



OSG's HY-PRO® CARB Variable Geometry Lineup

Vol 6

VGM Series

3-Flute • 5-Flute • 6-Flute • 7-Flute

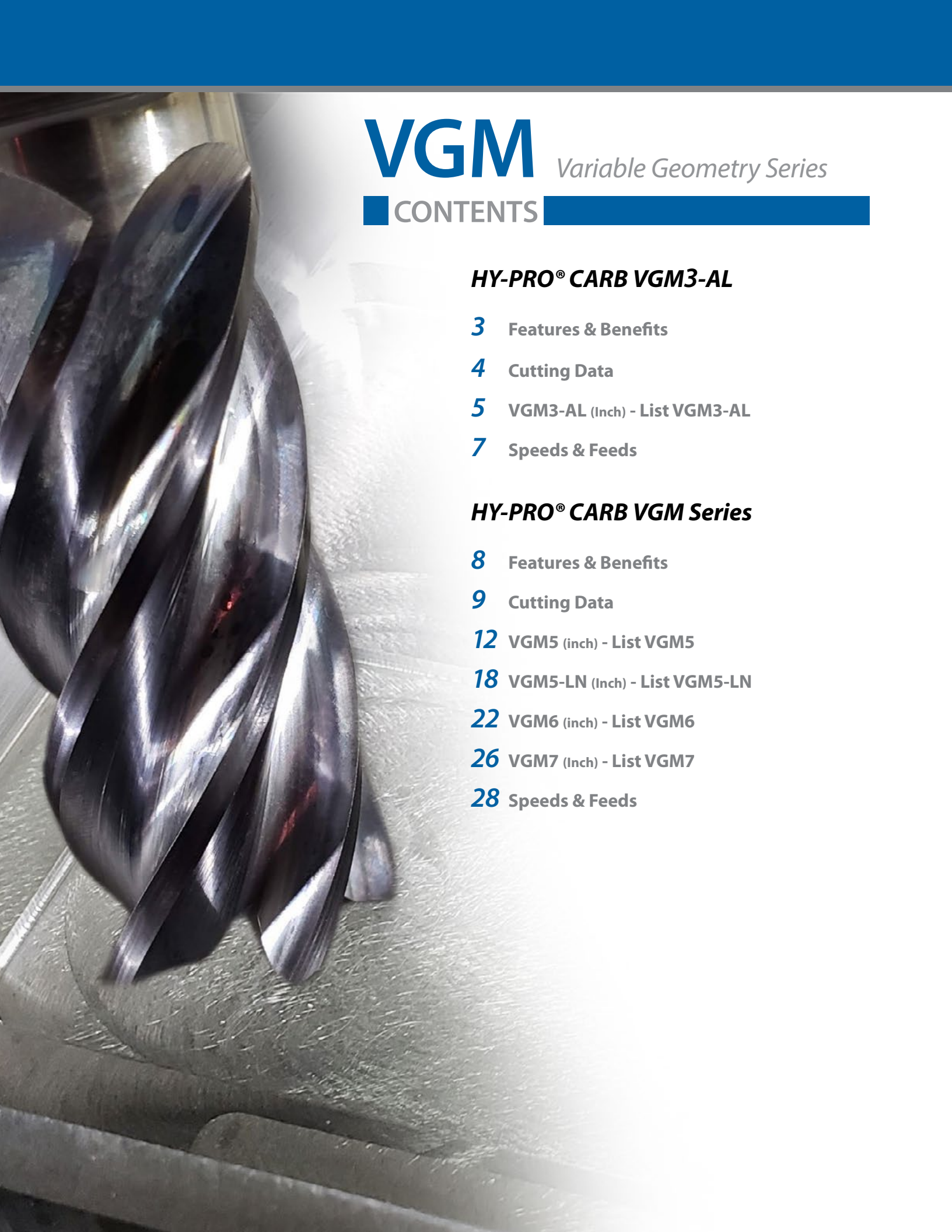


NEW VGM3-AL
Now Added!



For more information
scan the QR code to visit:
osgtool.com/hypro-carb-vgm-series





VGM

Variable Geometry Series

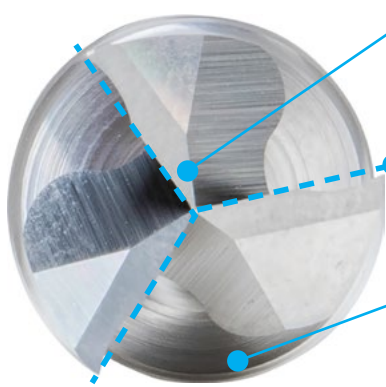
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Center Cutting

3 cutting edges to center; ideal for plunging and ramping.

Variable Index

Reduces vibration during machining.

Unique Flute Geometry

Maintains excellent cutting edge sharpness and tool rigidity.

Center Cutting

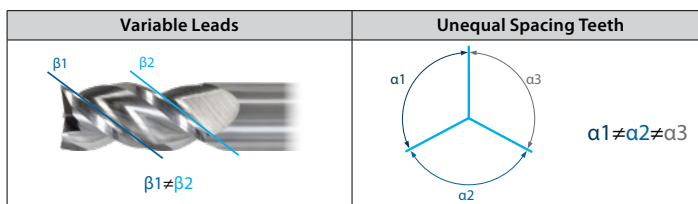
For High Speed Milling and Faster Part Entry

The cutting load is equalized among the cutting edges with greater stability to enable high speed milling. Highly effective for plunging and ramping.

Variable Index and Helix

Stable and High Efficiency Milling

Stable and high efficiency milling is made possible by the suppression of vibration and chattering.



VGM3-AL Size Offering

3-Flute Lineup

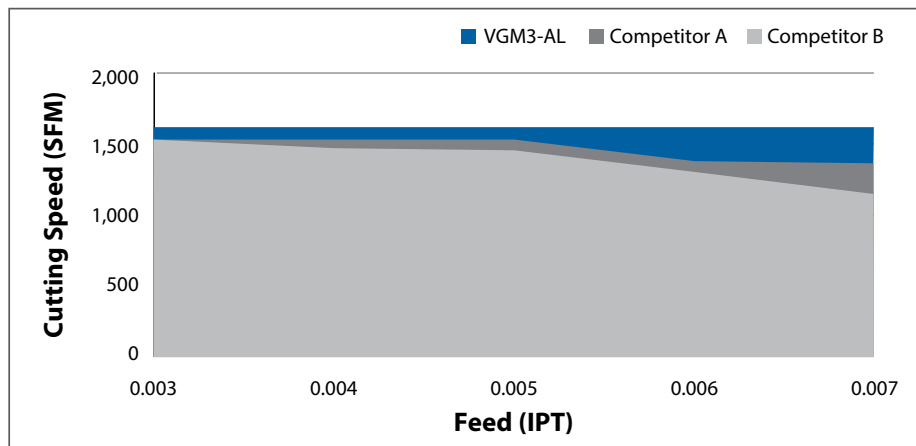
OSG's VGM3-AL is the newest 3-Flute addition to the VGM Series. Available with multiple lengths of cut, with both square and corner radius variations.

Name	No. of Flutes	End Cut Type	Reduced Neck	LOC	Neck Length	Total # of EDPs
VGM3-AL	3	SQ & CR	N/A	2 to 3xD	-	54

VGM3-AL - High Efficiency Milling

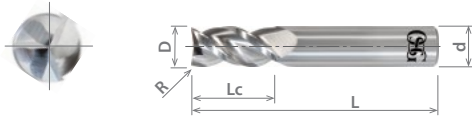
A7075 Aluminum

Tool	VGM3-AL	Competitor A	Competitor B
Tool Size	1/2"		
Work Material	A7075		
Milling Method	Side Milling		
Depth of Cut	Aa=1.5", Ar=0.2"		
Coolant	Water-Soluble		
Machine	Vertical Machining Center		



List VGM3-AL

HY-PRO CARB VGM3-AL



NEW	SPEED FEED P7	CARBIDE	BR	3 FLUTE	40-43°				SHANK h6	REG	PACKED 1 PIECE
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Cutting Diameter Tolerance	
1/8" ≤ D ≤ 3/16"	+0 / -0.0003"
1/4" ≤ D ≤ 5/8"	+0 / -0.0004"
3/4" ≤ D ≤ 1"	+0 / -0.0005"

EDP Number		Diameter	Corner Radius	Length of Cut	Overall Length	Shank Diameter	L/D Ratio
		D (Fractional Size)	R (Inch)	Lc (Inch)	L (Inch)	d (Inch)	
VGM3-0001	●	1/8	-	0.375	1.500	0.125	3
VGM3-0002	●	1/8	0.010	0.375	1.500	0.125	3
VGM3-0003	●	1/8	0.015	0.375	1.500	0.125	3
VGM3-0004	●	1/8	0.030	0.375	1.500	0.125	3
VGM3-0005	●	3/16	-	0.563	2.000	0.188	3
VGM3-0006	●	3/16	0.015	0.563	2.000	0.188	3
VGM3-0007	●	3/16	0.020	0.563	2.000	0.188	3
VGM3-0008	●	3/16	0.030	0.563	2.000	0.188	3
VGM3-0009	●	1/4	-	0.625	2.500	0.250	2.5
VGM3-0010	●	1/4	0.010	0.625	2.500	0.250	2.5
VGM3-0011	●	1/4	0.015	0.625	2.500	0.250	2.5
VGM3-0012	●	1/4	0.020	0.625	2.500	0.250	2.5
VGM3-0013	●	1/4	0.030	0.625	2.500	0.250	2.5
VGM3-0014	●	1/4	0.060	0.625	2.500	0.250	2.5
VGM3-0015	●	5/16	-	0.813	2.500	0.313	2.6
VGM3-0016	●	5/16	0.020	0.813	2.500	0.313	2.6
VGM3-0017	●	5/16	0.030	0.813	2.500	0.313	2.6
VGM3-0018	●	3/8	-	1.000	2.500	0.375	2.6
VGM3-0019	●	3/8	0.010	1.000	2.500	0.375	2.6
VGM3-0020	●	3/8	0.015	1.000	2.500	0.375	2.6
VGM3-0021	●	3/8	0.020	1.000	2.500	0.375	2.6
VGM3-0022	●	3/8	0.030	1.000	2.500	0.375	2.6
VGM3-0023	●	3/8	0.060	1.000	2.500	0.375	2.6
VGM3-0024	●	3/8	0.090	1.000	2.500	0.375	2.6
VGM3-0025	●	3/8	0.125	1.000	2.500	0.375	2.6
VGM3-0026	●	7/16	-	1.250	2.750	0.438	2.8
VGM3-0027	●	7/16	0.020	1.250	2.750	0.438	2.8
VGM3-0028	●	1/2	-	1.250	3.000	0.500	2.5
VGM3-0029	●	1/2	0.010	1.250	3.000	0.500	2.5
VGM3-0030	●	1/2	0.015	1.250	3.000	0.500	2.5
VGM3-0031	●	1/2	0.020	1.250	3.000	0.500	2.5
VGM3-0032	●	1/2	0.030	1.250	3.000	0.500	2.5
VGM3-0033	●	1/2	0.060	1.250	3.000	0.500	2.5
VGM3-0034	●	1/2	0.090	1.250	3.000	0.500	2.5
VGM3-0035	●	1/2	0.125	1.250	3.000	0.500	2.5
VGM3-0036	●	5/8	-	1.625	3.500	0.625	2.6
VGM3-0037	●	5/8	0.030	1.625	3.500	0.625	2.6
VGM3-0038	●	5/8	0.060	1.625	3.500	0.625	2.6
VGM3-0039	●	5/8	0.090	1.625	3.500	0.625	2.6
VGM3-0040	○	5/8	0.125	1.625	3.500	0.625	2.6
VGM3-0041	●	3/4	-	1.625	4.000	0.750	2.2
VGM3-0042	●	3/4	0.015	1.625	4.000	0.750	2.2
VGM3-0043	●	3/4	0.030	1.625	4.000	0.750	2.2
VGM3-0044	●	3/4	0.060	1.625	4.000	0.750	2.2
VGM3-0045	○	3/4	0.090	1.625	4.000	0.750	2.2
VGM3-0046	●	3/4	0.120	1.625	4.000	0.750	2.2

● Stocked ○ Available Upon Request; MOQ May Apply ▲ Globally Stocked



CONTINUED ➔

P					M			K	N		S		H			
Steel					Stainless Steel			Cast Iron	Non-Ferrous		HRSA		Hardened Steel			
Carbon Steel			Alloy Steel	Aluminum					Nickel Alloy	Titanium						
Low	Medium	High														
1010	1035	1065	4140	Die Steel	300	400	17-4 PH	6061	Casting	Inconel	6Al4V	~35	35-45	45-50	50-70	
1018	1045	1065	4340		7075			(30 HRC)					HRC	HRC	HRC	HRC
								⊙	⊙							

○ Good ○ Best



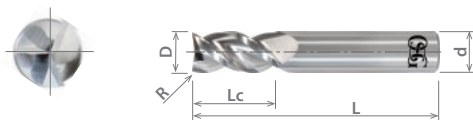
HY-PRO® CARB VGM3-AL

High Performance Variable Geometry End Mills

List VGM3-AL (Cont.)

HY-PRO CARB VGM3-AL

NEW	SPEED FEED P7	CARBIDE	BR	3 FLUTE	40-43°				SHANK h6	REG	PACKED 1 PIECE
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Cutting Diameter Tolerance	
$1/8" \leq D \leq 3/16"$	+0 / -0.0003"
$1/4" \leq D \leq 5/8"$	+0 / -0.0004"
$3/4" \leq D \leq 1"$	+0 / -0.0005"

EDP Number		Diameter	Corner Radius	Length of Cut	Overall Length	Shank Diameter	L/D Ratio
		D (Fractional Size)	R (Inch)	Lc (Inch)	L (Inch)	d (Inch)	
VGM3-0047	○	3/4	0.190	1.625	4.000	0.750	2.2
VGM3-0048	○	3/4	0.250	1.625	4.000	0.750	2.2
VGM3-0049	●	1	-	2.000	5.000	1.000	2
VGM3-0050	○	1	0.030	2.000	5.000	1.000	2
VGM3-0051	○	1	0.060	2.000	5.000	1.000	2
VGM3-0052	○	1	0.090	2.000	5.000	1.000	2
VGM3-0053	○	1	0.120	2.000	5.000	1.000	2
VGM3-0054	○	1	0.250	2.000	5.000	1.000	2

● Stocked ○ Available Upon Request; MOQ May Apply ▲ Globally Stocked



P					M			K	N		S	H				
Steel					Stainless Steel			Cast Iron	Non-Ferrous		HRSA		Hardened Steel			
Carbon Steel			Aluminum	Nickel Alloy					Titanium							
Low	Medium	High								Alloy Steel	Die Steel					
1010	1035	1065	4140	Die Steel	300	400	17-4 PH	6061	Casting	Inconel	6Al4V (30 HRC)	~35 HRC	35-45 HRC	45-50 HRC	50-70 HRC	
1018	1045		4340					7075								
								⊙	⊙							

○ Good ◎ Best



List VGM3-AL - HY-PRO® CARB VGM

Side Milling

Work Material	Aluminum Alloy A6061, A7075		Aluminum Alloy Casting		Copper Alloy C1100	
Cutting	600 - 1,700 SFM		600 - 1,700 SFM		400 - 1,200 SFM	
Depth of Cut	Aa = 1.5xD Ar = 0.2xD				Aa = 1.5xD Ar = 0.1xD	
Mill Dia.	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM
1/8	25,000	112.5	25,000	112.5	24,500	73.5
3/16	23,500	158.6	23,500	158.6	16,300	73.4
1/4	17,600	158.4	17,600	158.4	12,300	73.8
5/16	14,100	158.6	14,100	158.6	9,800	73.5
3/8	11,800	159.3	11,800	159.3	8,200	73.8
7/16	10,100	159.1	10,100	159.1	7,000	73.5
1/2	8,800	158.4	8,800	158.4	6,200	74.4
5/8	7,100	159.8	7,100	159.8	4,900	73.5
3/4	5,900	159.3	5,900	159.3	4,100	73.8
1	4,400	158.4	4,400	158.4	3,100	74.4

1. Use a rigid and precise machine and holder.
2. The indicated speeds and feeds are for milling with water-soluble coolant.
3. Please adjust the speed and feed when the cutting depth is large or when machines with low rigidity are used.
4. Reduce speed and feed as well as depth of cut when high precision is required.
5. Always use the appropriate cutting fluid recommended by the cutting fluid manufacturer in the machining of magnesium alloys.
6. Be cautious with the cutting chips as they are highly flammable and may pose a serious fire risk if not properly handled.

Slotting

Work Material	Aluminum Alloy A6061, A7075		Aluminum Alloy Casting		Copper Alloy C1100	
Cutting	400 - 1,300 SFM		400 - 1,300 SFM		240 - 800 SFM	
Depth of Cut	Aa = 1xD				Aa = 0.5xD	
Mill Dia.	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM
1/8	25,000	93.8	25,000	93.8	15,900	47.7
3/16	17,300	97.3	17,300	97.3	10,600	47.7
1/4	13,000	97.5	13,000	97.5	8,000	48.0
5/16	10,400	97.5	10,400	97.5	6,400	48.0
3/8	8,700	97.9	8,700	97.9	5,300	47.7
7/16	7,500	98.4	7,500	98.4	4,600	48.3
1/2	6,500	97.5	6,500	97.5	4,000	48.0
5/8	5,200	97.5	5,200	97.5	3,200	48.0
3/4	4,400	99.0	4,400	99.0	2,700	48.6
1	3,300	99.0	3,300	99.0	2,000	48.0

1. Use a rigid and precise machine and holder.
2. The indicated speeds and feeds are for milling with water-soluble coolant.
3. Please adjust the speed and feed when the cutting depth is large or when machines with low rigidity are used.
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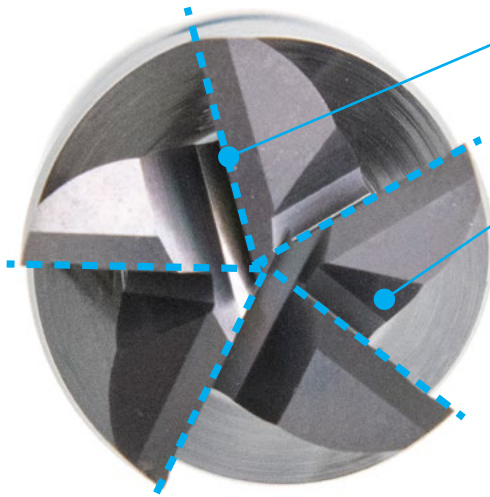
Plunging

Work Material	Aluminum Alloy A6061, A7075		Aluminum Alloy Casting		Copper Alloy C1100	
Cutting	350 SFM		350 SFM		200 SFM	
Depth of Cut	Aa = 1xD				Aa = 0.5xD	
Mill Dia.	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM
1/8	10,700	12.0	10,700	12.0	6,200	4.7
3/16	7,200	12.2	7,200	12.2	4,100	4.6
1/4	5,400	12.2	5,400	12.2	3,100	4.7
5/16	4,300	12.1	4,300	12.1	2,500	4.7
3/8	3,600	12.2	3,600	12.2	2,100	4.7
7/16	3,100	12.2	3,100	12.2	1,800	4.7
1/2	2,700	12.2	2,700	12.2	1,600	4.8
5/8	2,200	12.4	2,200	12.4	1,300	4.9
3/4	1,800	12.2	1,800	12.2	1,100	5.0
1	1,400	12.6	1,400	12.6	800	4.8

1. Use a rigid and precise machine and holder.
2. The indicated speeds and feeds are for milling with water-soluble coolant.
3. Please adjust the speed and feed when the cutting depth is large or when machines with low rigidity are used.
4. Reduce speed and feed as well as depth of cut when high precision is required.
5. Always use the appropriate cutting fluid recommended by the cutting fluid manufacturer in the machining of magnesium alloys.
6. Be cautious with the cutting chips as they are highly flammable and may pose a serious fire risk if not properly handled.

HY-PRO® CARB VGM Series

Features & Benefits



Variable Index

Reduces vibration during machining.

Unique Flute Geometry

Maintains excellent cutting edge sharpness and tool rigidity.

EXO Coating

Provides longer tool life through exceptional wear and heat resistance.



Variable Index & Unique Flute Geometry

Reduces Vibration and Chatter & Promotes Smooth, Stable Cutting w/Low Cutting Forces

Variable Index:

Unequal flute spacing reduces vibration during machining by altering the timing of each flute engaging in the workpiece.

Unique Flute Geometry:

Sharp rake angle, high helix and adjusted core diameter maintain excellent cutting edge sharpness and tool rigidity to promote smooth, stable cutting with low cutting force.

EXO Coating

Provides Long Tool Life

OSG's proprietary multi-layer coating provides longer tool life through higher wear and heat resistance than conventional TiAlN coatings.

Series	Coating	Type	Hardness (HV)	Thickness (μm)	Coefficient of Friction	Oxidation Temp (C)
VGx		TiAlN	2,800	3	0.3	800
VGM		TiAlN Multilayer	2,800	3	0.3	850

VGM Series Comprehensive Offering

5-, 6-, and 7-Flute Lineups

OSG's VGM offering features 5-, 6-, and 7-flute lineups, and is available with multiple Lengths of Cut, with both Square End and Corner Radius variations.

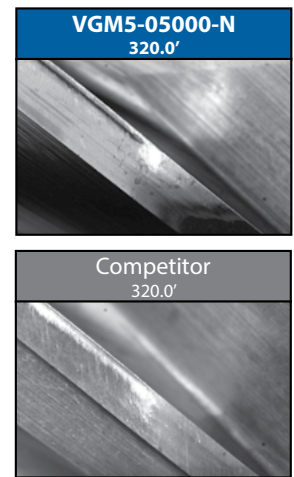
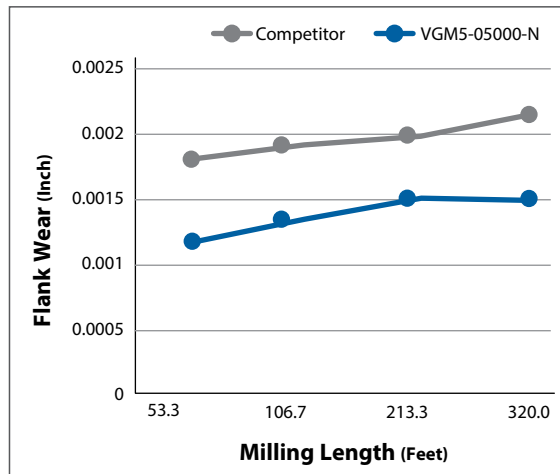
Name	No. of Flutes	End Cut Type	LOC	Reduced Neck	Neck Length	Total # of EDPs
VGM-5	5	SQ & CR	1.25 to 6D	N/A	–	326
VGM-5-LN	5	SQ & CR	1.25D	Yes	3 to 10D	211
VGM-6	6	SQ & CR	1.25 to 6D	N/A	–	186
VGM-7	7	SQ & CR	1.25 to 6D	N/A	–	110



VGM5 - Stable Performance Even in Stainless Steel

304 Stainless Steel

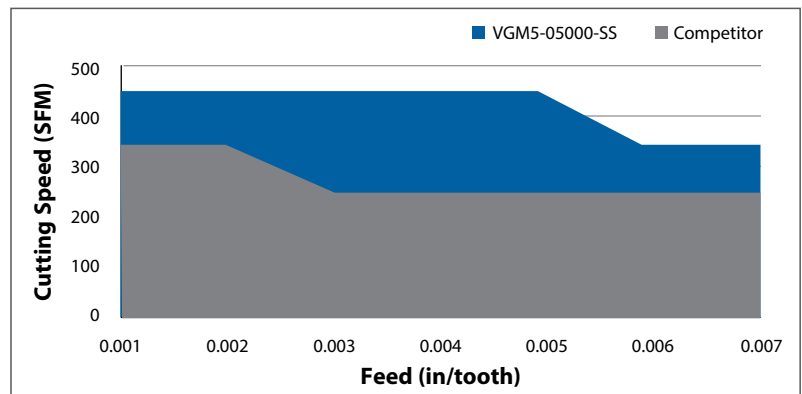
Tool	VGM5-05000-N	Competitor
Tool Size	1/2"	
Work Material	304 Stainless Steel	
Milling Method	Side Milling	
Cutting Speed	250 SFM (1,910 RPM)	
Feed	33.4 IPM (.0035IPT)	
Depth of Cut	Aa=1.2", Ar=0.05"	
Coolant	Water-Soluble	
Machine	Vertical Machining Center (CAT50)	



VGM5 - Stable Performance in a Wide Range of Conditions

304 Stainless Steel

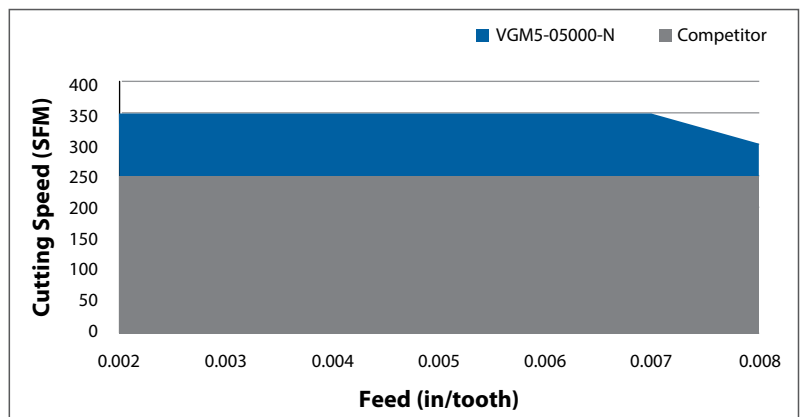
Tool Size	1/2"
Work Material	304 Stainless Steel
Milling Method	Side Milling
Depth of Cut	Aa=0.625", Ar=0.075"
Coolant	Water-Soluble
Machine	Vertical Machining Center (CAT50)



VGM5 - Stable Performance in a Wide Range of Conditions

304 Stainless Steel

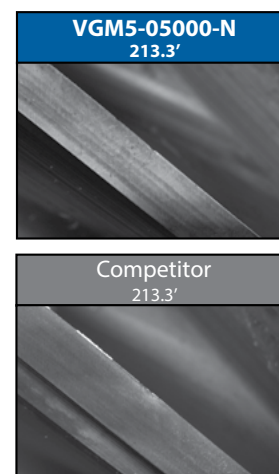
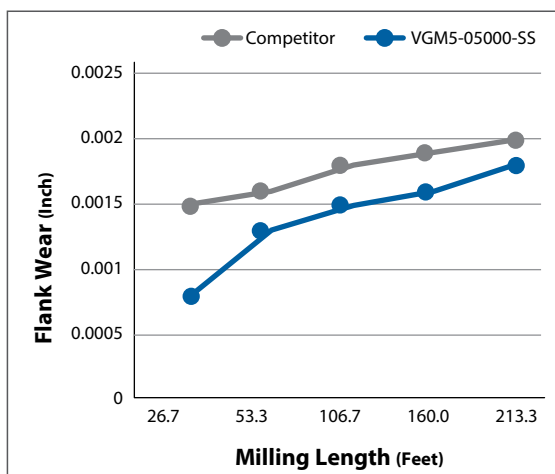
Tool Size	1/2"
Work Material	304 Stainless Steel
Milling Method	Side Milling
Depth of Cut	Aa=1.25", Ar=0.05"
Coolant	Water-Soluble
Machine	Vertical Machining Center (CAT50)



VGM5 - Stable Performance in 1045

1045 Medium Carbon Steel

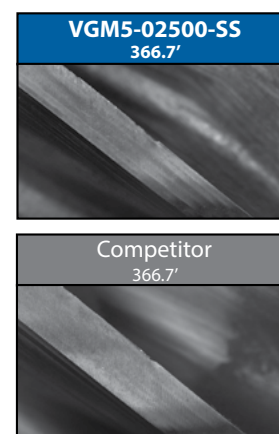
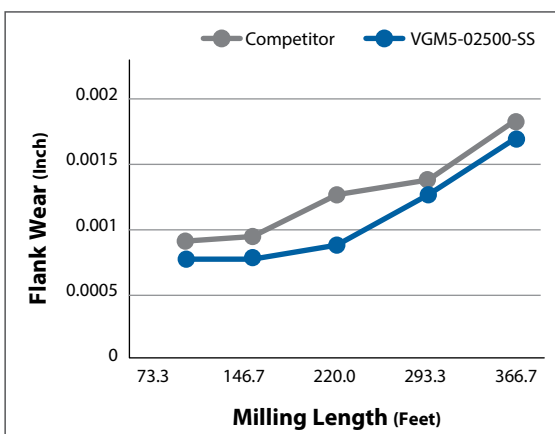
Tool	VGM5-05000-SS	Competitor
Tool Size	1/2"	
Work Material	1045 Medium Carbon Steel	
Milling Method	Side Milling	
Cutting Speed	550 SFM (4,200 RPM)	
Feed	100 IPM (0.0045IPT)	
Depth of Cut	Aa=0.625", Ar=0.2"	
Coolant	Water-Soluble	
Machine	Vertical Machining Center (CAT50)	



VGM5 - Stable Performance in 1045

1045 Medium Carbon Steel

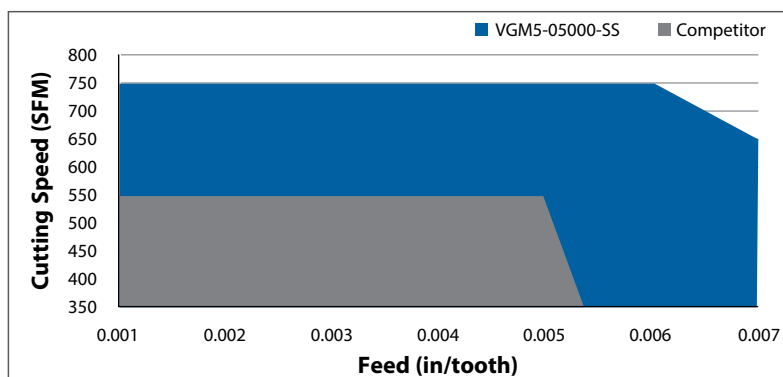
Tool	VGM5-02500-SS	Competitor
Tool Size	1/4"	
Work Material	1045 Medium Carbon Steel	
Milling Method	Side Milling	
Cutting Speed	450 SFM (6,870 RPM)	
Feed	68.7 IPM (0.002IPT)	
Depth of Cut	Aa=0.375", Ar=0.075"	
Coolant	Water-Soluble	
Machine	Vertical Machining Center (CAT50)	



VGM5 - Stable Performance in a Wide Range of Conditions

1045 Medium Carbon Steel

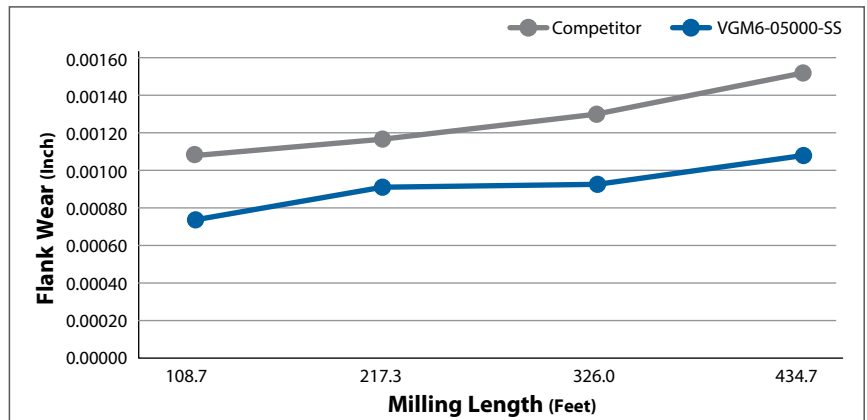
Tool Size	1/2"
Work Material	1045
Milling Method	Side Milling
Depth of Cut	Aa=0.625", Ar=0.15"
Coolant	Water-Soluble
Machine	Vertical Machining Center (CAT50)



VGM6 - Stable Performance in 1045

1045 Medium Carbon Steel

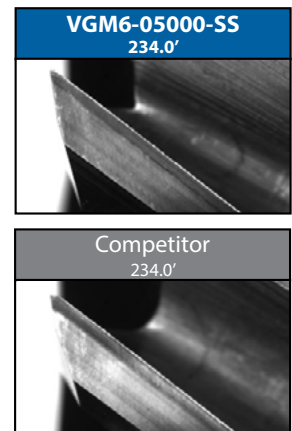
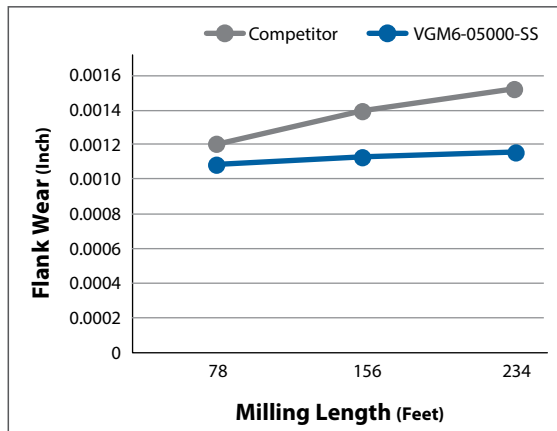
Tool	VGM6-05000-SS	Competitor
Tool Size	1/2"	
Work Material	1045	
Milling Method	Side Milling	
Cutting Speed	550 SFM(4,200 RPM)	
Feed	126 IPM(.005IPT)	
Depth of Cut	Aa=0.62", Ar=0.05"	
Coolant	Air blow	
Machine	Vertical Machining Center (CAT50)	



VGM6 - Stable Performance in Stainless Steel

304 Stainless Steel

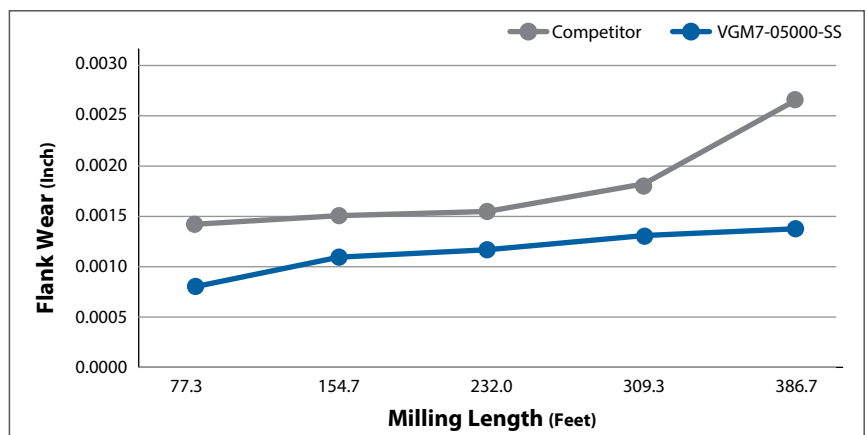
Tool	VGM6-05000-SS	Competitor
Tool Size	1/2"	
Work Material	304 Stainless Steel	
Milling Method	Side Milling	
Cutting Speed	200 SFM(1,530 RPM)	
Feed	45 IPM(.005IPT)	
Depth of Cut	Aa=.62", Ar=0.07"	
Coolant	Water-Soluble	
Machine	Vertical Machining Center (CAT50)	



VGM7 - Stable Performance in Stainless Steel

304 Stainless Steel

Tool	VGM7-05000-SS	Competitor
Tool Size	1/2"	
Work Material	304 Stainless Steel	
Milling Method	Side Milling	
Cutting Speed	200 SFM(1,530 RPM)	
Feed	53.5 IPM(.005IPT)	
Depth of Cut	Aa=0.62", Ar=0.07"	
Coolant	Water-Soluble	
Machine	Vertical Machining Center (CAT50)	



HY-PRO® CARB VGM5

High Performance Variable Geometry End Mills

List VGM5

HY-PRO® CARB VGM5



NEW
SIZES

SPEED
FEED
P28

CARBIDE

EXO®

5 FLUTE

40°



SHANK
h6

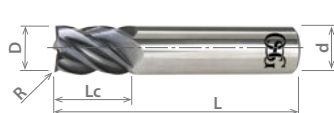
STUB

REG

LONG

EXTRA
LONG

PACKED
1 PIECE



Cutting Diameter Tolerance

1/8" ≤ D ≤ 3/16" +0 / -0.0015"

EDP Number		Diameter	Corner Radius	Length of Cut	Overall Length	Shank Diameter	L/D Ratio	Weldon Flat
		D (Fractional Size)	R (Inch)	Lc (Inch)	L (Inch)	d (Inch)		
VGM5-0001	●	1/8	-	0.188	1.500	0.125	1.5	-
VGM5-0002	●	1/8	0.010	0.188	1.500	0.125	1.5	-
VGM5-0003	●	1/8	-	0.250	1.500	0.125	2	-
VGM5-0004	●	1/8	0.010	0.250	1.500	0.125	2	-
VGM5-0005	●	1/8	0.015	0.250	1.500	0.125	2	-
VGM5-0006	●	1/8	0.030	0.250	1.500	0.125	2	-
VGM5-0007	●	1/8	-	0.375	1.500	0.125	3	-
VGM5-0008	●	1/8	0.010	0.375	1.500	0.125	3	-
VGM5-0009	●	1/8	-	0.500	2.250	0.125	4	-
VGM5-0010	●	1/8	0.010	0.500	2.250	0.125	4	-
VGM5-0011	●	1/8	0.015	0.500	2.250	0.125	4	-
VGM5-0012	●	1/8	0.030	0.500	2.250	0.125	4	-
VGM5-0013	●	1/8	-	0.625	2.250	0.125	5	-
VGM5-0014	●	1/8	0.010	0.625	2.250	0.125	5	-
VGM5-0015	●	1/8	-	0.750	2.250	0.125	6	-
VGM5-0016	●	1/8	0.010	0.750	2.250	0.125	6	-
VGM5-0017	●	1/8	0.015	0.750	2.250	0.125	6	-
VGM5-0018	●	1/8	0.030	0.750	2.250	0.125	6	-
VGM5-0019	●	5/32	-	0.234	2.000	0.156	1.5	-
VGM5-0020	●	5/32	0.010	0.234	2.000	0.156	1.5	-
VGM5-0021	●	5/32	-	0.313	2.000	0.156	2	-
VGM5-0022	●	5/32	0.010	0.313	2.000	0.156	2	-
VGM5-0023	●	5/32	-	0.469	2.250	0.156	3	-
VGM5-0024	●	5/32	0.010	0.469	2.250	0.156	3	-
VGM5-0025	●	3/16	-	0.281	2.000	0.188	1.5	-
VGM5-0026	●	3/16	0.010	0.281	2.000	0.188	1.5	-
VGM5-0027	●	3/16	0.015	0.281	2.000	0.188	1.5	-
VGM5-0028	●	3/16	0.030	0.281	2.000	0.188	1.5	-
VGM5-0029	●	3/16	-	0.375	2.000	0.188	2	-
VGM5-0030	●	3/16	0.010	0.375	2.000	0.188	2	-
VGM5-0031	●	3/16	-	0.563	2.250	0.188	3	-
VGM5-0032	●	3/16	0.010	0.563	2.250	0.188	3	-
VGM5-0033	●	3/16	0.015	0.563	2.250	0.188	3	-
VGM5-0034	●	3/16	0.030	0.563	2.250	0.188	3	-
VGM5-0035	●	3/16	-	0.750	2.250	0.188	4	-
VGM5-0036	●	3/16	0.010	0.750	2.250	0.188	4	-
VGM5-0037	●	3/16	0.030	0.750	2.250	0.188	4	-
VGM5-0038	●	3/16	-	0.938	2.250	0.188	5	-
VGM5-0039	●	3/16	0.010	0.938	2.250	0.188	5	-
VGM5-0040	●	3/16	0.015	0.938	2.250	0.188	5	-
VGM5-0041	●	7/32	-	0.328	2.000	0.219	1.5	-
VGM5-0042	●	7/32	0.010	0.328	2.000	0.219	1.5	-
VGM5-0043	●	7/32	-	0.438	2.500	0.219	2	-
VGM5-0044	●	7/32	0.010	0.438	2.500	0.219	2	-
VGM5-0045	●	1/4	-	0.375	2.000	0.250	1.5	-
VGM5-0046	●	1/4	0.010	0.375	2.000	0.250	1.5	-
VGM5-0047	●	1/4	0.015	0.375	2.000	0.250	1.5	-
VGM5-0048	●	1/4	0.020	0.375	2.000	0.250	1.5	-
VGM5-0049	●	1/4	0.030	0.375	2.000	0.250	1.5	-
VGM5-0050	●	1/4	0.060	0.375	2.000	0.250	1.5	-
VGM5-0051	●	1/4	-	0.500	2.500	0.250	2	-
VGM5-0052	●	1/4	0.010	0.500	2.500	0.250	2	-
VGM5-0053	●	1/4	0.015	0.500	2.500	0.250	2	-
VGM5-0054	●	1/4	0.020	0.500	2.500	0.250	2	-
VGM5-0055	●	1/4	0.030	0.500	2.500	0.250	2	-
VGM5-0056	●	1/4	0.060	0.500	2.500	0.250	2	-
VGM5-0057	●	1/4	-	0.750	2.500	0.250	3	-
VGM5-0058	●	1/4	0.010	0.750	2.500	0.250	3	-
VGM5-0059	●	1/4	0.015	0.750	2.500	0.250	3	-
VGM5-0060	●	1/4	0.020	0.750	2.500	0.250	3	-

● Stocked ○ Available Upon Request; MOQ May Apply ▲ Globally Stocked



List VGM5 (Continued)

HY-PRO® CARB VGM5

NEW
SIZESSPEED
FEED
P28

CARBIDE

EXO®

5 FLUTE

40°

SHANK
h6

STUB

REG

LONG

EXTRA
LONGPACKED
1 PIECE

EDP Number		Diameter	Corner Radius	Length of Cut	Overall Length	Shank Diameter	L/D Ratio	Weldon Flat
		D (Fractional Size)	R (Inch)	Lc (Inch)	L (Inch)	d (Inch)		
VGM5-0061	●	1/4	0.030	0.750	2.500	0.250	3	-
VGM5-0062	●	1/4	0.060	0.750	2.500	0.250	3	-
VGM5-0063	●	1/4	-	1.000	3.000	0.250	4	-
VGM5-0064	●	1/4	0.010	1.000	3.000	0.250	4	-
VGM5-0065	●	1/4	0.015	1.000	3.000	0.250	4	-
VGM5-0066	●	1/4	0.020	1.000	3.000	0.250	4	-
VGM5-0067	●	1/4	0.030	1.000	3.000	0.250	4	-
VGM5-0068	●	1/4	0.060	1.000	3.000	0.250	4	-
VGM5-0069	●	1/4	-	1.250	3.000	0.250	5	-
VGM5-0070	●	1/4	0.020	1.250	3.000	0.250	5	-
VGM5-0071	●	1/4	-	1.500	3.000	0.250	6	-
VGM5-0072	●	1/4	0.020	1.500	3.000	0.250	6	-
VGM5-0073	●	9/32	-	0.422	2.500	0.313	1.5	-
VGM5-0074	○	9/32	0.020	0.422	2.500	0.313	1.5	-
VGM5-0075	●	9/32	-	0.563	2.500	0.313	2	-
VGM5-0076	●	9/32	0.020	0.563	2.500	0.313	2	-
VGM5-0077	●	9/32	-	0.844	3.000	0.313	3	-
VGM5-0078	●	9/32	0.020	0.844	3.000	0.313	3	-
VGM5-0079	●	5/16	-	0.469	2.000	0.313	1.5	-
VGM5-0080	●	5/16	0.010	0.469	2.000	0.313	1.5	-
VGM5-0081	●	5/16	0.020	0.469	2.000	0.313	1.5	-
VGM5-0082	●	5/16	0.030	0.469	2.000	0.313	1.5	-
VGM5-0083	●	5/16	0.060	0.469	2.000	0.313	1.5	-
VGM5-0084	●	5/16	-	0.625	2.500	0.313	2	-
VGM5-0085	●	5/16	0.010	0.625	2.500	0.313	2	-
VGM5-0086	●	5/16	0.020	0.625	2.500	0.313	2	-
VGM5-0087	●	5/16	0.030	0.625	2.500	0.313	2	-
VGM5-0088	●	5/16	0.060	0.625	2.500	0.313	2	-
VGM5-0089	●	5/16	-	0.938	3.000	0.313	3	-
VGM5-0090	●	5/16	0.020	0.938	3.000	0.313	3	-
VGM5-0091	●	5/16	0.030	0.938	3.000	0.313	3	-
VGM5-0092	●	5/16	0.060	0.938	3.000	0.313	3	-
VGM5-0093	●	5/16	-	1.250	3.000	0.313	4	-
VGM5-0094	●	5/16	0.020	1.250	3.000	0.313	4	-
VGM5-0095	●	3/8	-	0.563	2.000	0.375	1.5	-
VGM5-0095-W	○	3/8	-	0.563	2.000	0.375	1.5	●
VGM5-0096	●	3/8	0.010	0.563	2.000	0.375	1.5	-
VGM5-0097	●	3/8	0.015	0.563	2.000	0.375	1.5	-
VGM5-0097-W	○	3/8	0.015	0.563	2.000	0.375	1.5	●
VGM5-0098	●	3/8	0.020	0.563	2.000	0.375	1.5	-
VGM5-0099	●	3/8	0.030	0.563	2.000	0.375	1.5	-
VGM5-0099-W	○	3/8	0.030	0.563	2.000	0.375	1.5	●
VGM5-0100	●	3/8	0.060	0.563	2.000	0.375	1.5	-
VGM5-0100-W	○	3/8	0.060	0.563	2.000	0.375	1.5	●
VGM5-0101	●	3/8	0.090	0.563	2.000	0.375	1.5	-
VGM5-0102	●	3/8	-	0.750	2.500	0.375	2	-
VGM5-0103	●	3/8	0.010	0.750	2.500	0.375	2	-
VGM5-0104	●	3/8	0.020	0.750	2.500	0.375	2	-
VGM5-0105	●	3/8	0.030	0.750	2.500	0.375	2	-
VGM5-0106	●	3/8	0.060	0.750	2.500	0.375	2	-
VGM5-0107	●	3/8	0.090	0.750	2.500	0.375	2	-
VGM5-0108	●	3/8	-	1.125	3.000	0.375	3	-
VGM5-0108-W	○	3/8	-	1.125	3.000	0.375	3	●
VGM5-0109	●	3/8	0.010	1.125	3.000	0.375	3	-

● Stocked ○ Available Upon Request; MOQ May Apply ▲ Globally Stocked

HPC

CONTINUED ➔

P					M			K	N		S		H			
Steel					Stainless Steel			Cast Iron	Non-Ferrous		HRSA		Hardened Steel			
Carbon Steel			Alloy Steel	Die Steel					Aluminum		Nickel Alloy	Titanium				
Low	Medium	High							6061	Casting	Inconel	6Al4V (30 HRC)				
1010	1035	1065	4140	Die Steel	300	400	17-4 PH	7075					~35 HRC	35-45 HRC	45-50 HRC	50-70 HRC
1018	1045	1065	4340													
○	○	○	○	○	○	○	○	○			○		○	○		

○ Good ○ Best



HY-PRO® CARB VGM5

High Performance Variable Geometry End Mills

List VGM5 (Continued)

HY-PRO® CARB VGM5



NEW
SIZES

SPEED
FEED
P28

CARBIDE

EXO®

5 FLUTE

40°

REG

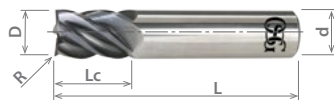
LONG

EXTRA
LONG

PACKED
1 PIECE

SHANK
h6

STUB



Cutting Diameter Tolerance	
1/8" ≤ D ≤ 3/16"	+0 / -0.0015"

EDP Number		Diameter	Corner Radius	Length of Cut	Overall Length	Shank Diameter	L/D Ratio	Weldon Flat
		D (Fractional Size)	R (Inch)	Lc (Inch)	L (Inch)	d (Inch)		
VGM5-0110	●	3/8	0.015	1.125	3.000	0.375	3	-
VGM5-0110-W	○	3/8	0.015	1.125	3.000	0.375	3	●
VGM5-0111	●	3/8	0.020	1.125	3.000	0.375	3	-
VGM5-0112	●	3/8	0.030	1.125	3.000	0.375	3	-
VGM5-0112-W	○	3/8	0.030	1.125	3.000	0.375	3	●
VGM5-0113	●	3/8	0.060	1.125	3.000	0.375	3	-
VGM5-0113-W	○	3/8	0.060	1.125	3.000	0.375	3	●
VGM5-0114	●	3/8	0.090	1.125	3.000	0.375	3	-
VGM5-0115	●	3/8	-	1.500	4.000	0.375	4	-
VGM5-0116	●	3/8	0.010	1.500	4.000	0.375	4	-
VGM5-0117	●	3/8	0.020	1.500	4.000	0.375	4	-
VGM5-0118	●	3/8	0.030	1.500	4.000	0.375	4	-
VGM5-0119	●	3/8	0.060	1.500	4.000	0.375	4	-
VGM5-0120	●	3/8	0.090	1.500	4.000	0.375	4	-
VGM5-0121	●	1/2	-	0.625	2.500	0.500	1.25	-
VGM5-0121-W	○	1/2	-	0.625	2.500	0.500	1.25	●
VGM5-0122	●	1/2	0.010	0.625	2.500	0.500	1.25	-
VGM5-0123	●	1/2	0.015	0.625	2.500	0.500	1.25	-
VGM5-0123-W	○	1/2	0.015	0.625	2.500	0.500	1.25	●
VGM5-0124	●	1/2	0.020	0.625	2.500	0.500	1.25	-
VGM5-0125	●	1/2	0.030	0.625	2.500	0.500	1.25	-
VGM5-0125-W	○	1/2	0.030	0.625	2.500	0.500	1.25	●
VGM5-0126	●	1/2	0.060	0.625	2.500	0.500	1.25	-
VGM5-0126-W	○	1/2	0.060	0.625	2.500	0.500	1.25	●
VGM5-0127	●	1/2	0.090	0.625	2.500	0.500	1.25	-
VGM5-0127-W	○	1/2	0.090	0.625	2.500	0.500	1.25	●
VGM5-0128	●	1/2	0.120	0.625	2.500	0.500	1.25	-
VGM5-0128-W	○	1/2	0.120	0.625	2.500	0.500	1.25	●
VGM5-0129	●	1/2	0.125	0.625	2.500	0.500	1.25	-
VGM5-0130	●	1/2	-	1.000	3.000	0.500	2	-
VGM5-0131	●	1/2	0.010	1.000	3.000	0.500	2	-
VGM5-0132	●	1/2	0.015	1.000	3.000	0.500	2	-
VGM5-0133	●	1/2	0.020	1.000	3.000	0.500	2	-
VGM5-0134	●	1/2	0.030	1.000	3.000	0.500	2	-
VGM5-0134-W	○	1/2	0.030	1.000	3.000	0.500	2	●
VGM5-0135	●	1/2	0.060	1.000	3.000	0.500	2	-
VGM5-0135-W	○	1/2	0.060	1.000	3.000	0.500	2	●
VGM5-0136	●	1/2	0.090	1.000	3.000	0.500	2	-
VGM5-0137	●	1/2	0.120	1.000	3.000	0.500	2	-
VGM5-0138	●	1/2	0.125	1.000	3.000	0.500	2	-
VGM5-0139	●	1/2	-	1.250	3.000	0.500	2.5	-
VGM5-0139-W	○	1/2	-	1.250	3.000	0.500	2.5	●
VGM5-0140	●	1/2	0.010	1.250	3.000	0.500	2.5	-
VGM5-0141	●	1/2	0.015	1.250	3.000	0.500	2.5	-
VGM5-0141-W	○	1/2	0.015	1.250	3.000	0.500	2.5	●
VGM5-0142	●	1/2	0.020	1.250	3.000	0.500	2.5	-
VGM5-0143	●	1/2	0.030	1.250	3.000	0.500	2.5	-
VGM5-0143-W	○	1/2	0.030	1.250	3.000	0.500	2.5	●
VGM5-0144	●	1/2	0.060	1.250	3.000	0.500	2.5	-
VGM5-0144-W	○	1/2	0.060	1.250	3.000	0.500	2.5	●
VGM5-0145	●	1/2	0.090	1.250	3.000	0.500	2.5	-
VGM5-0145-W	○	1/2	0.090	1.250	3.000	0.500	2.5	●
VGM5-0146	●	1/2	0.120	1.250	3.000	0.500	2.5	-
VGM5-0146-W	○	1/2	0.120	1.250	3.000	0.500	2.5	●
VGM5-0147	●	1/2	0.125	1.250	3.000	0.500	2.5	-
VGM5-0148	●	1/2	-	1.500	4.000	0.500	3	-
VGM5-0149	●	1/2	0.010	1.500	4.000	0.500	3	-
VGM5-0150	●	1/2	0.030	1.500	4.000	0.500	3	-
VGM5-0151	●	1/2	0.060	1.500	4.000	0.500	3	-
VGM5-0152	○	1/2	0.090	1.500	4.000	0.500	3	-

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List VGM5 (Continued)

HY-PRO® CARB VGM5



NEW
SIZES

SPEED
FEED
P28

CARBIDE

EXO®

5 FLUTE

40°

REG

LONG

EXTRA
LONG

PACKED
1 PIECE

EDP Number		Diameter	Corner Radius	Length of Cut	Overall Length	Shank Diameter	L/D Ratio	Weldon Flat
		D (Fractional Size)	R (Inch)	Lc (Inch)	L (Inch)	d (Inch)		
VGM5-0153	●	1/2	0.120	1.500	4.000	0.500	3	-
VGM5-0154	●	1/2	0.125	1.500	4.000	0.500	3	-
VGM5-0155	●	1/2	-	2.000	4.000	0.500	4	-
VGM5-0156	●	1/2	0.010	2.000	4.000	0.500	4	-
VGM5-0157	●	1/2	0.030	2.000	4.000	0.500	4	-
VGM5-0158	●	1/2	0.060	2.000	4.000	0.500	4	-
VGM5-0159	●	1/2	0.120	2.000	4.000	0.500	4	-
VGM5-0160	●	1/2	-	2.500	5.000	0.500	5	-
VGM5-0161	●	1/2	0.010	2.500	5.000	0.500	5	-
VGM5-0162	●	1/2	0.030	2.500	5.000	0.500	5	-
VGM5-0163	●	1/2	0.060	2.500	5.000	0.500	5	-
VGM5-0164	●	1/2	0.120	2.500	5.000	0.500	5	-
VGM5-0165	●	5/8	-	0.781	3.000	0.625	1.25	-
VGM5-0165-W	○	5/8	-	0.781	3.000	0.625	1.25	●
VGM5-0166	●	5/8	0.020	0.781	3.000	0.625	1.25	-
VGM5-0167	●	5/8	0.030	0.781	3.000	0.625	1.25	-
VGM5-0167-W	○	5/8	0.030	0.781	3.000	0.625	1.25	●
VGM5-0168	●	5/8	0.060	0.781	3.000	0.625	1.25	-
VGM5-0168-W	○	5/8	0.060	0.781	3.000	0.625	1.25	●
VGM5-0169	○	5/8	0.090	0.781	3.000	0.625	1.25	-
VGM5-0169-W	○	5/8	0.090	0.781	3.000	0.625	1.25	●
VGM5-0170	●	5/8	0.120	0.781	3.000	0.625	1.25	-
VGM5-0171	○	5/8	-	0.938	3.000	0.625	1.5	-
VGM5-0172	●	5/8	0.020	0.938	3.000	0.625	1.5	-
VGM5-0173	●	5/8	0.030	0.938	3.000	0.625	1.5	-
VGM5-0174	○	5/8	0.060	0.938	3.000	0.625	1.5	-
VGM5-0175	○	5/8	0.090	0.938	3.000	0.625	1.5	-
VGM5-0176	●	5/8	0.120	0.938	3.000	0.625	1.5	-
VGM5-0177	●	5/8	-	1.250	3.500	0.625	2	-
VGM5-0177-W	○	5/8	-	1.250	3.500	0.625	2	●
VGM5-0178	●	5/8	0.020	1.250	3.500	0.625	2	-
VGM5-0179	●	5/8	0.030	1.250	3.500	0.625	2	-
VGM5-0179-W	○	5/8	0.030	1.250	3.500	0.625	2	●
VGM5-0180	●	5/8	0.060	1.250	3.500	0.625	2	-
VGM5-0180-W	○	5/8	0.060	1.250	3.500	0.625	2	●
VGM5-0181	●	5/8	0.090	1.250	3.500	0.625	2	-
VGM5-0181-W	○	5/8	0.090	1.250	3.500	0.625	2	●
VGM5-0182	○	5/8	0.120	1.250	3.500	0.625	2	-
VGM5-0183	●	5/8	-	1.563	3.500	0.625	2.5	-
VGM5-0184	●	5/8	0.020	1.563	3.500	0.625	2.5	-
VGM5-0185	●	5/8	0.030	1.563	3.500	0.625	2.5	-
VGM5-0186	●	5/8	0.060	1.563	3.500	0.625	2.5	-
VGM5-0187	○	5/8	0.090	1.563	3.500	0.625	2.5	-
VGM5-0188	○	5/8	0.120	1.563	3.500	0.625	2.5	-
VGM5-0189	●	5/8	-	1.875	5.000	0.625	3	-
VGM5-0190	●	5/8	0.020	1.875	5.000	0.625	3	-
VGM5-0191	●	5/8	0.030	1.875	5.000	0.625	3	-
VGM5-0192	○	5/8	0.060	1.875	5.000	0.625	3	-
VGM5-0193	○	5/8	0.090	1.875	5.000	0.625	3	-
VGM5-0194	●	5/8	0.120	1.875	5.000	0.625	3	-
VGM5-0195	●	5/8	-	2.500	5.000	0.625	4	-
VGM5-0196	●	5/8	0.020	2.500	5.000	0.625	4	-
VGM5-0197	●	5/8	0.030	2.500	5.000	0.625	4	-
VGM5-0198	○	5/8	0.060	2.500	5.000	0.625	4	-

● Stocked ○ Available Upon Request; MOQ May Apply ▲ Globally Stocked

HPC

CONTINUED ➔

P					M			K	N		S		H			
Steel					Stainless Steel			Cast Iron	Non-Ferrous		HRSA		Hardened Steel			
Carbon Steel			Alloy Steel	Die Steel					Aluminum		Nickel Alloy	Titanium				
Low	Medium	High														
1010	1035	1065	4140	Die Steel	300	400	17-4 PH	6061	Casting	Inconel	6Al4V (30 HRC)	~35 HRC	35-45 HRC	45-50 HRC	50-70 HRC	
1018	1045		4340					7075								
																

○ Good ● Best



HY-PRO® CARB VGM5

High Performance Variable Geometry End Mills

List VGM5 (Continued)

HY-PRO® CARB VGM5



NEW
SIZES

SPEED
FEED
P28

CARBIDE

EXO®

5 FLUTE

40°



SHANK
h6

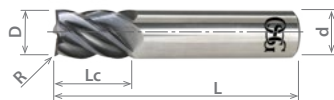
STUB

REG

LONG

EXTRA
LONG

PACKED
1 PIECE



Cutting Diameter Tolerance

1/8" ≤ D ≤ 3/16" +0 / -0.0015"

EDP Number		Diameter	Corner Radius	Length of Cut	Overall Length	Shank Diameter	L/D Ratio	Weldon Flat
		D (Fractional Size)	R (Inch)	Lc (Inch)	L (Inch)	d (Inch)		
VGM5-0199	●	5/8	0.090	2.500	5.000	0.625	4	-
VGM5-0200	○	5/8	0.120	2.500	5.000	0.625	4	-
VGM5-0201	●	3/4	-	0.938	3.000	0.750	1.25	-
VGM5-0202	●	3/4	0.020	0.938	3.000	0.750	1.25	-
VGM5-0203	●	3/4	0.030	0.938	3.000	0.750	1.25	-
VGM5-0204	●	3/4	0.060	0.938	3.000	0.750	1.25	-
VGM5-0205	●	3/4	0.090	0.938	3.000	0.750	1.25	-
VGM5-0206	●	3/4	0.120	0.938	3.000	0.750	1.25	-
VGM5-0207	●	3/4	0.190	0.938	3.000	0.750	1.25	-
VGM5-0208	●	3/4	0.250	0.938	3.000	0.750	1.25	-
VGM5-0209	●	3/4	-	1.125	4.000	0.750	1.5	-
VGM5-0209-W	○	3/4	-	1.125	4.000	0.750	1.5	●
VGM5-0210	●	3/4	0.020	1.125	4.000	0.750	1.5	-
VGM5-0211	●	3/4	0.030	1.125	4.000	0.750	1.5	-
VGM5-0211-W	○	3/4	0.030	1.125	4.000	0.750	1.5	●
VGM5-0212	●	3/4	0.060	1.125	4.000	0.750	1.5	-
VGM5-0212-W	○	3/4	0.060	1.125	4.000	0.750	1.5	●
VGM5-0213	●	3/4	0.090	1.125	4.000	0.750	1.5	-
VGM5-0213-W	○	3/4	0.090	1.125	4.000	0.750	1.5	●
VGM5-0214	●	3/4	0.120	1.125	4.000	0.750	1.5	-
VGM5-0214-W	○	3/4	0.120	1.125	4.000	0.750	1.5	●
VGM5-0215	○	3/4	0.190	1.125	4.000	0.750	1.5	-
VGM5-0216	○	3/4	0.250	1.125	4.000	0.750	1.5	-
VGM5-0217	●	3/4	-	1.500	4.000	0.750	2	-
VGM5-0217-W	○	3/4	-	1.500	4.000	0.750	2	●
VGM5-0218	●	3/4	0.020	1.500	4.000	0.750	2	-
VGM5-0219	●	3/4	0.030	1.500	4.000	0.750	2	-
VGM5-0219-W	○	3/4	0.030	1.500	4.000	0.750	2	●
VGM5-0220	●	3/4	0.060	1.500	4.000	0.750	2	-
VGM5-0220-W	○	3/4	0.060	1.500	4.000	0.750	2	●
VGM5-0221	●	3/4	0.090	1.500	4.000	0.750	2	-
VGM5-0221-W	○	3/4	0.090	1.500	4.000	0.750	2	●
VGM5-0222	●	3/4	0.120	1.500	4.000	0.750	2	-
VGM5-0222-W	○	3/4	0.120	1.500	4.000	0.750	2	●
VGM5-0223	○	3/4	0.190	1.500	4.000	0.750	2	-
VGM5-0224	●	3/4	0.250	1.500	4.000	0.750	2	-
VGM5-0225	●	3/4	-	2.250	5.000	0.750	3	-
VGM5-0226	●	3/4	0.020	2.250	5.000	0.750	3	-
VGM5-0227	●	3/4	0.030	2.250	5.000	0.750	3	-
VGM5-0228	●	3/4	0.060	2.250	5.000	0.750	3	-
VGM5-0229	●	3/4	0.090	2.250	5.000	0.750	3	-
VGM5-0230	●	3/4	0.120	2.250	5.000	0.750	3	-
VGM5-0231	○	3/4	0.190	2.250	5.000	0.750	3	-
VGM5-0232	●	3/4	0.250	2.250	5.000	0.750	3	-
VGM5-0233	●	3/4	-	3.000	6.000	0.750	4	-
VGM5-0234	●	3/4	0.020	3.000	6.000	0.750	4	-
VGM5-0235	●	3/4	0.030	3.000	6.000	0.750	4	-
VGM5-0236	●	3/4	0.060	3.000	6.000	0.750	4	-
VGM5-0237	○	3/4	0.090	3.000	6.000	0.750	4	-
VGM5-0238	●	3/4	0.120	3.000	6.000	0.750	4	-
VGM5-0239	●	3/4	0.190	3.000	6.000	0.750	4	-
VGM5-0240	●	3/4	0.250	3.000	6.000	0.750	4	-
VGM5-0241	●	3/4	-	3.750	7.000	0.750	5	-
VGM5-0242	○	3/4	0.020	3.750	7.000	0.750	5	-
VGM5-0243	●	3/4	0.030	3.750	7.000	0.750	5	-
VGM5-0244	●	3/4	0.060	3.750	7.000	0.750	5	-
VGM5-0245	●	3/4	0.090	3.750	7.000	0.750	5	-
VGM5-0246	●	3/4	0.120	3.750	7.000	0.750	5	-
VGM5-0247	●	3/4	0.190	3.750	7.000	0.750	5	-
VGM5-0248	●	3/4	0.250	3.750	7.000	0.750	5	-

● Stocked ○ Available Upon Request; MOQ May Apply ▲ Globally Stocked



List VGM5 (Continued)

HY-PRO® CARB VGM5



NEW
SIZES

SPEED
FEED
P28

CARBIDE

EXO®

5 FLUTE

40°

REG

LONG

EXTRA
LONG

SHANK
h6

STUB

REG

LONG

EXTRA
LONG

PACKED
1 PIECE

EDP Number		Diameter	Corner Radius	Length of Cut	Overall Length	Shank Diameter	L/D Ratio	Weldon Flat
		D (Fractional Size)	R (Inch)	Lc (Inch)	L (Inch)	d (Inch)		
VGM5-0249	●	1	-	1.250	4.000	1.000	1.25	-
VGM5-0249-W	○	1	-	1.250	4.000	1.000	1.25	●
VGM5-0250	●	1	0.030	1.250	4.000	1.000	1.25	-
VGM5-0250-W	○	1	0.030	1.250	4.000	1.000	1.25	●
VGM5-0251	●	1	0.060	1.250	4.000	1.000	1.25	-
VGM5-0251-W	○	1	0.060	1.250	4.000	1.000	1.25	●
VGM5-0252	●	1	0.090	1.250	4.000	1.000	1.25	-
VGM5-0252-W	○	1	0.090	1.250	4.000	1.000	1.25	●
VGM5-0253	○	1	0.120	1.250	4.000	1.000	1.25	-
VGM5-0253-W	○	1	0.120	1.250	4.000	1.000	1.25	●
VGM5-0254	○	1	0.190	1.250	4.000	1.000	1.25	-
VGM5-0255	●	1	0.250	1.250	4.000	1.000	1.25	-
VGM5-0256	●	1	-	2.000	5.000	1.000	2	-
VGM5-0256-W	○	1	-	2.000	5.000	1.000	2	●
VGM5-0257	●	1	0.030	2.000	5.000	1.000	2	-
VGM5-0257-W	○	1	0.030	2.000	5.000	1.000	2	●
VGM5-0258	●	1	0.060	2.000	5.000	1.000	2	-
VGM5-0258-W	○	1	0.060	2.000	5.000	1.000	2	●
VGM5-0259	●	1	0.090	2.000	5.000	1.000	2	-
VGM5-0259-W	○	1	0.090	2.000	5.000	1.000	2	●
VGM5-0260	●	1	0.120	2.000	5.000	1.000	2	-
VGM5-0260-W	○	1	0.120	2.000	5.000	1.000	2	●
VGM5-0261	●	1	0.190	2.000	5.000	1.000	2	-
VGM5-0262	●	1	0.250	2.000	5.000	1.000	2	-
VGM5-0263	●	1	-	3.000	6.000	1.000	3	-
VGM5-0264	○	1	0.030	3.000	6.000	1.000	3	-
VGM5-0265	●	1	0.060	3.000	6.000	1.000	3	-
VGM5-0266	○	1	0.090	3.000	6.000	1.000	3	-
VGM5-0267	○	1	0.120	3.000	6.000	1.000	3	-
VGM5-0268	○	1	0.190	3.000	6.000	1.000	3	-
VGM5-0269	●	1	0.250	3.000	6.000	1.000	3	-
VGM5-0270	●	1	-	4.000	7.000	1.000	4	-
VGM5-0271	●	1	0.030	4.000	7.000	1.000	4	-
VGM5-0272	●	1	0.060	4.000	7.000	1.000	4	-
VGM5-0273	○	1	0.090	4.000	7.000	1.000	4	-
VGM5-0274	○	1	0.120	4.000	7.000	1.000	4	-
VGM5-0275	●	1	0.190	4.000	7.000	1.000	4	-
VGM5-0276	○	1	0.250	4.000	7.000	1.000	4	-

● Stocked ○ Available Upon Request; MOQ May Apply ▲ Globally Stocked

HPC

P					M			K	N		S		H			
Steel					Stainless Steel			Cast Iron	Non-Ferrous		HRSA		Hardened Steel			
Carbon Steel			Alloy Steel	Die Steel					Aluminum		Nickel Alloy	Titanium				
Low	Medium	High														
1010	1035			4140 4340	300	400	17-4 PH		6061	Casting	Inconel	6Al4V	~35 HRC	35-45 HRC	45-50 HRC	50-70 HRC
1018	1045	1065							7075			(30 HRC)				
○	○	○	○	○	○	○	○	○			○		○	○		

○ Good ○ Best



HY-PRO® CARB VGM5-LN

High Performance Variable Geometry End Mills

List VGM5-LN

HY-PRO® CARB VGM5-LN, Long Neck



SPEED
FEED
P29

CARBIDE

EXO®

5 FLUTE

40°



SHANK
h6

STUB

PACKED
1 PIECE

Cutting Diameter Tolerance
1/8" ≤ D ≤ 1" +0 / -0.0015"



EDP Number		Diameter	Corner Radius	Length of Cut	Neck Length	Neck Diameter	Overall Length	Shank Diameter	L/D Ratio
		D (Fractional Size)	R (Inch)	Lc (Inch)	L1 (Inch)	d1 (Inch)	L (Inch)	d (Inch)	
VGM5-1001	●	1/8	-	0.156	0.375	0.118	2.250	0.125	3
VGM5-1002	●	1/8	0.010	0.156	0.375	0.118	2.250	0.125	3
VGM5-1003	●	1/8	0.015	0.156	0.375	0.118	2.250	0.125	3
VGM5-1004	●	1/8	0.030	0.156	0.375	0.118	2.250	0.125	3
VGM5-1005	●	1/8	-	0.156	0.500	0.118	2.250	0.125	4
VGM5-1006	●	1/8	0.010	0.156	0.500	0.118	2.250	0.125	4
VGM5-1007	○	1/8	0.015	0.156	0.500	0.118	2.250	0.125	4
VGM5-1008	●	1/8	0.030	0.156	0.500	0.118	2.250	0.125	4
VGM5-1009	●	1/8	-	0.156	0.750	0.118	3.000	0.125	6
VGM5-1010	●	1/8	0.010	0.156	0.750	0.118	3.000	0.125	6
VGM5-1011	○	1/8	0.015	0.156	0.750	0.118	3.000	0.125	6
VGM5-1012	●	1/8	0.030	0.156	0.750	0.118	3.000	0.125	6
VGM5-1013	●	1/8	-	0.156	1.000	0.118	3.000	0.125	8
VGM5-1014	●	1/8	0.010	0.156	1.000	0.118	3.000	0.125	8
VGM5-1015	●	1/8	0.015	0.156	1.000	0.118	3.000	0.125	8
VGM5-1016	●	1/8	0.030	0.156	1.000	0.118	3.000	0.125	8
VGM5-1017	●	3/16	-	0.234	0.563	0.178	2.000	0.188	3
VGM5-1018	●	3/16	0.010	0.234	0.563	0.178	2.000	0.188	3
VGM5-1019	●	3/16	0.015	0.234	0.563	0.178	2.000	0.188	3
VGM5-1020	●	3/16	0.030	0.234	0.563	0.178	2.000	0.188	3
VGM5-1021	●	3/16	-	0.234	0.750	0.178	2.000	0.188	4
VGM5-1022	●	3/16	0.010	0.234	0.750	0.178	2.000	0.188	4
VGM5-1023	●	3/16	0.030	0.234	0.750	0.178	3.000	0.188	4
VGM5-1024	●	3/16	-	0.234	1.125	0.178	3.000	0.188	6
VGM5-1025	●	3/16	0.010	0.234	1.125	0.178	3.000	0.188	6
VGM5-1026	●	3/16	0.015	0.234	1.125	0.178	3.000	0.188	6
VGM5-1027	●	3/16	0.030	0.234	1.125	0.178	3.000	0.188	6
VGM5-1028	●	3/16	-	0.234	1.313	0.178	3.000	0.188	7
VGM5-1029	●	3/16	0.010	0.234	1.313	0.178	3.000	0.188	7
VGM5-1030	●	3/16	0.030	0.234	1.313	0.178	3.000	0.188	7
VGM5-1031	●	1/4	-	0.313	0.750	0.237	4.000	0.250	3
VGM5-1032	●	1/4	0.010	0.313	0.750	0.237	4.000	0.250	3
VGM5-1033	●	1/4	0.015	0.313	0.750	0.237	4.000	0.250	3
VGM5-1034	●	1/4	0.020	0.313	0.750	0.237	4.000	0.250	3
VGM5-1035	●	1/4	0.030	0.313	0.750	0.237	4.000	0.250	3
VGM5-1036	●	1/4	0.060	0.313	0.750	0.237	4.000	0.250	3
VGM5-1037	●	1/4	-	0.313	1.000	0.237	4.000	0.250	4
VGM5-1038	●	1/4	0.010	0.313	1.000	0.237	4.000	0.250	4
VGM5-1039	●	1/4	0.015	0.313	1.000	0.237	4.000	0.250	4
VGM5-1040	●	1/4	0.020	0.313	1.000	0.237	4.000	0.250	4
VGM5-1041	●	1/4	0.030	0.313	1.000	0.237	4.000	0.250	4
VGM5-1042	●	1/4	0.060	0.313	1.000	0.237	4.000	0.250	4
VGM5-1043	●	1/4	-	0.313	1.250	0.237	4.000	0.250	5
VGM5-1044	●	1/4	0.010	0.313	1.250	0.237	4.000	0.250	5
VGM5-1045	●	1/4	0.015	0.313	1.250	0.237	4.000	0.250	5
VGM5-1046	●	1/4	0.020	0.313	1.250	0.237	4.000	0.250	5
VGM5-1047	●	1/4	0.030	0.313	1.250	0.237	4.000	0.250	5
VGM5-1048	●	1/4	0.060	0.313	1.250	0.237	4.000	0.250	5
VGM5-1049	●	1/4	-	0.313	1.500	0.237	4.000	0.250	6
VGM5-1050	●	1/4	0.010	0.313	1.500	0.237	4.000	0.250	6
VGM5-1051	●	1/4	0.015	0.313	1.500	0.237	4.000	0.250	6
VGM5-1052	●	1/4	0.020	0.313	1.500	0.237	4.000	0.250	6
VGM5-1053	●	1/4	0.030	0.313	1.500	0.237	4.000	0.250	6
VGM5-1054	●	1/4	0.060	0.313	1.500	0.237	4.000	0.250	6
VGM5-1055	●	1/4	-	0.313	2.000	0.237	4.000	0.250	8
VGM5-1056	●	1/4	0.020	0.313	2.000	0.237	4.000	0.250	8
VGM5-1057	●	1/4	-	0.313	2.500	0.237	4.000	0.250	10

● Stocked ○ Available Upon Request; MOQ May Apply ▲ Globally Stocked



List VGM5-LN (Cont.)

HY-PRO® CARB VGM5-LN, Long Neck



SPEED
FEED
P29

CARBIDE

EXO™

5 FLUTE

40°



SHANK
h6

STUB

PACKED
1 PIECE

EDP Number		Diameter	Corner Radius	Length of Cut	Neck Length	Neck Diameter	Overall Length	Shank Diameter	L/D Ratio
		D (Fractional Size)	R (Inch)	Lc (Inch)	L1 (Inch)	d1 (Inch)	L (Inch)	d (Inch)	
VGM5-1058	●	1/4	0.020	0.313	2.500	0.237	4.000	0.250	10
VGM5-1059	●	3/8	-	0.469	1.125	0.356	4.000	0.375	3
VGM5-1060	●	3/8	0.010	0.469	1.125	0.356	4.000	0.375	3
VGM5-1061	●	3/8	0.015	0.469	1.125	0.356	4.000	0.375	3
VGM5-1062	●	3/8	0.020	0.469	1.125	0.356	4.000	0.375	3
VGM5-1063	●	3/8	0.030	0.469	1.125	0.356	4.000	0.375	3
VGM5-1064	●	3/8	0.060	0.469	1.125	0.356	4.000	0.375	3
VGM5-1065	●	3/8	0.090	0.469	1.125	0.356	4.000	0.375	3
VGM5-1066	●	3/8	-	0.469	1.500	0.356	4.000	0.375	4
VGM5-1067	●	3/8	0.010	0.469	1.500	0.356	4.000	0.375	4
VGM5-1068	●	3/8	0.020	0.469	1.500	0.356	4.000	0.375	4
VGM5-1069	●	3/8	0.030	0.469	1.500	0.356	4.000	0.375	4
VGM5-1070	●	3/8	0.060	0.469	1.500	0.356	4.000	0.375	4
VGM5-1071	●	3/8	0.090	0.469	1.500	0.356	4.000	0.375	4
VGM5-1072	●	3/8	-	0.469	1.875	0.356	4.000	0.375	5
VGM5-1073	●	3/8	0.010	0.469	1.875	0.356	4.000	0.375	5
VGM5-1074	●	3/8	0.015	0.469	1.875	0.356	4.000	0.375	5
VGM5-1075	●	3/8	0.020	0.469	1.875	0.356	4.000	0.375	5
VGM5-1076	●	3/8	0.030	0.469	1.875	0.356	4.000	0.375	5
VGM5-1077	●	3/8	0.060	0.469	1.875	0.356	4.000	0.375	5
VGM5-1078	●	3/8	0.090	0.469	1.875	0.356	4.000	0.375	5
VGM5-1079	●	3/8	-	0.469	2.250	0.356	5.000	0.375	6
VGM5-1080	●	3/8	0.010	0.469	2.250	0.356	5.000	0.375	6
VGM5-1081	●	3/8	0.020	0.469	2.250	0.356	5.000	0.375	6
VGM5-1082	●	3/8	0.030	0.469	2.250	0.356	5.000	0.375	6
VGM5-1083	●	3/8	0.060	0.469	2.250	0.356	5.000	0.375	6
VGM5-1084	●	3/8	0.090	0.469	2.250	0.356	5.000	0.375	6
VGM5-1085	●	3/8	-	0.469	3.000	0.356	6.000	0.375	8
VGM5-1086	●	3/8	0.010	0.469	3.000	0.356	6.000	0.375	8
VGM5-1087	●	3/8	0.020	0.469	3.000	0.356	6.000	0.375	8
VGM5-1088	●	3/8	0.030	0.469	3.000	0.356	6.000	0.375	8
VGM5-1089	○	3/8	0.060	0.469	3.000	0.356	6.000	0.375	8
VGM5-1090	○	3/8	0.090	0.469	3.000	0.356	6.000	0.375	8
VGM5-1091	●	1/2	-	0.625	1.500	0.475	4.000	0.500	3
VGM5-1092	●	1/2	0.010	0.625	1.500	0.475	4.000	0.500	3
VGM5-1093	●	1/2	0.015	0.625	1.500	0.475	4.000	0.500	3
VGM5-1094	●	1/2	0.020	0.625	1.500	0.475	4.000	0.500	3
VGM5-1095	●	1/2	0.030	0.625	1.500	0.475	4.000	0.500	3
VGM5-1096	○	1/2	0.060	0.625	1.500	0.475	4.000	0.500	3
VGM5-1097	○	1/2	0.090	0.625	1.500	0.475	4.000	0.500	3
VGM5-1098	○	1/2	0.120	0.625	1.500	0.475	4.000	0.500	3
VGM5-1099	○	1/2	0.125	0.625	1.500	0.475	4.000	0.500	3
VGM5-1100	●	1/2	-	0.625	2.000	0.475	4.000	0.500	4
VGM5-1101	●	1/2	0.010	0.625	2.000	0.475	4.000	0.500	4
VGM5-1102	●	1/2	0.015	0.625	2.000	0.475	4.000	0.500	4
VGM5-1103	●	1/2	0.020	0.625	2.000	0.475	4.000	0.500	4
VGM5-1104	●	1/2	0.030	0.625	2.000	0.475	4.000	0.500	4
VGM5-1105	○	1/2	0.060	0.625	2.000	0.475	4.000	0.500	4
VGM5-1106	○	1/2	0.090	0.625	2.000	0.475	4.000	0.500	4
VGM5-1107	●	1/2	0.120	0.625	2.000	0.475	4.000	0.500	4
VGM5-1108	○	1/2	0.125	0.625	2.000	0.475	4.000	0.500	4
VGM5-1109	●	1/2	-	0.625	2.500	0.475	5.000	0.500	5

● Stocked ○ Available Upon Request; MOQ May Apply ▲ Globally Stocked

HPC

CONTINUED ➔

P					M			K	N		S		H					
Steel					Stainless Steel			Cast Iron	Non-Ferrous		HRS		Hardened Steel					
Carbon Steel			Alloy Steel	Die Steel					Aluminum		Nickel Alloy	Titanium						
Low	Medium	High							1010 1018	1035 1045	1065	4140 4340	300	400	17-4 PH	6061 7075	Casting	Inconel
○	○	○	○	○	○	○	○	○				○	○	○	○	○	○	○

○ Good ○ Best



HY-PRO® CARB VGM5-LN

High Performance Variable Geometry End Mills

List VGM5-LN (Cont.)

HY-PRO® CARB VGM5-LN, Long Neck



SPEED
FEED
P29

CARBIDE

EXO®

5 FLUTE

40°



SHANK
h6

STUB

PACKED
1 PIECE



Cutting Diameter Tolerance
1/8" ≤ D ≤ 1" +0 / -0.0015"

EDP Number		Diameter	Corner Radius	Length of Cut	Neck Length	Neck Diameter	Overall Length	Shank Diameter	L/D Ratio
		D (Fractional Size)	R (Inch)	Lc (Inch)	L1 (Inch)	d1 (Inch)	L (Inch)	d (Inch)	
VGM5-1110	●	1/2	0.010	0.625	2.500	0.475	5.000	0.500	5
VGM5-1111	●	1/2	0.015	0.625	2.500	0.475	5.000	0.500	5
VGM5-1112	●	1/2	0.020	0.625	2.500	0.475	5.000	0.500	5
VGM5-1113	●	1/2	0.030	0.625	2.500	0.475	5.000	0.500	5
VGM5-1114	●	1/2	0.060	0.625	2.500	0.475	5.000	0.500	5
VGM5-1115	○	1/2	0.090	0.625	2.500	0.475	5.000	0.500	5
VGM5-1116	○	1/2	0.120	0.625	2.500	0.475	5.000	0.500	5
VGM5-1117	○	1/2	0.125	0.625	2.500	0.475	5.000	0.500	5
VGM5-1118	●	1/2	-	0.625	3.000	0.475	6.000	0.500	6
VGM5-1119	●	1/2	0.010	0.625	3.000	0.475	6.000	0.500	6
VGM5-1120	●	1/2	0.030	0.625	3.000	0.475	6.000	0.500	6
VGM5-1121	●	1/2	0.060	0.625	3.000	0.475	6.000	0.500	6
VGM5-1122	●	1/2	0.090	0.625	3.000	0.475	6.000	0.500	6
VGM5-1123	○	1/2	0.120	0.625	3.000	0.475	6.000	0.500	6
VGM5-1124	○	1/2	0.125	0.625	3.000	0.475	6.000	0.500	6
VGM5-1125	●	1/2	-	0.625	4.000	0.475	6.000	0.500	8
VGM5-1126	●	1/2	0.010	0.625	4.000	0.475	6.000	0.500	8
VGM5-1127	○	1/2	0.030	0.625	4.000	0.475	6.000	0.500	8
VGM5-1128	○	1/2	0.060	0.625	4.000	0.475	6.000	0.500	8
VGM5-1129	○	1/2	0.120	0.625	4.000	0.475	6.000	0.500	8
VGM5-1130	●	1/2	-	0.625	5.000	0.475	7.000	0.500	10
VGM5-1131	○	1/2	0.010	0.625	5.000	0.475	7.000	0.500	10
VGM5-1132	●	1/2	0.030	0.625	5.000	0.475	7.000	0.500	10
VGM5-1133	●	1/2	0.060	0.625	5.000	0.475	7.000	0.500	10
VGM5-1134	●	1/2	0.120	0.625	5.000	0.475	7.000	0.500	10
VGM5-1135	●	5/8	-	0.781	1.875	0.593	5.000	0.625	3
VGM5-1136	●	5/8	0.020	0.781	1.875	0.593	5.000	0.625	3
VGM5-1137	○	5/8	0.030	0.781	1.875	0.593	5.000	0.625	3
VGM5-1138	○	5/8	0.060	0.781	1.875	0.593	5.000	0.625	3
VGM5-1139	○	5/8	0.090	0.781	1.875	0.593	5.000	0.625	3
VGM5-1140	○	5/8	0.120	0.781	1.875	0.593	5.000	0.625	3
VGM5-1141	●	5/8	-	0.781	2.500	0.593	6.000	0.625	4
VGM5-1142	●	5/8	0.020	0.781	2.500	0.593	6.000	0.625	4
VGM5-1143	●	5/8	0.030	0.781	2.500	0.593	6.000	0.625	4
VGM5-1144	○	5/8	0.060	0.781	2.500	0.593	6.000	0.625	4
VGM5-1145	○	5/8	0.090	0.781	2.500	0.593	6.000	0.625	4
VGM5-1146	○	5/8	0.120	0.781	2.500	0.593	6.000	0.625	4
VGM5-1147	●	5/8	-	0.781	3.125	0.593	6.000	0.625	5
VGM5-1148	●	5/8	0.020	0.781	3.125	0.593	6.000	0.625	5
VGM5-1149	○	5/8	0.030	0.781	3.125	0.593	6.000	0.625	5
VGM5-1150	○	5/8	0.060	0.781	3.125	0.593	6.000	0.625	5
VGM5-1151	○	5/8	0.090	0.781	3.125	0.593	6.000	0.625	5
VGM5-1152	○	5/8	0.120	0.781	3.125	0.593	6.000	0.625	5
VGM5-1153	○	5/8	-	0.781	3.750	0.593	6.000	0.625	6
VGM5-1154	●	5/8	0.020	0.781	3.750	0.593	6.000	0.625	6
VGM5-1155	○	5/8	0.030	0.781	3.750	0.593	6.000	0.625	6
VGM5-1156	○	5/8	0.060	0.781	3.750	0.593	6.000	0.625	6
VGM5-1157	○	5/8	0.090	0.781	3.750	0.593	6.000	0.625	6
VGM5-1158	○	5/8	0.120	0.781	3.750	0.593	6.000	0.625	6
VGM5-1159	●	3/4	-	0.938	2.250	0.712	4.000	0.750	3
VGM5-1160	●	3/4	0.020	0.938	2.250	0.712	4.000	0.750	3
VGM5-1161	●	3/4	0.030	0.938	2.250	0.712	4.000	0.750	3
VGM5-1162	○	3/4	0.060	0.938	2.250	0.712	4.000	0.750	3
VGM5-1163	○	3/4	0.090	0.938	2.250	0.712	4.000	0.750	3
VGM5-1164	○	3/4	0.120	0.938	2.250	0.712	4.000	0.750	3
VGM5-1165	○	3/4	0.190	0.938	2.250	0.712	4.000	0.750	3
VGM5-1166	○	3/4	0.250	0.938	2.250	0.712	4.000	0.750	3
VGM5-1167	●	3/4	-	0.938	3.000	0.712	6.000	0.750	4

● Stocked ○ Available Upon Request; MOQ May Apply ▲ Globally Stocked



List VGM5-LN (Cont.)

HY-PRO® CARB VGM5-LN, Long Neck



SPEED
FEED
P29

CARBIDE

EXO®

5 FLUTE

40°



SHANK
h6

STUB

PACKED
1 PIECE

EDP Number		Diameter	Corner Radius	Length of Cut	Neck Length	Neck Diameter	Overall Length	Shank Diameter	L/D Ratio
		D (Fractional Size)	R (Inch)	Lc (Inch)	L1 (Inch)	d1 (Inch)	L (Inch)	d (Inch)	
VGM5-1168	●	3/4	0.020	0.938	3.000	0.712	6.000	0.750	4
VGM5-1169	●	3/4	0.030	0.938	3.000	0.712	6.000	0.750	4
VGM5-1170	●	3/4	0.060	0.938	3.000	0.712	6.000	0.750	4
VGM5-1171	○	3/4	0.090	0.938	3.000	0.712	6.000	0.750	4
VGM5-1172	●	3/4	0.120	0.938	3.000	0.712	6.000	0.750	4
VGM5-1173	○	3/4	0.190	0.938	3.000	0.712	6.000	0.750	4
VGM5-1174	○	3/4	0.250	0.938	3.000	0.712	6.000	0.750	4
VGM5-1175	●	3/4	-	0.938	3.750	0.712	6.000	0.750	5
VGM5-1176	●	3/4	0.020	0.938	3.750	0.712	6.000	0.750	5
VGM5-1177	●	3/4	0.030	0.938	3.750	0.712	6.000	0.750	5
VGM5-1178	●	3/4	0.060	0.938	3.750	0.712	6.000	0.750	5
VGM5-1179	○	3/4	0.090	0.938	3.750	0.712	6.000	0.750	5
VGM5-1180	○	3/4	0.120	0.938	3.750	0.712	6.000	0.750	5
VGM5-1181	○	3/4	0.190	0.938	3.750	0.712	6.000	0.750	5
VGM5-1182	○	3/4	0.250	0.938	3.750	0.712	6.000	0.750	5
VGM5-1183	●	3/4	-	0.938	4.500	0.712	7.000	0.750	6
VGM5-1184	○	3/4	0.020	0.938	4.500	0.712	7.000	0.750	6
VGM5-1185	●	3/4	0.030	0.938	4.500	0.712	7.000	0.750	6
VGM5-1186	●	3/4	0.060	0.938	4.500	0.712	7.000	0.750	6
VGM5-1187	○	3/4	0.090	0.938	4.500	0.712	7.000	0.750	6
VGM5-1188	○	3/4	0.120	0.938	4.500	0.712	7.000	0.750	6
VGM5-1189	○	3/4	0.190	0.938	4.500	0.712	7.000	0.750	6
VGM5-1190	●	3/4	0.250	0.938	4.500	0.712	7.000	0.750	6
VGM5-1191	○	1	-	1.250	3.000	0.950	6.000	1.000	3
VGM5-1192	●	1	0.030	1.250	3.000	0.950	6.000	1.000	3
VGM5-1193	○	1	0.060	1.250	3.000	0.950	6.000	1.000	3
VGM5-1194	●	1	0.090	1.250	3.000	0.950	6.000	1.000	3
VGM5-1195	○	1	0.120	1.250	3.000	0.950	6.000	1.000	3
VGM5-1196	○	1	0.190	1.250	3.000	0.950	6.000	1.000	3
VGM5-1197	○	1	0.250	1.250	3.000	0.950	6.000	1.000	3
VGM5-1198	○	1	-	1.250	4.000	0.950	6.000	1.000	4
VGM5-1199	○	1	0.030	1.250	4.000	0.950	6.000	1.000	4
VGM5-1200	○	1	0.060	1.250	4.000	0.950	6.000	1.000	4
VGM5-1201	○	1	0.090	1.250	4.000	0.950	6.000	1.000	4
VGM5-1202	○	1	0.120	1.250	4.000	0.950	6.000	1.000	4
VGM5-1203	○	1	0.190	1.250	4.000	0.950	6.000	1.000	4
VGM5-1204	○	1	0.250	1.250	4.000	0.950	6.000	1.000	4
VGM5-1205	●	1	-	1.250	5.000	0.950	7.000	1.000	5
VGM5-1206	○	1	0.030	1.250	5.000	0.950	7.000	1.000	5
VGM5-1207	●	1	0.060	1.250	5.000	0.950	7.000	1.000	5
VGM5-1208	○	1	0.090	1.250	5.000	0.950	7.000	1.000	5
VGM5-1209	○	1	0.120	1.250	5.000	0.950	7.000	1.000	5
VGM5-1210	●	1	0.190	1.250	5.000	0.950	7.000	1.000	5
VGM5-1211	○	1	0.250	1.250	5.000	0.950	7.000	1.000	5

● Stocked ○ Available Upon Request; MOQ May Apply ▲ Globally Stocked

HP

P					M			K	N		S		H			
Steel					Stainless Steel			Cast Iron	Non-Ferrous		HRSA		Hardened Steel			
Carbon Steel			Alloy Steel	Aluminum					Nickel Alloy	Titanium						
Low	Medium	High														
1010	1035	1065	4140	Die Steel	300	400	17-4 PH		6061	Casting	Inconel	6Al4V (30 HRC)	~35 HRC	35-45 HRC	45-50 HRC	50-70 HRC
1018	1045	1065	4340					7075								
⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙			⊙		⊙	⊙	○		

○ Good ○ Best



HY-PRO® CARB VGM

High Performance Variable Geometry End Mills

List VGM6

HY-PRO® CARB VGM6



SPEED
FEED
P30

CARBIDE

EXO®

6 FLUTE

37°



SHANK
h6

STUB

REG

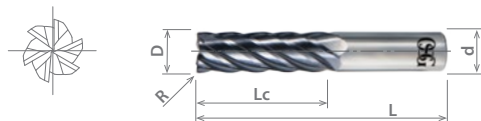
LONG

EXTRA
LONG

PACKED
1 PIECE

Cutting Diameter Tolerance

1/4" ≤ D ≤ 1" +0 / -0.0015"



EDP Number		Diameter	Corner Radius	Length of Cut	Overall Length	Shank Diameter	L/D Ratio
		D (Fractional Size)	R (Inch)	Lc (Inch)	L (Inch)	d (Inch)	
VGM6-0001	●	1/4	-	0.375	2.000	0.250	1.5
VGM6-0002	●	1/4	0.020	0.375	2.000	0.250	1.5
VGM6-0003	●	1/4	0.030	0.375	2.000	0.250	1.5
VGM6-0004	●	1/4	0.060	0.375	2.000	0.250	1.5
VGM6-0005	●	1/4	-	0.500	2.500	0.250	2
VGM6-0006	●	1/4	0.020	0.500	2.500	0.250	2
VGM6-0007	●	1/4	0.030	0.500	2.500	0.250	2
VGM6-0008	●	1/4	0.060	0.500	2.500	0.250	2
VGM6-0009	●	1/4	-	0.750	2.500	0.250	3
VGM6-0010	●	1/4	0.020	0.750	2.500	0.250	3
VGM6-0011	●	1/4	0.030	0.750	2.500	0.250	3
VGM6-0012	●	1/4	0.060	0.750	2.500	0.250	3
VGM6-0013	●	1/4	-	1.000	3.000	0.250	4
VGM6-0014	●	1/4	0.020	1.000	3.000	0.250	4
VGM6-0015	●	1/4	0.030	1.000	3.000	0.250	4
VGM6-0016	○	1/4	0.060	1.000	3.000	0.250	4
VGM6-0017	●	1/4	-	1.250	3.000	0.250	5
VGM6-0018	○	1/4	0.020	1.250	3.000	0.250	5
VGM6-0019	●	1/4	0.030	1.250	3.000	0.250	5
VGM6-0020	●	1/4	0.060	1.250	3.000	0.250	5
VGM6-0021	●	1/4	-	1.500	3.000	0.250	6
VGM6-0022	○	1/4	0.020	1.500	3.000	0.250	6
VGM6-0023	●	1/4	0.030	1.500	3.000	0.250	6
VGM6-0024	●	1/4	0.060	1.500	3.000	0.250	6
VGM6-0025	●	5/16	-	0.469	2.000	0.313	1.5
VGM6-0026	○	5/16	0.020	0.469	2.000	0.313	1.5
VGM6-0027	○	5/16	0.030	0.469	2.000	0.313	1.5
VGM6-0028	○	5/16	0.060	0.469	2.000	0.313	1.5
VGM6-0029	●	5/16	-	0.625	2.500	0.313	2
VGM6-0030	○	5/16	0.020	0.625	2.500	0.313	2
VGM6-0031	●	5/16	0.030	0.625	2.500	0.313	2
VGM6-0032	●	5/16	0.060	0.625	2.500	0.313	2
VGM6-0033	●	5/16	-	0.938	3.000	0.313	3
VGM6-0034	●	5/16	0.020	0.938	3.000	0.313	3
VGM6-0035	●	5/16	0.030	0.938	3.000	0.313	3
VGM6-0036	○	5/16	0.060	0.938	3.000	0.313	3
VGM6-0037	●	5/16	-	1.250	3.000	0.313	4
VGM6-0038	●	5/16	0.020	1.250	3.000	0.313	4
VGM6-0039	●	5/16	0.030	1.250	3.000	0.313	4
VGM6-0040	●	5/16	0.060	1.250	3.000	0.313	4
VGM6-0041	●	3/8	-	0.563	2.000	0.375	1.5
VGM6-0042	●	3/8	0.020	0.563	2.000	0.375	1.5
VGM6-0043	●	3/8	0.030	0.563	2.000	0.375	1.5
VGM6-0044	●	3/8	0.060	0.563	2.000	0.375	1.5
VGM6-0045	○	3/8	0.090	0.563	2.000	0.375	1.5
VGM6-0046	●	3/8	-	0.750	2.500	0.375	2
VGM6-0047	●	3/8	0.020	0.750	2.500	0.375	2
VGM6-0048	●	3/8	0.030	0.750	2.500	0.375	2
VGM6-0049	●	3/8	0.060	0.750	2.500	0.375	2
VGM6-0050	○	3/8	0.090	0.750	2.500	0.375	2
VGM6-0051	●	3/8	-	1.125	3.000	0.375	3
VGM6-0052	●	3/8	0.020	1.125	3.000	0.375	3
VGM6-0053	●	3/8	0.030	1.125	3.000	0.375	3
VGM6-0054	●	3/8	0.060	1.125	3.000	0.375	3
VGM6-0055	●	3/8	0.090	1.125	3.000	0.375	3

● Stocked ○ Available Upon Request; MOQ May Apply ▲ Globally Stocked



List VGM6 (Continued)

HY-PRO® CARB VGM6



SPEED
FEED
P30

CARBIDE

EXO®

6 FLUTE

37°



SHANK
h6

STUB

REG

LONG

EXTRA
LONG

PACKED
1 PIECE

EDP Number		Diameter	Corner Radius	Length of Cut	Overall Length	Shank Diameter	L/D Ratio
		D (Fractional Size)	R (Inch)	Lc (Inch)	L (Inch)	d (Inch)	
VGM6-0056	●	3/8	-	1.500	4.000	0.375	4
VGM6-0057	●	3/8	0.020	1.500	4.000	0.375	4
VGM6-0058	○	3/8	0.030	1.500	4.000	0.375	4
VGM6-0059	●	3/8	0.060	1.500	4.000	0.375	4
VGM6-0060	○	3/8	0.090	1.500	4.000	0.375	4
VGM6-0061	●	1/2	-	0.625	2.500	0.500	1.25
VGM6-0062	●	1/2	0.030	0.625	2.500	0.500	1.25
VGM6-0063	●	1/2	0.060	0.625	2.500	0.500	1.25
VGM6-0064	●	1/2	0.090	0.625	2.500	0.500	1.25
VGM6-0065	●	1/2	0.120	0.625	2.500	0.500	1.25
VGM6-0066	●	1/2	0.125	0.625	2.500	0.500	1.25
VGM6-0067	●	1/2	-	1.000	3.000	0.500	2
VGM6-0068	●	1/2	0.030	1.000	3.000	0.500	2
VGM6-0069	●	1/2	0.060	1.000	3.000	0.500	2
VGM6-0070	●	1/2	0.090	1.000	3.000	0.500	2
VGM6-0071	●	1/2	0.120	1.000	3.000	0.500	2
VGM6-0072	●	1/2	0.125	1.000	3.000	0.500	2
VGM6-0073	●	1/2	-	1.250	3.000	0.500	2.5
VGM6-0074	●	1/2	0.030	1.250	3.000	0.500	2.5
VGM6-0075	●	1/2	0.060	1.250	3.000	0.500	2.5
VGM6-0076	●	1/2	0.090	1.250	3.000	0.500	2.5
VGM6-0077	○	1/2	0.120	1.250	3.000	0.500	2.5
VGM6-0078	●	1/2	0.125	1.250	3.000	0.500	2.5
VGM6-0079	●	1/2	-	1.500	4.000	0.500	3
VGM6-0080	●	1/2	0.030	1.500	4.000	0.500	3
VGM6-0081	●	1/2	0.060	1.500	4.000	0.500	3
VGM6-0082	○	1/2	0.090	1.500	4.000	0.500	3
VGM6-0083	○	1/2	0.120	1.500	4.000	0.500	3
VGM6-0084	●	1/2	0.125	1.500	4.000	0.500	3
VGM6-0085	●	1/2	-	2.000	4.000	0.500	4
VGM6-0086	●	1/2	0.030	2.000	4.000	0.500	4
VGM6-0087	○	1/2	0.060	2.000	4.000	0.500	4
VGM6-0088	○	1/2	0.090	2.000	4.000	0.500	4
VGM6-0089	○	1/2	0.120	2.000	4.000	0.500	4
VGM6-0090	○	1/2	0.125	2.000	4.000	0.500	4
VGM6-0091	●	5/8	-	0.781	3.000	0.625	1.25
VGM6-0092	●	5/8	0.020	0.781	3.000	0.625	1.25
VGM6-0093	○	5/8	0.030	0.781	3.000	0.625	1.25
VGM6-0094	●	5/8	0.060	0.781	3.000	0.625	1.25
VGM6-0095	○	5/8	0.090	0.781	3.000	0.625	1.25
VGM6-0096	○	5/8	0.120	0.781	3.000	0.625	1.25
VGM6-0097	●	5/8	0.125	0.781	3.000	0.625	1.25
VGM6-0098	●	5/8	-	1.250	3.500	0.625	2
VGM6-0099	○	5/8	0.020	1.250	3.500	0.625	2
VGM6-0100	○	5/8	0.030	1.250	3.500	0.625	2
VGM6-0101	○	5/8	0.060	1.250	3.500	0.625	2

● Stocked ○ Available Upon Request; MOQ May Apply ▲ Globally Stocked

HPC

CONTINUED

P					M			K	N		S		H			
Steel					Stainless Steel			Cast Iron	Non-Ferrous		HRSA		Hardened Steel			
Carbon Steel			Alloy Steel	Die Steel					Aluminum		Nickel Alloy	Titanium				
Low	Medium	High														
1010	1035	1065	4140	Die Steel	300	400	17-4 PH	6061	Casting	Inconel	6Al4V (30 HRC)	~35 HRC	35-45 HRC	45-50 HRC	50-70 HRC	
1018	1045	1065	4340					7075								
○	○	○	○	○	○	○	○	○			○	○	○			

○ Good ○ Best



HY-PRO® CARB VGM

High Performance Variable Geometry End Mills

List VGM6 (Continued)

HY-PRO® CARB VGM6



SPEED
FEED
P30

CARBIDE

EXO®

6 FLUTE

37°



SHANK
h6

STUB

REG

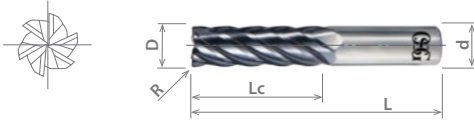
LONG

EXTRA
LONG

PACKED
1 PIECE

Cutting Diameter Tolerance

1/4" ≤ D ≤ 1" +0 / -0.0015"



EDP Number		Diameter	Corner Radius	Length of Cut	Overall Length	Shank Diameter	L/D Ratio
		D (Fractional Size)	R (Inch)	Lc (Inch)	L (Inch)	d (Inch)	
VGM6-0102	●	5/8	0.090	1.250	3.500	0.625	2
VGM6-0103	○	5/8	0.120	1.250	3.500	0.625	2
VGM6-0104	○	5/8	0.125	1.250	3.500	0.625	2
VGM6-0105	●	5/8	-	1.563	3.500	0.625	2.5
VGM6-0106	○	5/8	0.020	1.563	3.500	0.625	2.5
VGM6-0107	○	5/8	0.030	1.563	3.500	0.625	2.5
VGM6-0108	○	5/8	0.060	1.563	3.500	0.625	2.5
VGM6-0109	●	5/8	0.090	1.563	3.500	0.625	2.5
VGM6-0110	○	5/8	0.120	1.563	3.500	0.625	2.5
VGM6-0111	○	5/8	0.125	1.563	3.500	0.625	2.5
VGM6-0112	●	5/8	-	1.875	5.000	0.625	3
VGM6-0113	○	5/8	0.020	1.875	5.000	0.625	3
VGM6-0114	○	5/8	0.030	1.875	5.000	0.625	3
VGM6-0115	●	5/8	0.060	1.875	5.000	0.625	3
VGM6-0116	○	5/8	0.090	1.875	5.000	0.625	3
VGM6-0117	○	5/8	0.120	1.875	5.000	0.625	3
VGM6-0118	●	5/8	0.125	1.875	5.000	0.625	3
VGM6-0119	●	5/8	-	2.500	5.000	0.625	4
VGM6-0120	○	5/8	0.020	2.500	5.000	0.625	4
VGM6-0121	●	5/8	0.030	2.500	5.000	0.625	4
VGM6-0122	○	5/8	0.060	2.500	5.000	0.625	4
VGM6-0123	○	5/8	0.090	2.500	5.000	0.625	4
VGM6-0124	○	5/8	0.120	2.500	5.000	0.625	4
VGM6-0125	●	5/8	0.125	2.500	5.000	0.625	4
VGM6-0126	●	3/4	-	0.938	3.000	0.750	1.25
VGM6-0127	○	3/4	0.020	0.938	3.000	0.750	1.25
VGM6-0128	○	3/4	0.030	0.938	3.000	0.750	1.25
VGM6-0129	●	3/4	0.060	0.938	3.000	0.750	1.25
VGM6-0130	○	3/4	0.090	0.938	3.000	0.750	1.25
VGM6-0131	○	3/4	0.120	0.938	3.000	0.750	1.25
VGM6-0132	○	3/4	0.190	0.938	3.000	0.750	1.25
VGM6-0133	○	3/4	0.250	0.938	3.000	0.750	1.25
VGM6-0134	●	3/4	-	1.125	4.000	0.750	1.5
VGM6-0135	○	3/4	0.020	1.125	4.000	0.750	1.5
VGM6-0136	●	3/4	0.030	1.125	4.000	0.750	1.5
VGM6-0137	○	3/4	0.060	1.125	4.000	0.750	1.5
VGM6-0138	○	3/4	0.090	1.125	4.000	0.750	1.5
VGM6-0139	○	3/4	0.120	1.125	4.000	0.750	1.5
VGM6-0140	○	3/4	0.190	1.125	4.000	0.750	1.5
VGM6-0141	○	3/4	0.250	1.125	4.000	0.750	1.5
VGM6-0142	●	3/4	-	1.500	4.000	0.750	2
VGM6-0143	●	3/4	0.020	1.500	4.000	0.750	2
VGM6-0144	●	3/4	0.030	1.500	4.000	0.750	2
VGM6-0145	●	3/4	0.060	1.500	4.000	0.750	2
VGM6-0146	○	3/4	0.090	1.500	4.000	0.750	2
VGM6-0147	○	3/4	0.120	1.500	4.000	0.750	2
VGM6-0148	○	3/4	0.190	1.500	4.000	0.750	2
VGM6-0149	○	3/4	0.250	1.500	4.000	0.750	2
VGM6-0150	●	3/4	-	2.250	5.000	0.750	3
VGM6-0151	●	3/4	0.020	2.250	5.000	0.750	3
VGM6-0152	●	3/4	0.030	2.250	5.000	0.750	3
VGM6-0153	○	3/4	0.060	2.250	5.000	0.750	3
VGM6-0154	○	3/4	0.090	2.250	5.000	0.750	3
VGM6-0155	○	3/4	0.120	2.250	5.000	0.750	3
VGM6-0156	○	3/4	0.190	2.250	5.000	0.750	3

● Stocked ○ Available Upon Request; MOQ May Apply ▲ Globally Stocked



List VGM6 (Continued)

HY-PRO® CARB VGM6



SPEED
FEED
P30

CARBIDE

EXO®

6 FLUTE

37°



SHANK
h6

STUB

REG

LONG

EXTRA
LONG

PACKED
1 PIECE

EDP Number		Diameter	Corner Radius	Length of Cut	Overall Length	Shank Diameter	L/D Ratio
		D (Fractional Size)	R (Inch)	Lc (Inch)	L (Inch)	d (Inch)	
VGM6-0157	○	3/4	0.250	2.250	5.000	0.750	3
VGM6-0158	●	3/4	-	3.000	6.000	0.750	4
VGM6-0159	○	3/4	0.020	3.000	6.000	0.750	4
VGM6-0160	○	3/4	0.030	3.000	6.000	0.750	4
VGM6-0161	○	3/4	0.060	3.000	6.000	0.750	4
VGM6-0162	○	3/4	0.090	3.000	6.000	0.750	4
VGM6-0163	●	3/4	0.120	3.000	6.000	0.750	4
VGM6-0164	○	3/4	0.190	3.000	6.000	0.750	4
VGM6-0165	●	3/4	0.250	3.000	6.000	0.750	4
VGM6-0166	●	1	-	1.500	4.000	1.000	1.5
VGM6-0167	●	1	0.030	1.500	4.000	1.000	1.5
VGM6-0168	○	1	0.060	1.500	4.000	1.000	1.5
VGM6-0169	○	1	0.090	1.500	4.000	1.000	1.5
VGM6-0170	○	1	0.120	1.500	4.000	1.000	1.5
VGM6-0171	○	1	0.190	1.500	4.000	1.000	1.5
VGM6-0172	○	1	0.250	1.500	4.000	1.000	1.5
VGM6-0173	●	1	-	2.000	5.000	1.000	2
VGM6-0174	●	1	0.030	2.000	5.000	1.000	2
VGM6-0175	○	1	0.060	2.000	5.000	1.000	2
VGM6-0176	○	1	0.090	2.000	5.000	1.000	2
VGM6-0177	○	1	0.120	2.000	5.000	1.000	2
VGM6-0178	●	1	0.190	2.000	5.000	1.000	2
VGM6-0179	○	1	0.250	2.000	5.000	1.000	2
VGM6-0180	●	1	-	3.000	6.000	1.000	3
VGM6-0181	●	1	0.030	3.000	6.000	1.000	3
VGM6-0182	○	1	0.060	3.000	6.000	1.000	3
VGM6-0183	○	1	0.090	3.000	6.000	1.000	3
VGM6-0184	○	1	0.120	3.000	6.000	1.000	3
VGM6-0185	○	1	0.190	3.000	6.000	1.000	3
VGM6-0186	○	1	0.250	3.000	6.000	1.000	3

● Stocked ○ Available Upon Request; MOQ May Apply ▲ Globally Stocked

HPC

P					M			K	N		S		H			
Steel					Stainless Steel			Cast Iron	Non-Ferrous		HRSA		Hardened Steel			
Carbon Steel			Alloy Steel	Die Steel					Aluminum		Nickel Alloy	Titanium				
Low	Medium	High							6061 7075	Casting	Inconel	6Al4V (30 HRC)				
1010	1035	1065	4140	4340	300	400	17-4 PH						~35 HRC	35-45 HRC	45-50 HRC	50-70 HRC
1018	1045	1065	4340													
○	○	○	○	○	○	○	○	○			○	○	○	○		

○ Good ○ Best



HY-PRO® CARB VGM7

High Performance Variable Geometry End Mills

List VGM7

HY-PRO® CARB VGM7



SPEED
FEED
P31

CARBIDE

EXO®

7 FLUTE

36°



SHANK
h6

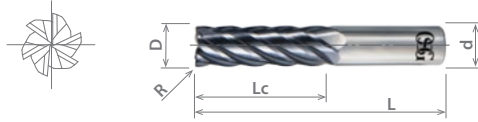
STUB

REG

LONG

EXTRA
LONG

PACKED
1 PIECE



Cutting Diameter Tolerance	
1/4" ≤ D ≤ 1"	+0 / -0.0015"

EDP Number		Diameter	Corner Radius	Length of Cut	Overall Length	Shank Diameter	L/D Ratio
		D (Fractional Size)	R (Inch)	Lc (Inch)	L (Inch)	d (Inch)	
VGM7-0001	●	1/4	-	0.375	2.000	0.250	1.5
VGM7-0002	●	1/4	0.020	0.375	2.000	0.250	1.5
VGM7-0003	●	1/4	0.030	0.375	2.000	0.250	1.5
VGM7-0004	●	1/4	0.060	0.375	2.000	0.250	1.5
VGM7-0005	●	1/4	-	0.500	2.500	0.250	2
VGM7-0006	●	1/4	0.020	0.500	2.500	0.250	2
VGM7-0007	●	1/4	0.030	0.500	2.500	0.250	2
VGM7-0008	●	1/4	0.060	0.500	2.500	0.250	2
VGM7-0009	●	1/4	-	0.750	2.500	0.250	3
VGM7-0010	●	1/4	0.020	0.750	2.500	0.250	3
VGM7-0011	●	1/4	0.030	0.750	2.500	0.250	3
VGM7-0012	●	1/4	0.060	0.750	2.500	0.250	3
VGM7-0013	●	1/4	-	1.000	3.000	0.250	4
VGM7-0014	●	1/4	0.020	1.000	3.000	0.250	4
VGM7-0015	●	1/4	0.030	1.000	3.000	0.250	4
VGM7-0016	●	1/4	0.060	1.000	3.000	0.250	4
VGM7-0017	●	1/4	-	1.250	3.000	0.250	5
VGM7-0018	●	1/4	0.020	1.250	3.000	0.250	5
VGM7-0019	●	1/4	0.030	1.250	3.000	0.250	5
VGM7-0020	●	1/4	0.060	1.250	3.000	0.250	5
VGM7-0021	●	1/4	-	1.500	3.000	0.250	6
VGM7-0022	●	1/4	0.020	1.500	3.000	0.250	6
VGM7-0023	●	1/4	0.030	1.500	3.000	0.250	6
VGM7-0024	●	1/4	0.060	1.500	3.000	0.250	6
VGM7-0025	●	5/16	-	0.469	2.000	0.313	1.5
VGM7-0026	●	5/16	0.020	0.469	2.000	0.313	1.5
VGM7-0027	●	5/16	0.030	0.469	2.000	0.313	1.5
VGM7-0028	●	5/16	0.060	0.469	2.000	0.313	1.5
VGM7-0029	●	5/16	-	0.625	2.500	0.313	2
VGM7-0030	●	5/16	0.020	0.625	2.500	0.313	2
VGM7-0031	●	5/16	0.030	0.625	2.500	0.313	2
VGM7-0032	●	5/16	0.060	0.625	2.500	0.313	2
VGM7-0033	●	5/16	-	0.938	3.000	0.313	3
VGM7-0034	●	5/16	0.020	0.938	3.000	0.313	3
VGM7-0035	●	5/16	0.030	0.938	3.000	0.313	3
VGM7-0036	●	5/16	0.060	0.938	3.000	0.313	3
VGM7-0037	●	5/16	-	1.250	3.000	0.313	4
VGM7-0038	●	5/16	0.020	1.250	3.000	0.313	4
VGM7-0039	●	5/16	0.030	1.250	3.000	0.313	4
VGM7-0040	●	5/16	0.060	1.250	3.000	0.313	4
VGM7-0041	●	3/8	-	0.563	2.000	0.375	1.5
VGM7-0042	●	3/8	0.020	0.563	2.000	0.375	1.5
VGM7-0043	●	3/8	0.030	0.563	2.000	0.375	1.5
VGM7-0044	●	3/8	0.060	0.563	2.000	0.375	1.5
VGM7-0045	●	3/8	-	0.750	2.500	0.375	2
VGM7-0046	●	3/8	0.020	0.750	2.500	0.375	2
VGM7-0047	●	3/8	0.030	0.750	2.500	0.375	2
VGM7-0048	●	3/8	0.060	0.750	2.500	0.375	2
VGM7-0049	●	3/8	-	1.125	3.000	0.375	3
VGM7-0050	●	3/8	0.020	1.125	3.000	0.375	3
VGM7-0051	●	3/8	0.030	1.125	3.000	0.375	3
VGM7-0052	●	3/8	0.060	1.125	3.000	0.375	3
VGM7-0053	●	3/8	-	1.500	4.000	0.375	4
VGM7-0054	●	3/8	0.020	1.500	4.000	0.375	4
VGM7-0055	●	3/8	0.030	1.500	4.000	0.375	4
VGM7-0056	●	3/8	0.060	1.500	4.000	0.375	4
VGM7-0057	●	1/2	-	0.625	2.500	0.500	1.25
VGM7-0058	●	1/2	0.030	0.625	2.500	0.500	1.25
VGM7-0059	●	1/2	0.060	0.625	2.500	0.500	1.25
VGM7-0060	●	1/2	-	1.000	3.000	0.500	2

● Stocked ○ Available Upon Request; MOQ May Apply ▲ Globally Stocked



List VGM7 (Continued)

HY-PRO® CARB VGM7



SPEED
FEED
P31

CARBIDE

EXO®

7 FLUTE

36°



SHANK
h6

STUB

REG

LONG

EXTRA
LONG

PACKED
1 PIECE

EDP Number		Diameter	Corner Radius	Length of Cut	Overall Length	Shank Diameter	L/D Ratio
		D (Fractional Size)	R (Inch)	Lc (Inch)	L (Inch)	d (Inch)	
VGM7-0061	●	1/2	0.030	1.000	3.000	0.500	2
VGM7-0062	●	1/2	0.060	1.000	3.000	0.500	2
VGM7-0063	●	1/2	-	1.250	3.000	0.500	2.5
VGM7-0064	●	1/2	0.030	1.250	3.000	0.500	2.5
VGM7-0065	●	1/2	0.060	1.250	3.000	0.500	2.5
VGM7-0066	●	1/2	-	1.500	4.000	0.500	3
VGM7-0067	●	1/2	0.030	1.500	4.000	0.500	3
VGM7-0068	●	1/2	0.060	1.500	4.000	0.500	3
VGM7-0069	●	1/2	-	2.000	4.000	0.500	4
VGM7-0070	●	1/2	0.030	2.000	4.000	0.500	4
VGM7-0071	●	1/2	0.060	2.000	4.000	0.500	4
VGM7-0072	●	5/8	-	0.781	3.000	0.625	1.25
VGM7-0073	●	5/8	0.030	0.781	3.000	0.625	1.25
VGM7-0074	○	5/8	0.060	0.781	3.000	0.625	1.25
VGM7-0075	●	5/8	-	1.250	3.500	0.625	2
VGM7-0076	●	5/8	0.030	1.250	3.500	0.625	2
VGM7-0077	●	5/8	0.060	1.250	3.500	0.625	2
VGM7-0078	●	5/8	-	1.563	3.500	0.625	2.5
VGM7-0079	●	5/8	0.030	1.563	3.500	0.625	2.5
VGM7-0080	●	5/8	0.060	1.563	3.500	0.625	2.5
VGM7-0081	●	5/8	-	1.875	5.000	0.625	3
VGM7-0082	●	5/8	0.030	1.875	5.000	0.625	3
VGM7-0083	○	5/8	0.060	1.875	5.000	0.625	3
VGM7-0084	●	5/8	-	2.500	5.000	0.625	4
VGM7-0085	●	5/8	0.030	2.500	5.000	0.625	4
VGM7-0086	●	5/8	0.060	2.500	5.000	0.625	4
VGM7-0087	●	3/4	-	0.938	3.000	0.750	1.25
VGM7-0088	●	3/4	0.030	0.938	3.000	0.750	1.25
VGM7-0089	○	3/4	0.060	0.938	3.000	0.750	1.25
VGM7-0090	●	3/4	-	1.125	4.000	0.750	1.5
VGM7-0091	●	3/4	0.030	1.125	4.000	0.750	1.5
VGM7-0092	●	3/4	0.060	1.125	4.000	0.750	1.5
VGM7-0093	●	3/4	-	1.500	4.000	0.750	2
VGM7-0094	●	3/4	0.030	1.500	4.000	0.750	2
VGM7-0095	●	3/4	0.060	1.500	4.000	0.750	2
VGM7-0096	●	3/4	-	2.250	5.000	0.750	3
VGM7-0097	●	3/4	0.030	2.250	5.000	0.750	3
VGM7-0098	●	3/4	0.060	2.250	5.000	0.750	3
VGM7-0099	●	3/4	-	3.000	6.000	0.750	4
VGM7-0100	●	3/4	0.030	3.000	6.000	0.750	4
VGM7-0101	●	3/4	0.060	3.000	6.000	0.750	4
VGM7-0102	●	1	-	1.500	4.000	1.000	1.5
VGM7-0103	●	1	0.030	1.500	4.000	1.000	1.5
VGM7-0104	○	1	0.060	1.500	4.000	1.000	1.5
VGM7-0105	●	1	-	2.000	5.000	1.000	2
VGM7-0106	○	1	0.030	2.000	5.000	1.000	2
VGM7-0107	○	1	0.060	2.000	5.000	1.000	2
VGM7-0108	●	1	-	3.000	6.000	1.000	3
VGM7-0109	●	1	0.030	3.000	6.000	1.000	3
VGM7-0110	○	1	0.060	3.000	6.000	1.000	3

● Stocked ○ Available Upon Request; MOQ May Apply ▲ Globally Stocked

HPC

P					M			K	N		S		H			
Steel					Stainless Steel			Cast Iron	Non-Ferrous		HRSA		Hardened Steel			
Carbon Steel			Alloy Steel	Die Steel					Aluminum		Nickel Alloy	Titanium				
Low	Medium	High							300	400	17-4 PH	6061 7075	Casting	Inconel	6Al4V (30 HRC)	~35 HRC
1010	1035	1065	4140	Die Steel	300	400	17-4 PH	Cast Iron				6Al4V (30 HRC)	~35 HRC	35-45 HRC	45-50 HRC	50-70 HRC
1018	1045	1065	4340													
○	○	○	○	○	○	○	○	○			○	○	○	○		

○ Good ○ Best



List VGM5 - HY-PRO® CARB VGM

Side Milling

Hardness	–		Up to 30 HRC		–		–		–		–		–		35 HRC	
Work Material	Mild Steels Carbon Steels Cast Iron		Tool Steel Alloy Steel		Stainless Steel 304		Titanium Alloy Ti-6AL-4V		Inconel 718		Inconel 625		Cast Iron		Hardened Steel	
Cutting	350-650 SFM		350-650 SFM		200-350 SFM		200-350 SFM		100-200 SFM		150-250 SFM		350-750 SFM		200-350 SFM	
Depth of Cut	Aa = up to Max LOC, Ar= 0.3xD						Aa = up to Max LOC, Ar= 0.2xD		Aa = up to Max LOC, Ar= 0.1xD				Aa = up to Max LOC, Ar= 0.3xD		Aa = up to Max LOC, Ar= 0.15xD	
Mill Dia.	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM
Inch																
1/8	16,794	84.0	16,794	84.0	7,634	38.2	7,634	38.2	4,580	22.9	6,107	30.5	16,794	84.0	7,634	38.2
5/32	13,435	86.1	13,435	86.1	6,107	39.1	6,107	39.1	3,664	18.3	4,885	24.4	13,435	86.1	6,107	39.1
3/16	11,196	88.2	11,196	88.2	5,089	40.1	5,089	40.1	3,053	22.9	4,071	30.5	11,196	88.2	5,089	40.1
7/32	9,597	90.3	9,597	90.3	4,362	41.0	4,362	41.0	2,617	19.6	3,490	26.2	9,597	90.3	4,362	41.0
1/4	8,397	92.4	8,397	92.4	3,817	42.0	3,817	42.0	2,290	22.9	3,053	30.5	8,397	92.4	3,817	42.0
9/32	7,464	94.5	7,464	94.5	3,393	42.9	3,393	42.9	2,036	20.4	2,714	27.1	7,464	94.5	3,393	42.9
5/16	6,718	96.6	6,718	96.6	3,053	43.9	3,053	43.9	1,832	18.3	2,443	24.4	6,718	96.6	3,053	43.9
3/8	5,598	98.0	5,598	98.0	2,545	44.5	2,545	44.5	1,527	19.1	2,036	25.4	5,598	98.0	2,545	44.5
1/2	4,198	88.2	4,198	88.2	1,908	40.1	1,908	40.1	1,145	14.3	1,527	19.1	4,198	88.2	1,908	40.1
5/8	3,359	70.5	3,359	70.5	1,527	32.1	1,527	32.1	916	11.5	1,221	15.3	3,359	70.5	1,527	32.1
3/4	2,799	61.6	2,799	61.6	1,272	28.0	1,272	28.0	763	9.5	1,018	12.7	2,799	61.6	1,272	28.0
1	2,099	46.2	2,099	46.2	954	21.0	954	21.0	573	8.6	763	11.5	2,099	46.2	954	21.0

1. The above milling condition is a guideline for L/D ratio 1.25 and 1.5.
2. Use a rigid and precise machine and holder.
3. The rotational speed is calculated by the median of the recommended cutting speed.
Adjustments may be necessary depending on the rigidity or the workpiece, fixture, and machine.
4. Please use a suitable fluid with high smoke retardant properties.
5. During dry (no fluid) milling, please use air blow to remove chips from the milling area and to eliminate chip packing.
6. Please use water-soluble coolant when machining stainless steel and titanium alloy.
7. Reduce speed and feed as well as depth of cut when high precision is required.

Speed & Feed Reduction Chart by L/D Ratio

Hardness	–		Up to 30 HRC		–		–		–		–		–		35 HRC	
Work Material	Mild Steels Carbon Steels Cast Iron		Tool Steel Alloy Steel		Stainless Steel 304		Titanium Alloy Ti-6AL-4V		Inconel 718		Inconel 625		Cast Iron		Hardened Steel	
L/D Ratio	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM
2	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
2.5	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
3	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%
4	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%
5	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
6	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%

Aa & Ar Adjustment Chart by L/D Ratio

Hardness	–		Up to 30 HRC		–		–		–		–		–		35 HRC	
Work Material	Mild Steels Carbon Steels Cast Iron		Tool Steel Alloy Steel		Stainless Steel 304		Titanium Alloy Ti-6AL-4V		Inconel 718		Inconel 625		Cast Iron		Hardened Steel	
L/D Ratio	Aa	Ar	Aa	Ar	Aa	Ar	Aa	Ar	Aa	Ar	Aa	Ar	Aa	Ar	Aa	Ar
2		0.2 x D		0.2 x D		0.2 x D		0.15 x D		0.08 x D		0.08 x D		0.2 x D		0.1 x D
2.5		0.2 x D		0.2 x D		0.2 x D		0.15 x D		0.08 x D		0.08 x D		0.2 x D		0.1 x D
3		0.15 x D		0.15 x D		0.15 x D		0.1 x D		0.05 x D		0.05 x D		0.15 x D		0.05 x D
4	Up to Max. LOC	0.1 x D	Up to Max. LOC	0.1 x D	Up to Max. LOC	0.1 x D	Up to Max. LOC	0.05 x D	Up to Max. LOC	0.03 x D	Up to Max. LOC	0.03 x D	Up to Max. LOC	0.1 x D	Up to Max. LOC	0.03 x D
5		0.1 x D		0.1 x D		0.1 x D		0.05 x D		0.03 x D		0.03 x D		0.1 x D		0.03 x D
6		0.05 x D		0.05 x D		0.05 x D		0.03 x D		0.02 x D		0.02 x D		0.05 x D		0.02 x D



List VGM5-LN - HY-PRO® CARB VGM

Side Milling

Hardness	–		Up to 30 HRC		–		–		–		–		–		35 HRC	
Work Material	Mild Steels Carbon Steels Cast Iron		Tool Steel Alloy Steel		Stainless Steel 304		Titanium Alloy Ti-6AL-4V		Inconel 718		Inconel 625		Cast Iron		Hardened Steel	
Cutting	350-650 SFM		350-650 SFM		200-350 SFM		200-350 SFM		100-200 SFM		150-250 SFM		350-750 SFM		200-350 SFM	
Depth of Cut	Aa = up to Max LOC, Ar= 0.3xD						Aa = up to Max LOC, Ar= 0.2xD		Aa = up to Max LOC, Ar= 0.1xD				Aa = up to Max LOC, Ar= 0.3xD		Aa = up to Max LOC, Ar= 0.15xD	
Mill Dia.	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM
Inch																
1/8	16,794	84.0	16,794	84.0	7,634	38.2	7,634	38.2	4,580	22.9	6,107	30.5	16,794	84.0	7,634	38.2
3/16	11,196	88.2	11,196	88.2	5,089	40.1	5,089	40.1	3,053	22.9	4,071	30.5	11,196	88.2	5,089	40.1
1/4	8,397	92.4	8,397	92.4	3,817	42.0	3,817	42.0	2,290	22.9	3,053	30.5	8,397	92.4	3,817	42.0
3/8	5,598	98.0	5,598	98.0	2,545	44.5	2,545	44.5	1,527	19.1	2,036	25.4	5,598	98.0	2,545	44.5
1/2	4,198	88.2	4,198	88.2	1,908	40.1	1,908	40.1	1,145	14.3	1,527	19.1	4,198	88.2	1,908	40.1
5/8	3,359	70.5	3,359	70.5	1,527	32.1	1,527	32.1	906	11.5	1,221	15.3	3,359	70.5	1,527	32.1
3/4	2,799	61.6	2,799	61.6	1,272	28.0	1,272	28.0	763	9.5	1,018	12.7	2,799	61.6	1,272	28.0
1	2,099	46.2	2,099	46.2	954	21.0	954	21.0	573	8.6	763	11.5	2,099	46.2	954	21.0

- The above milling condition is a guideline for L/D ratio 3.
- Use a rigid and precise machine and holder.
- The rotational speed is calculated by the median of the recommended cutting speed.
Adjustments may be necessary depending on the rigidity of the workpiece, fixture, and machine.
- Please use a suitable fluid with high smoke retardant properties.
- During dry (no fluid) milling, please use air blow to remove chips from the milling area and to eliminate chip packing.
- Please use water-soluble coolant when machining stainless steel and titanium alloy.
- Reduce speed and feed as well as depth of cut when high precision is required.

Speed & Feed Reduction Chart by L/D Ratio

Hardness	–		Up to 30 HRC		–		–		–		–		–		35 HRC	
Work Material	Mild Steels Carbon Steels Cast Iron		Tool Steel Alloy Steel		Stainless Steel 304		Titanium Alloy Ti-6AL-4V		Inconel 718		Inconel 625		Cast Iron		Hardened Steel	
L/D Ratio	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM
4	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%
5	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%
6	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
7	45%	45%	45%	45%	45%	45%	45%	45%	45%	45%	45%	45%	45%	45%	45%	45%
8	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%
9	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%
10	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%

Aa & Ar Adjustment Chart by L/D Ratio

Hardness	–		Up to 30 HRC		–		–		–		–		–		35 HRC	
Work Material	Mild Steels Carbon Steels Cast Iron		Tool Steel Alloy Steel		Stainless Steel 304		Titanium Alloy Ti-6AL-4V		Inconel 718		Inconel 625		Cast Iron		Hardened Steel	
L/D Ratio	Aa	Ar	Aa	Ar	Aa	Ar	Aa	Ar	Aa	Ar	Aa	Ar	Aa	Ar	Aa	Ar
4	1 x D		1 x D		1 x D		1 x D		1 x D		1 x D		1 x D		1 x D	
5	0.75 x D		0.75 x D		0.75 x D		0.75 x D		0.75 x D		0.75 x D		0.75 x D		0.75 x D	
6	0.6 x D		0.6 x D		0.6 x D		0.6 x D		0.6 x D		0.6 x D		0.6 x D		0.6 x D	
7	0.5 x D	0.3 x D	0.5 x D	0.3 x D	0.5 x D	0.3 x D	0.5 x D	0.2 x D	0.5 x D	0.1 x D	0.5 x D	0.1 x D	0.5 x D	0.3 x D	0.5 x D	0.15 x D
8	0.4 x D		0.4 x D		0.4 x D		0.4 x D		0.4 x D		0.4 x D		0.4 x D		0.4 x D	
9	0.2 x D		0.2 x D		0.2 x D		0.2 x D		0.2 x D		0.2 x D		0.2 x D		0.2 x D	
10	0.2 x D		0.2 x D		0.2 x D		0.2 x D		0.2 x D		0.2 x D		0.2 x D		0.2 x D	

List VGM6 - HY-PRO® CARB VGM

Side Milling

Hardness	–		Up to 30 HRC		–		–		–		–		–		35 HRC	
Work Material	Mild Steels Carbon Steels Cast Iron		Tool Steel Alloy Steel		Stainless Steel 304		Titanium Alloy Ti-6AL-4V		Inconel 718		Inconel 625		Cast Iron		Hardened Steel	
Cutting	350-550 SFM		350-550 SFM		150-350 SFM		150-350 SFM		100-200 SFM		150-250 SFM		350-650SFM		150-350 SFM	
Depth of Cut	Aa = up to Max LOC, Ar= 0.2xD				Aa = up to Max LOC, Ar= 0.15xD				Aa = up to Max LOC, Ar= 0.08xD				Aa = up to Max LOC, Ar= 0.2xD		Aa = up to Max LOC, Ar= 0.1xD	
Mill Dia.	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM
Inch																
1/4	6,870	90.7	6,870	90.7	3,817	50.4	3,817	50.4	2,290	27.5	3,053	36.6	7,634	100.8	3,817	50.4
5/16	5,496	98.9	5,496	98.9	3,053	55.0	3,053	55.0	1,832	22.0	2,443	29.3	6,107	109.9	3,053	55.0
3/8	4,580	96.2	4,580	96.2	2,545	53.4	2,545	53.4	1,527	22.9	2,036	30.5	5,089	106.9	2,545	53.4
1/2	3,435	86.6	3,435	86.6	1,908	48.1	1,908	48.1	1,145	17.2	1,527	22.9	3,817	96.2	1,908	48.1
5/8	2,748	69.3	2,748	69.3	1,527	38.5	1,527	38.5	916	13.7	1,221	18.3	3,053	76.9	1,527	38.5
3/4	2,290	60.5	2,290	60.5	1,272	33.6	1,272	33.6	763	11.5	1,018	15.3	2,545	67.2	1,272	33.6
1	1,718	45.3	1,718	45.3	954	25.2	954	25.2	573	10.3	763	13.7	1,908	50.4	954	25.2

1. The above milling condition is a guideline for L/D ratio 1.25 and 1.5.
2. Use a rigid and precise machine and holder.
3. The rotational speed is calculated by the median of the recommended cutting speed.
Adjustments may be necessary depending on the rigidity or the workpiece, fixture, and machine.
4. Please use a suitable fluid with high smoke retardant properties.
5. During dry (no fluid) milling, please use air blow to remove chips from the milling area and to eliminate chip packing.
6. Please use water-soluble coolant when machining stainless steel and titanium alloy.
7. Reduce speed and feed as well as depth of cut when high precision is required.

Speed & Feed Reduction Chart by L/D Ratio

Hardness	-		Up to 30 HRC		-		-		-		-		-		35 HRC	
Work Material	Mild Steels Carbon Steels Cast Iron		Tool Steel Alloy Steel		Stainless Steel 304		Titanium Alloy Ti-6AL-4V		Inconel 718		Inconel 625		Cast Iron		Hardened Steel	
L/D Ratio	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM
2	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
2.5	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
3	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%
4	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%
5	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
6	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%

Aa & Ar Adjustment Chart by L/D Ratio

Hardness	-		Up to 30 HRC		-		-		-		-		-		35 HRC	
Work Material	Mild Steels Carbon Steels Cast Iron		Tool Steel Alloy Steel		Stainless Steel 304		Titanium Alloy Ti-6AL-4V		Inconel 718		Inconel 625		Cast Iron		Hardened Steel	
L/D Ratio	Aa	Ar	Aa	Ar	Aa	Ar	Aa	Ar	Aa	Ar	Aa	Ar	Aa	Ar	Aa	Ar
2		0.15 x D		0.15 x D		0.1 x D		0.1 x D		0.05 x D		0.05 x D		0.15 x D		0.08 x D
2.5		0.15 x D		0.15 x D		0.1 x D		0.1 x D		0.05 x D		0.05 x D		0.15 x D		0.08 x D
3		0.1 x D		0.1 x D		0.08 x D		0.08 x D		0.03 x D		0.03 x D		0.1 x D		0.05 x D
4		0.08 x D		0.08 x D		0.05 x D		0.05 x D		0.02 x D		0.02 x D		0.08 x D		0.03 x D
5		0.08 x D		0.08 x D		0.05 x D		0.05 x D		0.02 x D		0.02 x D		0.08 x D		0.03 x D
6		0.05 x D		0.05 x D		0.03 x D		0.03 x D		0.01 x D		0.01 x D		0.05 x D		0.02 x D



List VGM7 - HY-PRO® CARB VGM

Side Milling

Hardness	–		Up to 30 HRC		–		–		–		–		–		35 HRC	
Work Material	Mild Steels Carbon Steels Cast Iron		Tool Steel Alloy Steel		Stainless Steel 304		Titanium Alloy Ti-6AL-4V		Inconel 718		Inconel 625		Cast Iron		Hardened Steel	
Cutting	350-500 SFM		350-500 SFM		150-350 SFM		150-350 SFM		100-200 SFM		150-250 SFM		350-600SFM		150-350 SFM	
Depth of Cut	Aa = up to Max LOC, Ar= 0.15xD				Aa = up to Max LOC, Ar= 0.1xD				Aa = up to Max LOC, Ar= 0.05xD				Aa = up to Max LOC, Ar= 0.15xD		Aa = up to Max LOC, Ar= 0.08xD	
Mill Dia.	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM
Inch																
1/4	6,870	105.8	6,870	105.8	3,817	58.8	3,817	58.8	2,290	37.4	3,053	42.7	7,634	117.6	3,817	58.8
5/16	5,496	115.4	5,496	115.4	3,053	64.1	3,053	64.1	1,832	29.9	2,443	34.2	6,107	128.2	3,053	64.1
3/8	4,580	112.2	4,580	112.2	2,545	62.3	2,545	62.3	1,527	31.2	2,036	35.6	5,089	124.7	2,545	62.3
1/2	3,435	101.0	3,435	101.0	1,908	56.1	1,908	56.1	1,145	23.4	1,527	26.7	3,817	112.2	1,908	56.1
5/8	2,748	80.8	2,748	80.8	1,527	44.9	1,527	44.9	916	18.7	1,221	21.4	3,053	89.8	1,527	44.9
3/4	2,290	70.5	2,290	70.5	1,272	39.2	1,272	39.2	763	15.6	1,018	17.8	2,545	78.4	1,272	39.2
1	1,718	52.9	1,718	52.9	954	29.4	954	29.4	573	14.0	763	16.0	1,908	58.8	954	29.4

- The above milling condition is a guideline for L/D ratio 1.25 and 1.5.
- Use a rigid and precise machine and holder.
- The rotational speed is calculated by the median of the recommended cutting speed.
Adjustments may be necessary depending on the rigidity or the workpiece, fixture, and machine.
- Please use a suitable fluid with high smoke retardant properties.
- During dry (no fluid) milling, please use air blow to remove chips from the milling area and to eliminate chip packing.
- Please use water-soluble coolant when machining stainless steel and titanium alloy.
- Reduce speed and feed as well as depth of cut when high precision is required.

Speed & Feed Reduction Chart by L/D Ratio

Hardness	-		Up to 30 HRC		-		-		-		-		-		35 HRC	
Work Material	Mild Steels Carbon Steels Cast Iron		Tool Steel Alloy Steel		Stainless Steel 304		Titanium Alloy Ti-6AL-4V		Inconel 718		Inconel 625		Cast Iron		Hardened Steel	
L/D Ratio	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM	Speed RPM	Feed IPM
2	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
2.5	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
3	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%
4	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%
5	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
6	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%

Aa & Ar Adjustment Chart by L/D Ratio

Hardness	-		Up to 30 HRC		-		-		-		-		-		35 HRC	
Work Material	Mild Steels Carbon Steels Cast Iron		Tool Steel Alloy Steel		Stainless Steel 304		Titanium Alloy Ti-6AL-4V		Inconel 718		Inconel 625		Cast Iron		Hardened Steel	
L/D Ratio	Aa	Ar	Aa	Ar	Aa	Ar	Aa	Ar	Aa	Ar	Aa	Ar	Aa	Ar	Aa	Ar
2		0.1 x D		0.1 x D		0.08 x D		0.08 x D		0.03 x D		0.03 x D		0.1 x D		0.05 x D
2.5		0.1 x D		0.1 x D		0.08 x D		0.08 x D		0.03 x D		0.03 x D		0.1 x D		0.05 x D
3	Up to Max. LOC	0.07x D	Up to Max. LOC	0.07x D	Up to Max. LOC	0.05x D	Up to Max. LOC	0.05x D	Up to Max. LOC	0.02 x D	Up to Max. LOC	0.02 x D	Up to Max. LOC	0.07x D	Up to Max. LOC	0.03x D
4		0.05x D		0.05x D		0.03x D		0.03x D		0.02 x D		0.02 x D		0.05x D		0.02x D
5		0.05x D		0.05x D		0.03x D		0.03x D		0.02 x D		0.02 x D		0.05x D		0.02x D
6		0.03 x D		0.03 x D		0.02x D		0.02x D		0.01x D		0.01x D		0.03 x D		0.01x D



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 Safe use of cutting tools

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

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OSG USA, Inc. : 800-837-2223

OSG Canada, Ltd. : 905-632-8032 • OSG Royco (Mexico) : (52) 477 478-02-00

