-	-	-	-	2000 -15,000 (600-4500)
	Aluminum 7% - 12% Si	-	1250-2500 (375-750)	-	-	-	-	1500 - 10,000 (450-3000)
	Aluminum > 12% Si	-	800-1500 (240-450)	-	-	-	-	1000 - 3000 (300-900)
	Non-Ferrous	-	600-1400 (180-420)	-	-	-	-	1000 - 3000 (300-900)

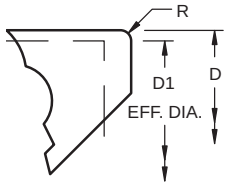
90° High Shear End Mills



STYLE 1

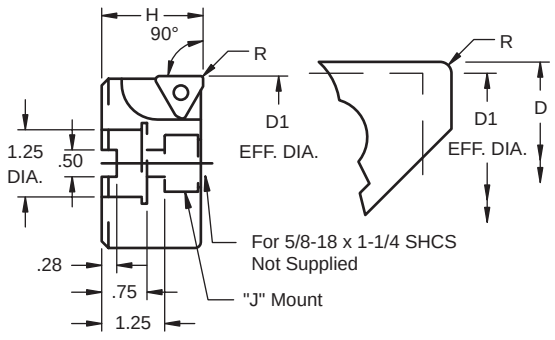


STYLE 2

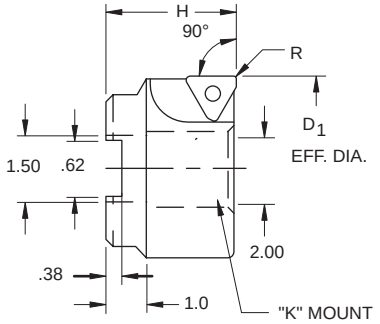


Part Number	Style	Max. D.O.C.	Dimensions				Insert Screw	Inserts Req'd	Wt. (lbs.)	EDP#
			Eff. D1	Max. D	L	L1				
STE90 150 4.5R1 075S	1	.50	1.47	1.50	1.75	2.03	PT 588T	1	0.86	62042
STE 90 200 4.5R2 075S	1	.50	1.97	2.00	1.75	2.03	PT 484T	2	1.22	50751
STE90 150 4.5R1 100W	2	.50	1.47	1.50	1.75	2.28	PT 588T	1	1.14	62043
STE90 200 4.5R2 100W	2	.50	1.97	2.00	1.75	2.28	PT 484T	2	1.46	62151

90° High Shear Shell Mills

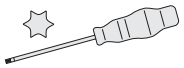


Style 3



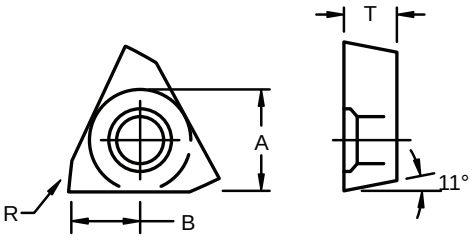
STYLE 4

Part Number	Style	Max. D.O.C.	Dimensions				Insert Screw	Inserts Req'd	Wt. (lbs.)	EDP#
			Eff. D1	Max. D	H	L1				
STE 90 31 2 4.5R3 125F	3	.50	3.12	3.15	1.97	—	PT 484T	3	N.A.	62151
STE90 489 4.5R4 150F	4	.50	4.89	4.92	2.48	—	PT 484T	4	2.34	62152



Spare Parts					
Insert Size	Insert Screw		Driver		Torque (in lbs)
	Part#	EDP#	Part#	EDP#	
ALL	PT 588T	52294	T 20 Torx Wrench	50091	70
ALL	PT 484T	52278	T 20 Torx Wrench	50091	70

Note: Valenite recommends the use of PT745 antiseize lubricant (EDP# 50050) on insert screw threads and head.



Inserts							
Part Number	Dimensions				Available Grades / EDP#		
	A	T	R	B	VP5045	VPUK20	VPD720
TEGA453015P1SF	0.562	0.187	0.015	0.380	-	-	41274
TEGA453015PJ1S	0.562	0.187	0.015	0.380	-	24248	-
TEGA453015PTA1S	0.562	0.187	0.015	0.380	23228	-	-
TEGA453031PJ1S	0.562	0.187	0.031	0.380	-	24249	-
TEGA453031PTA1S	0.562	0.187	0.031	0.380	23230	-	-
TEGA453062PJ1S	0.562	0.187	0.062	0.380	-	24250	-
TEGA453125PJ1S	0.562	0.187	0.125	0.380	-	24251	-

Table of Contents

ValMILL®

V555 & V556 High Feed Milling System

Save time and reduce production costs with high productivity milling cutters.

High feed-rate machining, combined with a low axial engagement, reduces production times while utilizing existing machinery.

The V556 High Feed Milling Cutter, with inserts featuring 5 cutting edges, is specifically designed to cover a range of diameters from 1.25 to 6.00 inches.

In addition to the economic benefit of 5 cutting edges, the V556 milling cutter offers the advantage of being multi-functional. Not only is it a rough and finish face mill, but it is also capable of plunging, ramping and helical interpolation.

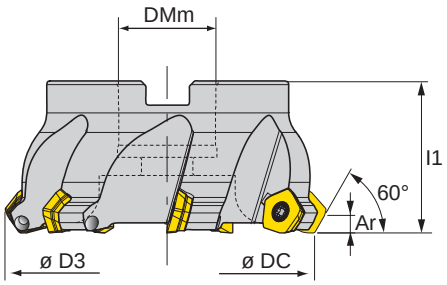
With the V556 High Feed Milling System, Valenite offers productive tool solutions in 1.25 to 6 inch diameters, which allows a feed of approximately 0.08 ipt.

Key Features & Competitive Advantages

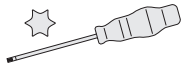
	V556	V555
Cost Effective	5 cutting edges competitively priced with square and triangle inserts.	5 cutting edges, competitively priced with 4-edge square inserts of equivalent size, with minimal change in DOC capability.
Strength	The cutting stresses are directed to the axis of the milling cutter. The pentagonal shape insert provides larger bearing surfaces, closer to the surface being machined, directly opposing the forces generated by the cut.	The pentagonal shape insert provides larger bearing surfaces, closer to the surface being machined, directly opposing the forces generated by the cut.
Durability	Robust insert (.215” thick) has 30% more carbide than equivalent size squares for longer tool life and increased protection of the insert seat and cutter body.	Robust insert (.215” thick) has 30% more carbide than equivalent size squares for longer tool life and increased protection of the insert seat and cutter body.
Performance	Designed for high-speed facing operations in roughing and finishing. Can reduce machining time by increasing metal removal rates by 320 to 60%. DOC capability of up to 0.08 inch.	Positive, free cutting inserts are available in a variety of geometries and ValPro™ grades to cover all of your applications, over the range of part materials.
Flexibility	Can also be used for ramping, interpolation and plunging operations with large tool overhangs. The high positive axial cutting is suitable for low power machines.	Cutter bodies are contoured to take full advantage of Valenite’s optional coolant screws.

V555 Mills, Spare Parts & Inserts

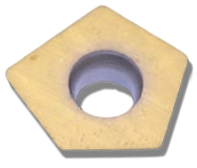
ValMILL®



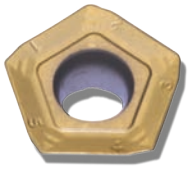
V555 Face Mills											
Part Number	DC	D3	DMm	l1	# Inserts	ap Max	Insert Size	Wt (lbs)	Max RPM	Optional Coolant Screw	EDP#
V555 A 09 0200 G 04R	2.00	2.35	0.75	1.50	4	0.21	PD…09…	0.71	19,000	PT 888	56039
V555 A 09 0250 G05R	2.50	2.85	0.75	1.75	5		PD…09…	1.06	16,000	PT 888	56040
V 555 A 09 0300 H06R	3.00	3.35	1.00	2.00	6		PD…09…	2.05	14,000	PT 870	56041
V 555 A 09 0400 K07R	4.00	4.35	1.50	2.00	7		PD…09…	4.06	12,000	PT 890	56042
V 555 A 09 0500 K08R	5.00	5.35	1.50	2.38	8		PD…09…	6.00	10,000	PT 872	56043
V 555 A 09 0600 K09R	6.00	6.35	1.50	2.38	9	0.21	PD…09…	7.39	9,000	PT 872	56044
V 555 A 09 0800 C12R	8.00	8.35	2.50	2.38	10		PD…09…	17	8,500	PT 873	62986
V 555 A 09 1000 C14R	10.00	10.35	2.50	2.38	11		PD…09…	25	8,000	PT 873	62987
V 555 A 09 1200 F16R	12.00	12.35	2.50	2.38	12		PD…09…	44	7,000	PT 873	62988



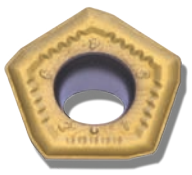
V555 & V556 Spare Parts					
Insert Size	Insert Screw		Torx Driver		Torque (in-lbs.)
	Part Number	EDP#	Part Number	EDP#	
V555	DVF2097	62499	TX220PLUS	61933	54
V556	DVF3608	62974			



PDHX FR (Wiper)



SR81



ER41

V555 Inserts					
Part Number	PVD Coated Cutting Diameter		CVD Coated Cutting Diameter		Uncoated
	VP5020	VP5040	VP5135	VP1120	VPUK20
PDMT 0905 DE SR81	02499	-	02500	19585	-
PDKT 0905 DE ER41	02458	02459	20460	19584	-
PDKT 0905 DE ER11	02457	-	-	19583	-
PDKT 0905 DE FR11	-	-	-	-	02462
PDHX 0905 DE FR	22358	-	-	-	22357

V556 and V555 inserts are not interchangeable.

Wiper Insert to be used with ER41 Geometry only.

Material		SFM										V555 Feed Rates (ipt)		
		CVD Coated		PVD Coated		PVD Coated		CVD Coated		Uncoated		Geometries		
		VP1120		VP5020		VP5040		VP5135		VPUK20		FR/ER 11	ER 41	SR 81
Steels P	Carbon	-	-	1200	900	950	600	800	500	-	-	0.002 - 0.006	0.004 - 0.008	0.006 - 0.012
	Alloy	-	-	850	350	-	-	-	-	-	-			
Stainless Steels M	Ferritic, Austenitic	-	-	820	550	575	330	460	230	-	-	0.002 - 0.006	0.004 - 0.008	0.006 - 0.012
	PH and Duplex	-	-	-	-	-	-	-	-	-	-			
Cast Irons K	Gray	1000	700	1100	660	-	-	-	-	-	-	0.002 - 0.006	0.004 - 0.008	0.006 - 0.012
	Ductile & Nodular	800	500	800	525	-	-	-	-	-	-			
High Temperature Alloys S	Titanium	-	-	295	215	-	-	200	150	-	-	0.002 - 0.006	-	-
	Nickel & Cobalt Base Alloys - Hastelloy, Inconel, Haynes Stellite	-	-	215	180	100	70	100	70	-	-			
	Ni & Co Based	-	-	180	140	-	-	-	-	-	-			
Aluminum & Non-Ferrous Materials N	Low Silicon	-	-	3500	2500	-	-	-	-	2500	1100	0.002 - 0.006	0.004 - 0.008	0.006 - 0.012
	High Silicon	-	-	1200	900	-	-	-	-	1000	700			
Hardened Materials H	30 to 45 Rc	-	-	540	240	360	240	-	-	-	-	-	0.003 - 0.006	-
	45 to 55 Rc	-	-	180	150	240	150	-	-	-	-			

V555 Technical Guidelines

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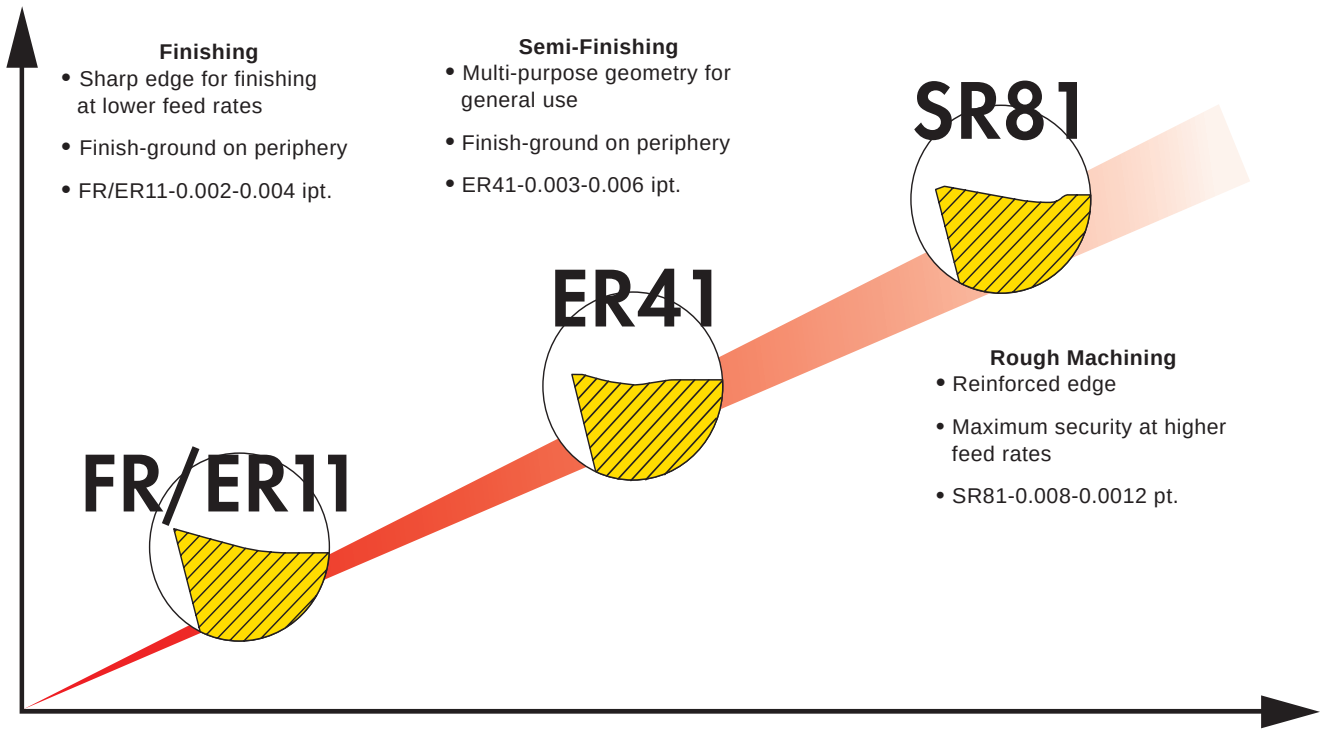
Pick the right geometry: FR/ER11, ER41, or SR81



ER - Slightly Honed Cutting Edge

FR - Up Sharp Cutting Edge

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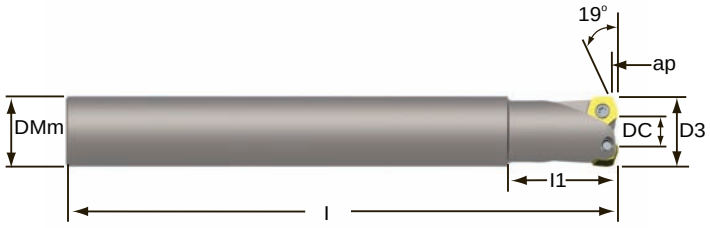
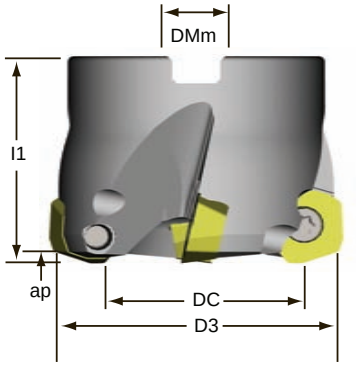
V556 High Feed Mill



V556 End Mills											
Part Number	Dimensions (inches)							Insert Size	Wt (lbs)	Max RPM	EDP#
	D3	DC	DMm	l	l1	# Inserts	ap Max				
V556A 09 125 CE 20	1.250	0.715	1.250	10.00	2.00	2	0.08	PDMX09	3.10	29,000	62991
V556A 09 150 CE 20	1.50	0.929	1.250	10.00	2.00	3	0.08	PDMX09	3.20	25,000	62981



V556 Face Mills												
Part Number	Dimensions (inches)							Insert Size	Wt- (lbs)	Max RPM	Optional Coolant Screw	EDP#
	D3	DC	DMm	Mount*	l1	# Inserts	ap Max					
V556A 09 0200 G 04R	2.00	1.421	0.75	G	1.50	4	0.08	PDMX09	0.65	20,000	PT888	62975
V556A 09 0250 G 05R	2.50	1.917	0.75	G	1.75	5	0.08	PDMX09	1.10	17,000	PT888	62976
V556A 09 0300 H 06R	3.00	2.417	1.00	H	2.00	6	0.08	PDMX09	2.00	15,500	PT870	62977
V556A 09 0400 K 07R	4.00	3 .421	1.50	K	2.00	7	0.08	PDMX09	3.90	13,000	PT890	62978
V556A 09 0500 K 08R	5.00	4 .421	1.50	K	2.38	8	0.08	PDMX09	6.20	11,500	PT872	62979
V556A 09 0600 K 09R	6.00	5.421	1.50	K	2.38	9	0.08	PDMX09	8.10	10,500	PT872	62980

*For detailed Mount information see J3 and J4.

ER 51

ER 51

SR 81

V556 Inserts				
Part Number	VP5020	VP5040	VP5135	VP1120
PDMX 0905 ZE SR81	20278	20279	20280	-
PDMX 0905 ZE ER51	20276	20277	-	20275

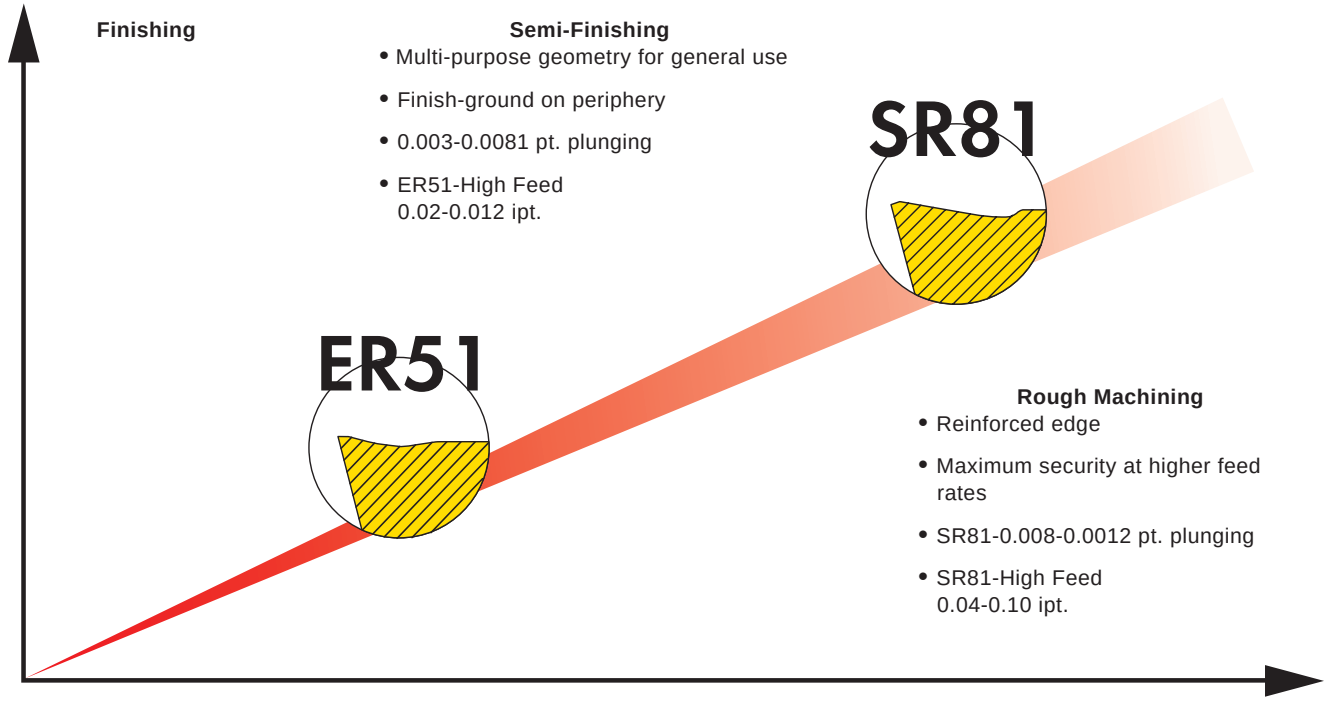
V556 and V555 inserts are not interchangeable.

V556 High Feed Mill Application Guide

ValMILL®

Material Group	Category	SFM								V556 Feed Rates (ipt)			
		CVD Coated		PVD Coated		PVD Coated		CVD Coated		Uncoated	High Feed Geometries		Ramping Geometries	
		VP1120		VP5020		VP5040		VP5135		VPUK20	ER 51	SR 81	ER 51	SR 81
Steels P	Carbon	-	-	1200	900	950	600	800	500	-	-	0.02 - 0.06	0.04 - 0.10	0.02	0.06
	Alloy	-	-	850	350	-	-	-	-	-	-	0.02 - 0.04	0.04 - 0.08		
Stainless Steels M	Ferritic and Martensitic 180 - 240 Bhn	-	-	820	550	575	330	460	230	-	-	0.02 - 0.04	0.03 - 0.06	0.02	0.06
	Austenitic 140 - 180 Bhn	-	-	-	-	-	-	-	-	-	-				
	PH and Duplex 220 - 260 Bhn	-	-	702	-	-	-	-	-	-	-	-	-	-	-
Cast Irons K	Gray	1000	700	1100	660	-	-	-	-	-	-	0.02 - 0.06	-	0.02	0.06
	Ductile & Nodular	800	500	800	525	-	-	-	-	-	-				
High Temperature Alloys S	Titanium	-	-	295	215	-	-	200	150	-	-	0.02 - 0.04	-	0.02	-
	Nickel & Cobalt Base Alloys - Hastelloy, Inconel, Haynes Stellite	-	-	215	180	100	70	100	70	-	-				
	Ni & Co Based	-	-	180	140	-	-	-	-	-	-				
Aluminum & Non-Ferrous Materials N	Low Silicon	-	-	3500	2500	-	-	-	-	2500	1100	0.04 - 0.12	-	0.004	-
	High Silicon	-	-	1200	900	-	-	-	-	1000	700				
Hardened Materials H	30 to 45 Rc	-	-	540	240	360	240	-	-	-	-	0.02 - 0.04	0.03 - 0.06	0.02	0.06
	45 to 55 Rc	-	-	180	150	240	150	-	-	-	-	-	0.02 - 0.04		0.02

Pick the right geometry: ER51 or SR81



V556 High Feed Mill Technical Guidelines

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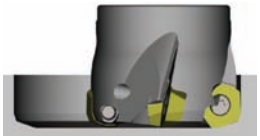
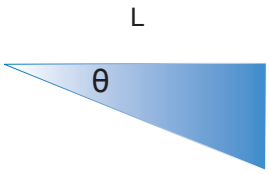
Ramping



Helical Interpolation

Plunge Milling

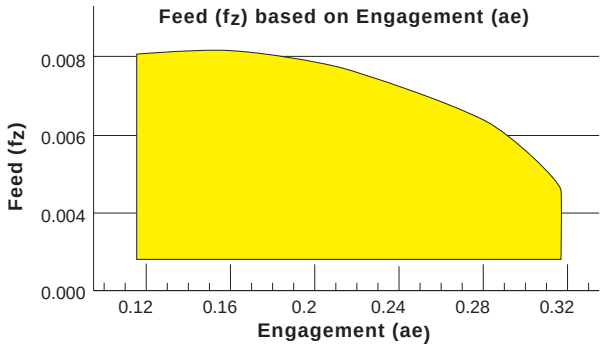


Ramping - length (L) based on Maximum DOC of 0.08 and ramping angle

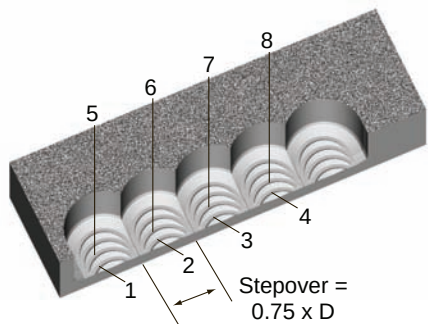
D3 Diameter	ap Max. (DOC)	Ramping		Helical Interpolation			Plunging		
							Min ae	Overhang	
								L< 3XD	3D ≤ L ≤ 6D
		Ramp θ	L	D Hole Min.	D Hole Max.	Dp Max.		Max ae	Max ae
1.25	0.08	0	--	--	--	--	0.12	0.16	0.16
1.50	0.08	8	0.56	2.66	3.22	1.00	0.12	0.16	0.16
2.00	0.08	8	0.56	3.28	3.85	1.88	0.12	0.24	0.17
2.50	0.08	7	0.64	4.30	4.87	2.39	0.12	0.27	0.18
3.00	0.08	5	0.90	5.35	5.92	2.35	0.12	0.28	0.19
4.00	0.08	3	1.50	7.22	7.78	3.85	0.12	0.31	0.20
5.00	0.08	2.5	1.80	9.35	9.92	4.92	0.12	0.31	0.22
6.00	0.08	2	2.30	11.36	11.92	5.92	0.12	0.31	0.24

Dp Max = Hole described by center line of cutter while helical interpolating.

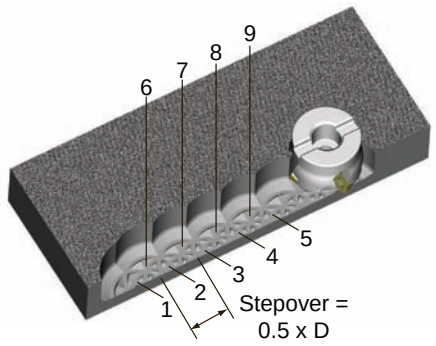
V556 Plunging



Millling Cutter With Overhang L≤3xD

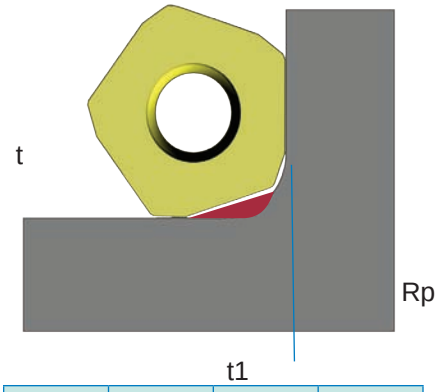


Millling Cutter With Overhang L≥3xD



Application Strategy

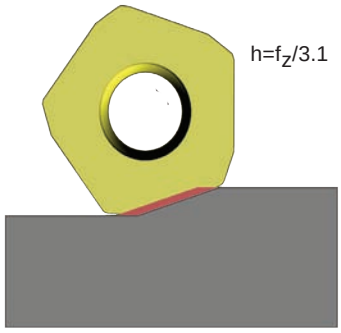
Radius Programming

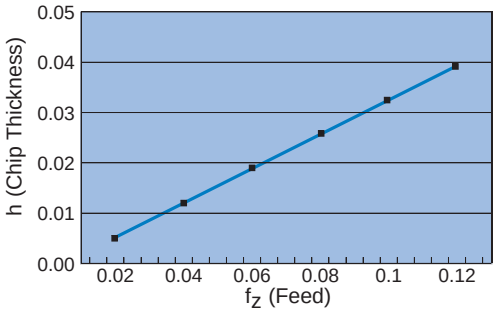


Dc	Rp	t	t1
1.25	0.18	0.04	0.27
1.50-6	0.18	0.04	0.29

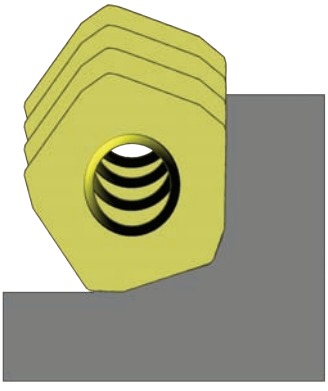
The radius of the insert is different from the radius to be programmed (Rp)

Real Chip Thickness Feed-vs-Chip Thickness



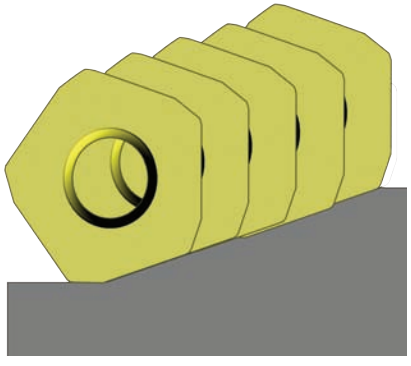


Machining on a Vertical Surface



Reduce feed rate (f_z) to .02 max when approaching a vertical face to avoid vibration and chipping of the inserts

Machining on a Non-Vertical Surface



19 degrees

Follow a 19º gradient to retain high feed rates without creating vertical faces

45° Load VSR Shear Mill

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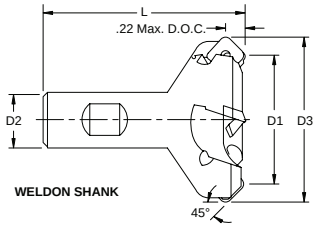
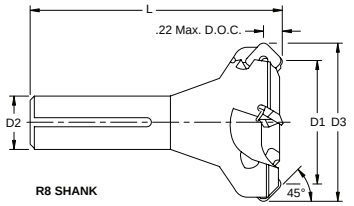
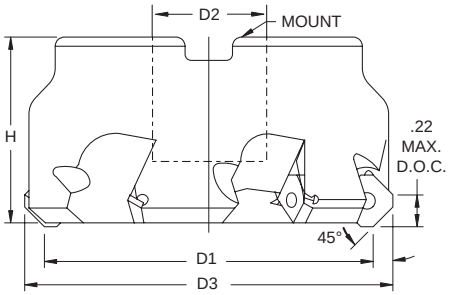




End Mills											
Part Number	Style	Dimensions				# of Inserts. Req'd	Insert Style	Max. D.O.C.	Max. RPM	Wt. (lbs.)	EDP#
		D1	D2	D3	L						
VSRDA 4 R 1500 W06 03	Weldon	1.50	0.750	2.024	3.250	3	SE..42	0.22	12,000	0.63	50866
VSRDA 4 R 1500 R8 03	R8	1.50	0.949	2.024	5.000	3	SE..42	0.22	12,000	1.20	50865
VSRDA 4 R 2000 W06 04	Weldon	2.00	0.750	2.516	3.250	4	SE..42	0.22	12,000	0.94	50868
VSRDA 4 R 2000 W08 04	Weldon	2.00	1.000	2.516	3.250	4	SE..42	0.22	12,000	1.40	50869
VSRDA 4 R 2500 W08 05	Weldon	2.50	1.000	3.016	3.760	5	SE..42	0.22	10,000	1.75	50872
VSRDA 4 R 2500 R8 05	R8	2.50	0.949	3.016	5.250	5	SE..42	0.22	10,000	2.00	50871



Face Mills											
Part Number	Mount	Dimensions				# of Inserts Req'd	Insert Style	Max. D.O.C.	Max. RPM	Wt. (lbs.)	EDP#
		D1	D2	D3	H						
VSRDA 4 R 0200 G 04	G	2.000	0.750	2.520	1.500	4	SE..42	0.22	12,000	1.30	51391
VSRDA 4 R 0300 H 06	H	3.000	1.000	3.520	1.750	6	SE..42	0.22	10,000	2.56	51392
VSRDA 4 R 0400 K 06	K	4.000	1.500	4.520	2.000	6	SE..42	0.22	9,000	4.90	51393
VSRDA 4 R 0500 K 07	K	5.000	1.500	5.510	2.375	7	SE..42	0.22	8,000	8.50	51394
VSRDA 4 L 0500 K 07*	K	5.000	1.500	5.510	2.375	7	SE..42	0.22	8,000	8.50	51388
VSRDA 4 R 0600 K 07	K	6.000	1.500	6.510	2.375	7	SE..42	0.22	7,000	12.50	51395
VSRDA 4 L 0600 K 07*	K	6.000	1.500	6.510	2.375	7	SE..42	0.22	7,000	12.50	51389
VSRDA 4 R 0800 C 08	C	8.000	2.500	8.510	2.375	8	SE..42	0.22	5,500	22.44	51396
VSRDB 4 R 0200 G 04	G	2.000	0.750	2.520	1.500	4	SE..43	0.22	11,500	1.30	50874
VSRDB 4 R 0250 G 05 •	G	2.500	0.750	3.010	1.500	5	SE..43	0.22	10,000	2.00	50875
VSRDB 4 R 0300 H 05	H	3.000	1.000	3.520	1.750	5	SE..43	0.22	9,800	2.56	50876
VSRDB 4 R 0400 K 06	K	4.000	1.500	4.520	2.000	6	SE..43	0.22	8,500	4.87	50877
VSRDB 4 R 0500 K 07 •	K	5.000	1.500	5.510	2.375	7	SE..43	0.22	7,800	8.50	50878
VSRDB 4 R 0600 K 08	K	6.000	1.500	6.510	2.375	8	SE..43	0.22	6,700	12.50	50879

• Non-Stock * LH Rotation

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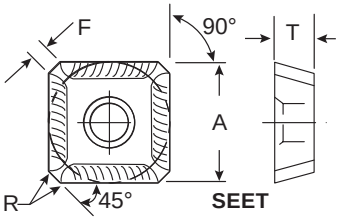
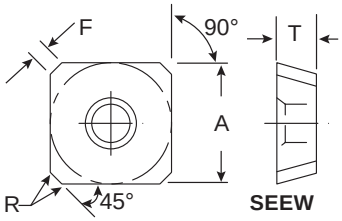
VSR Shear Mill Spare Parts & Inserts



SEET



SEEW

Part Number	Dimensions				PVD			CVD		PCD	ISO Number
	A	T	R	F	VP5020	VP5045	VP1020	VP5142	VP1130	VPD720	
SEET 42 AFER	1/2	0.120	0.044	0.094	23138	23272	24063	22937	22825	-	SEET 1203 AFER
SEET 43 AFER	1/2	0.188	0.015	0.094	23139	23273	24064	22938	22826	-	SEET 1204 AFER
*SEET 53 AFER	5/8	0.188	0.015	0.094	-	-	-	22939	22827	-	SEET 1504 AFER
SEEW 42 A7A T00420	1/2	0.125	0.005	0.053	23140	23187	-	22940	-	-	SEEW 1203 A7A T00420
SEEW 42 A7J	1/2	0.125	0.005	0.053	-	-	24066	-	-	-	SEEW 1203 A7J
SEEW 43 AEJR F	1/2	0.188	0.015	0.057	-	-	-	-	-	41011	SEEW 1204 AEJR F
SEEW 43 AESN	1/2	0.188	0.015	0.057	-	23188	-	22941	-	-	SEEW 1204 AESN
SEEW 43 AFFN	1/2	0.188	0.015	0.057	-	-	24068	-	-	-	SEEW 1204 AFFN
SEEW 43 AFFN F	1/2	0.188	0.015	0.057	-	-	-	-	-	41012	SEEW 1204 AFFN F
SEEW 43 AFFN H	1/2	0.188	0.015	0.057	-	-	-	-	-	41013	SEEW 1204 AFFN H
SEEW 43 AFSN	1/2	0.188	0.046	0.057	23141	-	-	-	-	-	SEEW 1204 AFSN
SEEW 43 AFTN	1/2	0.188	0.046	0.057	24070	-	-	-	-	-	SEEW 1204 AFTN

*Insert for special cutters.

Spare Parts					
Insert Size	Insert Screw		Torx Wrench		Torque (in-lbs)
	Part#	EDP#	Part#	EDP#	
42	PT 700T	52307	T 15 Torx Wrench	50087	32
43	PT 546T	52290	T 20 Torx Wrench	50087	63
53	PT 711T	52308	T 20 Torx Wrench	50087	63

Note: Valenite recommends the use of PT745 antiseize lubricant (EDP# 50050) on insert screw threads and head.

Note: Face mills are designed to allow use of Valenite Coolant Screws. See Technical section for application information

VSR Shear Mill Application Guide

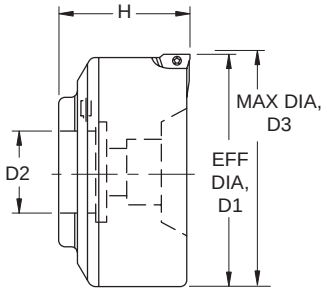
ValMILL®

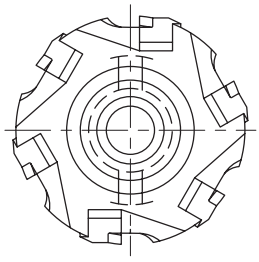
Material			SFM						Feed/Tooth in (mm)
			PVD		PVD	CVD	CVD	PCD	
			VP5020	VP5045	VP1020	VP5142	VP1130	VPD720	
Steels P	Free Machining & Low Carbon	120-170 BHN	800-1100 (240-330)	500-800 (150-240)	-	500-800 (150-240)	-	-	0.002-0.005 (.05-.13) 0.006-0.012 (.15-.30)
	Medium & High Carbon	180-220 BHN	600-800 (180-240)	350-600 (105-180)	-	350-600 (105-180)	-	-	0.002-0.005 (.05-.13) 0.006-0.012 (.15-.30)
	Alloy & Easy To Machine Tool Steels	200-240 BHN	500-700 (150-210)	300-450 (90-135)	-	300-450 (90-135)	-	-	0.002-0.005 (.05-.13) 0.006-0.012 (.15-.30)
	Tool & Die Steels	220-260 BHN	350-500 (105-150)	200-350 (60-105)	-	200-350 (60-105)	-	-	0.002-0.005 (.05-.13) 0.006-0.012 (.15-.30)
Stainless Steels M	Ferritic & Martensitic	180-240 BHN	500-700 (150-210)	300-500 (90-150)	-	300-500 (90-150)	-	-	0.002-0.005 (.05-.13) 0.006-0.012 (.15-.30)
	Austenitic	140-180 BHN	400-600 (120-180)	250-450 (75-135)	-	250-450 (75-135)	-	-	0.002-0.005 (.05-.13) 0.006-0.012 (.15-.30)
	PH & Duplex	220-260 BHN	350-500 (105-150)	200-350 (60-105)	-	200-350 (60-105)	-	-	0.002-0.005 (.05-.13) 0.006-0.012 (.15-.30)
Cast Irons K	Gray Cast Iron	180-260 BHN	600-700 (180-210)	-	400-700 (120-215)	-	600-900 (200-300)	-	0.002-0.005 (.05-.13) 0.006-0.012 (.15-.30)
		220-260 BHN	500-600 (150-180)	-	350-600 (110-180)	-	500-700 (150-210)	-	.006-.010 (.15-.25) .008-.016 (.20-.40)
	Ductile & Maliable Cast Iron	140-180 BHN	500-600 (150-180)	-	350-600 (110-180)	-	500-700 (150-210)	-	0.002-0.005 (.05-.13) 0.006-0.012 (.15-.30)
		220-260 BHN	400-500 (120-150)	-	350-500 (110-150)	-	400-600 (130-200)	-	0.002-0.005 (.05-.13) 0.006-0.012 (.15-.30)
	Compacted Graphite Cast Iron	180-240 BHN	500-700 (150-215)	-	350-500 (110-150)	-	400-600 (130-200)	-	0.002-0.005 (.05-.13) 0.006-0.012 (.15-.30)
High Temperature Alloys S	Iron Based Alloys	-	225-250 (65-75)	175-225 (55-65)	-	-	-	-	0.002-0.005 (.05-.13) 0.006-0.012 (.15-.30)
	Nickel & Cobalt Base Alloys Hastelloy, Inconel, Stellite	-	150-175 (45-55)	125-150 (35-45)	-	-	-	-	0.002-0.005 (.05-.13) 0.006-0.012 (.15-.30)
	Titanium Alloys 6al-v4	-	225-275 (65-85)	150-200 (45-60)	-	-	-	-	0.002-0.005 (.05-.13) 0.006-0.012 (.15-.30)
Aluminum & Non-Ferrous Materials N	Aluminum < 7% Si	-	1500-3000 (450-900)	-	-	-	-	2000 - 15,000 (600-4500)	0.002-0.005 (.05-.13) 0.006-0.012 (.15-.30)
	Aluminum 7% - 12% Si	-	1250-2500 (375-750)	-	-	-	-	1500 - 10,000 (450-3000)	0.002-0.005 (.05-.13) 0.006-0.012 (.15-.30)
	Aluminum > 12% Si	-	800-1500 (240-450)	-	-	-	-	1000 - 3000 (300-900)	0.002-0.005 (.05-.13) 0.006-0.012 (.15-.30)
	Non-Ferrous	-	600-1400 (180-420)	-	-	-	-	1000 - 3000 (300-900)	0.002-0.005 (.05-.13) 0.006-0.012 (.15-.30)

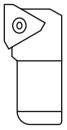
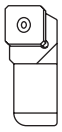
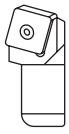
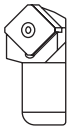
ValMILL®

MasterMill® Face Mills - Cutter Assemblies

Cartridge Styles





Cartridge Style	Cutter Assembly Part Number	Dimensions				Cartridge Part Number	Cartridge EDP#	Insert	Number of Cartridges	Mount*	Assembly EDP#
		D1	D2	D3	H						
 ST90	MM035ST90RH	2.940	1.00	2.94	2.00	MMCST9033PPD	50613	TPEW322PD…	5	H	50989
	MM046ST90RJ	3.940	1.25	3.94	2.00				6	J	50998
	MM058ST90RK	4.940	1.50	4.94	2.38				8	K	51007
 SS90	MM035SS90RH	2.880	1.00	2.88	2.00	MMCSS9043P	50610	SPMW43.../ (WC)SPEW436	5	H	50988
	MM046SS90RJ	3.880	1.25	3.88	2.00				6	J	50997
 SS75	MM035SS75RH	3.000	1.00	3.27	2.00	MMCSS7543P	50609	SPEW43ED…/ SPEWX43ED… /SPEW43…/ SPMW43…	5	H	50987
 SS45	MM035SS45RH	2.750	1.00	3.27	2.00	MMCSS4543AEF	50607	SPEW43A	5	H	50986
									12		

Note: Assemblies are supplied complete with parts, cartridges and wrenches, less inserts.
*For detailed Mount information see J3 and J4.

MasterMill® Face Mills

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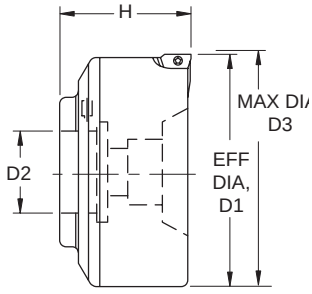


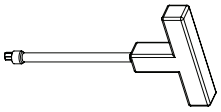
Cutter Bodies Only					
Part Number	Dimensions		Cartridges Req'd	Mount*	EDP#
	Nominal Diameter	Nominal Height			
MM0305R100F	3.000	2.00	5	H	50983
MM0406R125F	4.000	2.00	6	J	50991

*For detailed Mount information see J3 and J4.

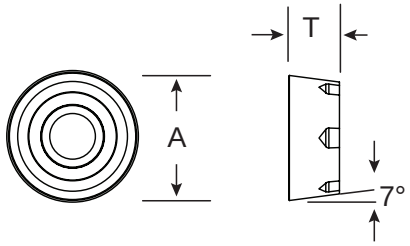
Additional Cartridge Styles			
Part Number	EDP#	Lead Angle	Used With Inserts
MMCM1001606C	50603	–	RCMT1605MOTX
MMCSS4543AEF	50607	45°	SPEW43A...
MMCSS4543AF	50608	45°	SEET43...
MMCSS8543P	50609	75°	SPEW43ED..., SPEWX43ED..., SPEW43..., SPMW43...
MMCSS9043P	50610	90°	SPMW43...
MMCST9033PPD	50613	90°	TPEW332PD...

Spare Parts					
Cutter Body	Wedge		Wedge Screw		Torque (in lbs)
	Part#	EDP#	Part#	EDP#	
ALL	DLW 8	50442	DLS 8	50642	105

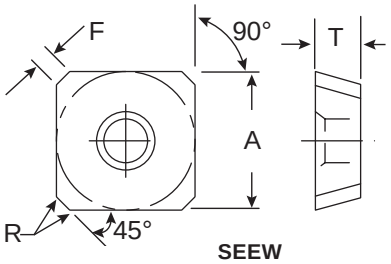
Note: Valenite recommends the use of PT745 antiseize lubricant (EDP# 50050) on insert screw threads and head.



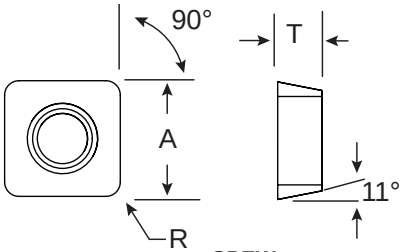
Cutter Body	Locating Pin		Cam Wrench	
	Part#	EDP#	Part#	EDP#
ALL	PT 624	50645	PT 625	50033



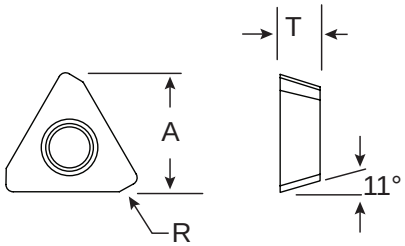
RCMT



SEEW



SPEW



TPEW

Master Mill Inserts												
Part Number	Dimensions			Feed* in (mm)	VP5020	VP5142	VP5045	VP1120	VP1130	VPUK20	PCD VPD720	ISO Number
	A	T	R									
RCMT 16 06 MOTX	0.216	0.63	-	.005-.018** (0.13-0.46)	-	56583	-	-	-	03303	-	RCMT 1606M0TX
SEEW 43 AEJR F	0.500	0.187	45° Tipped	.005-.025 (0.13-0.64)	-	-	-	-	-	-	41011	SEEW 1204 AEJR F
SEEW 43 AESN	0.500	0.187	45°	.005-.025 (0.13-0.64)	-	22941	23188	-	-	-	-	SEEW 1204 AESN
SPEW 43 EDFR	0.500	0.187	15°	.005-.025 (0.13-0.64)	-	22948	23292	-	-	-	-	SPEW 1204 EDFR
SPEW 43 EDJR F	0.500	0.187	15° Tipped	.005-.025 (0.13-0.64)	-	-	-	-	-	-	06465	SPEW 1204 EDJR F
SPEW 434	0.500	0.187	0.063	.005-.025 (0.13-0.64)	-	-	23293	-	-	-	-	SPEW 120416
SPEW 434 H	0.500	0.187	0.0625 Full Edge	.005-.025 (0.13-0.64)	-	-	-	-	-	-	41025	SPEW 120416 H
TPEW 332 PDJRF	0.375	0.187	0.031 Tipped	.005-.015 (0.13-0.38)	-	-	-	-	-	-	41052	TPEW 160408 PDJRF
TPEW 332 PDTR	0.375	0.187	0.031	.005-.015 (0.13-0.38)	-	22961	23237	-	-	-	-	TPEW 160408 PDTR

* Adjust feed due to lead angle to avoid premature failure.
** Adjust feed per tooth based on DOC - See V500 for chip thickness correction calculations

Application Guide

ValMILL®

Material		Hardness	SFM (m/min.)						
			PVD		CVD			Uncoated	PCD
			VP5020	VP5045	VP5142	VP1120	VP1130	VPUK20	VPD720
Steels P	Free Machining & Low Carbon	120-170 BHN	800-1100 (240-330)	500-800 (150-240)	500-800 (150-240)	-	-	-	-
	Medium & High Carbon	180-220 BHN	600-800 (180-240)	350-600 (105-180)	350-600 (105-180)	-	-	-	-
	Alloy & Easy To Machine Tool Steels	200-240 BHN	500-700 (150-210)	300-450 (90-135)	300-450 (90-135)	-	-	-	-
	Tool & Die Steels	220-260 BHN	350-500 (105-150)	200-350 (60-105)	200-350 (60-105)	-	-	-	-
Stainless Steels M	Ferritic & Martensitic	180-240 BHN	500-700 (150-210)	300-500 (90-150)	300-500 (90-150)	-	-	-	-
	Austenitic	140-180 BHN	400-600 (120-180)	250-450 (75-135)	250-450 (75-135)	-	-	-	-
	PH & Duplex	220-260 BHN	350-500 (105-150)	200-350 (60-105)	200-350 (60-105)	-	-	-	-
Cast Irons K	Gray Cast Iron	180-260 BHN	600-700 (180-210)	-	-	800-1000 (240-300)	600-900 (200-300)	250-400 (75-130)	Bi-Metal <1500 (<450)
		220-260 BHN	500-600 (150-180)	-	-	700-800 (210-240)	500-700 (150-210)	200-300 (60-90)	Bi-Metal <1500 (<450)
	Ductile Iron	140-180 BHN	500-600 (150-180)	-	-	700-800 (210-240)	500-700 (150-210)	225-350 (65-105)	-
		220-260 BHN	400-500 (120-150)	-	-	500-700 (150-210)	400-600 (130-200)	200-300 (60-90)	-
High Temperature Alloys S	Iron Based Alloys	-	225-250 (65-75)	175-225 (55-65)	-	-	-	150-200 (45-60)	-
	Nickel & Cobalt Base Alloys Hastelloy, Inconel, Stellite	-	150-175 (45-55)	125-150 (35-45)	-	-	-	75-100 (25-30)	-
	Titanium Alloys 6al-v4	-	225-275 (65-85)	150-200 (45-60)	-	-	-	100-150 (30-45)	-
Aluminum & Non-Ferrous Materials N	Aluminum < 7% Si	-	1500-3000 (450-900)	-	-	-	-	1000-2000 (300-600)	2000 -15,000 (600-4500)
	Aluminum 7% - 12% Si	-	1250-2500 (375-750)	-	-	-	-	800-1750 (240-525)	1500 - 10,000 (450-3000)
	Aluminum > 12% Si	-	800-1500 (240-450)	-	-	-	-	500-1000 (150-300)	1000 - 3000 (300-900)
	Non-Ferrous	-	600-1400 (180-420)	-	-	-	-	400-1000 (120-300)	1000 - 3000 (300-900)

Always follow manufacturers recommendations and do not exceed maximum RPM for every cutter prior to running recommended speeds.
Ensure cutter and inserts are in proper working order and each is secure to avoid potential injury.

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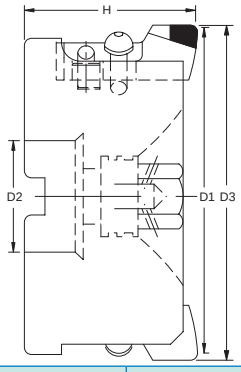
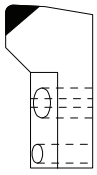
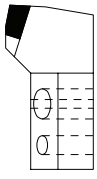
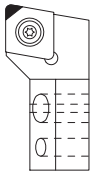
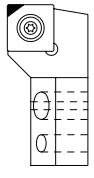
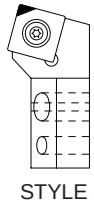
Aluminum Body HVA Face Mills - Cutter Assemblies

Cartridge Styles



Cartridge Style	Cutter Assembly Part Number	Dimensions				Cartridge Part Number	Cartridge EDP#	Number of Cartridges	Mount*	Max. RPM	Assembly EDP#
		D1	D2	D3	H						
 STYLE 1	VF 1A 90CA025H3R•	2.5	1.00	2.68	2.00	VFAB 90BAR	50622	3	H	15,000	56516
	VF 1A 90CA030H4R•	3	1.00	3.18	2.00			4	H	13,500	51033
	VF 1A 90CA040J5R•	4	1.25	4.18	2.00			5	J	11,500	51034
	VF 1A 90CA120F14R•	12	2.50	12.18	2.38			14	F	6,500	51039
 STYLE 2	VF 2A 75CA025H3R•	2.5	1.00	2.60	2.00	VFAB 75BAR	50621	3	H	15,000	56517
	VF 2A 75CA120F14R•	12	2.50	12.10	2.38			14	F	6,500	51046
 STYLE 3	VF 3A 90CA025H3R•	2.5	1.00	2.56	2.00	VFAA 90SCR	50619	3	H	15,000	56518
	VF 3A 90CA030H4R	3	1.00	3.06	2.00			4	H	13,500	51047
	VF 3A 90CA040J5R	4	1.25	4.06	2.00			5	J	11,500	51048
	VF 3A 90CA050K6R•	5	1.50	5.06	2.38			6	K	10,500	51049
	VF 3A 90CA060K8R	6	1.50	6.06	2.38			8	K	9,500	51050
	VF 3A 90CA080C10R•	8	2.50	8.06	2.38			10	C	8,000	51051
	VF 3A 90CA120F14R•	12	2.50	12.06	2.38			14	F	6,500	51053
 STYLE 4	VF 4A 90CA025H3R•	2.5	1.00	2.56	2.00	VFAA 90SSR	50620	3	H	15,000	56519
	VF 4A 90CA030H4R	3	1.00	3.06	2.00			4	H	13,500	51054
	VF 4A 90CA040J5R	4	1.25	4.06	2.00			5	J	11,500	51055
	VF 4A 90CA060K8R	6	1.50	6.06	2.38			8	K	9,500	51057
	VF 4A 90CA100C12R•	10	2.50	10.06	2.38			12	C	7,000	51059
 STYLE 5	VF 5A 75CA030H4R	3	1.00	3.23	2.00	VFAA 75SSR	50617	4	H	13,500	51061
	VF 5A 75CA050K6R	5	1.50	5.23	2.38			6	K	10,500	51063
	VF 5A 75CA060K8R	6	1.50	6.23	2.38			8	K	9,500	51064

Note: Assemblies are supplied complete with parts, cartridges and wrenches, less inserts.
• Denotes non-stock standard.
* For detailed Mount information see J3 and J4.

Aluminum Body HVA Face Mills

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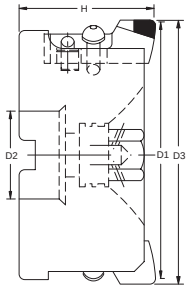

Cutter Bodies Only					
Part Number	Dimensions		Cartridges Req'd	Mount*	EDP#
	Nom. D1	Nom. H			
VFA 025 3R BDY	2.500	2.00	3	H	62564
VFA 030 4R BDY	3.000	2.00	4	H	51068
VFA 040 5R BDY	4.000	2.00	5	J	51069
VFA 050 6R BDY	5.000	2.38	6	K	51070
VFA 060 8R BDY	6.000	2.38	8	K	51071
VFA 080 10R BDY	8.000	2.38	10	C	51072
VFA 100 12R BDY	10.000	2.38	12	C	51073
VFA 120 14R BDY	12.000	2.38	14	F	51074

Order cartridges separately.
Note: Face mills are designed to allow use of Valenite Coolant Screws. See Technical Section for application.
*For detailed Mount information see J3 and J4.

Cartridges											
Part Number	Edge Style	Grade	Lead	Axial Rake	Radial Rake	Corner Radius	Dimensions				EDP#
							L1	L2	H1	H2	
VFAB 90BAR	PCD Tip Brazed onto cartridge body	PCD	0°	0° neu.	7° pos.	.090 R, .075 Flat	1.5	0.25	0.548	0.638	50622
VFAB 75BAR	PCD Tip Brazed onto cartridge body	PCD	15°	10° pos.	7° pos.	.015 R, .113 Flat	1.5	0.25	0.548	0.599	50621
VFAA 90SCR	CPEW32.52PDFR-F	VPD720	0°	10° pos.	7° pos.	0.031 R, 0.073 Flat	1.5	0.25	0.548	0.578	50619
	CPEW32.52PDJR	1020				0.031 R, 0.073 Flat					
	CPEX 32.52 4FA-HVA	VC722				.031 R					
	CPEW 32.52 PDFR-4FA	VC722				0.031 R, 0.073 Flat					
VFAA 90SSR	SPMW 32.52 J	VP1020	0°	5° pos.	3° neg.	.31 R	1.5	0.25	0.548	0.578	50620
	SPEW 32.52-RF	VPD720				.031 R					
	SPEW 32.52 R-H	VPD720				.031 R, Full Edge					
VFAA 75SSR	SPMW 32.52 J	VP1020	15°	5° pos.	3° neg.	.31 R	1.5	0.375	0.58	0.661	50617
	SPEW 32.52 R-F	VPD720				0.031 R					
	SPEW 32.52 R-H	VPD720				0.031 R, Full Edge					
	SPEW 23.51 -F	VPD720				0.015 R					
	SPEW 23.52 -F	VPD720				0.031 R					
	SPEW 23.52 -H	VPD720				0.031 R, Full Edge					

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Aluminum Body HVA Face Mills, Spare Parts & Inserts



Spare Parts						
Cutter Body	Insert Screw		Mounting Screw		Adjustment Pin	
	Part#	EDP#	Part#	EDP#	Part#	EDP#
ALL	PT 700T	52307	CSC 1A	52818	PT 863 PIN	50646

Note: Valenite recommends the use of PT745 antiseize lubricant (EDP# 50050) on insert screw threads and head.

Cutter Body	Insert Wrench		Torque (in-lbs)
	Part#	EDP#	
ALL	T 15 Torx Wrench	50087	6

Master Mill HVA Inserts											
Part Number	Dimensions			Feature	VP5020	VP5142	VP5045	VP1130	PCD VPD720	CBN VC722	ISO Number
	A	T	R								
CPEW 32.52 PDF LF	0.375	0.156	0.031	Left Hand - Wiper Flat	-	-	-	-	41110	-	CPEW 09T308 PDF-LF
CPEW 32.52 PDF RF	0.375	0.156	0.031	Right Hand - Wiper Flat	-	-	-	-	41111	-	CPEW 09T308 PDF-RF
CPEW 32.52 PDFR 4FA	0.375	0.156	0.031	Right Hand - Wiper Flat	-	-	-	-	-	40249	CPEW 09T308 PDFR 4FA
CPEX 32.52 4FA HVA	0.375	0.156	0.031	Netural - No Flat	-	-	-	-	-	40250	CPEX 09T3084 FAHVA
CPEX 32.52 HVA F	0.375	0.156	0.031	Netural - No Flat	-	-	-	-	41112	-	CPEX 09T308 HVA F
SPEW 32.51 F	0.375	0.156	-	Tipped	-	-	-	-	41020	-	SPEW 09T304 F
SPEW 32.52 F	0.375	0.156	0.031	Tipped	-	-	-	-	41021	-	SPEW 09T308 F
SPEW 32.52 H	0.375	0.156	0.031	Full Edge	-	-	-	-	41022	-	SPEW 09T308 H
SPEW 32.52-RF	0.375	0.156	0.031	Right Hand - 3° Clearance Tipped	-	-	-	-	41272	-	SPEW 09T308-RF
SPEW 32.52-RH	0.375	0.156	0.031	Right Hand - 3° Clearance Full Edge	-	-	-	-	41273	-	SPEW 09T308-RH
SPMW 32.51	0.375	0.156	-	-	-	-	23305	22844	-	-	SPMW 09T304
SPMW 32.52	0.375	0.156	0.031	-	23159	22958	23306	23594	-	-	SPMW 09T308
SPMW 32.52 4FA	0.375	0.156	0.031	-	-	-	-	-	-	40012	SPMW 09T308 4FA
SPMW 32.52 FX	0.375	0.156	0.031	Right Handed 10° Leading Edge	-	-	-	-	41267	-	SPMW 09T308 FX

QC Face Mills For Cast Iron

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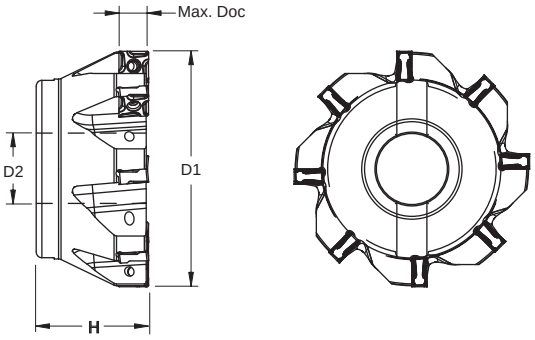
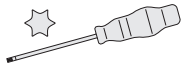
Cutters for Screw Held Inserts



0° Lead Face Mills, Screw Held Inserts, Axial Rake +0°, Radial Rake +0°									
Part Number	Dimensions			Max. DOC	Mount*	Inserts Req'd	Max. RPM	Wt (lbs)	EDP#
	D1	D2	H						
VFQS 90SE 0300 H05R	3.00	1.00	1.75	0.380	H	5	9,400	2.0	51420
VFQS 90SE 0400 J07R	4.00	1.25	2.00	0.380	J	7	7,900	3.5	51421
VFQS 90SE 0400 K07R	4.00	1.50	2.00	0.380	K	7	7,900	4.0	51422
VFQS 90SE 0500 K08R	5.00	1.50	2.38	0.380	K	8	6,900	6.5	51423
VFQS 90SE 0600 K10R	6.00	1.50	2.38	0.380	K	10	6,300	8.5	51424
VFQS 90SE 0800 C12R	8.00	2.50	2.38	0.380	C	12	5,300	18.0	51425
VFQS 90SE 1200 F18R	12.00	2.50	2.38	0.380	F	18	4,300	50.0	51427

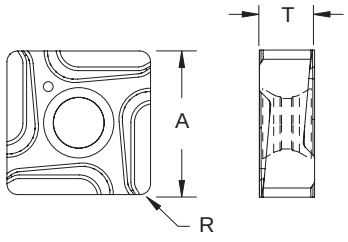
All cutters come complete less insert.
*For detailed Mount information see J3 and J4.



Spare Parts					
Screw Held Inserts	Insert Screw		Torx Wrench		Torque (in lbs)
	Part#	EDP#	Part#	EDP#	
All	PT711T	52308	T 20 Torx Scr Dr	50090	65

Note: Valenite recommends the use of PT745 antiseize lubricant (EDP# 50050) on insert screw threads and head.
Face Mills are designed to allow use of Valenite Coolant Screws.

Screw Held Inserts



SNEX

VFQS Style QC Mill Inserts - Screw Held Inserts - General Purpose Coarse Pitch								
Part Number	Dimensions			Feature	Available Grades/EDP #			ISO Number
	A	T	R		VP1120	VP1130	VP1020	
SNEX 15T612 ER QC	0.625	0.280	0.046	Right Handed	19603	22831	24709	SNEX 15T612 ER-QC

QC Face Mills For Cast Iron

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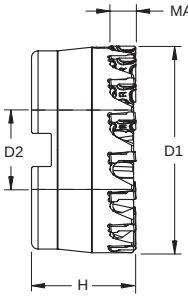
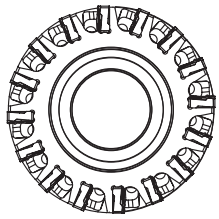
Cutters for Wedge Held Inserts





0° Lead Face Mills, Wedge Held Inserts, Axial Rake +0°, Radial Rake +0°											
Part Number	Dimensions			Max. DOC	Mount*	Inserts Req'd	#Adj. Pockets	Max. RPM	Wt (lbs)	RH EDP#	LH EDP#
	D1	D2	H								
VFQF 90SD 0200 G06R/L	2.00	0.75	2.00	0.250	G	6	1	7,700	2.6	62550	*
VFQF 90SD 0300 H12R/L	3.00	1.00	1.75	0.250	H	12	2	7,700	2.6	51405	51404
VFQF 90SD 0400 J16R/L	4.00	1.25	2.00	0.250	J	16	2	6,500	4.7	51407	51406
VFQF 90SD 0400 K16R/L	4.00	1.50	2.00	0.250	K	16	2	6,500	5.2	51409	51408
VFQF 90SD 0500 K20R/L	5.00	1.50	2.38	0.250	K	20	4	5,700	8.3	51411	51410
VFQF 90SD 0600 K24R/L	6.00	1.50	2.38	0.250	K	24	4	5,200	11.0	51413	51412
VFQF 90SD 0800 C32R/L	8.00	2.50	2.38	0.250	C	32	4	4,450	22.0	51415	51414
VFQF 90SD 1000 C40R/L	10.00	2.50	2.38	0.250	C	40	8	4,000	37.0	51417	51416
VFQF 90SD 1200 F48R/L	12.00	2.50	2.38	0.250	F	48	8	3,600	54.0	51419	51418

Note: Use hex wrench M2.5DIN911 (included with cutter) for wedge screw and adjustment screw. Torque wedge screw to 35 in/lbs. (torque wrench VMTW 103W is available for optional purchase).

*Not compatible with Through-Coolant Screw PT888.

*For detailed Mount information see J3 and J4.

Right-hand shown

Spare Parts									
Wedge Held Inserts	Wedge Screw		Insert Wedge		Adjustment Screw		Adjustment Sleeve		Torque (in lbs)
	Part#	EDP#	Part#	EDP#	Part#	EDP#	Part#	EDP#	
R Hand	LS104	52895	PT1105	50027	PT1151	50483	PT1152	50484	35
L Hand	LS104	52895	PT1106	50028	PT1151	50483	PT1153	50485	35

QC Face Mills, Inserts & Application Data

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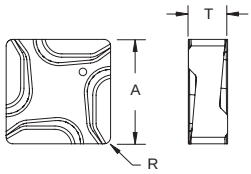
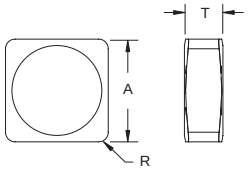
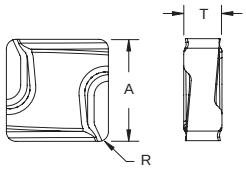
Wedge Held Inserts



SNEF



(WC)SNE Wiper



(W)SNEF Wiper

QC Mill Inserts - Wedge Held Inserts - Adjustable Style Fine Pitch								
Part Number	Dimensions			Feature	Available Grade/EDP #			ISO Number
	A	T	R		VP1120	VP1130	VP1020	
SNEF 12 04 08 EL QC	0.500	0.187	0.031	Left Handed	19601	22829	24097	SNEF 120408 EL-QC
SNEF 12 04 08 ER QC	0.500	0.187	0.031	Right Handed	19602	22830-	24708	SNEF 120408 ER-QC
WSNEF 12 04 08 EL	0.500	0.187	0.031	Left Handed Wiper	20322	22873	-	WSNEF 120408 EL
WSNEF 12 04 08 ER	0.500	0.187	0.031	Right Handed Wiper	20323	22874	24688	WSNEF 120408 ER
(WC) SNE 12 04 12	0.500	0.187	-	Crowned Wiper	20321	22872	24719	WCSNEv 120412

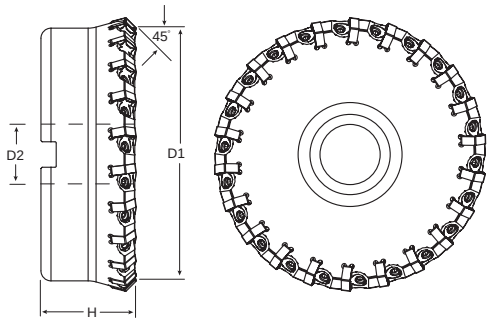
QC Insert Application Data

Material		Maximum Chip Thickness		SFM		
		General Purpose Coarse Pitch	Adjustable Style Fine Pitch	CVD		PVD
				1120	1130	1020
Cast Irons (K)	Gray Cast Iron 180 - 220 BHN	.006-.010 .010-.020	.004-.008 .006-.012	1000 800	900 600	700 400
	Gray Cast Iron 220 - 260 BHN	.006-.010 .008-.016	.004-.008 .006-.010	800 700	700 500	600 350
	Ductile & Malleable Cast Iron 140 -180 BHN	.006-.010 .010-.020	.004-.008 .006-.012	800 700	700 500	600 350
	Ductile & Malleable Cast Iron 220-260 BHN	.006-.010 .008-.016	.004-.008 .006-.010	700 500	600 400	500 350
	Compacted Graphite Cast Iron 180 - 240 BHN	.006-.010 .008-.016	.004-.008 .006-.010	700 500	600 400	500 350

ValMILL®

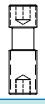
V057 Milling System for Iron

45° Lead Face Mill - Rougher



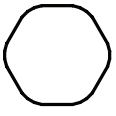
45° Lead Face Mills, 45° Lead Rougher									
Part Number	Max. DOC	Dimensions			Mount*	Inserts Req'd	Wt (lbs)	R Hand EDP#	L Hand EDP#
		D1	D2	H					
VFHX45HR0394K14R/L	.250	3.94	1.50	2.38	K	14	6	51453	51452
VFHX45HR0492K18R/L	.250	4.92	1.50	2.38	K	18	10	51455	51454
VFHX45HR0630K22R/L	.250	6.30	1.50	2.38	K	22	18	51457	51456
VFHX45HR0984F36R/L	.250	9.84	2.50	2.38	F	36	44	51461	51460

*For detailed Mount information see J3 and J4.

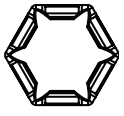


Spare Parts							
Cutter Body	Wedge Screw		Lock Wedge		Inserts		
	Part#	EDP#	Part#	EDP#			
ALL	2748600900	50017	2748358200	50016	HNGX 090508MH	HNGX 090516MR	HNEX 0905ZZS

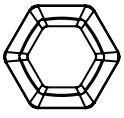
Note: Valenite recommends the use of PT745 antiseize lubricant (EDP# 50050) on threads.



HNEX ZZS7



HNGX MH



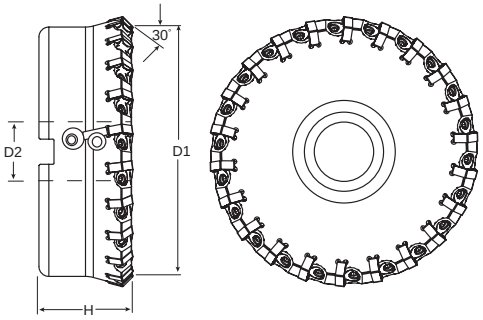
HNGX MR

V057 Milling System - 45° Lead Rougher Inserts										
Part Number	Dimensions			VP5142	VP1120	VP1130	VP1020	VPQ130	VPUK20	ISO Number
	Max DOC	Edges	R							
HNEX 09 05 ZZS7	0.315	12	-	-	-	-	-	41208	-	HNEX 0905ZZS7
HNGX 09 05 08 MH	0.315	12	0.031	-	00211	22817	-	-	03134	HNGX 090508-MH
HNGX 09 05 16 MR	0.315	12	0.063	22619	00212	22818	-	-	-	HNGX 090516-MR

V057 Milling System for Iron

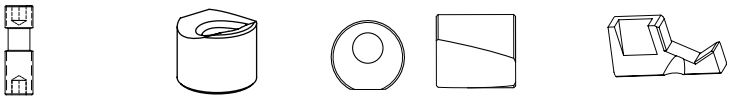
ValMILL®

30° Lead Face Mill - Rougher



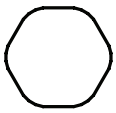
30° Lead Face Mills, 30° Lead Rougher										
Part Number	Max.* DOC	Dimensions			Mount*	Anvils Req'd	Inserts Req'd	Wt (lbs)	R Hand EDP#	L Hand EDP#
		D1	D2	H						
VFHX30HR0394K10R/L	.315	3.94	1.50	2.38	K	2	10	6	51441	51440
VFHX30HR0492K15R/L	.315	4.92	1.50	2.38	K	3	15	11	51443	51442
VFHX30HR0630K20R/L	.315	6.30	1.50	2.38	K	4	20	19	51445	51444
VFHX30HR0787C25R/L	.315	7.87	2.50	2.38	C	5	25	27	51447	51446
VFHX30HR1240F40R/L	.315	12.40	2.50	2.38	F	8	40	72	51451	51450

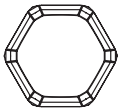
* Max DOC = .150 when using HNEX inserts. Set anvil inserts in line with fixed pocket inserts.
* For detailed Mount information see J3 and J4.

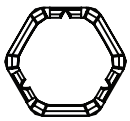


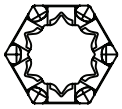
Spare Parts											
Cutter	Wedge Screw		Lock Wedge		Adjustment Wedge		Anvil		Inserts		
	Part#	EDP#	Part#	EDP#	Part#	EDP#	Part#	EDP#			
Right Hand	2748600900	50017	2748358200	50016	2748308500	50015	27485 00200	50668	HNGX 090508MH	HNGX 090516MR	HNEX 0905ZZS
Left Hand	2748600900	50017	2748358200	50016	2748308500	50015	2748500100	50667			

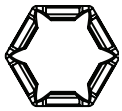
Note: Valenite recommends the use of PT745 antiseize lubricant (EDP# 50050) on threads.

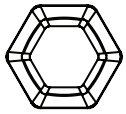

HNEX ZZS7


HNGF MF


HNGF MT


HNGX MM


HNGX MH

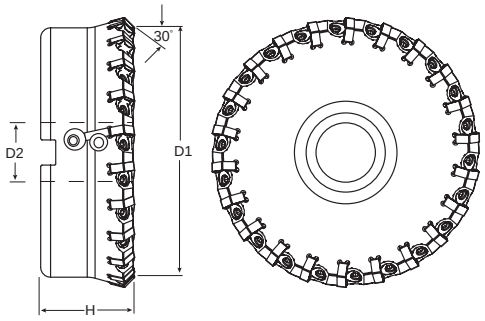

HNGX MR

V057 Milling System - 30° Lead Rougher & General Purpose Inserts										
Part Number	Dimensions			Available Grades/EDP #						ISO Number
	Max DOC	Edges	R	VP5142	VP1120	VP1130	VP1020	VPQ130	VPUK20	
HNEX 09 05 ZZS7	0.315	12	--	-	-	-	-	41208	-	HNEX 0905ZZS7
HNGF 09 05 04 MF	0.040	12	0.015	-	00140	22815	-	-	-	HNGF 090504-MF
HNGF 09 05 04 MT	0.315	6 + 6	0.015	-	00204	-	-	-	-	HNGF 090504-MT
HNGX 09 05 04 MM	0.040	12	0.015	-	00206	22816	-	-	-	HNGX 090504-MM
HNGX 09 05 08 MH	0.315	12	0.031	-	00211	22817	-	-	03134	HNGX 090508-MH
HNGX 09 05 16 MR	0.315	12	0.063	22619	00212	22818	-	-	-	HNGX 090516-MR

ValMILL®

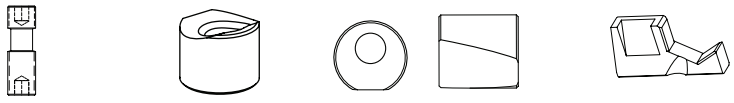
V057 Milling System for Iron

30° Lead Face Mill - Finisher



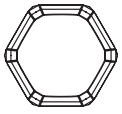
30° Lead Face Mills , 30° Lead Finisher										
Part Number	Max. DOC	Dimensions			Mount*	Anvils Req'd	Inserts Req'd**	Wt (lbs)	R Hand EDP#	L Hand EDP#
		D1	D2	H						
VFHX30HF0394K10R/L	.315	3.94	1.50	2.38	K	2	8 + 2	6	51429	51428
VFHX30HF0492K15R/L	.315	4.92	1.50	2.38	K	3	12 + 3	11	51431	51430
VFHX30HF0630K20R/L	.315	6.30	1.50	2.38	K	4	16 + 4	19	51433	51432
VFHX30HF0787C25R/L	.315	7.87	2.50	2.38	C	5	20 + 5	27	51435	51434
VFHX30HF0984F30R/L	.315	9.84	2.50	2.38	F	6	24 + 6	44	51437	51436
VFHX30HF1240F40R/L	.315	12.40	2.50	2.38	F	8	32 + 8	72	51439	51438

Set anvil inserts .002" ahead of fixed pocket inserts. Inserts must be ordered separately.
*For detailed Mount information see J3 and J4.
**Inserts required 8+2= 8 Standard and 2 Wipers.

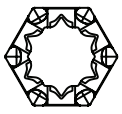


Spare Parts									
Cutter	Wedge Screw		Lock Wedge		Adjustment Wedge		Anvil		Pocket Insert + Anvil Insert
	Part#	EDP#	Part#	EDP#	Part#	EDP#	Part#	EDP#	
Right Hand	2748600900	50017	2748358200	50016	2748308500	50015	2748500400	50670	HNGX090508MH + HNGF090504MT HNGX090504MM + HNGX090504MF
Left Hand	2748600900	50017	2748358200	50016	2748308500	50015	2748500300	50669	HNGX090508MH + HNGF090504MT HNGX090504MM + HNGX090504MF

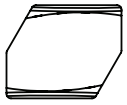
Note: Valenite recommends the use of PT745 antiseize lubricant (EDP# 50050) on insert screw threads and head.



HNGF MF

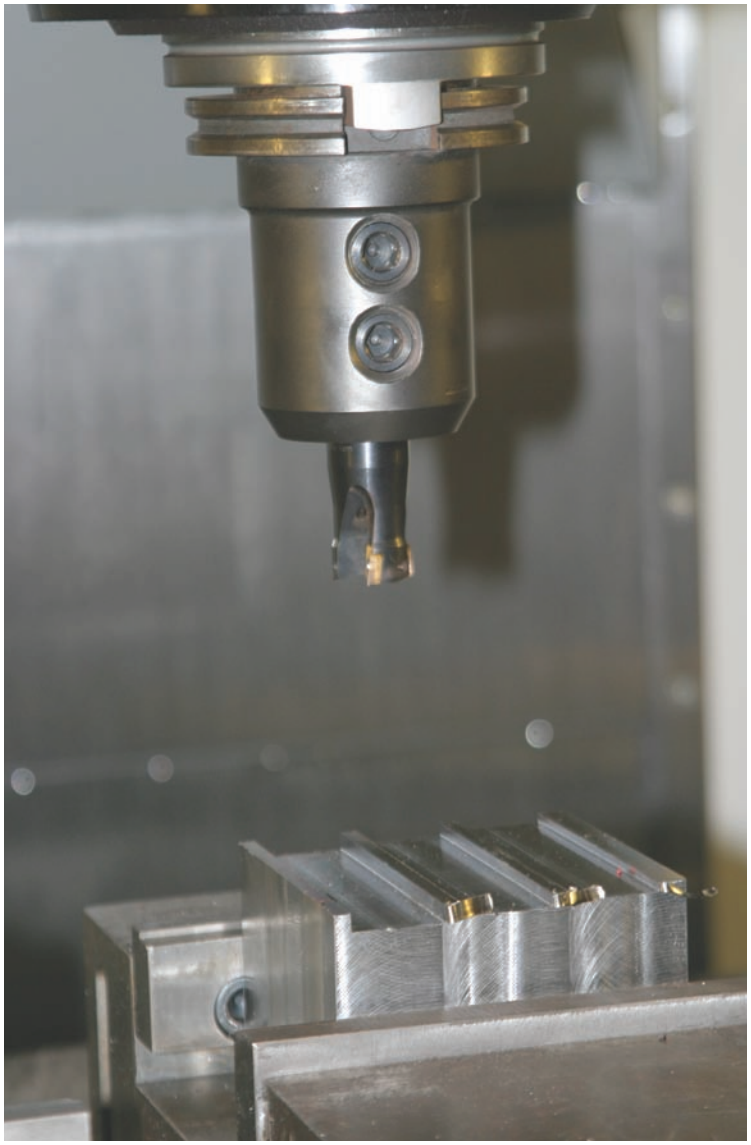


HNGX MM



WXNE

V057 Milling System - 30° Lead Finisher Inserts										
Part Number	Dimensions			Available Grades/EDP #						ISO Number
	Max DOC	Edges	R	VP5142	VP1120	VP1130	VP1020	VPQ130	VPUK20	
HNGF 09 05 04 MF	0.040	12	0.015	-	00140	22815	-	-	-	HNGF 090504-MF
HNGX 09 05 04 MM	0.040	12	0.015	-	00206	22816	-	-	-	HNGX 090504-MM
WXNE 20 05 08	0.040	2R+2L	0.031	-	-	-	24691	-	-	WXNE 200508



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Milling Inserts									
Part Number	PVD Finishing Steels/SS		PVD General Purpose Steels/SS		MT CVD Roughing Steels/SS		PVD Roughing Steels/SS		PVD For Cast Iron
	VP5005	VP5007	VP5020	VP5035	VP5135	VP5142	VP5040	VP5045	VP1020
	EDP#								
ABC 2442								23243	
ABC 2448								23245	
ABCF 2442			23124			22927		23242	
AP 070204 ER-11			19617				19618		
AP 070204 ER-81			19619				19620		
AP 070204 FR-11									
AP 100304 ER-81			14723				14728		
AP 100304 FR-11									
AP 100305 ER-31			17929				17930		
AP 100308 ER-31			14724						
AP 100308 ER-81			14725				14729		
AP 100316 ERC-31			17931				17932		
AP 130404 ER-31			2501				2502		
AP 130408 ER-31			14726				14730		
AP 130408 ER-81			14727		14732		14731		
AP 130408 FR-11									
AP 130412 ER-31			02503		02505		02504		
AP 130412 FR-31									
AP 130412 ER-31									
AP 130412 ER-31									
AP 130416 ER-31			02507				02508		
AP 130416 FR-31									
AP 130424 ERC-31			02511				02512		
AP 130424 FRC-31									
AP 130432 ERC-31			02564				02566		
AP 130432 FRC-31									
AP 130448 ERC-31			02576				02579		
AP 130448 FRC-31									
AP 160604 ER-31			19895				19896		
AP 160604 FR-11									
AP 160608 ER-31			19899				19900		
AP 160608 ER-81			19902		19904		19903		
AP 160608 FR-11									
AP 160612 ER-31			19907				19908		
AP 160612 ER-81			20314		20316		20315		
AP 160612 FR-31									
AP 160616 ER-31			19911				19912		
AP 160616 ER-81			20318		20320		20319		
AP 160616 FR-31									
AP 160620 ER-31			19914						
AP 160624 ER-31			19915				19916		
AP 160632 ERC-31			19918				19919		
AP 160632 FRC-31									
AP 160648 ERC-31			19921				19922		

Milling Inserts									
MT CVD For Cast Irons		Uncoated			Cermet	PCD	pCBN	Silicon Nitride	ISO Number
VP1120	VP1130	VPUK10	VPUK20	VPUP30	VP6020	VPD720	VC722	VPQ130	
EDP#									
									ABCN 2442
									ABCN 2448
									ABCF 2442
									AP 070204 ER-11
									AP 070204 ER-81
			19621						AP 070204 FR-11
									AP 100304 ER-81
			14744						AP 100304 FR-11
									AP 100305 ER-31
19579									AP 100308 ER-31
									AP 100308 ER-81
									AP 100316 ERC-31
									AP 130404 ER-31
19580									AP 130408 ER-31
									AP 130408 ER-81
			14745						AP 130408 FR-11
19581									AP 130412 ER-31
			02506						AP 130412 FR-31
									AP 130412 ER-31
					17940				AP 130412 ER-31
19582									AP 130416 ER-31
			02509						AP 130416 FR-31
									AP 130424 ERC-31
			02561						AP 130424 FRC-31
									AP 130432 ERC-31
			02575						AP 130432 FRC-31
									AP 130448 ERC-31
			02584						AP 130448 FRC-31
19894									AP 160604 ER-31
			19897						AP 160604 FR-11
19898									AP 160608 ER-31
19901									AP 160608 ER-81
			19905						AP 160608 FR-11
19906									AP 160612 ER-31
20313									AP 160612 ER-81
			19909						AP 160612 FR-31
19910									AP 160616 ER-31
20317									AP 160616 ER-81
			19913						AP 160616 FR-31
									AP 160620 ER-31
									AP 160624 ER-31
19917									AP 160632 ERC-31
			19920						AP 160632 FRC-31
									AP 160648 ERC-31

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Milling Inserts									
Part Number	PVD Finishing Steels/SS		PVD General Purpose Steels/SS		MT CVD Roughing Steels/SS		PVD Roughing Steels/SS		PVD For Cast Iron
	VP5005	VP5007	VP5020	VP5035	VP5135	VP5142	VP5040	VP5045	VP1020
	EDP#								
AP 160664 ERC-31			19923				19924		
APET 10 03 05 ER			22885			22887		22886	23702
APET 10 03 08 ER			22889			22890			
APET 160404-HS	23703		23704			22891			
APET 160408-ER	23705		22893			22895		22894	
APET 160408-HS			23707			22897		22896	
APET 160416-ER	23708		22899			22901		22900	
APET 160416-HS			23709			22902		22921	
APET 160424-ER			22904			22906		22905	
APET 160432-ER	23710		22907			22909		22908	
APET 160432-HS						22910			
APET 160448-ER			22911			22912		23246	
APET 160464-ER			22913			22915		22914	
APET 160464-HS						22916			
APET 160448-HS			23711						
APKT 10 03 04 ER			22917						
APKT 10 03 05 ER			22919			22920			
APKT 10 03 16 ER			23125						
APMW 16 04 PDTR							14660		
CDEW 31.52.42RH									
CDEW 322.42L			23126					23247	13723
CDEW 322.42L F									
CDEW 322.42LH									
CDEW 322.42R			23127					23248	23743
CDEW 322.42R F									
CDEW 322.42R H									
CDEW 322.44L								23249	
CDEW 322.44R			23128					23251	
CDEW 322.46R								23252	
CDEW 322.48R			23129						
CDEW 327.531L								23167	
CDEW 327.531R								23169	
CNGA 432									
CPEW 32.52 F									
CPEW 32.52 PDF LF									
CPEW 32.52 PDF RF									
CPEW 32.52 PDFR 4FA									
CPEW 32.52 PDJR									23823
CPEX 32.52 4FA HVA									
CPEX 32.52 HVA F									
ENCC 34L 0745								23170	
ENCC 34R 0745								23171	
ENCC 44R 1045								23172	
ENCC 55R 1545			23130			22928		23173	

Milling Inserts									
MT CVD For Cast Irons		Uncoated			Cermet	PCD	pCBN	Silicon Nitride	ISO Number
VP1120	VP1130	VPUK10	VPUK20	VPUP30	VP6020	VPD720	VC722	VPQ130	
EDP#									
									AP 160664 ERC-31
	22884								APET 100305-ER
19575	22888								APET 100308-ER
									APET 160404-HS
19576	22892								APET 160408-ER
			23706						APET 160408-HS
19577	22898								APET 160416-ER
									APET 160416-HS
	22903								APET 160424-ER
19578									APET 160432-ER
									APET 160432-HS
									APET 160448-ER
									APET 160464-ER
									APET 160464-HS
									APET 160448-HS
									APKT 100304-ER
	22918								APKT 100305-ER
									APKT 100316-ER
									APMW 1604 PDTR
						40013			CDEW 31.52.42RH
22311	22809		23739						CDEW 322.42L
						41102			CDEW 322.42-LF
						41103			CDEW 322.42LH
22312	22810								CDEW 322.42R
						41104			CDEW 322.42-RF
						41105			CDEW 322.42R H
	23163								CDEW 322.44L
	23164		24701						CDEW 322.44R
	23165								CDEW 322.46R
									CDEW 322.48R
	23166								CDEW 327.531L
	23168								CDEW 327.531R
	22811								CNGA 120408
						41109			CPEW 09T308 F
						41110			CPEW 09T308 PDF-LF
						41111			CPEW 09T308 PDF-RF
							40249		CPEW 09T308 PDFR 4FA
									CPEW 09T308 PDJR
							40250		CPEX 09T3084 FAHVA
						41112			CPEX 09T308 HVA F
									ENCC 34L 0745
									ENCC 34R 0745
									ENCC 44R 1045
									ENCC 55R 1545

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Milling Inserts									
Part Number	PVD Finishing Steels/SS		PVD General Purpose Steels/SS		MT CVD Roughing Steels/SS		PVD Roughing Steels/SS		PVD For Cast Iron
	VP5005	VP5007	VP5020	VP5035	VP5135	VP5142	VP5040	VP5045	VP1020
	EDP#								
HNEX 09 05 ZZS7									
HNGF 09 05 04 MF									
HNGF 09 05 04 MT									
HNGX 09 05 04 MM									
HNGX 09 05 08 MH									
HNGX 09 05 16 MR						22619			
HPC 532								23175	
HPC 633									23964
HPE 633								23177	
LNE 32.53 0345			23131			22929		23253	23968
LNE 32.53 0345 T7									
LNE 32.53 0645								23254	
LNE 32.534								23255	23969
LNE 32.534 E									
LNE 32.54 0345									24706
LNE 4.534 0345			23132			22930		23257	
LNE 4.534 0345 T7									
LNE 4.5344									23970
PDHX 09 05 DEFR			22358						
PDKT 09 05 DEER 11			2457						
PDKT 09 05 DEER 41			2458		02460		02459		
PDKT 09 05 DEFR 11									
PDMT 09 05 DESR 81			02499		02500				
PDMX 09 05 ZE ER51			20276				20277		
PDMX 09 05 ZE SR81			20278		20280		20279		
PG10 03 08 N81			17695						
PG13 04 08 N81			17696						
PG16 04 08 N81			17697						
RCGTX 3.42 A								23181	
RCGTX 4.32.5 B								23182	
RCGTX 5.33 B								23183	
RCGTX 6.33 B								23184	
RCGTX 7.33 B								23258	
RCMT 16 06 M0TX								24748	
RCMT 16 06 MO43						3305		23259	
RCMT 16 06 MOTX						56582			
RD 33 NN						22931		23261	
RD 33 NP						22932		23263	
RD 45 NN								23264	
RD 45 NP								23265	
RDEW 43			23133						
RDEW 43 B								23260	
RDEW 43 T00516			23986						

Milling Inserts									
MT CVD For Cast Irons		Uncoated			Cermet	PCD	pCBN	Silicon Nitride	ISO Number
VP1120	VP1130	VPUK10	VPUK20	VPUP30	VP6020	VPD720	VC722	VPQ130	
EDP#									
								41208	HNEX 0905ZZS7
00140	22815								HNGF 090504-MF
00204									HNGF 090504-MT
00206	22816								HNGX 090504-MM
00211	22817		03134						HNGX 090508-MH
00212	22818								HNGX 090516-MR
	23174		23962						HPCN 090408
			23963						HPCN 110412
	23176		23966						HPEN 110412
22305	22819		23967						LNE 32.53 0345
								41263	LNE 32.53 0345T7
	23178								LNE 32.53 0645
22306	23179								LNE 32.534
								41210	LNE 32.534 E
22307									LNE 32.54 0345
22308	23180								LNE 4.534 0345
								41211	LNE 4.534 0345 T7
22309									LNE 4.5344
			22357						PDHX 0905 DEFR
19583									PDKT 0905 DEER-11
19584									PDKT 0905 DEER-41
			02462						PDKT 0905 DEFR-11
19585									PDMT 0905 DESR-81
20275									PDMX 0905 ZE ER-51
									PDMX 0905 ZE SR-81
									PG100308 N81
									PG130408 N81
									PG160408 N81
									RCGTX 3.42 A
									RCGTX 13T300 EN
									RCGTX 5.33 B
									RCGTX 6.33 B
									RCGTX 7.33 B
									RCMT 1606M0TX
									RCMT 1606 MO43
			03303						RCMT 1606 MOTX
									RD 090400 NN
									RD 090400 NP
									RD 120700 NN
									RD 120700 NP
									RDEW 1204
									RDEW 1204 B
									RDEW 1204 T00516

Product Offering

ValMILL®

Milling Inserts									
Part Number	PVD Finishing Steels/SS		PVD General Purpose Steels/SS		MT CVD Roughing Steels/SS		PVD Roughing Steels/SS		PVD For Cast Iron
	VP5005	VP5007	VP5020	VP5035	VP5135	VP5142	VP5040	VP5045	VP1020
	EDP#								
RDHW 07 T1 MOEN91			17834				17835		
RDHW 08 T2 MOEN91			17699				17700		
RDHW 10 03 MOENF691			17701				17702		
RDHW 12 T3 MOENF691			17936				17937		
RDMT 07 T1 MO SN 61							14705		
RDMT 08 T2 MO SN 61					14707		14706		
RDMT 10 03 MOSNF661					14709		14708		
RDMT 12 04 MOTX						19752			
RDMT 12 T3 MO SNF661					14711		14710		
RDMT 16 04 MO SNF661					14714		14713		
RDMT 16 05 MOTX						03333			
RDMW 16 04 MOSNF6					14715				
RGA 038 A		00629		00770					
RGA 038 T08		00771							
RGA 038 T16		00631							
RGA 038B		02654							
RGA 050 A		00772		00649					
RGA 050 T08		01212							
RGA 050 T16		00651							
RGA 050B		02655							
RGA 062 A		00879		00653					
RGA 062B		02656							
RGA 075 A		00886		00655					
RGA 075 T08		00893							
RGA 075 T16		00657							
RGA 075B		02657							
RGA 100 A		00896		00658					
RGA 100 T16		00660							
RGA 100B		02658							
RGA 125 A		00897		00662					
RGA 125B		02659							
RNM 64 SS								23266	
RNMC 5.24 SS			23134					23185	
SD 322 D						22784		22783	
SD 322 D 3P						22786		22785	
SD 322 P			22787			22808		22807	24036
SD 322 P 3P						22792		22791	
SD 322 P CM			22789			22790			24037
SD 322 P F									
SD 333 NN								23269	
SD 333 NP						22794		22793	
SD 422 P			24042			22797		22796	
SD 422 P 3P						22801		22800	
SD 422 P CM			24044			22799			24043

Milling Inserts									
MT CVD For Cast Irons		Uncoated			Cermet	PCD	pCBN	Silicon Nitride	ISO Number
VP1120	VP1130	VPUK10	VPUK20	VPUP30	VP6020	VPD720	VC722	VPQ130	
EDP#									
19586									RDHW 07 T1 MOEN-91
19587									RDHW 08 T2 MOEN-91
19588									RDHW 1003MOENF6-91
19589									RDHW 12 T3 MOENF6-91
									RDMT 07 T1 MO SN-61
									RDMT 08 T2 MO SN-61
									RDMT 1003MOSNF6-61
	22820								RDMT 1204 MO-TX
									RDMT 12 T3 MOSNF6-61
									RDMT 1604 MOSNF6-61
									RDMT 1605 MO-TX
19590									RDMW 1604 MOSNF6
									RGA 038 A
									RGA 038 T08
									RGA 038 T16
									RGA 038B
									RGA 050 A
									RGA 050 T08
									RGA 050 T16
									RGA 050B
									RGA 062 A
									RGA 06-2B
									RGA 075 A
									RGA 075 T08
									RGA 075 T16
									RGA 075B
									RGA 100 A
									RGA 100 T16
									RGA 100B
									RGA 125 A
									RGA 125B
									RNMN 1906 SS
19591	22821			24005					RNMC 5.24 SS
			24031						SD 090308 D
									SD 090308 D-3P
			24032	24033					SD 090308 P
									SD 090308 P-3P
	22788								SD 090308 P-CM
						40999			SD 090308 P F
									SD 333 NN
			24038						SD 333 NP
19596	22795		24037	24040					SD 120308 P
									SD 120308 P-3P
	22798								SD 120308 P-CM

Product Offering

ValMILL®

Milling Inserts									
Part Number	PVD Finishing Steels/SS		PVD General Purpose Steels/SS		MT CVD Roughing Steels/SS		PVD Roughing Steels/SS		PVD For Cast Iron
	VP5005	VP5007	VP5020	VP5035	VP5135	VP5142	VP5040	VP5045	VP1020
	EDP#								
SD 422 P F									
SD 422 P H									
SD 532 P			22802					22803	
SD 532 P 3P								22806	
SD 532 P CM						22805			24047
SD SEE 42 A7A T00420			23135			22968		23267	
SD SEE 42 AR7 F									
SDMT 1506 PD R-ML						3523			
SDMT 1506 PDR-MH						3346			
SDMT 150608 EN21			14716		14718		14717		
SDMT 150608 SN-81			14719		14721		14720		
SEC 322 F									
SEC 322 H									
SEC 322 J									
SEC 421 F									
SEC 422									24052
SEC 422 F									
SEC 422 H									
SEC 422 J									
SEC 423 F									
SEC 424 H									
SEC 424 J									
SEC 632 F									
SEC 633 F									
SEC 633 J									
SECW 2.51.51						22934		23271	
SECW 21.21						22933		23270	
SEER 42 AFER			23136			22935		23186	24062
SEER 43 AFER			23137			22936			
SEET 42 AFER			23138			22937		23272	24063
SEET 43 AFER			23139			22938		23273	24064
SEET 53 AFER						22939			
SEEW 42 A7A T00420			23140			22940		23187	
SEEW 42 A7J									24066
SEEW 43 AEJR F									
SEEW 43 AESN						22941		23188	
SEEW 43 AFFN F									
SEEW 43 AFFN H									
SEEW 43 AFFN									24068
SEEW 43 AFSN			23141			22942			
SEEW 43 AFTN			24070						
SEG 322 J									
SEHN 42 AFEN	24072								
SEHN 42 AFFN	24074								24073

Milling Inserts									
MT CVD For Cast Irons		Uncoated			Cermet	PCD	pCBN	Silicon Nitride	ISO Number
VP1120	VP1130	VPUK10	VPUK20	VPUP30	VP6020	VPD720	VC722	VPQ130	
EDP#									
						41000			SD 120308 PF
						41001			SD 120308 PH
			24045	24046					SD 150408 P
									SD 150408 P-3P
	22804								SD 150408 P-CM
									SD SEE 1203A7AT00420
						40998			SD SEE 1203 AR7 F
19593	22823								SDMT 1506 PD R-ML
19592	22822								SDMT 1506 PDR-MH
19594									SDMT 150608 EN21
19595									SDMT 150608 SN-81
						41002			SECN 090308 F
						41003			SECN 090308 H
		24050	24051						SEHN 090308 J
						41004			SECN 120304 F
									SECN 120308
						41005			SECN 120308 F
						41006			SECN 120308 H
		24053	24054						SEHN 120308 J
						41007			SECN 120312 F
						41008			SECN 120316 H
		24055	24056	24057					SEHN 120316 J
						41009			SECN 190408 F
						41010			SECN 190412 F
		24060	24061						SEHN 190412 J
									SECW 070204
									SECW 06T204
19597	22824								SEER 1203 AFER
19598									SEER 1204 AF-ER
	22825								SEET 1203 AFER
	22826								SEET 1204 AF-ER
	22827								SEET 1504 AF-ER
									SEEW 1203 A7A T00420
			24065						SEEW 1203 A7J
						41011			SEEW 1204 AEJR F
									SEEW 1204 AESN
						41012			SEEW 1204 AFFN F
						41013			SEEW 1204 AFFN H
									SEEW 1204 AFFN
									SEEW 1204 AFSN
									SEEW 1204 AFTN
		24707							SEGN 090308 J
19599									SEHN 1203 AFEN
									SEHN 1203 AFFN

Product Offering

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Milling Inserts									
Part Number	PVD Finishing Steels/SS		PVD General Purpose Steels/SS		MT CVD Roughing Steels/SS		PVD Roughing Steels/SS		PVD For Cast Iron
	VP5005	VP5007	VP5020	VP5035	VP5135	VP5142	VP5040	VP5045	VP1020
	EDP#								
SEHN 42 AFSN			23142			22943		23275	
SEHN 42 AFTN			24075			22944			
SEHN 43 AFEN	24076								
SEHN 43 AFFN									24077
SEHN 43 AFSN			23143			22945		23276	
SEHN 43 AFTN			24078						
SEHN 53 AFSN			23144						
SEHN 53 AFTN			24079						
SFE 42E 10F									
SFE 42E 10J									
SFE 42E 4									24081
SFE 42E 4J									
SFE 42H 4J									
SFE 63E 13F									
SFE 63E 13J									
SFE 63E J									
SFE 63H J									
SNC 43A T7									
SNC 43L								23189	24777
SNCX 11 03 2C								23587	
SNCX 11 T3 2C								23586	
SNCX 12 05 2C								23588	
SNE 533 T6									
SNE 63A T7									
SNE 63K T7									
SNEA 322								23589	
SNEA 322 4F									
SNEA 322 4FA									
SNEA 432								23590	
SNEA 433 4FA									
SNEA 543								23591	
SNEF 12 04 08 EL QC									24097
SNEF 12 04 08 ER QC									24708
SNEX 15 T612 ER QC									24709
SNF 63D								23278	
SNF 63K								23279	
SNG 432								23280	
SNG 433								23281	
SNG 633			22922						
SNG 634								23282	
SNG 643			23592						
SNGN 453 ZDT7									
SNGN 454 ZDT7									
SNKT 15 05 AZR 31						04569			

Milling Inserts									
MT CVD For Cast Irons		Uncoated			Cermet	PCD	pCBN	Silicon Nitride	ISO Number
VP1120	VP1130	VPUK10	VPUK20	VPUP30	VP6020	VPD720	VC722	VPQ130	
EDP#									
									SEHN 1203 AFSN
									SEHN 1203 AFTN
									SEHN 1204 AFEN
									SEHN 1204 AFFN
19600									SEHN 1204 AFSN
								41215	SEHN 1204 AFTN
									SEHN 1504 AFSN
									SEHN 1504 AFTN
						41264			SFEN 1203E 10F
		24080							SFEN 1203E 10J
									SFEN 1203E 4
		24082							SFEN 1203E 4J
		24083							SFEN 1203H 4J
						41266			SFEN 1904 E 13F
		24086							SFEN 1904 E 13J
		24084	24085						SFEN 1904 EJ
		24087							SFEN 1904 HJ
								41216	SNCN 1204 A T7
	22828								SNCN 1204 L
									SNCX 1103 2C
			24092						SNCX 11T3 2C
									SNCX 1205 2C
								41217	SNEN 150412 T6
								41218	SNEN 1904 A T7
								41219	SNEN 1904 K T7
			24093	24094					SNEA 090308
							40268		SNEA 090308 4F
							40319		SNEA 090308 4FA
			24095						SNEA 120408
							40270		SNEA 120412 4FA
			24096						SNEA 150612
19601	22829								SNEF 120408 EL-QC
19602	22830								SNEF 120408 ER-QC
19603	22831								SNEX 15T612 ER-QC
									SNFN 1904 D
									SNFN 1904 K
			24104	24105					SNGN 120408
	22832								SNGN 120412
									SNGN 190412
									SNGN 190416
									SNGN 190612
								41261	SNGN 120712 ZDT7
								41262	SNGN 120716 ZDT7
19604	22833								SNKT 1505 AZR-31

Product Offering

ValMILL®

Milling Inserts									
Part Number	PVD Finishing Steels/SS		PVD General Purpose Steels/SS		MT CVD Roughing Steels/SS		PVD Roughing Steels/SS		PVD For Cast Iron
	VP5005	VP5007	VP5020	VP5035	VP5135	VP5142	VP5040	VP5045	VP1020
	EDP#								
SNKT 43.521									
SNKT 43.521						03529			24106
SNKT 43.531						03538		23190	
SNM 63SS 1								23283	
SNM 63SS 2								23284	
SNM 64SS 1								23285	
SNM 64SS 2								23286	
SNMC 542 H								23191	
SNMT 43.531						03547			
SNPC 63D								23192	
SNPE 63D						22946		23193	
SNPE 63G								23194	
SPC 422								23288	
SPC 424								23289	
SPC 42A								23287	
SPC 42E								23195	
SPC 533								23196	
SPC 534								23197	
SPC 633								23198	
SPE 322								23203	
SPE 322 1H			23150					23204	
SPE 422								23294	24710
SPE 422 1H			23151			22949		23295	
SPE 424									24165
SPE 424								23296	
SPE 42E								23205	
SPE 42EBT								23206	
SPE 432									
SPE 433								23297	
SPE 433 1H						22950		23207	
SPE 434								23298	
SPE 434 E									
SPE 533						22951		23209	
SPE 533 1H						22952		23210	
SPE 534								23211	
SPE 634								23215	
SPE 634 1H								23216	
SPE 634 E									
SPE 63A T7									
SPE 63E								23212	
SPE 63L								23213	
SPET 432 MM			23145						
SPEW 32.5 A017A 1H			23146			22947		23199	24158
SPEW 32.5 A017B 1H			23147					23200	

Milling Inserts									
MT CVD For Cast Irons		Uncoated			Cermet	PCD	pCBN	Silicon Nitride	ISO Number
VP1120	VP1130	VPUK10	VPUK20	VPUP30	VP6020	VPD720	VC722	VPQ130	
EDP#									
					17941				SNKT 1205 AZR 21
19605	22834								SNKT 1205 AZR 21
19606	22835		3534						SNKT 1205 AZR-31
									SNMN 1904 SS 1
									SNMN 1904 SS 2
			24135	24136					SNMN 1906 SS 1
			24137	24138					SNMN 1906 SS 2
									SNMC 150608 H
19607	22836								SNMT 1205AZR-31
									SNPC 1904 D
									SNPE 1904 D
									SNPE 1904 G
				24152					SPCN 120308
									SPCN 120316
			24150						SPCN 1203 A
			24151						SPCN 1203 E
									SPCN 150412
									SPCN 150416
									SPCN 190412
									SPEN 090308
									SPEN 090308 1H
			24163						SPEN 120308
									SPEN 120308 1H
									SPEN 120316
									SPEN 120316
	22838								SPEN 1203 E
									SPEN 1203 EBT
	22839								SPEN 120408
	22840		24167						SPEN 120412
22310									SPEN 120412 1H
			24711						SPEN 120416
								41240	SPEN 120416 E
			24168						SPEN 150412
									SPEN 150412 1H
			24169						SPEN 150416
									SPEN 190416
	24712								SPEN 190416 1H
								41242	SPEN 190416 E
								41241	SPEN 1904 AT7
									SPEN 1904 E
									SPEN 1904 L
									SPET 120408-MM
	22837								SPEW 09T3 A017A 1H
									SPEW 09T3 A017B 1H

Product Offering

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Milling Inserts									
Part Number	PVD Finishing Steels/SS		PVD General Purpose Steels/SS		MT CVD Roughing Steels/SS		PVD Roughing Steels/SS		PVD For Cast Iron
	VP5005	VP5007	VP5020	VP5035	VP5135	VP5142	VP5040	VP5045	VP1020
	EDP#								
SPEW 32.51 F									
SPEW 32.52 F									
SPEW 32.52 H									
SPEW 32.52-RF									
SPEW 32.52-RH									
SPEW 43 EDFR						22948		23292	
SPEW 43 EDJR F									
SPEW 43 EDTR			24160						
SPEW 432 F									
SPEW 433 F									
SPEW 434								23293	
SPEW 434 H									
SPEW 43A 022A 1H			23148					23290	
SPEW 43A 022B 1H			23149					23291	
SPEWX 43 EDFR									24157
SPEX 221 1H								23201	
SPG 322			23593					23218	24177
SPG 322 H									
SPG 421 F									
SPG 422									
SPG 422			23152			22953		23299	
SPG 422 H									
SPG 422 T00720			23153						
SPG 422 T7									
SPG 424			23154			22954		23300	
SPG 424 T7									
SPG 432 T7									
SPG 433			23155					23301	
SPG 433 A			24189						
SPG 433 T7									
SPG 434 E									
SPG 434 T7									
SPG 633			23156			22955		23302	
SPG 633 T00720			23157						
SPG 634								23303	04429
SPG 634 BT						22956		23219	
SPG 634 E									
SPG 634 T7									
SPG 638 A								23221	
SPKN 12 03 EDER			23158					23222	
SPKN 12 03 EDSR						22957		23224	
SPKN 15 04 EDSR								23225	
SPMW 2.522								23304	24203
SPMW 32.51								23305	

Milling Inserts									
MT CVD For Cast Irons		Uncoated			Cermet	PCD	pCBN	Silicon Nitride	ISO Number
VP1120	VP1130	VPUK10	VPUK20	VPUP30	VP6020	VPD720	VC722	VPQ130	
EDP#									
						41020			SPEW 09T304 F
						41021			SPEW 09T308 F
						41022			SPEW 09T308 H
						41272			SPEW 09T308-RF
						41273			SPEW 09T308-RH
			24159						SPEW 1204 EDFR
						06465			SPEW 1204 EDJR F
									SPEW 1204 ED TR
						41023			SPEW 120408 F
						41024			SPEW 120412 F
			24161	24162					SPEW 120416
						41025			SPEW 120416 H
									SPEW 1204 A 022A 1H
									SPEW 1204 A 022B 1H
									SPEWX 1204 ED FR
									SPEX 060304 1H
	22841	24175	24176						SPGN 090308
						41029			SPGN 090308 H
						41031			SPGN 120304 F
		24181							SPGN 120308
	22842		24182	24183					SPGN 120308
						41033			SPGN 120308 H
									SPGN 120308 T00720
								41243	SPGN 120308 T7
	22843		24186	24187					SPGN 120316
								41244	SPGN 120316 T7
								41245	SPGN 120408 T7
			24188						SPGN 120412
									SPGN 120412 A
								41246	SPGN 120412 T7
								41247	SPGN 120416 E
								41248	SPGN 120416 T7
			24193	24194					SPGN 190412
									SPGN 190412 T00720
			24195						SPGN 190416
									SPGN 190416 BT
								41249	SPGN 190416 E
								41250	SPGN 190416 T7
									SPGN 190432 A
			24197						SPKN 1203 EDER
									SPKN 1203 EDSR
									SPKN 1504 EDSR
			24202						SPMW 070308
	22844								SPMW 09T304

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Milling Inserts									
Part Number	PVD Finishing Steels/SS		PVD General Purpose Steels/SS		MT CVD Roughing Steels/SS		PVD Roughing Steels/SS		PVD For Cast Iron
	VP5005	VP5007	VP5020	VP5035	VP5135	VP5142	VP5040	VP5045	VP1020
	EDP#								
SPMW 32.52			23159			22958		23306	
SPMW 32.52 4F									
SPMW 32.52 4FA									
SPMW 32.52 FX									
SPMW 432	24211		23160			22959		23227	
SPU 422			23161						
SPU 432			23162						
TEGA 4.53 015 P1 SF									
TEGA 4.53.015 PTA 1S								23228	
TEGA 4.53.031 PTA 1S								23230	
TEGX BNI 264 312								23231	
TEGX BNI 291 375								23233	
TEGX BNI 296 500								23234	
TEGX BNI 356 625						22960		23235	
TEGX BNI 422 750								23307	
TEGX BNI 427 1000								23308	
TGEB 3.52 NGM L094								23595	
TGEB 3.52 NGM L125								23596	
TGGX BNI 723 1000			24262					23236	
TNEA 222 4F									
TNEA 322 4F									
TNEA 332 4F									
TNEA 432 4F									
TNGA 2.522 .150								23309	
TPEW 332 PDFR									24400
TPEW 332 PDJRF									
TPEW 332 PDTR			24402			22961		23237	
TPG 322			22923						
TPG 432			22924						
TPG 433			22925						
TPGT 1.81.51 P2S								22969	
TPGT 2.52.52 P2S								22971	
TPGT 22.025 P2S								22970	
TPKN 16 03 PDER								23239	
TPKN 16 03 PDSR								23240	
TPKN 22 04 PDSR						22962		23241	
TPU 322								23310	
TPU 432								23311	
W SNEF 12 04 08 EL									
W SNEF 12 04 08 ER									24688
W XNE 20 05 08									24691
WC SNE 12 04 12									24719
WC SPEW 436			01195						24664
WC XNE 20 05 08									24668

Milling Inserts									
MT CVD For Cast Irons		Uncoated			Cermet	PCD	pCBN	Silicon Nitride	ISO Number
VP1120	VP1130	VPUK10	VPUK20	VPUP30	VP6020	VPD720	VC722	VPQ130	
EDP#									
	23594								SPMW 09T308
							40279		SPMW 09T308 4F
							40012		SPMW 09T308 4FA
						41267			SPMW 09T308 FX
	22845								SPMW 120408
				24214					SPUN 120308
									SPUN 120408
						41274			TEGA 453015P1 SF
									TEGA 4.53.015 PTA 1S
									TEGA 4.53.031 PTA 1S
									TEGX BNI 264 312
									TEGX BNI 291 375
									TEGX BNI 296 500
									TEGX BNI 356 625
									TEGX BNI 220308750
									TEGX BNI 427 1000
									TGEB 3.52 NGM L094
									TGEB 3.52 NGM L125
									TGGX BNI 723 1000
							40282		TNEA 110308 4F
							40283		TNEA 160308 4F
							40284		TNEA 160408 4F
							40285		TNEA 220408 4F
			24280	24717					TNGA 130308 .150
			24399						TPEW 160408 PDFR
						41052			TPEW 160408 PDJRF
									TPEW 160408 PDTR
		24451	24452	24454					TPGN 160308
	23597		24467	24468					TPGN 220408
			24472	24473					TPGN 220412
									TPGT 090204-P2S
									TPGT 2.52.52 P2S
									TPGT 22.025 P2S
									TPKN 1603 PDER
				24480					TPKN 1603 PDSR
									TPKN 2204 PDSR
			24506	24507					TPUN 160308
				24508					TPUN 220408
20322	22873								WSNEF 120408 EL
20323	22874								WSNEF 120408-ER
									WXNE 200508
20321	22872								WCSNE 120412
									WC SPEW 120424
									WC XNE 200508

Product Offering

ValMILL®

Milling Inserts									
Part Number	PVD Finishing Steels/SS		PVD General Purpose Steels/SS		MT CVD Roughing Steels/SS		PVD Roughing Steels/SS		PVD For Cast Iron
	VP5005	VP5007	VP5020	VP5035	VP5135	VP5142	VP5040	VP5045	VP1020
	EDP#								
XDHT 09 03 04						03571			
XDHT 09 03 08						03576			
XDHT 09 03 12									
XPHT 16 04 04						03588			
XPHT 16 04 04AL									
XPHT 16 04 08						03592		23312	
XPHT 16 04 08 AL									00054
XPHT 16 04 08 FR									
XPHT 16 04 12						03693		23313	
XPHT 16 04 12 AL									
XPHT 16 04 12 L						22963			
XPHT 16 04 16						04443			
XPHT 16 04 16 AL									
XPHT 16 04 16 L						22964			
XPHT 16 04 16 LAL									
XPHT 16 04 20						22965			
XPHT 16 04 25 AL									
XPHT 16 04 32						22966			
XPHT 16 04 32 AL									
XPHT 16 04 40								22926	
XPNT 16 04 12						04512			
YPA 050 31	02844						02447		
YPA 062 31	02854						02448		
YPA 062 71							14661		
YPA 075 31	02931						02449		
YPA 075 71							14662		
YPA 100 31	02951						02451		
YPA 100 71							14663		
YPA 125 31	02952						02452		
YPA 125 71							14664		
YPA 150 31	02976						02453		
YPA 150 71							14665		
YPA 200 31	03128						02454		
YPA 200 71							14666		

ValMILL®

Product Offering

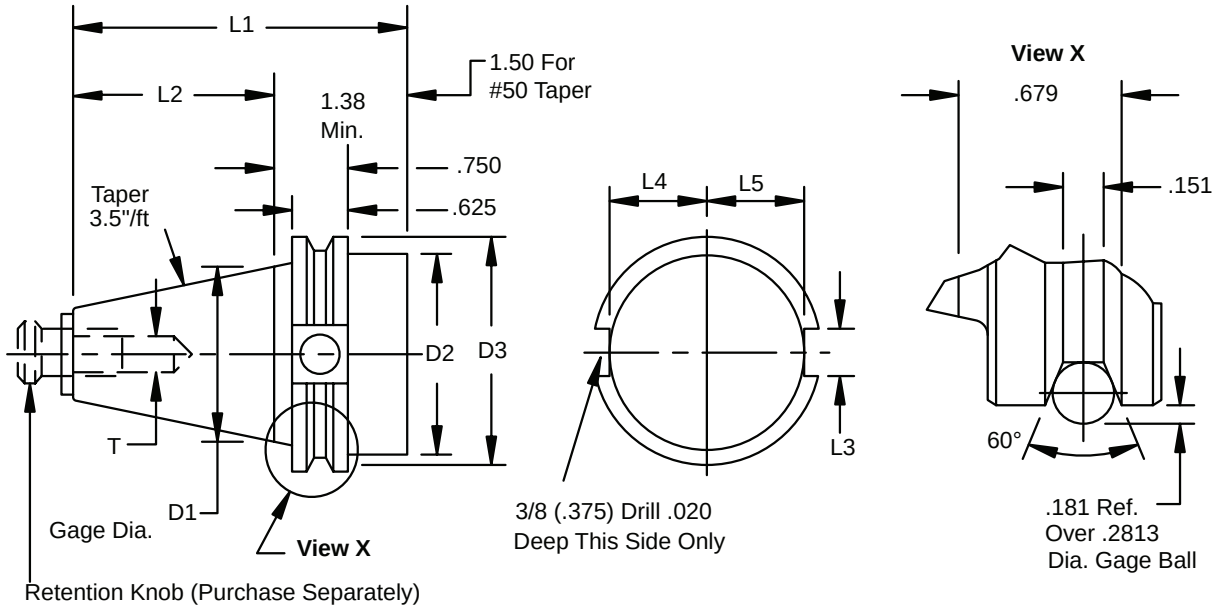
Milling Inserts									
MT CVD For Cast Irons		Uncoated			Cermet	PCD	pCBN	Silicon Nitride	ISO Number
VP1120	VP1130	VPUK10	VPUK20	VPUP30	VP6020	VPD720	VC722	VPQ130	
EDP#									
19608	22875		17682						XDHT 090304
19609	22876		03574						XDHT 090308
19610									XDHT 090312
19611	22877								XPHT 160404
			19886						XPHT 160404-AL
19612	22878								XPHT 160408
			03597						XPHT 160408-AL
19613									XPHT 160408-FR
19614	22879		03687						XPHT 160412
			03704						XPHT 160412-AL
			04435						XPHT 160412 L
19615	22880								XPHT 160416
			04465						XPHT 160416-AL
			17871						XPHT 160416 L
			17872						XPHT 160416 L-AL
									XPHT 160420
			04483						XPHT 160425-AL
									XPHT 160432
			17683						XPHT 160432-AL
									XPHT 160440
19616	22881								XPNT 160412
									YPA 050-31
									YPA 062-31
									YPA 062-71
									YPA 075-31
									YPA 075-71
									YPA 100-31
									YPA 100-71
									YPA 125-31
									YPA 125-71
									YPA 150-31
									YPA 150-71
									YPA 200-31
									YPA 200-71

Table of Contents

ValMILL®

CAT "V" Taper Shank Adapters

Shank Dimensional Information

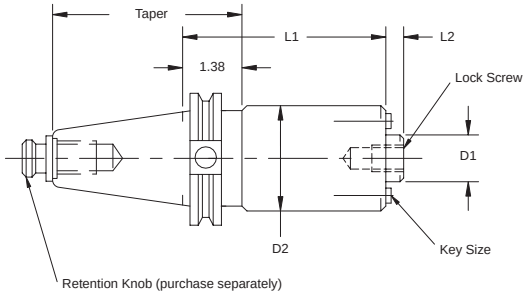


Taper	Dimensions								Thread
	D1	D2	D3	L1	L2	L3	L4	L5	
V40CT	1.750	1.750	2.500	4.062	2.687	0.638	0.985	0.890	5/8-11
V50CT	2.750	2.750	3.875	5.375	4.000	1.016	1.485	1.390	1-8

CAT "V" Taper Shank Adapters

ValMILL®

Shell Mill Adapters
CAT40 and CAT50



ANSI Part Number	ISO Part Number	Taper	D1	D2	L1	L2	Key Size	Wt. (lbs.)	EDP#
V40CTS75150	AA305-40 19 038	40	0.75	1.75	1.50	0.68	0.31	2.9	65799
V40CTS75400	AA305-40 19 101	40	0.75	1.75	4.00	0.68	0.31	4	57022
V40CTS100200	AA305-40 25 051	40	1.00	2.25	2.00	0.68	0.38	3.2	00854
V40CTS100400	AA305-40 25 101	40	1.00	2.25	4.00	0.68	0.38	4.2	57017
V40CTS125225	AA305-40 32 057	40	1.20	2.75	2.25	0.68	0.50	4.2	00855
V40CTS150240	AA305-40 38 061	40	1.50	3.75	2.40	0.94	0.62	7	00105
V50CTS75150	AA305-50 19 038	50	0.75	1.75	1.50	0.68	0.31	7.3	65841
V50CTS75350	AA305-50 19 089	50	0.75	1.75	3.50	0.68	0.31	8.2	00882
V50CTS75550	AA305-50 19 140	50	0.75	1.75	5.50	0.68	0.31	11	00888
V50CTS100200	AA305-50 25 051	50	1.00	2.25	2.00	0.68	0.38	7.9	00867
V50CTS100400	AA305-50 25 101	50	1.00	2.25	4.00	0.68	0.38	11.2	00874
V50CTS125150	AA305-50 32 038	50	1.25	2.75	1.50	0.68	0.50	9.3	65837
V50CTS125350	AA305-50 32 089	50	1.25	2.75	3.50	0.68	0.50	12	57036
V50CTS125550	AA305-50 32 150	50	1.25	2.75	5.50	0.68	0.50	14.1	65838
V50CTS125775	AA305-50 32 197	50	1.25	2.75	7.75	0.68	0.50	17.4	57038
V50CTS150240	AA305-50 38 061	50	1.50	3.75	2.40	0.94	0.62	10.8	00875
V50CTS150400	AA305-50 38 101	50	1.50	3.75	4.00	0.94	0.62	15	00880
V50CTS150600	AA305-50 38 152	50	1.50	3.75	6.00	0.94	0.62	21.6	65839
V50CTS150775	AA305-50 38 197	50	1.50	3.75	7.75	0.94	0.62	29.1	57043
V50CTS200240	AA305-50 51 061	50	2.00	4.88	2.40	0.94	0.75	13.9	65840
V50CTS250240	AA305-50 63 061	50	2.50	4.88	2.40	0.11	1.00	13.9	00881

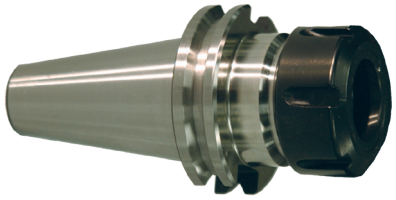
Spare Parts							
Pilot Dia. (D1)	Lock Screw	Description	EDP#	Torque ft.-lbs.		Drive Key	EDP#
.75”	3212 030-606	3/8”-24 SHCS	50162	45		5631 062-01	55851
* 1.00”	3212 030-707	1/2”-20 SHCS	55774	110		5631 062-02	55852
* 1.25”	3212 030-757	5/8” 18 SHCS	55775	208		5631 062-03	55868
1.50”	5512 065-10	3/4”-16 Universal Screw	55776	208		5631 062-04	55869
2.00”	5512 065-11	1”-14 Universal Screw	55777	366		5631 062-05	55870
2.50”	5512 065-11	1”-14 Universal Screw	55777	366		5631 062-06	55871

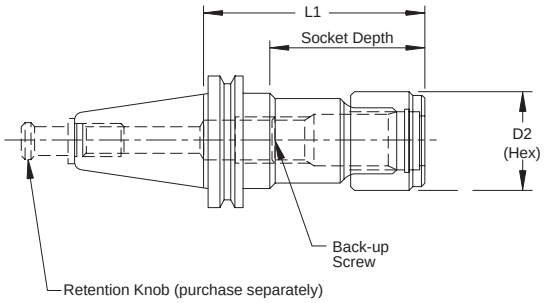
* Both a socket head cap screw (SHCS) and universal screw are provided with the adapter

ValMILL®

CAT "V" Taper Shank Adapters

Collet Chuck Adapters
CAT40 and CAT50





ANSI Part Number	ISO Part Number	Taper	Collet Series	D2	L1	Max. Socket Depth	Wt. lbs.	Torque ft.-lbs.	EDP#
V40CTSAC16262*	AA3B14-40 16 067	40	ER 16 .020-.393	1.11	2.62	2.55	1.7	52	65790
V40CTSAC16312	AA314-40 16 079	40	ER 16 .020-.393	1.11	3.12	2.12	1.7	52	65791
V40CTSAC16412*	AA3B14-40 16 105	40	ER 16 .020-.393	1.11	4.12	2.12	2.0	52	65794
V40CTSAC16512	AA314-40 16 130	40	ER 16 .020-.393	1.11	5.12	2.12	2.5	52	00848
V40CTSAC20312	AA314-40 20 079	40	ER 20 .093-.511	1.34	3.12	3.00	2.5	74	00849
V40CTSAC20412*	AA3B14-40 20 105	40	ER 20 .093-.511	1.34	4.12	4.00	2.9	74	01163
V40CTSAC20612*	AA3B14-40 20 156	40	ER 20 .093-.511	1.34	6.12	4.00	2.9	74	01173
V40CTSAC25262	AA314-40 25 067	40	ER 25 .093-.630	1.67	2.62	2.50	3.3	95	65795
V40CTSAC25412*	AA3B14-40 25 105	40	ER 25 .093-.630	1.67	4.12	4.00	3.3	95	01176
V40CTSAC25612*	AA3B14-40 25 156	40	ER 25 .093-.630	1.67	6.12	4.00	3.3	95	01193
V40CTSAC32248	AA314-40 32 063	40	ER 32 .078-.787	1.97	2.48	4.00	2.0	125	65796
V40CTSAC32312*	AA3B14-40 32 079	40	ER 32 .078-.787	1.97	3.12	4.00	2.0	125	01388
V40CTSAC32412*	AA3B14-40 32 105	40	ER 32 .078-.787	1.97	4.12	4.00	2.5	125	01399
V40CTSAC32612	AA314-40 32 156	40	ER 32 .078-.787	1.97	6.12	4.00	3.5	125	00851
V50CTSAC16412*	AA3B14-50 16 105	50	ER 16 .020-.393	1.11	4.12	2.62	7.9	52	65834
V50CTSAC20412*	AA3B14-50 20 105	50	ER 20 .093-.511	1.34	4.12	4.00	7.9	74	06935
V50CTSAC25412*	AA3B14-50 25 105	50	ER 25 .093-.630	1.67	4.12	4.00	7.9	95	07979
V50CTSAC32412*	AA3B14-50 32 105	50	ER 32 .078-.787	1.97	4.12	4.00	7.9	125	65835
V50CTSAC32812	AA314-50 32 206	50	ER 32 .078-.787	1.97	8.12	4.00	10.0	125	65836

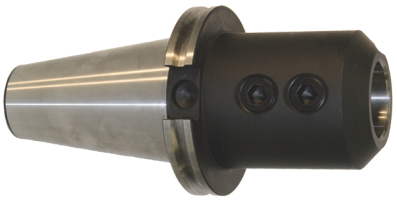
* Adapter has flange coolant capability by removing coolant plugs

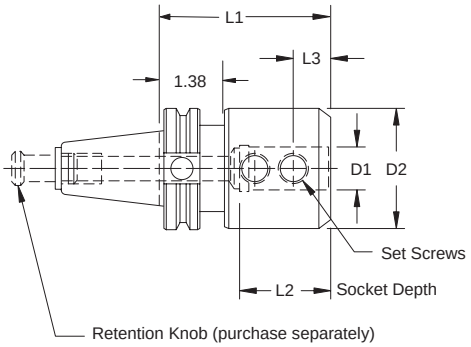
Spare Parts						
Collet Series	Collet Nut	EDP#	Collet Wrench	EDP#	Back-up Screw	EDP#
ER16	5533 050-06	55850	PT638	55460	5514 044-01	55824
ER20	5533 050-01	55846	PT1177	62674	5514 018-01	55778
ER25	5533 050-02	55847	PT1121	62673	5514 018-03	55780
ER32	5533 050-03	55848	PT639	55461	5514 018-04	55814

CAT "V" Taper Shank Adapters

ValMILL®

End Mill Adapters
CAT40





ANSI Part Number	ISO Part Number	Taper	D1	D2	L1	L2	L3	Approx. Wt. (lbs.)	EDP#
V40CTE12175	AA320-40 03 044	40	0.125	0.69	1.75	3.00	0.19	2.7	00035
V40CTE12250	AA320-40 03 063	40	0.125	0.69	2.50	3.80	0.19	2.7	56935
V40CTE18250	AA320-40 05 063	40	0.188	0.69	2.50	3.80	0.44	2.8	65773
V40CTE25175	AA320-40 06 044	40	0.250	0.88	1.75	3.00	0.44	2.5	56754
V40CTE25250	AA320-40 06 063	40	0.250	0.88	2.50	3.80	0.44	2.8	00846
V40CTE31250	AA320-40 08 063	40	0.312	1.00	2.50	3.80	0.44	3.0	65774
V40CTE37175	AA320-40 09 044	40	0.375	1.00	1.75	3.00	0.75	2.7	56758
V40CTE37250	AA320-40 09 063	40	0.375	1.00	2.50	3.80	0.75	2.7	00096
V40CTE37450	AA320-40 09 114	40	0.375	1.00	4.50	3.80	0.75	3.8	65776
V40CTE43262	AA320-40 11 067	40	0.438	1.25	2.62	3.80	0.75	2.7	56948
V40CTE50175	AA320-40 13 044	40	0.500	1.25	1.75	3.00	0.88	1.4	56950
V40CTE50262	AA320-40 13 067	40	0.500	1.25	2.62	3.80	0.88	2.7	00099
V40CTE50462	AA320-40 13 117	40	0.500	1.25	4.62	3.80	0.88	3.8	65777
V40CTE56262	AA320-40 14 067	40	0.563	1.25	2.62	2.05	0.88	3.0	56954
V40CTE62175	AA320-40 16 044	40	0.625	1.50	1.75	2.24	0.94	2.0	56956
V40CTE62275	AA320-40 16 070	40	0.625	1.50	2.75	3.62	0.94	3.1	01161
V40CTE62600	AA320-40 16 152	40	0.625	1.50	6.00	3.31	0.94	4.3	65781
V40CTE75175	AA320-40 19 044	40	0.750	1.75	1.75	2.37	1.00	1.9	56961
V40CTE75350	AA320-40 19 089	40	0.750	1.75	3.50	3.94	1.00	3.6	65782
V40CTE75600	AA320-40 19 152	40	0.750	1.75	6.00	3.94	1.00	5.5	65785
V40CTE87375	AA320-40 22 095	40	0.875	1.88	3.75	4.25	1.00	3.6	65786
V40CTE100175	AA320-40 25 044	40	1.000	2.00	1.75	2.38	1.12	2.7	65766
V40CTE100400	AA320-40 25 101	40	1.000	2.00	4.00	4.50	1.12	5.3	65769
V40CTE100600	AA320-40 25 152	40	1.000	2.00	6.00	4.50	1.12	8.0	56933
V40CTE125200*	AA320-40 32 051	40	1.25*	2.50	2.00	2.50	1.12	2.0	56937
V40CTE125400	AA320-40 32 101	40	1.250	2.50	4.00	3.75	1.12	4.9	65772
V40CTE150400	AA320-40 38 101	40	1.500	2.62	4.00	2.38	1.12	4.9	56939

* Does not have tool changer safe zone. May not fit some machines. Deviates from ANSI BS.50/1994

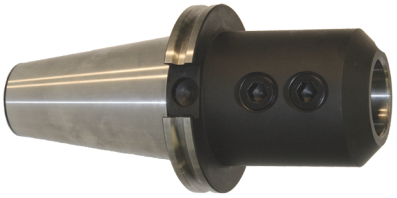
Spare Parts

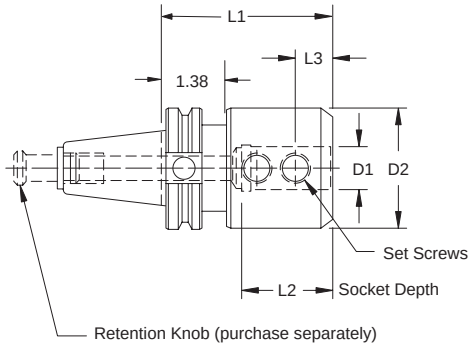
D1	Set Screw	EDP#	Torque ft.-lbs.
0.125	5514 022-01	55815	3
0.188	5514 022-01	55815	4
0.250	5514 022-03	55816	7
0.312	5514 022-03	55816	9
0.375	5514 022-04	55817	12
0.500	5514 022-05	55818	17
0.625	5514 022-06	55819	31
0.750	5514 022-08	55821	43

D1	Set Screw	EDP#	Torque ft.-lbs.
0.875	5514 022-08	55821	48
1.000	5514 022-09	55822	69
1.250	5514 022-07	55820	69
1.250*	5818X12WSS	55414	69
1.500	5514 022-07	55820	69

CAT "V" Taper Shank Adapters

ValMILL®
End Mill Adapters
CAT50





ANSI Part Number	ISO Part Number	Taper	D1	D2	L1	L2	L3	Approx. Wt. (lbs.)	EDP#
V50CTE25250	AA320-50 06 063	50	0.250	0.88	2.50	3.00	0.44	6	56785
V50CTE37250	AA320-50 09 063	50	0.375	1.00	2.50	3.00	0.75	6	65823
V50CTE37650	AA320-50 09 165	50	0.375	1.00	6.50	3.00	0.75	8	65824
V50CTE50262	AA320-50 13 067	50	0.500	1.25	2.62	3.80	0.88	7.1	65825
V50CTE50462	AA320-50 13 117	50	0.500	1.25	4.62	3.80	0.88	7.5	65826
V50CTE50662	AA320-50 13 168	50	0.500	1.25	6.62	5.00	0.88	8	61099
V50CTE62375	AA320-50 16 095	50	0.625	1.50	3.75	3.50	0.94	7.6	65827
V50CTE62575	AA320-50 16 146	50	0.625	1.50	5.75	3.50	0.94	7.6	65862
V50CTE62775	AA320-50 16 197	50	0.625	1.50	7.75	3.50	0.94	8	61101
V50CTE75162	AA320-50 19 041	50	0.750	2.75	1.62	4.00	1.00	7.4	65828
V50CTE75375	AA320-50 19 095	50	0.750	1.75	3.75	4.00	1.00	9.7	65829
V50CTE75775	AA320-50 19 197	50	0.750	1.75	7.75	4.00	1.00	12.5	61108
V50CTE87375	AA320-50 22 095	50	0.875	1.88	3.75	4.19	1.00	9.5	65830
V50CTE87775	AA320-50 22 197	50	0.875	1.88	7.75	4.19	1.00	12	61124
V50CTE100162	AA320-50 25 041	50	1.000	2.75	1.62	2.50	1.12	7.7	65816
V50CTE100400	AA320-50 25 101	50	1.000	2.00	4.00	4.44	1.12	9.5	65817
V50CTE100600	AA320-50 25 152	50	1.000	2.00	6.00	4.44	1.12	10	61050
V50CTE100800	AA320-50 25 203	50	1.000	2.00	8.00	4.44	1.12	12	61051
V50CTE125262	AA320-50 32 067	50	1.250	2.75	2.62	3.50	1.50	7.3	00859
V50CTE125400	AA320-50 32 101	50	1.250	2.50	4.00	3.35	1.12	9	00865
V50CTE125800	AA320-50 32 203	50	1.250	2.50	8.00	3.35	1.12	13.6	65819
V50CTE150262	AA320-50 38 067	50	1.500	2.75	2.62	2.25	1.50	8.5	65820
V50CTE150400	AA320-50 38 101	50	1.500	2.75	4.00	4.50	1.12	10.9	65821
V50CTE150800	AA320-50 38 203	50	1.500	2.75	8.00	4.50	1.12	13.6	02408
V50CTE200562	AA320-50 51 143	50	2.000	3.75	5.62	3.50	1.41	15.4	65822
V50CTE200962	AA320-50 51 244	50	2.000	3.75	9.62	3.50	1.41	18	06421
V50CTE250650	AA320-50 64 165	50	2.500	4.00	6.50	4.00	1.50	15.4	56996

Spare Parts

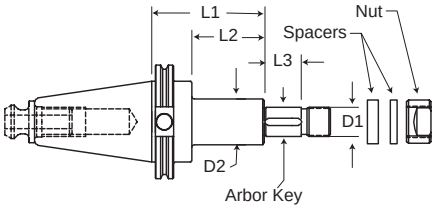
D1	Set Screw	EDP#	Torque ft.-lbs.
0.250	5514 022-03	55816	7
0.312	5514 022-03	55816	9
0.375	5514 022-04	55817	12
0.500	5514 022-05	55818	17
0.625	5514 022-06	55819	31
0.750	5514 022-08	55821	43

D1	Set Screw	EDP#	Torque ft.-lbs.
0.875	5514 022-08	55821	48
1.000	5514 022-09	55822	69
1.250	5514 022-07	55820	69
1.250*	5818X12WSS	55414	69
1.500	5514 022-07	55820	69
2.000	114X78WSS	55390	125
2.500	114X78WSS	55390	125

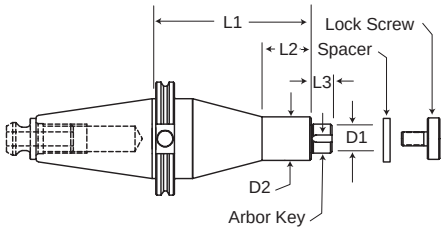
CAT "V" Taper Shank Adapters

ValMILL®

Stub Arbor Adapters
CAT40 and CAT50



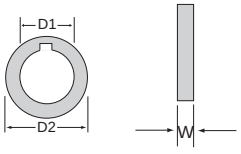
Style 1



Style 2

ANSI Part Number	Taper	D1	D2	L1	L2	L3	Style	Wt. (lbs.)	Torque ft.-lbs.	EDP#
V40CTB100400	40	1.00	1.75	4.00	3.25	0.72	2	5.0	110	57050
V40CTB125400	40	1.25	1.75	4.00	3.25	0.72	2	5.0	110	57051
V40CTB150400	40	1.50	2.12	4.00	1.50	0.98	2	6.3	208	57052
V50CTB100500	50	1.00	1.50	5.00	1.70	0.72	2	12.8	110	57053
V50CTB125600	50	1..25	1.75	6.00	1.50	0.72	2	12.8	110	57054
V50CTB150600	50	1.50	2.12	6.00	1.62	0.98	2	14.5	208	57055
V50CTB200600	50	2.00	2.75	6.00	5.25	1.25	1	14.5	208	52217

Side View
Stub Arbor Spacer



Arbor Key

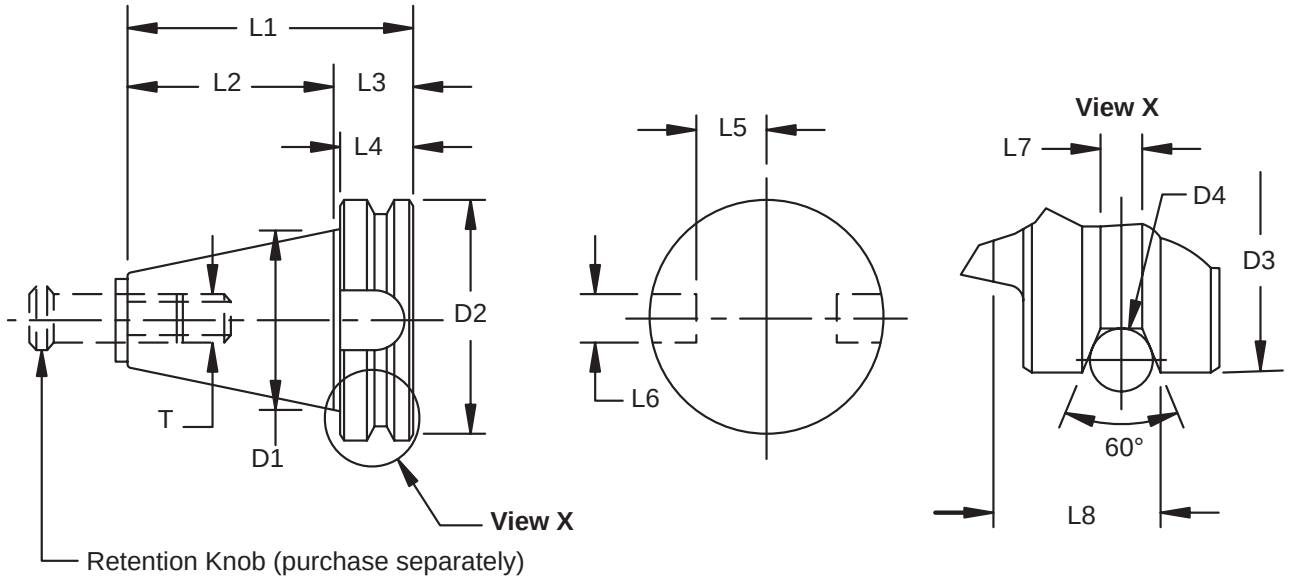
See table above for dimensional information.

Spare Parts													
Pilot (D1)	Lock Screw	EDP#	Spacer 1	Width (W)	EDP#	Spacer 2	Width (W)	EDP#	Spacer 3	Width (W)	EDP#	Arbor Key	EDP#
1.00	5003 UNIV SCR	55401	PT56618	1/8"	55455	PT56614	1/4"	55454	PT56638	3/8"	55456	PT569	50360
1.25	5004 UNIV SCR	55402	PT51814	1/4"	55448	PT51838	3/8"	55449	-	-	-	PT516	56479
1.50	5005 UNIV SCR	55403	PT51918	1/8"	55452	PT51914	1/4"	55451	PT51912	1/2"	55450	PT517	56480
2.00	013500	00821	014912	1/8"	00822	014913	1/2"	00825	014914	3/4"	00827	SAK20	00820

ValMILL®

BT Taper Shank Adapters

Shank Dimensional information



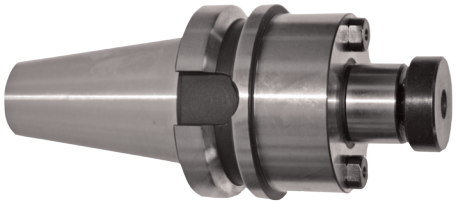
Taper	Dimensions												
	D1	D2	D3	D4	T	L1	L2	L3	L4	L5	L6	L7	L8
BT30	1.250	1.811	2.210	0.313	M12X1.75	2.772 *	1.906	0.866	0.787	0.646	0.637	0.157	0.693
BT40	1.750	2.479	2.731	0.313	M16X2.0	3.637**	2.575	1.062	0.984	0.886	0.637	0.197	0.810

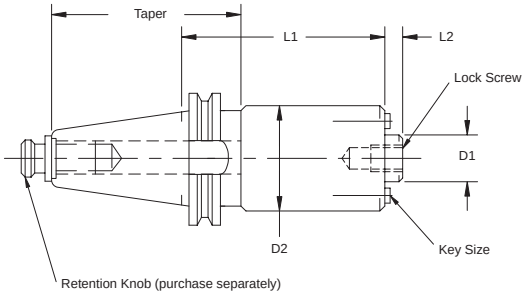
* This dimension is 2.862 when tooling has a larger diameter than D2.
** This dimension is 3.911 when tooling has a larger diameter than D2.

BT Taper Shank Adapters

ValMILL®

Shell Mill Adapters
BT30 and BT40





ANSI Part Number	ISO Part Number	Taper	D1	D2	L1	L2	Key Size	Wt. (lbs.)	EDP#
BT30S75118	AA205-30 19 030	30	0.75	1.75	1.18	0.69	0.31	1.6	57142
BT30S100177	AA205-30 25 045	30	1.00	2.25	1.77	0.69	0.38	1.7	57141
BT40S75200	AA205-40 19 051	40	0.75	1.75	2.00	0.69	0.31	3.1	23516
BT40S100200	AA205-40 25 051	40	1.00	2.25	2.00	0.69	0.38	4.4	65869
BT40S125225	AA205-40 32 057	40	1.25	2.75	2.25	0.69	0.5	5.4	65870
BT40S150225	AA205-40 38 057	40	1.50	3.75	2.25	0.94	0.62	7.2	65871

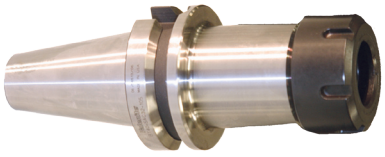
Spare Parts						
Pilot Dia. (D1)	Lock Screw	Description	EDP#	Torque ft.-lbs.	Drive Key	EDP#
.75”	3212 030-606	3/8”-24 SHCS	50162	45	5631 062-01	55851
* 1.00”	3212 030-707	1/2”-20 SHCS	55774	110	5631 062-02	55852
* 1.25”	3212 030-757	5/8” 18 SHCS	55775	208	5631 062-03	55868
1.50”	5512 065-10	3/4”-16 Universal Screw	55776	208	5631 062-04	55869
2.00”	5512 065-11	1”-14 Universal Screw	55777	366	5631 062-05	55870
2.50”	5512 065-11	1”-14 Universal Screw	55777	366	5631 062-06	55871

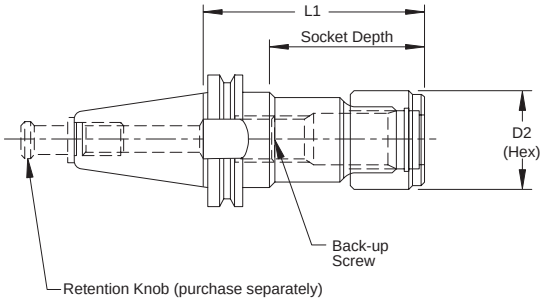
* Both a socket head cap screw (SHCS) and universal screw are provided with the adapter

ValMILL®

BT Taper Shank Adapters

Collet Chuck Adapters
BT30 and BT40





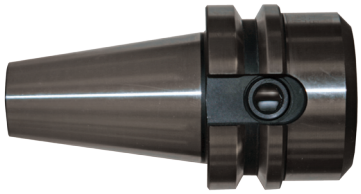
ANSI Part Number	ISO Part Number	Taper	Collet Series	D2	L1	Max. Socket Depth	Wt. lbs.	Torque ft.-lbs.	EDP#
BT30SAC16063	AA214-30 16 063	30	ER 16 (.020-.393)	1.11	2.48	1.95	1.4	52	00830
BT30SAC32063	AA214-30 32 063	30	ER 32 (.078-.787)	1.97	2.48	2.20	0.9	125	00831
BT40SAC16079	AA214-40 16 079	40	ER 16 (.020-.393)	1.11	3.12	2.12	1.7	52	00832
BT40SAC16105	AA214-40 16 105	40	ER 16 (.020-.393)	1.11	4.12	3.62	2.7	52	00838
BT40SAC32105	AA214-40 32 105	40	ER 32 (.078-.787)	1.97	4.12	4.00	2.7	125	65868

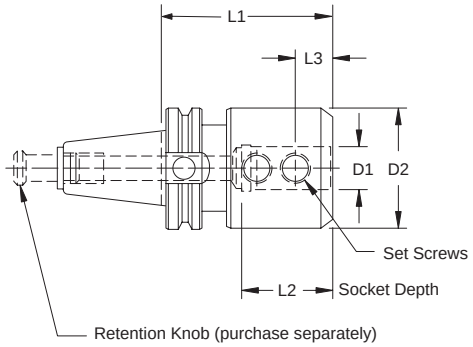
Spare Parts						
Collet Series	Collet Nut	EDP#	Collet Wrench	EDP#	Back-up Screw	EDP#
ER16	5533 050-06	55850	PT638	55460	5514 044-01	55824
ER20	5533 050-01	55846	PT1177	62674	5514 018-01	55778
ER25	5533 050-02	55847	PT1121	62673	5514 018-03	55780
ER32	5533 050-03	55848	PT639	55461	5514 018-04	55814

BT Taper Shank Adapters

ValMILL®

End Mill Adapters
BT30 and BT40





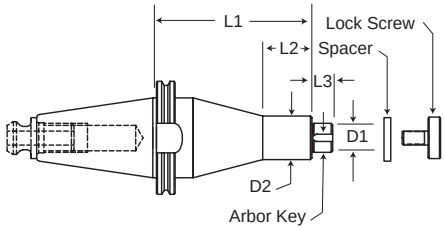
ANSI Part Number	ISO Part Number	Taper	D1	D2	L1	L2	L3	Approx. Wt. (lbs.)	EDP#
BT30E12238	AA220-30 03 060	30	0.125	0.75	2.38	3.31	0.38	0.9	57094
BT30E18238	AA220-30 05 060	30	0.188	0.75	2.38	3.31	0.50	1.1	57095
BT30E25238	AA220-30 06 060	30	0.250	0.81	2.38	3.31	0.38	1.1	57096
BT30E37238	AA220-30 09 060	30	0.375	1.38	2.38	3.31	0.75	1.5	57098
BT30E50175	AA220-30 13 045	30	0.500	1.50	1.75	1.75	0.88	1.6	57099
BT30E50238	AA220-30 13 060	30	0.500	1.38	2.38	2.00	0.88	1.6	57100
BT30E62250	AA220-30 15 063	30	0.625	1.44	2.50	2.24	0.94	1.7	57101
BT30E75250	AA220-30 19 063	30	0.750	2.00	2.50	2.25	1.00	2.2	57102
BT30E100275	AA220-30 25 070	30	1.000	2.38	2.75	2.50	1.12	3.5	57092
BT40E12225	AA220-40 03 057	40	0.125	0.69	2.25	3.00	0.19	2.8	56551
BT40E18225	AA220-40 05 057	40	0.188	0.69	2.25	3.00	0.44	2.8	56554
BT40E25225	AA220-40 06 057	40	0.250	0.88	2.25	3.00	0.44	2.8	56556
BT40E31225	AA220-40 08 057	40	0.312	1.00	2.25	3.00	0.44	2.8	56561
BT40E37225	AA220-40 09 057	40	0.375	1.00	2.25	3.00	0.75	3	56562
BT40E50175	AA220-40 13 045	40	0.500	1.75	1.75	2.75	0.88	3	57120
BT40E50225	AA220-40 13 057	40	0.500	1.25	2.25	3.00	0.88	3	56564
BT40E62225	AA220-4016 057	40	0.625	1.50	2.25	3.50	0.94	3	65865
BT40E75175	AA220-40 19 045	40	0.750	1.75	1.75	2.75	1.00	1.9	57124
BT40E75338	AA220-40 19 086	40	0.750	1.75	3.38	2.38	1.00	3.8	56566
BT40E100175	AA220-40 25 045	40	1.000	2.00	1.75	2.38	1.12	1.7	56550
BT40E100400	AA220-40 25 101	40	1.000	2.00	4.00	4.44	1.12	5.6	57112
BT40E125200	AA220-40 31 51	40	1.250	2.50	2.00	2.38	1.12	2.1	56553
BT40E125400	AA220-40 32 101	40	1.250	2.50	4.00	3.38	1.12	5.6	61126

Spare Parts

D1	Set Screw	EDP#	Torque ft.-lbs.
0.125	5514 022-01	55815	3
0.188	1428X14WSS	55392	4
0.250	5514 022-03	55816	7
0.312	5514 022-03	55816	9
0.375	5514 022-04	55817	12
0.500	5514 022-05	55818	17
0.625	5514 022-06	55819	31

D1	Set Screw	EDP#	Torque ft.-lbs.
0.750	5514 022-08	55821	43
0.875	5514 022-08	55821	48
1.000	5514 022-09	55822	69
1.250	5514 022-07	55820	69

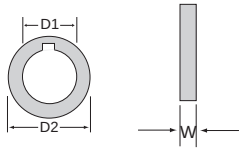
Stub Arbor Adapters
BT40



Style 2

ANSI Part Number	Taper	D1	D2	L1	L2	L3	Style	Wt. (lbs.)	Torque ft.-lbs.	EDP#
BT40B100400	40	1.00	1.75	4.00	2.97	0.72	2	5.2	110	57158
BT40B125400	40	1.00	1.75	4.00	2.94	0.72	2	5.2	110	57159

Side View
Stub Arbor Spacer



Arbor Key

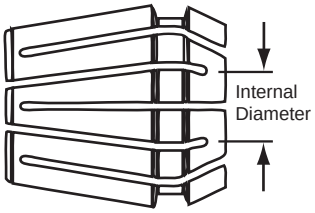
See table above for dimensional information.

Spare Parts													
Pilot (D1)	Lock Screw	EDP#	Spacer 1	Width (W)	EDP#	Spacer 2	Width (W)	EDP#	Spacer 3	Width (W)	EDP#	Key	EDP#
1.00	5003 UNIV SCR	55401	PT56618	1/8"	55455	PT56614	1/4"	55454	PT56638	3/8"	55456	PT569	50360
1.25	5004 UNIV SCR	55402	PT51814	1/4"	55448	PT51838	3/8"	55449	-	-	-	PT516	56479
1.50	5005 UNIV SCR	55403	PT51918	1/8"	55452	PT51914	1/4"	55451	PT51912	1/2"	55450	PT517	56480
2.00	013500	00821	014912	1/8"	00822	014913	1/2"	00825	014914	3/4"	00827	SAK20	00820

Collets

ValMILL®

VSAC Single Angle Collets
Inch ER Style



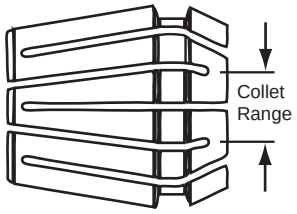
INCH Series 11, 16, 20, 25 & 32									
Internal Diameter		VSAC 32 Series		VSAC 25 Series		VSAC 20 Series		VSAC 16 Series	
Fraction	Decimal	Part Number	EDP#	Part Number	EDP#	Part Number	EDP#	Part Number	EDP#
1/16	0.0625	NA	NA	NA	NA	NA	NA	VSAC 16 062	56678
3/32	0.0937	VSAC 32 093	56726	VSAC 25 093	56705	*VSAC 20 093	56691	*VSAC 16 093	56679
1/8	0.1250	VSAC 32 125	56855	VSAC 25 125	56706	*VSAC 20 125	56692	*VSAC 16 125	56680
5/32	0.1562	VSAC 32 156	56728	VSAC 25 156	56707	*VSAC 20 156	56693	*VSAC 16 156	56750
3/16	0.1875	VSAC 32 188	56730	VSAC 25 188	56709	*VSAC 20 188	56694	*VSAC 16 188	56682
7/32	0.2188	*VSAC 32 218	56731	VSAC 25 218	56710	*VSAC 20 218	56695	*VSAC 16 219	56683
1/4	0.2500	*VSAC 32 250	56732	VSAC 25 250	56711	*VSAC 20 250	56696	*VSAC 16 250	56684
9/32	0.2812	*VSAC 32 281	56734	VSAC 25 281	56712	*VSAC 20 281	56697	*VSAC 16 281	56685
5/16	0.3125	*VSAC 32 312	56735	VSAC 25 312	56713	*VSAC 20 312	56698	*VSAC 16 312	56686
11/32	0.3438	*VSAC 32 343	56736	VSAC 25 343	56714	*VSAC 20 343	56699	*VSAC 16 343	56688
3/8	0.3750	*VSAC 32 375	56737	VSAC 25 375	56715	*VSAC 20 375	56700	*VSAC 16 375	56689
13/32	0.4062	*VSAC 32 406	56738	VSAC 25 406	56718	*VSAC 20 406	56701	-	-
7/16	0.4375	*VSAC 32 437	56739	VSAC 25 437	56719	*VSAC 20 437	56702	-	-
15/32	0.4688	*VSAC 32 468	56740	VSAC 25 468	56720	*VSAC 20 468	56703	-	-
1/2	0.5000	*VSAC 32 500	56741	VSAC 25 500	56721	*VSAC 20 500	56704	-	-
17/32	0.5312	*VSAC 32 531	56742	VSAC 25 531	56722	-	-	-	-
9/16	0.5625	*VSAC 32 562	56743	VSAC 25 562	56723	-	-	-	-
19/32	0.5938	*VSAC 32 593	56744	VSAC 25 593	56724	-	-	-	-
5/8	0.6250	*VSAC 32 625	56583	VSAC 25 625	56725	-	-	-	-
21/32	0.6562	*VSAC 32 656	56745	-	-	-	-	-	-
11/16	0.6875	*VSAC 32 687	56746	-	-	-	-	-	-
23/32	0.7188	*VSAC 32 718	56747	-	-	-	-	-	-
3/4	0.7500	*VSAC 32 750	56748	-	-	-	-	-	-

* Included in Collet Sets

Collet Sets

Collet Set Number	Description	EDP#
VSAC11207KIT	ER 11 collet set - INCH 7 collets	56675
VSAC1613210KIT	ER 16 collet set - INCH 10 colletts	56681
VSAC3218KIT	ER 32 collet set - INCH 18 collets	56729

VSAC Single Angle Collets
Metric ER Style



METRIC Series 32 & 16					
Range		Metric VSAC 32 Series		Metric VSAC 16 Series	
Metric	Inch	Part Number	EDP#	Part Number	EDP#
0.5 - 1	.019 - .039”	-	-	*VSAC 16 01	55984
1 - 2	.039 - .079	-	-	*VSAC 16 12	55985
2 - 3	.079 - .118	*VSAC 32 23	56004	*VSAC 16 23	55986
3 - 4	.118 - .157	*VSAC 32 34	56005	*VSAC 16 34	55987
4 - 5	.157 - .197	*VSAC 32 45	56006	*VSAC 16 45	55988
5 - 6	.197 - .236	*VSAC 32 56	56007	*VSAC 16 56	55989
6 - 7	.236 - .276	*VSAC 32 67	56008	*VSAC 16 67	55990
7 - 8	.276 - .315	*VSAC 32 78	56009	*VSAC 16 78	55991
8 - 9	.315 - .354	*VSAC 32 89	56010	*VSAC 16 89	55992
9 - 10	.354 - .394	*VSAC 32 910	56011	*VSAC 16 910	55993
10 - 11	.394 - .433	*VSAC 32 1011	55994	-	-
11 - 12	.433 - .472	*VSAC 32 1112	55995	-	-
12 - 13	.472 - .512	*VSAC 32 1213	55996	-	-
13 - 14	.512 - .551	*VSAC 32 1314	55997	-	-
14 - 15	.551 - .591	*VSAC 32 1415	55998	-	-
15 - 16	.591 - .630	*VSAC 32 1516	55999	-	-
16 - 17	.630 - .669	*VSAC 32 1617	56000	-	-
17 - 18	.669 - .709	*VSAC 32 1718	56001	-	-
18 - 19	.709 - .748	*VSAC 32 1819	56002	-	-
19 - 20	.748 - .787	*VSAC 32 1920	56003	-	-

* Included in Collet Sets

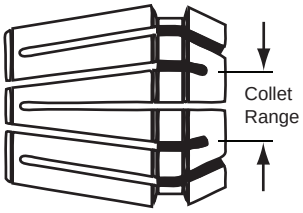
Collet Sets

Collet Set Number	Description	EDP#
VSAC16210KIT	ER 16 collet set - METRIC 8 collets	97195
VSAC32220KIT	ER 32 collet set - METRIC 18 collets	97196

Collets

ValMILL®

VCFC Single Angle Collets
1,000 PSI Max. ER Style



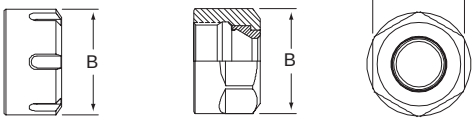
Coolant Sealed									
Range		VCFC 32 Series		VCFC 25 Series		VCFC 20 Series		VCFC 16 Series	
Metric	Inch	Part Number	EDP#	Part Number	EDP#	Part Number	EDP#	Part Number	EDP#
3 - 4	.118 - .157	VCFC 32 34	56359	-	-	VCFC 20 34	56373	VCFC 16 34	56342
4 - 5	.157 - .197	*VCFC 32 45	56360	VCFC 25 45	56386	VCFC 20 45	56374	*VCFC 16 45	56343
5 - 6	.197 - .236	*VCFC 32 56	56361	VCFC 25 56	56387	VCFC 20 56	56375	*VCFC 16 56	56344
6 - 7	.236 - .276	*VCFC 32 67	56362	VCFC 25 67	56388	VCFC 20 67	56376	*VCFC 16 67	56345
7 - 8	.276 - .315	*VCFC 32 78	56363	VCFC 25 78	56389	VCFC 20 78	56377	*VCFC 16 78	56346
8 - 9	.315 - .354	*VCFC 32 89	56364	VCFC 25 89	56390	VCFC 20 89	56378	*VCFC 16 89	56347
9 - 10	.354 - .394	*VCFC 32 910	56365	VCFC 25 910	56391	VCFC 20 910	56379	*VCFC 16 910	56348
10 - 11	.394 - .433	*VCFC 32 1011	56349	VCFC 25 1011	56380	VCFC 20 1011	56370	-	-
11 - 12	.433 - .472	*VCFC 32 1112	56350	VCFC 25 1112	56381	VCFC 20 1112	56371	-	-
12 - 13	.472 - .512	*VCFC 32 1213	56351	VCFC 25 1213	56382	VCFC 20 1213	56372	-	-
13 - 14	.512 - .551	*VCFC 32 1314	56352	VCFC 25 1314	56383	-	-	-	-
14 - 15	.551 - .591	*VCFC 32 1415	56353	VCFC 25 1415	56384	-	-	-	-
15 - 16	.591 - .630	*VCFC 32 1516	56354	VCFC 25 1516	56385	-	-	-	-
16 - 17	.630 - .669	*VCFC 32 1617	56355	-	-	-	-	-	-
17 - 18	.669 - .709	*VCFC 32 1718	56356	-	-	-	-	-	-
18 - 19	.709 - .748	*VCFC 32 1819	56357	-	-	-	-	-	-
19 - 20	.748 - .787	*VCFC 32 1920	56358	-	-	-	-	-	-

* Included in Collet Sets

Collet Sets

Collet Set Number	Description	EDP#
VCFC16410KIT	COOLIT collet ER 16 set 6 collets	97199
VCFC32420KIT	COOLIT collet ER 32 set 16 collets	97202

Spanner and Hex Type Collet Nuts

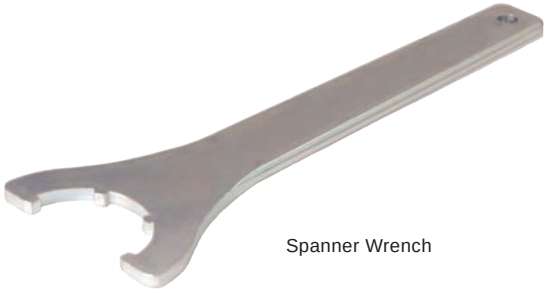


Spanner Type **Hex Type**

Collet Series	Collet Nut	Size and Style	B	EDP#
ER16	5533 050-06	1” Hex	1.1”	55850
ER20	5533 050-01	1.18” Hex	1.33”	55846
ER25	5533 050-02	Spanner	1.64”	55847
ER32	5533 050-03	Spanner	1.96”	55848

Spanner and Hex Type Collet Nut Wrenches

Hex Wrench



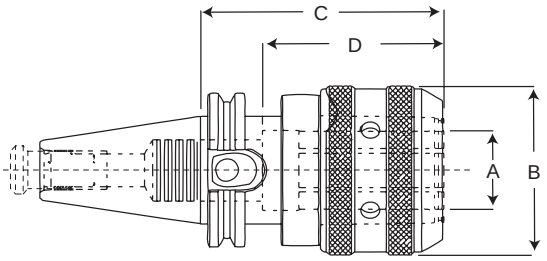
Spanner Wrench

Part Number	Nut Type	Torque ft/lbs.	Overall Length	EDP#
PT638	ER16 (1”Hex Nut)	36	5.51”	55460
PT639	ER32 (Spanner Style)	85	9.84”	55461
PT1177	ER20 (1.18” Hex Nut)	74	6.5”	62674
PT1121	ER25 (Spanner Style)	95	8.25”	62673

Milling Chucks, Bushings, and Retention Knobs

ValMILL®

Milling Chucks



- Alloy steel hardened to Rc 56-60 for long service life
- End mill socket T.I.R. ≤ .0002”
- Through-spindle coolant capability
- Flange entry coolant is available on request

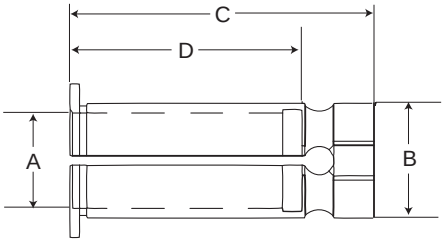
Order Retention Knob separately

3/4 Inch 75MC Chucks								
Part Number	Taper Type	EDP#	Dimensions				Back Up Screw	EDP#
			A (Dia.)	B (Dia.)	C	D		
BT40 75MC3 364	BT40	62501	.75	2.19	3.64	2.24	BS 09	65877
V40CT 75MC3 371	CAT 40	62502	.75	2.19	3.71	2.24	BS 09	65877
V50CT 75MC3 396	CAT 50	62503	.75	2.19	3.96	2.24	BS 09	65877

1 1/4 Inch 12MC Chucks								
Part Number	Taper Type	EDP#	Dimensions				Back Up Screw	EDP#
			A (Dia.)	B (Dia.)	C	D		
BT40 12MC4 444	BT40	62504	1.25	2.75	4.44	3.00	BS 08	65878
V40CT 12MC4 413	CAT 40	62505	1.25	2.75	4.13	3.00	BS 08	65878
V50CT 12MC4 413	CAT 50	62506	1.25	2.75	4.13	3.00	BS 08	65878
V50CT 1 2MC4 600	CAT 50	62507	1.25	2.75	6.00	3.00	BS 08	65878

Order Back Up Screws and Spanner Wrench 1OOCNW separately, EDP# 55311.

Bushings



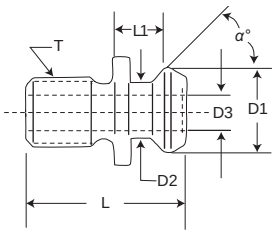
Series	Dimensions	
	C	D
75MC	2.00	1.375
12MC	2.75	1.375

75MC Bushings			
Part Number	Dimensions		EDP#
	A	B	
75MCRB 188	.1875	.75	62508
75MCRB 250	.2500	.75	55320
75MCRB 313	.3125	.75	55321
75MCRB 375	.3750	.75	55322
75MCRB 500	.5000	.75	55323
75MCRB 625	.6250	.75	55324

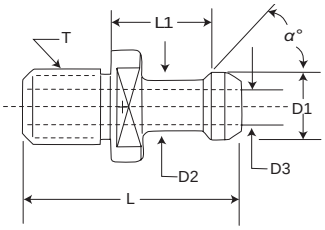
12MC Bushings			
Part Number	Dimensions		EDP#
	A	B	
12MCRB 250	.2500	1.25	55313
12MCRB 313	.3125	1.25	55314
12MCRB 375	.3750	1.25	55315
12MCRB 500	.5000	1.25	55316
12MCRB 625	.6250	1.25	55317
12MCRB 750	.7500	1.25	55318
12MCRB 875	.8750	1.25	55319
12MCRB 100	1.0000	1.25	55312

Retention Knobs

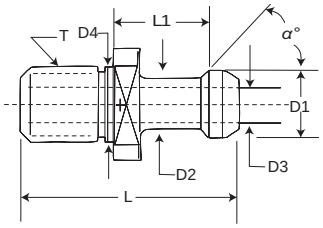
ValMILL®



Style 1



Style 2



Style 3

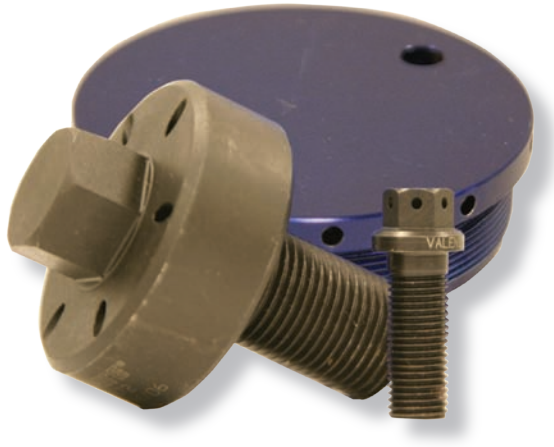
BT Retention Knobs

Part Number	Taper	Thread	Style	Dimensions						EDP#	Notes
				D1	D2	D4	L	L1	α		
PT 585 45	BT30	M12	3	.43	.27	.492	1.69	.709	45	55581	MAS P30T 1
PT 585 60	BT30	M12	3	.43	.27	.492	1.69	.709	60	55582	MAS P30T 1 1
PT 444 45	BT40	M16	3	.59	.39	.669	2.36	1.102	45	55552	MAS P40T 1
PT 444 60	BT40	M16	3	.59	.39	.669	2.36	1.102	60	55553	MAS P40T 1 1
PT 444 90	BT40	M16	3	.59	.39	.669	2.36	1.102	90	55554	MAS P40T 90
PT 532 45	BT40 to V45CT	5/8-11	2	.59	.39	-	2.25	.990	45	55564	BT40 machine convert to 40 CAT
PT 532 60	BT40 to V45CT	5/8-11	2	.59	.39	-	2.25	.990	60	55566	BT40 machine convert to 40 CAT
PT 532 90	BT40 to V45CT	5/8-11	2	.59	.39	-	2.25	.990	90	55567	BT40 machine convert to 40 CAT
PT 536 45C	BT50 to V50CT	1 - 8	2	.91	.67	-	3.35	1.386	45	55571	BT50 machine convert to 50 CAT
PT 536 60	BT50 to V50CT	1 - 8	2	.91	.67	-	3.35	1.386	60	55572	BT50 machine convert to 50 CAT
PT 536 90	BT50 to V50CT	1 - 8	2	.91	.67	-	3.35	1.386	90	55573	BT50 machine convert to 50 CAT

CAT Retention Knobs

Part Number	Taper	Thread	Style	Dimensions						EDP#	Notes
				D1	D2	D3	L	L1	α		
PT 475C	V40CT	5/8-11	1	.74	.49	.28	1.49	.440	45	55560	CAT Standard
PT 475	V40CT	5/8-11	1	.74	.49	-	1.49	.440	45	55559	CAT Standard
PT 552C	V40CT	5/8-11	2	.59	.40	.16	2.25	1.139	45	55575	
PT 552	V40CT	5/8-11	2	.59	.40	-	2.25	1.139	45	55574	
PT 572 45	V40CT	5/8-11	2	.59	.39	-	2.12	.990	45	55579	
PT 275C	V50CT	1 - 8	1	1.14	.39	.47	2.30	.700	45	55551	CAT Standard
PT 573	V50CT	1 - 8	1	1.14	.82	-	2.30	.700	45	55580	CAT Standard PT 275 without coolant hole

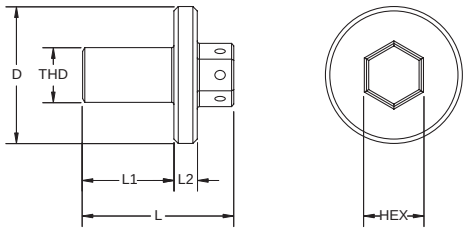
WARNING: Various knob styles are not necessarily interchangeable. To avoid the potential for injury, tooling damage or machine damage, always make sure the proper retention know is used for a given adapter and according to machine specifications. Special care should be taken not to interchange metric and inch threaded retention knobs. Use of a metric threaded knob with a non-metric threaded adapter shank, or vice versa, could cause inadequate coupling of the adapter to the spindle during machining and a failure of the components. Always use machine guards, protective clothing and safety glasses to prevent burns or other injury to body or eyes from flying objects.



Shower Head Coolant Caps & Screws

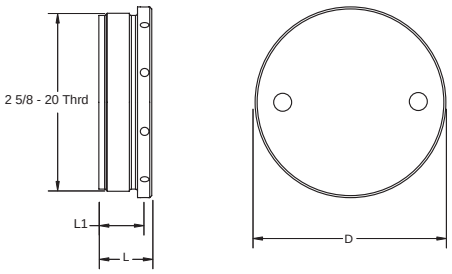
ValMILL®

- Unique multi-port “Shower Head” mounting screw delivers through-the-spindle cutting fluid.
- Centrifugal force accelerates cutting fluid to ensure efficient chip evacuation.
- Compatible with Valenite’s Shell Mill Adapters to make through-the-spindle coolant machines more effective for face milling.



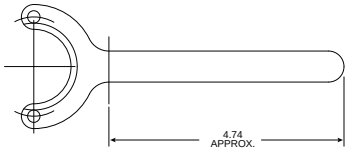
Coolant Screws										
Part Number	Dimensions				Thread Size	Hex	Torque ft./lbs. Steel/Alum.	Mount	Cutter Height	EDP#
	D	L	L1	L2						
PT-888	0.56	1.38	1.00	0.12	3/8-24	.375	33/23	G	-	55472
PT-889	0.75	1.79	1.25	0.14	1/2-20	.50	65/45	H	1.75	55473
PT-870	0.75	2.11	1.25	0.44	1/2-20	.50	65/45	H	2.00	50647
PT-871	0.94	2.11	1.25	0.44	5/8-18	.625	80/56	J	2.00	55584
PT-890	1.88	2.07	1.25	0.32	3/4-16	.75	150	K	2.00	55974
PT-872	1.88	2.44	1.25	0.69	3/4-16	.75	150	K	2.38	50648
PT-942	0.709	1.81	1.18	0.25	M12-1.75	.472	65/45	Special	-	RFQ*

Note: Valenite recommends the use of PT745 antiseize lubricant (EDP# 50050) on insert screw threads and head.
*Contact your local Valenite Distributor or Valenite Customer Service.

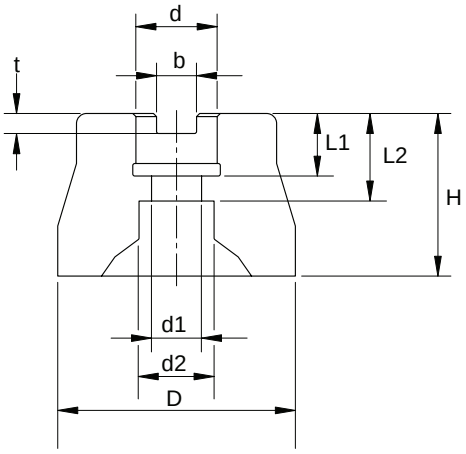


Coolant Cap							
Part Number	Dimensions			Thread Size	Hex	Mount	EDP#
	D	L	L1				
PT-873	2.81	.78	.57	2 5/8 - 20	.375	C	50649

Note: Valenite recommends the use of PT745 antiseize lubricant (EDP# 50050) on insert screw threads and head.

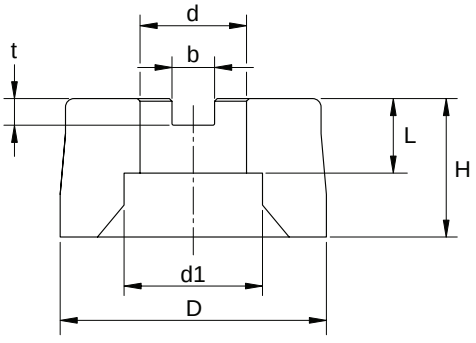


Wrench for Coolant Cap	
Wrench	
Part#	EDP#
PT876	52334



	Mount	D (Diameter)	H	d	d1	d2	b	t	L1	L2	Note:
Metric	N	40	40	16	9	12.5	8.4	5.8	18	27	
	P	50	40	22	11	18	10.4	6.3	20	26	
	R	80	50	27	13	22	12.4	7	22	28	
	T	100	50	32	17	14	14.4	8	25	31	
	V	125	63	40	21	35	16.4	9	29	35	
Inch	G	2, 2.5	1.50	0.75	3/8	0.6	0.32	0.18	0.75	1.02	3/8-24 x 1 Socket Head Cap Screw
	H	2.5, 3	varies	1.00	1/2	0.8	0.38	0.22	0.75	1.02	1/2-20 x 1-1/4 Socket Head Cap Screw
	A	4, 4.5	2.38	0.62	3/4	1.2	0.62	0.38	1.00	1.38	3/4-16 x 1-3/4 Socket Head Cap Screw
	J	4	varies	1.25	5/8	1.0	0.38	0.22	0.75	1.02	5/8-18 x 1-1/4 Socket Head Cap Screw

All dimensions are given as a general guideline and vary with cutter design.
Contact Valenite Technical Support or your Valenite representative for more details.

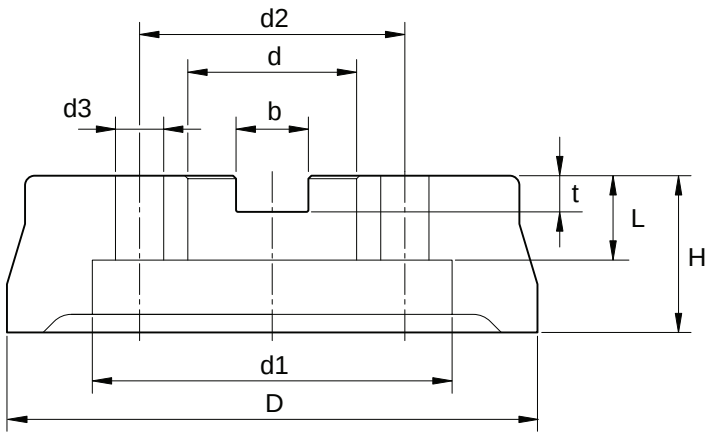


	Mount	D (Diameter)	H	d	d1	b	t	L	Note:
Metric	Q	63	40	22	30	10.4	6.3	26	
	S	80	50	27	37	12.4	7	28	
	U	100	50	32	45	14.4	8	31	
	W	125	63	40	55	16.4	9	35	
Inch	B	varies	varies	1.50	2.00	0.62	0.38	1.38	VLS-3 Lock Screw
	K	5, 6	2.38	1.50	2.00	0.62	0.38	1.00	#5005 Universal Screw

All dimensions are given as a general guideline and vary with cutter design.
Contact Valenite Technical Support or your Valenite representative for more details.

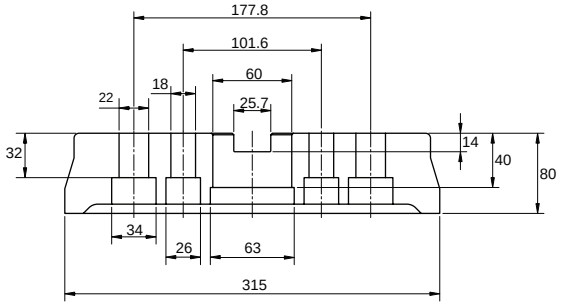
Face & Shell Mill Mounts

ValMILL®

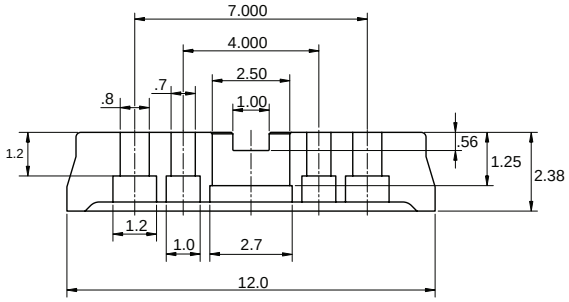


	Mount	D (Diameter)	H	d	d1	d2	d3	b	t	L	Note:
Metric	X	160	63	40	87	66.7	14	16.4	9	28	Minimum keyway length 105
	Y	200	63	60	128	101.6	18	25.7	14	32	Minimum keyway length 155
Inch	C	8, 10	2.38	2.50	2.80	4.00 BLT CRL.	5/8	1.00	0.56	1.25	
	M	6	2.38	1.50	2.00	2.625 BLT CRL.	1/2	0.62	0.38	1.00	#40-N.M.T.B.

All dimensions are given as a general guideline and vary with cutter design.
Contact Valenite Technical Support or your Valenite representative for more details.



Z



F

	Mount	D (Diameter)	H	d	d1	d2	d3	b	t	L	Note:
Metric	Z	315	80	60	63	101.6/177.8	18/22	25.7	14	40	Minimum keyway length 245
Inch	F	12	2.38	2.50	2.7	4.000/7.000 BLT CRL	0.7, 0.8	1.00	0.56	1.25	

All dimensions are given as a general guideline and vary with cutter design.
Contact Valenite Technical Support or your Valenite representative for more details.

Torque Wrenches (Bits Ordered Separately)			
Part Number	**Torque Value**	**EDP#**	**Color**
VMTW103W	35 in./lb.	50119	Green
VMTW54W	54 in./lb.	50127	Black
VMTW92W	65 in./lb.	50129	Yellow
VMTW33W	80 in./lb.	61956	Red
VMTW101W	115 in./lb.	50118	Blue
VMTW320W	132 in./lb.	50124	Gray
VMTW400W	156 in./lb.	50126	Orange
VMTW23W	23 in./lb.	50138	Silver

Bits		
Part Number	**Size**	**EDP#**
VMHK185-0	5/64	50107
VMHK185-1	3/32	50108
VMHK185-9	7/64	61954
VMHK185-2	1/8	50109
VMHK185-3	5/32	50111
VMHK18525mm	2.5mm	61953
VMHK1853mm	3mm	50112
VMHK185-3	4mm	50111
T7TORXBIT	T7	50099
T8TORXBIT	T8	50102
T10TORXBIT	T10	50081
T15TORXBIT	T15	50085
T20TORXBIT	T20	50089
T25TORXBIT	T25	50093
T30TORXBIT	T30	50095
T7TORXPLUSBIT	T7IP	62569
T8TORXPLUSBIT	T8IP	62570
T10TORXPLUSBIT	T10IP	62575
T15TORXPLUSBIT	T15IP	62566
T20TORXPLUSBIT	T20IP	62567
T25TORXPLUSBIT	T25IP	62568
T30TORXPLUSBIT	T30IP	52362

Wrenches		
Part Number	**Size**	**EDP#**
764HEXWRENCH	7/64	57336
116HEXWRENCH	1/16	57305
316HEXWRENCH	3/16	57314
516HEXWRENCH	5/16	57330
18HEXWRENCH	1/8	57311
332HEXWRENCH	3/32	57317
532HEXWRENCH	5/32	57331
564HEXWRENCH	5/64	57333
T5TORXWRENCH	T5	50097
T6TORXWRENCH	T6	50098
T7TORXWRENCH	T7	50101
T8TORXWRENCH	T8	50104
T10TORXWRENCH	T10	50083
T15TORXWRENCH	T15	50087
T20TORXWRENCH	T20	50091
T25TORXWRENCH	T25	50094
T30TORXWRENCH	T30	50096

DRIVERS (Bits Ordered Separately)		
Part Number	**Torque Value**	**EDP#**
H25 Hand Driver	-	50025
VMTW23SD	23 in./lb.	50122

T-Wrenches		
Part Number	**Size**	**EDP#**
18THANDWRENCH	1/8	57312
M25TWRENCH	2.5mm	55436
M2TWRENCH	2mm	55437
M3TWRENCH	3mm	55438
M4TWRENCH	4mm	55439
M5TWRENCH	5mm	55540
M6TWRENCH	6mm	55441
T15THANDWRENCH	T15	50084
T20THANDWRENCH	T20	50088
T25THANDWRENCH	T25	50092
DMP3139	T25IP	61922
DMP3460	T30IP	50148
DMP3441	T40IP	61923

Drivers		
Part #	**Size**	**EDP#**
T7TORXSCRDR	T7	50100
T8TORXSCRDR	T8	50103
T10TORXSCRDR	T10	50082
T15TORXSCRDR	T15	50086
T20TORXSCRDR	T20	50090
TX207PLUS	T7IP	50147
TX208PLUS	T8IP	61930
TX209PLUS	T9IP	62530
TX210PLUS	T10IP	61931
TX215PLUS	T15IP	61932
TX220PLUS	T20IP	61933

PT 745 Anti Seize (For Insert and Wedge Screws)	
Part Number	**EDP#**
PT745	50050

ANTI SEIZE contains solid lubricants, powered metals and corrosion inhibitors in mineral oil. This product aids in assembly of threaded and non-threaded components while ensuring non-destructive disassembly. This product contains release and sealing properties, excellent aging resistance, a high service temperature range (-40° to +2100°, F) and will not affect torque values on threaded connections.

General Torque Specifications

ValMILL®

By Thread Size		
Thread Size	**Torque (in/lb)**	**Torque (N/cm)**
M2	4	45
M2.2	6	68
M2.5	8	90
M3	15	169
M3.5	21	237
M4	35	395
M4.5	48	542
M5	71	802
M6	119	1345
M8	288	3254
M10	575	6497
#4-40	12	136
#5-40	17	192
#6-32	23	260
#8-32	39	441
#10-24	53	599
#10-32	60	678
1/4-20	125	1412
1/4-28	145	1638
5/16-18	263	2972
5/16-24	290	3277
3/8-16	470	5310
3/8-24	530	5988

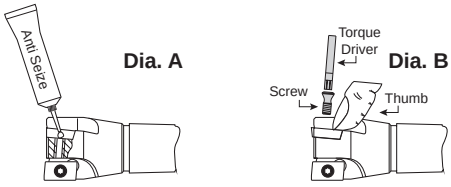
Inch and metric screws have a 50% torque safety factor

Notes:

1. Tighten screws to the lowest torque value shown, based on either thread or drive size.
2. For best results, use a torque wrench from the chart. Locate the closest (either lower or higher) torque value from the torque chart, then identify the wrench from the torque value.

	By Wrench Size		
	Wrench Size	**Torque (in/lb)**	**Torque (N/cm)**
Hex	0.050	5	56
	1/16	9	102
	5/64	18	203
	3/32	32	362
	7/64	50	565
	1/8	74	836
	9/64	106	1198
	5/32	145	1638
	3/16	250	2825
	7/32	397	4485
	1/4	593	6700
Torx®	T6	4	45
	T7	6	68
	T8	8	90
	T9	14	158
	T10	21	237
	T15	47	531
	T20	65	734
	T25	108	1220
Torx Plus®	06IP	6.4	72
	07IP	12	136
	08IP	20	226
	09IP	24	271
	10IP	31	350
	15IP	56	633
	20IP	94	1062
	25IP	137	1548
	27IP	202	2282
	30IP	275	3107
	40IP	478	5401

Instructions for Assembly of Inserts with Screws



- Make sure all surfaces are clean.
- Inspect screw for wear and replace as necessary.
- PT745 Anti Seize must be applied regularly to the screw threads when assembling inserts into the cutter body (Dia. A).
- Before tightening the insert screw, make sure that the bottom of the insert is in contact with the seating surface by pressing on the back of the insert with your thumb (Dia. B).

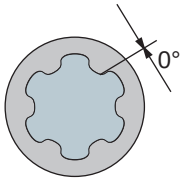
Never pull the insert into position using only the screw as this will result in poor positioning of the insert, and improper insert retention.

- Tighten screw to the recommended torque value. Valenite recommends the use of a torque driver/torque wrench to avoid damaging the screws and to ensure the proper torque value is applied.
- This simple procedure is essential to achieve optimum performance and is applicable for all tools where the inserts are retained by a screw.

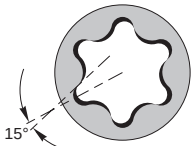
Note: Do not exceed the maximum recommended RPM. Cutter body, pocket area, inserts and screws require periodic inspection.
Do not use if damaged!

The Torx Plus® System

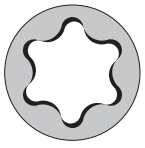
- Longer driver life
- Torx Plus® screws accept Torx® drivers
- Torx Plus® drivers cannot be used on Torx® screws



The Torx Plus® driver contact angle is 0º.



The Torx® driver contact angle is 15º.



The Torx® bit driver may be used on a Torx Plus® screw.

Guide to Workpiece Materials

ValMILL®

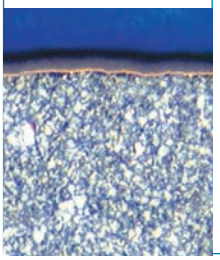
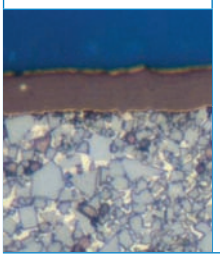
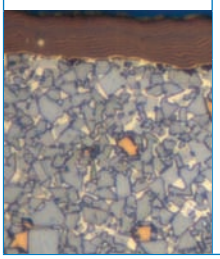
Guide To Workpiece Materials		
Category		**Material Designations**
Steels P	**Free Machining & Low Carbon**	1006, 1008, 1010, 1015, 1018, 1020, 1022, 1025, 1117, 1141, 1213, 12L13, 12L14, 11L41
	Medium & High Carbon	1030, 1035, 1040, 1045, 1052, 1055, 1060, 1085, 1095, 1424, 1541, 1551
	Alloy & Easy To Machine Tool Steels	4130, 4140, 4150, 4340, 5140, 4320, 5120, 8620, 6150, 52100, W1, W2, W5, 300M
	Tool & Die Steels	M1, M2, T1, T4, T15, A2, A3, D2, D4, O1, 02, H10, H11, H13, P2, P20
Stainless Steels M	**Ferritic & Martensitic**	403, 405, 409, 410S, 414, 430, 431, 434, 440, 442
	Austenitic	201, 203, 303, 304, 304L, 316, 316L, 321, 327, NITRONIC 40, CUSTOM 455
	PH & Duplex	15-5 PHG, 17-4 PH, PH13-8 Mo, AM350, AM355, FERRALIUM 255, 329, S32950
Cast Irons K	**Gray Cast Iron**	ASTM A48, CLASS 20, 25, 30, 35,40 SAE J431C GRADES G2000, G2500, G3000, G3500, G4000
	Compacted Graphite Iron	ASTM A842-85 GRADES 300, 350, 400 SAE J1887 GRADES C250, C300HN, C300, C350, C400, C450, C500HN
	Ductile Iron & Malleable Low & Medium Tensile	ASTM A546 GRADES 60-40-18, 65-45-12, 80-55-06 SAE 434 J434C GRADES D4512, D5506 ASTM A220 GRADES 40010, 45006, 45008, 55005, 600004 SAE J158 GRADES M3210, M4505, M5003, M5503
	Ductile Iron & Malleable High Tensile	ASTM A536, GRADES 100-70-03 SAE J434C GRADE D7003 ASTM A220 GRADES 70003, 820002, 90001 SAE J158 GRADES M7002, M8501
High Temperature Alloys S	**Iron Based Alloys**	A-286, INCOLOY 800, 801, 802, N-155, 19-9 DL
	Nickel & Cobalt Base Alloys Hastelloy, Inconel, Stellite	INCONEL 600, 625, 718, X750, WASPALOY, MIMONIC 90, UDIMET 500 & 700, MONEL ALLOYS L-605, HAYNES ALLOY 25, 188, HAYNES STELLITE 6, 21, WI-52
	Titanium Alloys	6Al4V, 5Al-2.5Sn, 6Al-2Sn-4Zr-6Mo
Aluminum & Non-Ferrous Materials N	**Aluminum < 7% Si**	AA 2014, 2024, 4032, 6061, 6151, 7075 SAE 304, 335, 336, 380
	Aluminum 7% - 12% Si	AA 380, A380, 384, A384 SAE 303, 305, 306, 308, 309, 383
	Aluminum > 12% Si	AA 390, 392
	Non-Ferrous	PRECIOUS METALS, COPPER, BRASS ALLOYS, PLASTICS, MAGNESIUM ALLOYS

Material		Hard-ness	SFM (m/min.)									
			PVD				CVD				Uncoated	PCD
			VP1020	VP5020	VP5040	VP5045	VP5135	VP5142	VP1120	VP1130	VPUK20	VPD720
Steels P	Free Machining & Low Carbon	120-170 BHN	-	800-1100 (240-330)	700-900 (210-270)	500-800 (150-240)	600-800 (180-240)	500-800 (150-240)	-	-	-	-
	Medium & High Carbon	180-220 BHN	-	600-800 (180-240)	500-600 (150-180)	350-600 (105-180)	400-600 (120-180)	350-600 (105-180)	-	-	-	-
	Alloy & Easy To Machine Tool Steels	200-240 BHN	-	500-700 (150-210)	400-550 (120-165)	300-450 (90-135)	350-450 (105-135)	300-450 (90-135)	-	-	-	-
	Tool & Die Steels	220-260 BHN	-	350-500 (105-150)	300-400 (90-120)	200-350 (60-105)	250-350 (75-105)	200-350 (60-105)	-	-	-	-
Stainless Steels M	Ferritic & Martensitic	180-240 BHN	-	500-700 (150-210)	400-550 (120-165)	300-500 (90-150)	350-500 (105-150)	300-500 (90-150)	-	-	-	-
	Austenitic	140-180 BHN	-	400-600 (120-180)	350-500 (105-150)	250-450 (75-135)	300-450 (90-135)	250-450 (75-135)	-	-	-	-
	PH & Duplex	220-260 BHN	-	350-500 (105-150)	300-400 (90-120)	200-350 (60-105)	250-350 (75-105)	200-350 (60-105)	-	-	-	-
Cast Irons K	Gray Cast Iron	180-260 BHN	400-700 (120-215)	600-700 (180-210)	-	-	-	-	800-1000 (240-300)	600-900 (200-300)	250-400 (75-130)	Bi-Metal <1500 (<450)
		220-260 BHN	350-600 (110-180)	500-600 (150-180)	-	-	-	-	700-800 (210-240)	500-700 (150-210)	200-300 (60-90)	Bi-Metal <1500 (<450)
	Ductile Iron	140-180 BHN	350-600 (110-180)	500-600 (150-180)	-	-	-	-	700-800 (210-240)	500-700 (150-210)	225-350 (65-105)	-
		220-260 BHN	350-500 (110-150)	400-500 (120-150)	-	-	-	-	500-700 (150-210)	400-600 (130-200)	200-300 (60-90)	-
High Temperature Alloys S	Iron Based Alloys	-	-	225-250 (65-75)	225-250 (65-75)	175-225 (55-65)	200-225 (60-65)	-	-	-	150-200 (45-60)	-
	Nickel & Cobalt Base Alloys Hastelloy, Inconel, Stellite	-	-	150-175 (45-55)	125-150 (35-45)	125-150 (35-45)	125-150 (35-45)	-	-	-	75-100 (25-30)	-
	Titanium Alloys 6al-v4	-	-	225-275 (65-85)	200-250 (60-75)	150-200 (45-60)	150-200 (45-60)	-	-	-	100-150 (30-45)	-
Aluminum & Non-Ferrous Materials N	Aluminum < 7% Si	-	-	1500-3000 (450-900)	-	-	-	-	-	-	1000-2000 (300-600)	2000 -15,000 (600-4500)
	Aluminum 7% - 12% Si	-	-	1250-2500 (375-750)	-	-	-	-	-	-	800-1750 (240-525)	1500 - 10,000 (450-3000)
	Aluminum > 12% Si	-	-	800-1500 (240-450)	-	-	-	-	-	-	500-1000 (150-300)	1000 - 3000 (300-900)
	Non-Ferrous	-	-	600-1400 (180-420)	-	-	-	-	-	-	400-1000 (120-300)	1000 - 3000 (300-900)

Always follow manufacturers recommendations and do not exceed maximum RPM for every cutter prior to running recommended speeds. Ensure cutter and inserts are in proper working order and each is secure to avoid potential injury.

Grade Descriptions

ValMILL®

Grade	Description	Performance	ISO Class	Application
VP5005 	**PVD coated** TiAlN/TiN Sub-Micron Substrate	**Finishing** High Wear Resistance & Edge Strength	**P05**	Primarily used for finishing of hardened molds & dies
VP5007 	**PVD Coating** TiAlN/TiN Micrograin Coating Tough Substrate	**Finish Milling Grade** Excellent Wear Resistance Outstanding Edge Integrity Superior Surface Finishes	**P07**	Primarily used for finishing of hardened molds & dies
VP5020 	**PVD coated** TiAlN/TiN Sub-Micron Substrate	**Universal Medium Machining** High Edge Strength & Moderate Toughness	**P20**	Higher speeds with lighter feeds, no coolant
			M20	Medium speeds with moderate feeds, coolant optional
			S20	Elevated speeds with moderate feeds, use generous coolant
VP5040 	**PVD Coating** TiAlN/TiN Coating Medium Grain Substrate	**Heavy Roughing** High Toughness	**P40**	Moderate speeds with heavy feeds, best without coolant
			M30	PH Stainless, moderate speeds & feeds, no coolant
VP5045 	**PVD coated** TiAlN/TiN Coarse Grain Substrate	**Universal Heavy Roughing** Highest Toughness	**P45**	Low to moderate speeds with heavy feeds, coolant optional
			M45	Low to moderate speeds with heavy feeds, coolant optional
			S40	Low to moderate speeds with heavy feeds, use generous coolant

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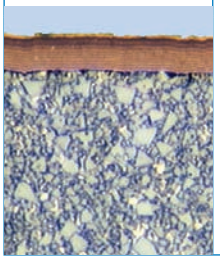
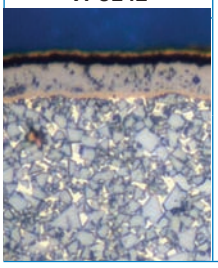
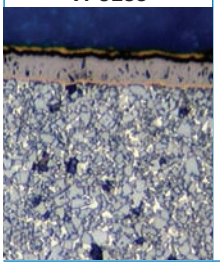
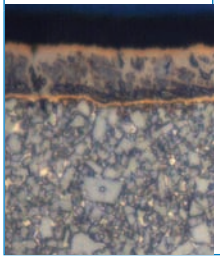
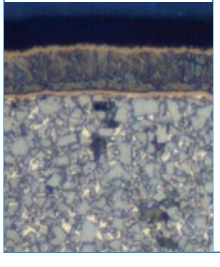
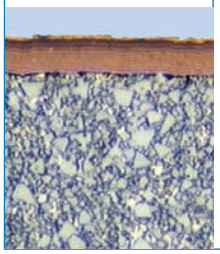
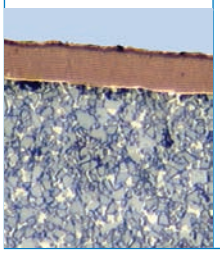
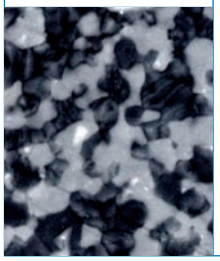
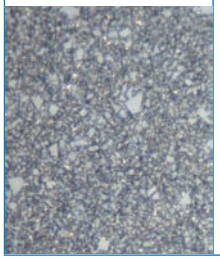
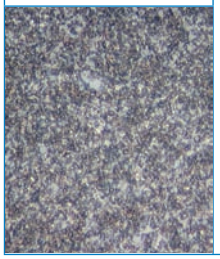
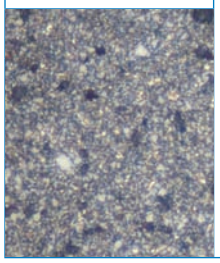
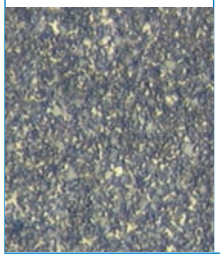
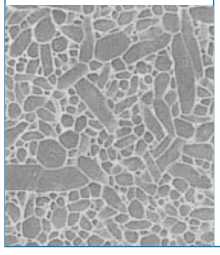
Grade Descriptions

Grade	Description	Performance	ISO Class	Application
VP1020 	**PVD Coated Carbide** TiAlN/TiN Multi-Layer Coating Fine Grain Substrate	**Medium Duty Grade** Excellent Wear Resistance Excellent Toughness and Chipping Resistance Less Build-up at the Cutting Edge	**P15**	Medium to high speed machining
			M15	
			K15	
			S15	
			N15	
VP5142 	**MT TiCN/Al2O3/TiN coated** With Polished Edge Coarse Grain Substrate	**Roughing** High Wear Resistance	**P30**	Elevated speeds with moderate feeds, no coolant
			M30	Elevated speeds with moderate feeds, no coolant
VP5135 	**MT TiCN/Al2O3/TiN coated** Medium Grain Substrate	**Roughing** High Wear Resistance	**P25**	Elevated speeds with moderate feeds, no coolant
			M25	Elevated speeds with moderate feeds, no coolant
VP1120 	**MT TiCN/Al2O3/TiN coated** with Top Polish Fine Grain Substrate	**Medium roughing** High Wear Resistance	**K20**	Elevated speeds with moderate feeds, no coolant
VP1130 	**MT TiCN/Al2O3/TiN coated** with Top Polish Fine Grain Substrate	**Heavy Roughing** High Toughness	**K30**	Moderate speeds with heavy feeds, best without coolant

Grade Descriptions

ValMILL®

Grade	Description	Performance	ISO Class	Application
VP5815 	**PVD Coated Carbide** TiAlN/TiN Multi-Layer Coating Fine Grain Substrate	**Medium Duty Grade** Excellent Wear Resistance Excellent Toughness and Chipping Resistance Less Build-up at the Cutting Edge	**P15** **M15** **K15** **S15** **N15**	Medium to high speed machining
VP5845 	**PVD Coated Milling Grade** TiAlN/Tin Coating High Cobalt Substrate	Excellent Toughness Excellent Wear Resistance	**P45** **M40** **K45** **S40** **N40**	High feed
VP6020 	**Cermet**	**Light Machining**	**P15**	Elevated speeds with light feeds, no coolant
VPUK20 	**Uncoated** Fine Grain Substrate	**Roughing** High Wear Resistance	**K20**	Low to Moderate speeds with heavy feeds, coolant optional
VPUP30 	**Uncoated** Fine Grain Alloy Substrate	**Roughing** High Toughness High Crater Resistance	**P40**	Moderate speeds with heavy feeds, best without coolant

Grade	Description	Performance	ISO Class	Application
VPUS10 	**Uncoated** Sub-Micron Substrate	**Medium Roughing** High Wear Resistance	**K10**	Moderate speeds with light feeds, coolant optional
		Light Machining High Edge Strength Low tToughness	**S10**	Low to moderate speeds with low feeds, use generous coolant
		Medium Roughing High Wear Resistance	**N25**	Low to moderate speeds with heavy feeds, coolant optional
US25 	**Uncoated** Sub-Micron Substrate	**Roughing** High Edge Strength Toughness	**S22**	Moderate speeds with moderate feeds, use generous coolant
VPD720	**PCD** Polycrystalline Diamond Grade Medium Granulometry	**General Purpose** High Wear Resistance Excellent Edge Integrity	**N25**	High speeds with moderate feeds, coolant optional
VC722	**pCBN** High Content CBN	**General Purpose** High Wear Resistance Tough CBN Also Good for Hard Part Milling	**K10**	Higher speeds with lighter feeds, no coolant
			H10	Slower speeds with light feeds, no coolant
VPQ130 	**Silicon NItride** Tough Grade	**General Purpose** High Wear Resistance High Productivity	**K10**	Higher speeds with moderate feeds, no coolant

Milling Formulas

ValMILL®

Inch
SFM = RPM x DIA x 0.262
RPM = (SFM x 3.82) / DIA
MRR = W x DOC x IPM
IPM = FPT x T x RPM
FPR = IPM / RPM
FPT = IPM / (RPM x T)
IPR = FPT x T ⟶ FPR = IPM / RPM
HP = W x DOC x IPM / K
HP = W x DOC x IPM x PF

Conversion From Inch To Metric
SMPM = SFM x 0.3048
SMPM = RPM x DIA x 0.0799
MMPR = IPR x 25.40
MMPR = MMPT x T x RPM

PF and K Values for Milling Formulas		
Material	**PF**	**K**
Aluminum	0.250	4.00 +
Brass Soft	0.333	3.00
Brass Hard	0.500	2.00
Bronze Hard	0.714	1.40
Bronze Very Hard	1.538	0.65
Cast Iron (< 200BHN)	0.667	1.50
Cast Iron (> 200BHN)	1.000	1.00
Malleable Iron	0.800	1.25
Steel (100BHN)	1.250	0.80
Steel (150BHN)	1.429	0.70
Steel (200BHN)	1.538	0.65
Steel (250BHN)	1.667	0.60
Steel (300BHN)	1.818	0.55
Steel (400BHN)	2.000	0.50

Key	Description
SFM	Surface Feet Per Minute
SMPM	Surface Meters Per Minute
RPM	Rotations Per Minute
IPM	Inches Per Minute
FPR	Feed Per Revolution
IPR	Inch Per Revolution
MMPR	MM Per Revolution
FPT	Feed Per Tooth
T	Number Of Teeth
DIA	Diameter
W	Width Of Cut
DOC	Depth Of Cut
LOC	Length Of Cut
MRR	Material Removal Rate (in^3/minute)
K	Material Constant
PF	Power Factor

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V 440 A 075 075 WD 20	C8
V 440 A 100 100 CD 23	C8
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V490 A 15 0300 H 06R	E2
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V50CTB125600	I7
V50CTB150600	I7
V50CTB200600	I7
V50CTE100162	I6
V50CTE100400	I6
V50CTE100600	I6
V50CTE100800	I6
V50CTE125262	I6
V50CTE125400	I6
V50CTE125800	I6
V50CTE150262	I6
V50CTE150400	I6
V50CTE150800	I6
V50CTE200562	I6
V50CTE200962	I6
V50CTE250650	I6
V50CTE25250	I6
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V50CTS125775	I3
V50CTS150240	I3
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V50CTS150600	I3
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V 555 A 09 0500 K08R	G3
V 555 A 09 0600 K09R	G3
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