



# Groove Milling

High Precision Tools for Groove Milling



METRIC

# Groove Milling

## High Precision Tools for Groove Milling



See it in action

### GM Solid

Solid Carbide Groove Milling tools for miniature and small bore diameters

Ø3.0 - 10.00 mm

- Min. bore diameter 6mm
- 4 flutes
- Width of groove 0.7-2.0 mm
- Depth of groove max 1.5mm



### Mini-V

Indexable tool with 1 cutting corner for milling applications with miniature and small bore diameters

Ø8.0 - 16 mm

Available in a variety of grooving profiles:

- Square Grooving
- Round Grooving
- DIN 472/471



### GM Slot

Groove Milling tool with 3 corner indexable inserts for internal and external grooving, threading and chamfering applications

- Min. bore diameter 12.7mm
- 3 flutes
- Width of groove 0.74 - 5.25mm
- Depth of groove max 3.25mm



### SGM

Shallow Groove Milling for shallow groove milling applications

- Min. bore diameter 48mm
- Long overhang
- Width of groove 1.25-4.0mm
- Depth of groove max 3.5mm



# GROOVE MILLING CATALOG

## GM SOLID

■ GM Solid Ordering Code System .....	Page 4
■ GM Solid - Square Grooving .....	Page 5
■ GM Solid - Chamfering .....	Page 5
■ GM Solid Groove Milling Technical Data .....	Page 6

## MINI-V

■ Mini-V Ordering Code System .....	Page 7
■ Grooving .....	Page 8
■ Grooving DIN 472 .....	Page 8
■ Grooving with R .....	Page 9
■ Grooving DIN 7993 .....	Page 9
■ Toolholder - Carbide Shank with Alloy Steel Head .....	Page 10
■ Toolholder - Alloy Steel Shank .....	Page 10
■ Mini-V Groove Milling Technical Data .....	Page 11

## GM SLOT

■ GM Slot Ordering Code System .....	Page 12
■ GM Slot - Square Grooving .....	Page 13
■ GM Slot - Round Grooving .....	Page 14
■ GM Slot - Chamfering .....	Page 14
■ GM Slot Holder - Carbide Cylindrical Shank for Groove Milling Application .....	Page 15
■ GM Slot Holder - Weldon Shank for Groove Milling Application .....	Page 16
■ GM Slot Groove Milling Technical Data .....	Page 17

## SGM

■ SGM Ordering Code System .....	Page 18
■ Circlip Non Standard .....	Page 19
■ Circlip DIN 471/472 .....	Page 20
■ O Ring DIN 3770 .....	Page 20
■ O Ring BS 1806, DIN 3601, DIN 3771 .....	Page 21
■ O Ring BS 4518 .....	Page 21
■ SGM Toolholders - Multi Insert Holders .....	Page 22
■ SGM Groove Milling Technical Data .....	Page 23

# GM Solid



## For Miniature and Small Bore Diameters

### GM Solid Ordering Code System

#### Square Grooving

<b>G</b>	<b>S</b>	<b>4</b>	<b>C</b>	<b>070</b>	<b>6</b>	<b>8</b>	<b>L15</b>	<b>R00</b>	<b>VTH</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>

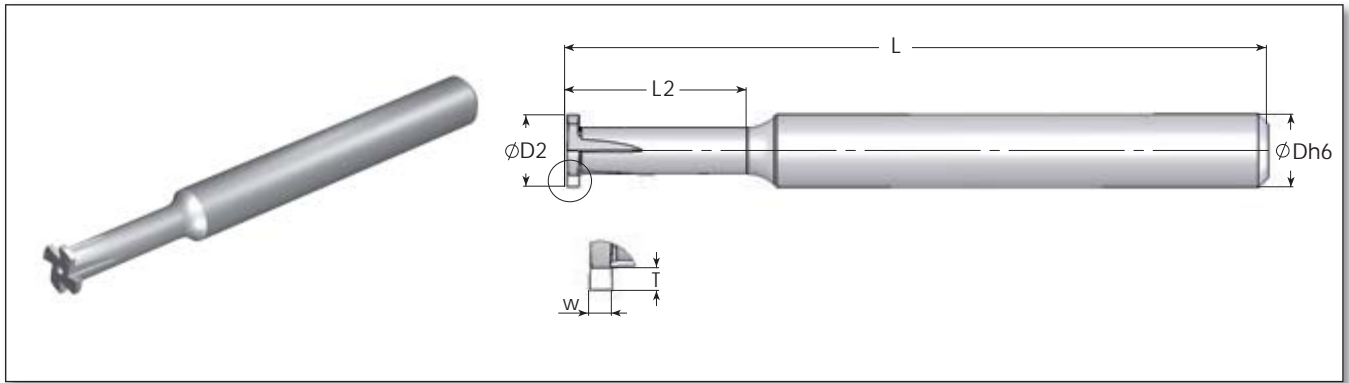
<b>1 - Product Line</b> G - Grooving	<b>2 - Type</b> Solid	<b>3 - Number of Flutes</b> 4 - Four flutes 6 - Six flutes	<b>4 - Cooling</b> C - Cooling None - Without Cooling	<b>5 - Groove Width (mm)</b> 070 - 0.7 mm 080 - 0.8 mm 090 - 0.9 mm 100 - 1.0 mm 150 - 1.5 mm 200 - 2.0 mm	<b>6 - Shank Diameter (mm)</b> 06 - 6 mm 08 - 8 mm 10 - 10 mm
<b>7 - Groove Depth</b> 08 - 0.8 mm 12 - 1.2 mm 15 - 1.5 mm	<b>8 - VV</b> L15 - 15 mm L25 - 25 mm L35 - 35 mm	<b>9 - Radius Groove Width Length</b> R00 - None	<b>10 - Carbide Grade Width Length</b> VTH		

#### Chamfering

<b>G</b>	<b>M</b>	<b>4</b>	<b>CH</b>	<b>90</b>	<b>060</b>	<b>06</b>	<b>L15</b>	<b>VTH</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>

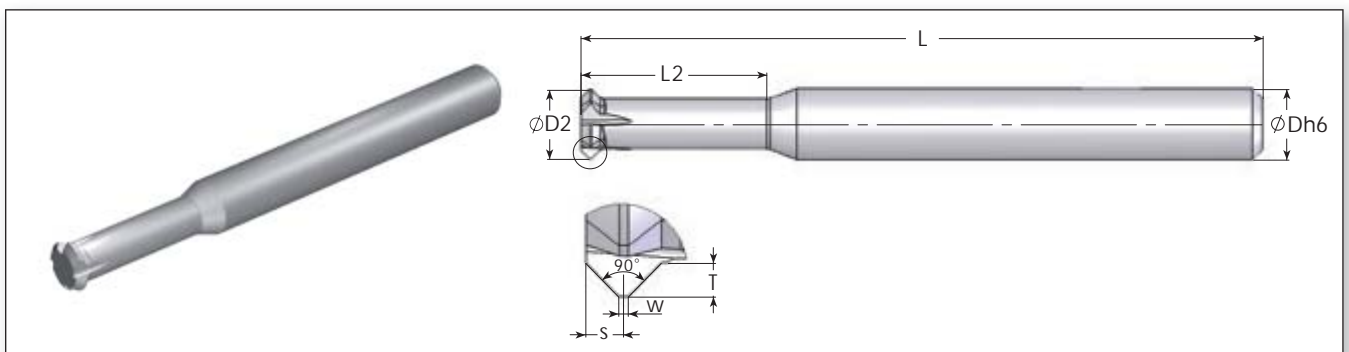
<b>1 - Product Line</b> G - Grooving	<b>2 - Type</b> Milling	<b>3 - Number of Flutes</b> 4 - Four flutes	<b>4 - Profile</b> CH - Chamfering	<b>5 - Angle of Chamfering</b> 90	<b>6 - Shank Diameter</b> 030 - 3mm 040 - 4mm 050 - 5mm 060 - 6mm 080 - 8mm
<b>7 - Max. Chamfer Size</b> 06 - 0.6 mm 12 - 1.2 mm	<b>8 - Tool Cutting Length</b> L15 - 15 mm L25 - 25 mm L35 - 35 mm	<b>9 - Carbide Grade</b> VTH			

## GM Solid - Square Grooving



Width of Groove W +/-0.02mm	Depth of Cut T max mm	Ordering Code	Dimensions mm				
			D2	Dh6	L	L2	No. of Flutes
0.7	0.8	GS4C 0700608-L15R00 VTH	5.9	6	58	15	4
0.8		GS4C 0800608-L15R00 VTH					
0.9		GS4C 0900608-L15R00 VTH					
1.0		GS4C 1000608-L15R00 VTH					
1.5		GS4C 1500608-L15R00 VTH					
0.7	1.2	GS4C 0700812-L25R00 VTH	7.9	8	68	25	4
0.8		GS4C 0800812-L25R00 VTH					
0.9		GS4C 0900812-L25R00 VTH					
1.0		GS4C 1000812-L25R00 VTH					
1.5		GS4C 1500812-L25R00 VTH					
2.0		GS4C 2000812-L25R00 VTH					
0.7	1.5	GS6C 0701015-L35R00 VTH	9.9	10	78	35	6
0.8		GS6C 0801015-L35R00 VTH					
0.9		GS6C 0901015-L35R00 VTH					
1.0		GS6C 1001015-L35R00 VTH					
1.5		GS6C 1501015-L35R00 VTH					
2.0	GS6C 2001015-L35R00 VTH						

## GM Solid - Chamfering




Depth of Cut T max mm	Ordering Code	Dimensions mm						
		D2	S	L	L2	W	No. of Flutes	Dh6
0.6	GM3CH90 03006-L12 VTH	2.9	0.7	39	12	0.2	3	3
0.8	GM3CH90 04008-L10 VTH	3.9	0.9	51	10			4
1.1	GM4CH90 05011-L12 VTH	4.95	1.2	51	12.5			5
0.6	GM4CH90 06006-L15 VTH	5.9	0.8	58	15	4	6	
	GM4CH90 06006-L25 VTH			68	25			
1.2	GM4CH90 08012-L25 VTH	7.9	1.4	68	25	8		
	GM4CH90 08012-L35 VTH			78	35			

# GM Solid Groove Milling Technical Data

Recommended Grades, Cutting Speeds Vc [m/min], Feed f [mm/tooth]

Material Group	Vargus No.	Material	Hardness Brinell HB	Vc [m/min]	Peripheral Feed	
				VTH	f [mm/tooth]	
<b>P</b> Steel	1	Unalloyed Steel	Low Carbon (C=0.1-0.25 %)	125	100-210	0.07-0.2
	2		Medium Carbon (C=0.25-0.55 %)	150	100-180	0.07-0.2
	3		High Carbon (C=0.55-0.85 %)	170	100-170	0.07-0.2
	4	Low Alloy Steel (alloying elements ≤5%)	Non Hardened	180	60-90	0.07-0.2
	5		Hardened	275	80-150	0.07-0.2
	6		Hardened	350	70-140	0.07-0.2
	7	High Alloy Steel (alloying elements >5%)	Annealed	200	60-130	0.07-0.2
	8		Hardened	325	70-110	0.07-0.2
	9	Cast Steel	Low Alloy (alloying elements <5%)	200	100-170	0.07-0.2
	10		High Alloy (alloying elements >5%)	225	70-120	0.07-0.2
<b>M</b> Stainless Steel	11	Stainless Steel Ferritic	Non Hardened	200	100-170	0.07-0.2
	12		Hardened	330	100-170	0.05-0.15
	13	Stainless Steel Austenitic	Austenitic	180	70-140	0.07-0.2
	14		Super Austenitic	200	70-140	0.07-0.2
	15	Stainless Steel Cast Ferritic	Non Hardened	200	70-140	0.1-0.2
	16		Hardened	330	70-140	0.07-0.2
	17	Stainless Steel Cast Austenitic	Austenitic	200	70-120	0.07-0.2
	18		Hardened	330	70-120	0.07-0.2
<b>K</b> Cast Iron	28	Malleable Cast Iron	Ferritic (short chips)	130	60-130	0.1-0.22
	29		Pearlitic (long chips)	230	60-120	0.07-0.2
	30	Grey Cast Iron	Low Tensile Strength	180	60-130	0.07-0.2
	31		High Tensile Strength	260	60-100	0.07-0.2
	32	Nodular Sg Iron	Ferritic	160	60-125	0.07-0.2
	33		Pearlitic	260	50-90	0.07-0.2
<b>N(K)</b> Non-Ferrous Metals	34	Aluminium Alloys Wrought	Non Aging	60	100-250	0.1-0.25
	35		Aged	100	100-180	0.1-0.25
	36	Aluminium Alloys	Cast	75	150-400	0.1-0.25
	37		Cast & Aged	90	150-280	0.1-0.25
	38		Cast Si 13-22%	130	80-150	0.1-0.25
	39	Copper and Copper Alloys	Brass	90	120-210	0.1-0.25
	40		Bronze and Non Leaded Copper	100	120-210	0.07-0.22
<b>S(M)</b> Heat Resistant Material	23	Titanium Alloys	Pure 99.5 Ti	400Rm	70-140	0.07-0.13
	24		α+β Alloys	1050Rm	20-50	0.07-0.13

## Grades and Their Application

Grade	Application Type	Sample
VTH	A general-purpose, heavy duty groove milling grade TiCN coated for high wear resistance	

# Mini-V



## For Miniature and Small Bore Diameters

### Mini-V Ordering Code System

#### Grooving Inserts

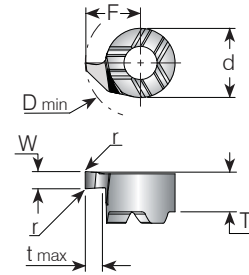
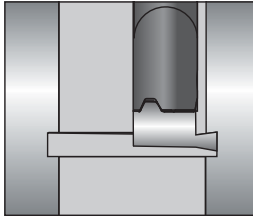
V	08	GS	W120	T 100	R	VBX
1	2	3	4	5	6	7
<b>1 - Product Line</b>	<b>2 - Insert Style</b>	<b>3 - Type of Application</b>	<b>4 - Groove Width</b>	<b>5 - Groove Depth</b>	<b>6 - RH or LH</b>	<b>7 - Carbide Grade</b>
V - Mini-V	08, 11, 14, 16	GS - Square Grooving D472 - DIN 472 Grooving Square Partial GSR - Grooving Square with R D7993 - D7993 Grooving Round Partial	W070 - 0.7 mm W080 - 0.8 mm W090 - 0.9 mm W100 - 1.0 mm W110 - 1.1 mm W120 - 1.2 mm W130 - 1.3 mm W150 - 1.5 mm W160 - 1.6 mm W180 - 1.8 mm W200 - 2.0 mm W250 - 2.5mm W300 - 3.0mm W350 - 3.5mm W400 - 4.0mm W430 - 4.3mm	T 100 - 1.0 mm T230 - 2.3 mm T400 - 4.0mm T430 - 4.3mm	R - RH L - LH	VBX VTX

#### Toolholders

C	V	08	-	12	21	
1	2	3		4	5	6
<b>1 - Holder Type</b>	<b>2 - Product Line</b>	<b>3 - Insert Style</b>	<b>4 - Shank Diameter</b>	<b>5 - Tool Overhang</b>	<b>6 - RH or LH</b>	
C - Carbide Shank None - Steel Shank	V - Mini-V	08, 11, 14, 16	6, 8, 12, 16	12, 21, 29, 30, 42, 50, 56, 64	None - RH L - LH	

# Mini-V Grooving

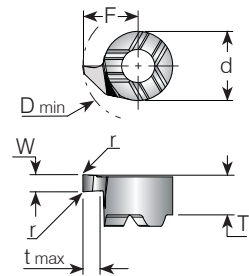
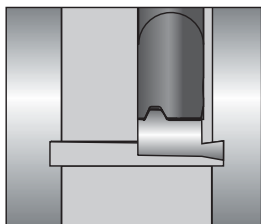
## Internal



Insert Style	Ordering Code	Dimensions (mm)					Min. Bore dia.			Toolholder
	RH	d	W	t max	r	T	F	D min		
V08	V08GS W100T100 R...	6	1	1	0.05	3.6	4.80	10	.V08-...	
	V08GS W150T100 R...		1.5							
	V08GS W200T100 R...		2							
V11	V11GS W100T230 R...	8	1	2.3	0.05	3.95	6.70	13.8	.V11-...	
	V11GS W120T230 R...		1.2							
	V11GS W150T230 R...		1.5							
	V11GS W200T230 R...		2							
V14	V14GS W250T230 R...	9	2.5	3.3	0.05	5.6	9	18.4	.V14-...	
	V14GS W150T400 R...		1.5							
	V14GS W200T400 R...		2							
	V14GS W250T400 R...		2.5							
V16	V16GS W300T400 R...	11	3	4.3	0.05	5.6	10.2	20.8	.V16-...	
	V16GS W200T430 R...		2							
	V16GS W300T430 R...		3							
	V16GS W350T430 R...		3.5							
	V16GS W400T430 R...		4							

# Mini-V Grooving DIN 472

## Internal

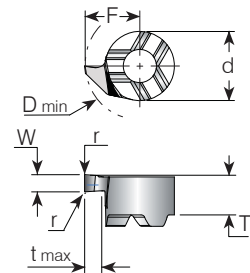
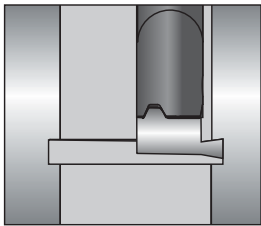


Insert Style	Ordering Code	Width of Circlip (mm)		Dimensions (mm)				Min. Bore dia.			Toolholder
	RH	m	W	d	t max	T	F	D min			
V08	V08D472 W070T100 R...	0.7	0.73	6	1	3.6	4.80	10	.V08-...		
	V08D472 W080T100 R...	0.8	0.83								
	V08D472 W090T100 R...	0.9	0.93								
	V08D472 W110T100 R...	1.1	1.2								
	V08D472 W130T100 R...	1.3	1.4								
	V08D472 W160T100 R...	1.6	1.7								
V11	V11D472 W070T100 R...	0.7	0.73	8	1.2	3.95	6.70	13.8	.V11-...		
	V11D472 W080T100 R...	0.8	0.83		1.3						
	V11D472 W090T100 R...	0.9	0.93		1.5						
	V11D472 W110T230 R...	1.1	1.2		2.3						
	V11D472 W130T230 R...	1.3	1.4		2.3						
	V11D472 W160T230 R...	1.6	1.7		2.3						
V14	V14D472 W130T400 R...	1.4	1.3	9	4	5.6	9	18.4	.V14-...		
	V14D472 W160T400 R...	1.7	1.6								



## Grooving with R

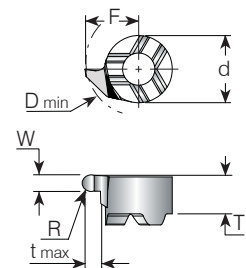
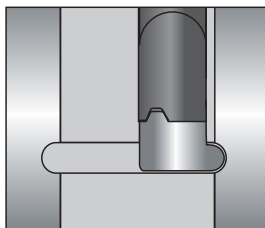
### Internal



Insert Style	Ordering Code	Dimensions (mm)							Min. Bore dia.	Toolholder
RH		d	W	t max	T	F	r	D min	Toolholder	
V08	V08GSR W150T100 R...	6	1.5	1	3.6	4.80	0.2	10	.V08-...	
V11	V11GSR W200T230 R...	8	2	2.3	3.95	6.70	0.2	13.8	.V11-...	

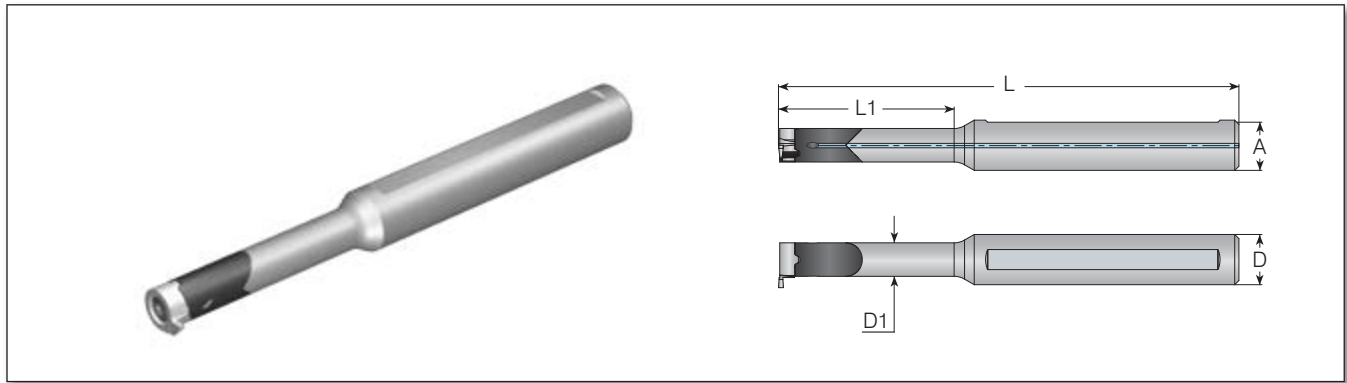
## Grooving DIN 7993 - Round Partial

### Internal



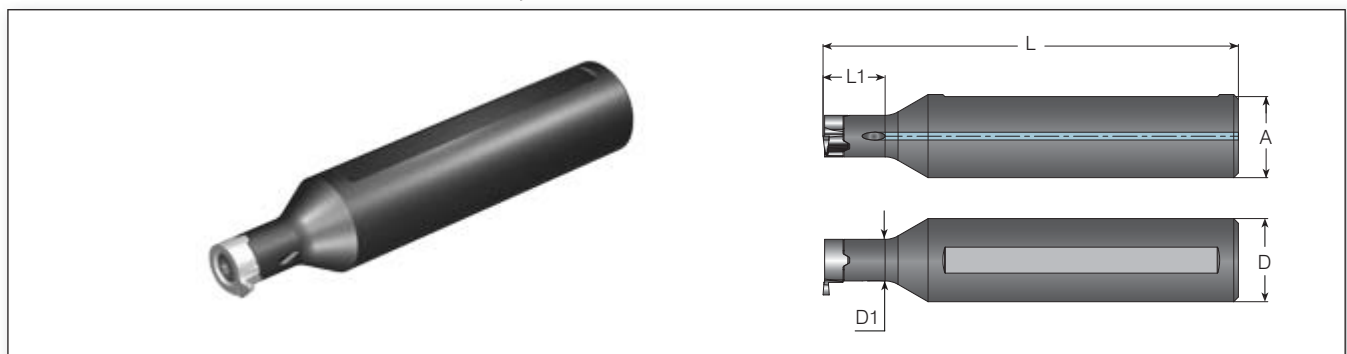
Insert Style	Ordering Code	Dimensions (mm)							Min. Bore dia.	Toolholder
RH		d	W	t max	T	F	R	D min	Toolholder	
V08	V08D7993 W120T100 R...	6	1.2	1	3.6	4.80	0.6	10	.V08-...	
	V08D7993 W180T100 R...		1.8				0.9			
V11	V11D7993 W120T230 R...	8	1.2	2.3	3.95	6.70	0.6	13.8	.V11-...	
	V11D7993 W180T230 R...		1.8				0.9			
	V11D7993 W200T230 R...		2				1.0			
V14	V14D7993 W120T400 R...	9	1.2	4	5.6	9	0.6	18.4	.V14-...	
	V14D7993 W180T400 R...		1.8				0.9			
	V14D7993 W200T400 R...		2				1.0			
	V14D7993 W220T400 R...		2.2				1.1			

## Mini-V Toolholders - Carbide Shank with Alloy Steel Head



Insert Style	Ordering Code		Dimensions mm					Spare Parts		
	Sleeve	Holder RH	A	L	L1	D	D1	Screw	Size	Key
V08	-	CV08-1221	11.5	80.5	21	12	6	SNV08	M2.6x0.45x8	K2T
	-	CV08-1230	11.5	90.5	30	12	6			
	-	CV08-1242	11.5	100.5	42	12	6			
	-	CV08-1250	11.5	115	50	12	6			
V11	-	CV11-1229	11.5	95	29	12	8	SNV11	M3.5x0.6x10	K3T
	-	CV11-1242	11.5	110	42	12	8			
	-	CV11-1256	11.5	120	56	12	8			
	-	CV11-1264	11.5	130	64	12	8			
V16	-	CV16-1240	11.0	130	40	12	11	SNV16	M5x0.8x12	K4T
	-	CV16-1256	11	130	56	12	11			
	-	CV16-1280	11	150	80	12	11			

## Mini-V Toolholders - Alloy Steel Shank





Insert Style	Ordering Code		Dimensions mm					Spare Parts		
	Sleeve	Holder RH	A	L	L1	D	D1	Screw	Size	Key
V08	-	V08-1612	15.6	80	12	16	6	SNV08	M2.6x0.45x8	K2T
V11	-	V11-1612	15.6	80	12	16	8	SNV11	M3.5x0.6x10	K3T
V14	-	V14-1620	15.0	100	20	16	11	SNV14	M4x0.7x12	KT15
V16	-	V16-1622	15.0	100	22	16	11	SNV16	M5.0x0.8x12	K4T

# Mini-V Groove Milling Technical Data

## Recommended Grades, Cutting Speeds Vc [m/min], Feed f [mm/tooth]

Material Group	Vargus No.	Material	Hardness Brinell HB	Vc [m/min]	Peripheral Feed	
				VBX/VTX	f [mm/tooth]	
<b>P</b> Steel	1	Unalloyed Steel	Low Carbon (C=0.1-0.25 %)	125	100-210	0.07-0.2
	2		Medium Carbon (C=0.25-0.55 %)	150	100-180	0.07-0.2
	3		High Carbon (C=0.55-0.85 %)	170	100-170	0.07-0.2
	4	Low Alloy Steel (alloying elements ≤5%)	Non Hardened	180	60-90	0.07-0.2
	5		Hardened	275	80-150	0.07-0.2
	6		Hardened	350	70-140	0.07-0.2
	7	High Alloy Steel (alloying elements >5%)	Annealed	200	60-130	0.07-0.2
	8		Hardened	325	70-110	0.07-0.2
	9	Cast Steel	Low Alloy (alloying elements <5%)	200	100-170	0.07-0.2
	10		High Alloy (alloying elements >5%)	225	70-120	0.07-0.2
<b>M</b> Stainless Steel	11	Stainless Steel Ferritic	Non Hardened	200	100-170	0.07-0.2
	12		Hardened	330	100-170	0.05-0.15
	13	Stainless Steel Austenitic	Austenitic	180	70-140	0.07-0.2
	14		Super Austenitic	200	70-140	0.07-0.2
	15	Stainless Steel Cast Ferritic	Non Hardened	200	70-140	0.1-0.2
	16		Hardened	330	70-140	0.07-0.2
	17	Stainless Steel Cast Austenitic	Austenitic	200	70-120	0.07-0.2
	18		Hardened	330	70-120	0.07-0.2
<b>K</b> Cast Iron	28	Malleable Cast Iron	Ferritic (short chips)	130	60-130	0.1-0.22
	29		Pearlitic (long chips)	230	60-120	0.07-0.2
	30	Grey Cast Iron	Low Tensile Strength	180	60-130	0.07-0.2
	31		High Tensile Strength	260	60-100	0.07-0.2
	32	Nodular Sg Iron	Ferritic	160	60-125	0.07-0.2
	33		Pearlitic	260	50-90	0.07-0.2
<b>N(K)</b> Non-Ferrous Metals	34	Aluminium Alloys Wrought	Non Aging	60	100-250	0.1-0.25
	35		Aged	100	100-180	0.1-0.25
	36	Aluminium Alloys	Cast	75	150-400	0.1-0.25
	37		Cast & Aged	90	150-280	0.1-0.25
	38	Aluminium Alloys	Cast Si 13-22%	130	80-150	0.1-0.25
	39	Copper and Copper Alloys	Brass	90	120-210	0.1-0.25
	40		Bronze and Non Leaded Copper	100	120-210	0.07-0.22
	<b>S(M)</b> Heat Resistant Material	23	Titanium Alloys	Pure 99.5 Ti	400Rm	70-140
24		A+Ss Alloys		1050Rm	20-50	0.07-0.13

### Grades and Their Application

Grade	Application Type	Sample
<b>VBX</b>	General use carbide grade for Mini-V inserts. TiCN coated.	
<b>VTX</b>	TiAlN coated carbide grade. Ideal for Stainless Steel and high cutting speeds.	

# GM Slot



## For Small and Medium Bore Diameters

### GM Slot Ordering Code System

#### Inserts Ordering Code System

<b>7</b> 1	<b>V</b> 2	<b>GS</b> 3	<b>1.21</b> 4	-	<b>1.50</b> 5	<b>GM</b> 6	<b>3</b> 7	<b>VBX</b> 8
<b>1-Insert Size</b> 7 - I.C. 6.8 mm 9 - I.C. 8.5 mm 11 - I.C. 10.7 mm	<b>2-Insert Style</b> V - Style	<b>3-Type of Application</b> GS - Square Grooving GSR - Square Grooving with R GR - Round Grooving CH - Chamfering			<b>4-Groove Standard Width (mm)</b> 0.74 - 5.15		<b>5-Groove Depth (mm)</b> 1.5 2.5 3.25	
<b>6 - System</b> GM - Groove Milling	<b>7 - Cutting Edge Number</b> 3	<b>8 - Carbide Grade</b> VBX						

#### HOLDERS Ordering Code System

<b>C</b> 1	<b>GM</b> 2	<b>9</b> 3	<b>C</b> 4	<b>13</b> 5	-	<b>45</b> 6	-	<b>7</b> 7	-	<b>3</b> 8
<b>1 - Holder Type</b> C - Carbide Shank None - Steel Shank	<b>2 - System</b> GM - Groove Milling	<b>3 - Shank Dia. (mm)</b> 9 - 25.4		<b>4 - Shank Style</b> C - Cylindrical W - Weldon		<b>5 - Max Cutting Dia. (mm)</b> 13 - 22				
<b>6 - Tool Overhang (mm)</b> 25 45	<b>7 - Insert Size</b> 7 - I.C. 6.8 mm 9 - I.C. 8.5mm 11 - I.C. 10.7mm		<b>8 - Number of Flutes</b> 3							

## GM Slot - Square Grooving



### Square Grooving

Insert Size	Groove Dimensions			Ordering Code	Dimensions mm			Toolholder
	Width of Circlip (mm)	W +0.03	t1 max		r	Ds	T	
7V	0.70	0.74	1.5	0.1	7VGS0.74-1.50GM3 ...	12.7	3.15	-
	0.80	0.84			7VGS0.84-1.50GM3 ...			
	0.90	0.94			7VGS0.94-1.50GM3 ...			
	1.10	1.21			7VGS1.21-1.50GM3 ...			
	1.30	1.41			7VGSR1.41-1.50GM3 ...			
	-	1.50			7VGSR1.50-1.50GM3 ...			
	-	1.57			7VGSR1.57-1.50GM3 ...			
	1.60	1.71			7VGSR1.71-1.50GM3 ...			
	-	2.00			7VGSR2.00-1.50GM3 ...			
	-	2.39			7VGSR2.39-1.50GM3 ...			
9V	-	2.50	2.5	0.2	7VGSR2.50-1.50GM3 ...	16.7	4.45	-
	1.10	1.17			9VGS1.17-2.50GM3 ...			
	1.30	1.41			9VGS1.41-2.50GM3 ...			
	-	1.50			9VGSR1.50-2.50GM3 ...			
	1.50	1.57			9VGSR1.57-2.50GM3 ...			
	1.60	1.71			9VGSR1.71-2.50GM3 ...			
	-	2.00			9VGSR2.00-2.50GM3 ...			
	2.3	2.39			9VGSR2.39-2.50GM3 ...			
	-	2.50			9VGSR2.50-2.50GM3 ...			
	-	3.00			9VGSR3.00-2.50GM3 ...			
11V	-	3.18	3.25	0.2	9VGSR3.18-2.50GM3 ...	21.7	5.75	-
	1.10	1.17			11VGS1.17-3.25GM3 ...			
	-	1.3			11VGS1.30-3.25GM3 ...			
	1.30	1.42			11VGS1.42-3.25GM3 ...			
	-	1.50			11VGSR1.50-3.25GM3 ...			
	1.45	1.55			11VGSR1.55-3.25GM3 ...			
	-	1.57			11VGSR1.57-3.25GM3 ...			
	1.60	1.71			11VGSR1.71-3.25GM3 ...			
	-	2.00			11VGSR2.00-3.25GM3 ...			
	2.30	2.39			11VGSR2.39-3.25GM3 ...			
	-	2.50			11VGSR2.50-3.25GM3 ...			
	-	3.00			11VGSR3.00-3.25GM3 ...			
	3.10	3.18			11VGSR3.18-3.25GM3 ...			
	-	4.00			11VGSR4.00-3.25GM3 ...			
-	4.75	11VGSR4.75-3.25GM3 ...						
5.15	5.26	11VGSR5.26-3.25GM3 ...						

## GM Slot - Round Grooving



### Round Grooving

Insert Size	Groove Dimensions			Ordering Code	Dimensions mm			Toolholder
	W +0.03	t1 max	r		RH	Ds	T	
7V	2.2	1.50	1.1	7VGR1.10-1.50GM3 ...	12.7	3.15	-	CGMC 8C13-40-7-3 CCGMC 9C13-45-7-3 GMC 20W13-25-7-3
9V	2.50	2.5	1.25	9VGR1.10-2.50GM3 ...	16.7	4.45	-	CGMC 7/16C17-45-9-3 CGMC 11.5C17-50-9-3 GMC 20W17-35-9-3
11V	2.00		1.0	11VGR1.00-3.25GM3 ...	22.7	5.75	-	CGMC 14C22-60-11-3 CGMC 15C22-65-11-3 GMC 25W22-45-11-3
	2.20	3.25	1.1	11VGR1.10-3.25GM3 ...				
	3.00		1.5	11VGR1.50-3.25GM3 ...				

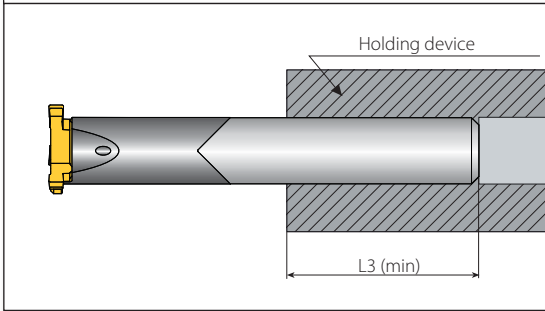
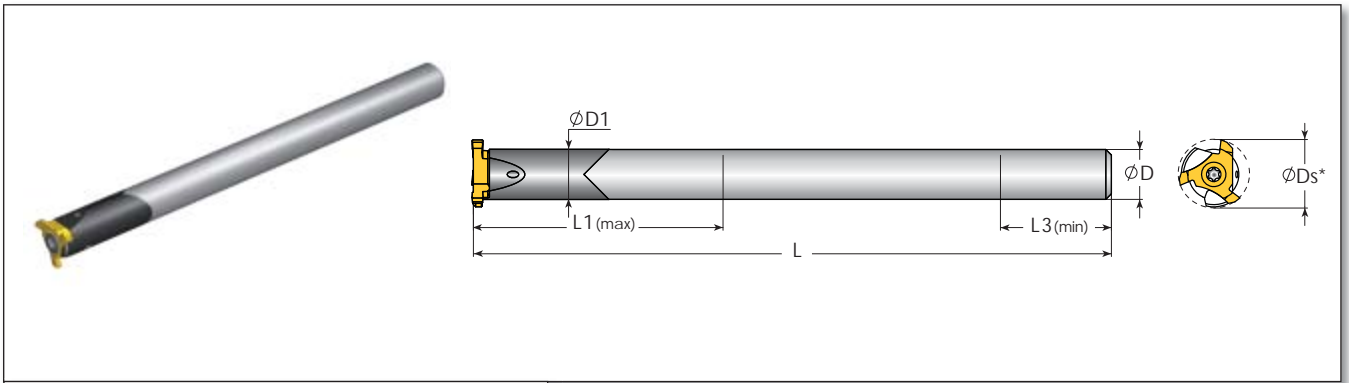
## GM Slot - Chamfering



### Chamfering

Insert Size	Groove Dimensions			Ordering Code	Dimensions mm			Toolholder
	W +0.03	t1 max	r		RH	Ds	T	
7V	1.2	1.50	-	7VCH1.20-1.50GM3 ...	12.7	3.15	1.6	CGMC 8C13-40-7-3 CCGMC 9C13-45-7-3 GMC 20W13-25-7-3
9V	1.4	2.50	-	9VCH1.40-2.50GM3 ...	16.7	4.45	2.25	CGMC 7/16C17-45-9-3 CGMC 11.5C17-50-9-3 GMC 20W17-35-9-3
11V	1.6	3.25	-	11VCH1.60-3.25GM3 ...	22.7	5.75	2.9	CGMC 14C22-60-11-3 CGMC 15C22-65-11-3 GMC 25W22-45-11-3

# GM Slot Toolholders - Carbide Cylindrical Shank for Groove Milling Application

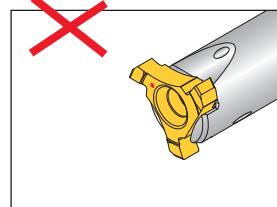
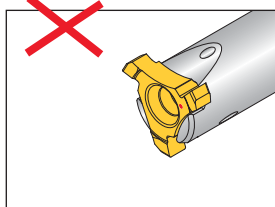
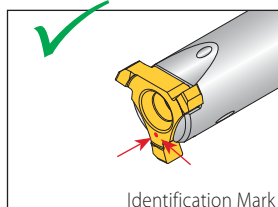
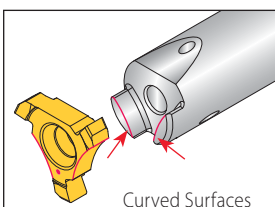


## Spare Parts

Insert Size	Ordering Code	Dimensions mm					Spare Parts				
		L	L1	L3 (min)	D	D1	Screw	Size	Key/Blade	Handle	Size
7V	CGMC 9C13-45-7-3	115	45	20	9	9	SN2T8-M1	M3.0x0.5x9	K2T	-	Torx T8
	8										
	8										
9V	CGMC 11.5C17-50-9-3	125	50	25	11.5	11.5	SN3T15-M2	M4x0.7x13.5	Blade T15-1/4	Smart Handle 1/4X2	Torx T15
	12										
	11										
11V	CGMC 15C22-65-11-3	135	65	32	15	15	SN4T20-M3	M5x0.8x15.5	Blade T20-1/4	Smart Handle 1/4X2	Torx T20
	14										
	16										

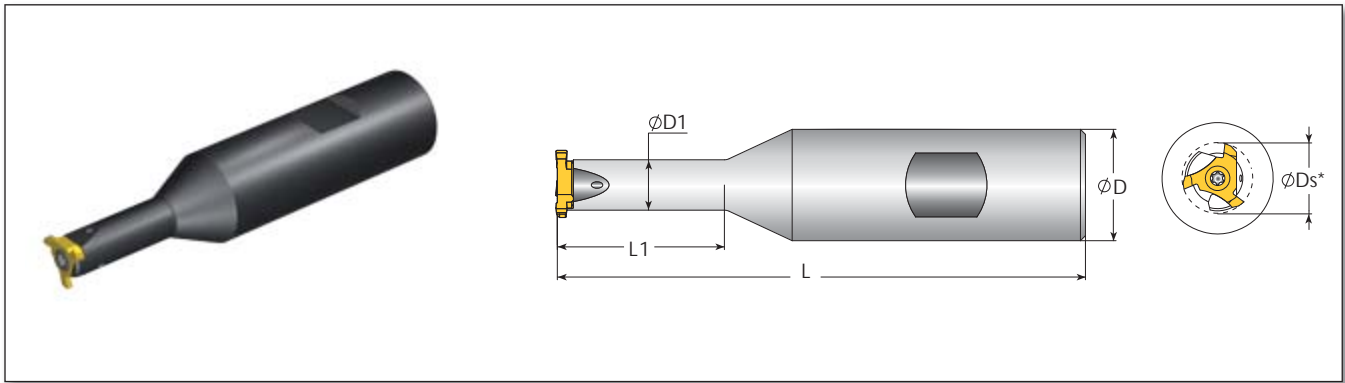
\*For Ds dimensions, see pages 13-14

For Correct Clamping:



Always mount insert with the identification mark between the two curved surfaces on the toolholder

## GM Slot Toolholders - Weldon Shank for Groove Milling Application



Insert Size	Ordering Code	Dimensions mm					Spare Parts				
		L	L1	L3 (min)	D	D1	Screw	Size	Key/Blade	Handle	Size
7V	GMC 20W13-25-7-3	95	25	-	20	9	SN2T8-M1	M3.0x0.5x9	K2T	-	Torx T8
	GMC 075W050-100-7-3	95.3	25.4	-	19	9					
9V	GMC 20W17-30-9-3	100	30	-	20	11.5	SN3T15-M2	M4x0.7x13.5	Blade T15-1/4	Smart Handle 1/4X2	Torx T15
	GMC 075W066-118-9-3	101.6	30	-	19	11.5					
11V	GMC 25W22-45-11-3	115	45	-	25	15	SN4T20-M3	M5x0.8x15.5	Blade T20-1/4	Smart Handle 1/4X2	Torx T20
	GMC 100W085-175-11-3	114.3	44.5	-	25.4	15					

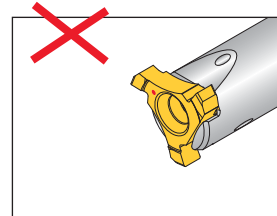
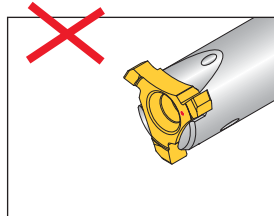
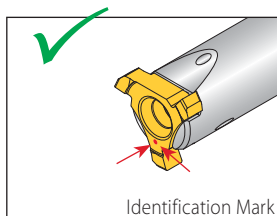
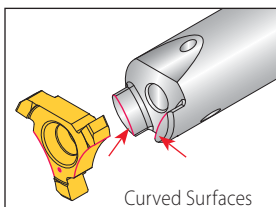
\*For Ds dimensions, see pages 13-14

For Correct Clamping:

9V



11V



Always mount insert with the identification mark between the two curved surfaces on the toolholder





# GM Slot Groove Milling Technical Data

Recommended Grades, Cutting Speeds Vc [m/min], Feed f [mm/tooth]

Material Group	Vargus No.	Material	Hardness Brinell HB	Vc [m/min]	Peripheral Feed	
				VBX/VTX	f [mm/tooth]	
<b>P</b> Steel	1	Unalloyed Steel	Low Carbon (C=0.1-0.25 %)	125	80-160	0.07-0.3
	2		Medium Carbon (C=0.25-0.55 %)	150	80-150	0.07-0.3
	3		High Carbon (C=0.55-0.85 %)	170	80-150	0.07-0.3
	4	Low Alloy Steel (alloying elements ≤5%)	Non Hardened	180	80-160	0.07-0.3
	5		Hardened	275	80-150	0.07-0.3
	6		Hardened	350	80-140	0.07-0.25
	7	High Alloy Steel (alloying elements >5%)	Annealed	200	60-100	0.07-0.3
	8		Hardened	325	50-80	0.07-0.25
	9	Cast Steel	Low Alloy (alloying elements <5%)	200	80-160	0.07-0.25
	10		High Alloy (alloying elements >5%)	225	60-120	0.07-0.25
<b>M</b> Stainless Steel	11	Stainless Steel Ferritic	Non Hardened	200	70-130	0.07-0.3
	12		Hardened	330	60-110	0.04-0.25
	13	Stainless Steel Austenitic	Austenitic	180	70-130	0.07-0.3
	14		Super Austenitic	200	60-120	0.07-0.25
	15	Stainless Steel Cast Ferritic	Non Hardened	200	80-140	0.07-0.3
	16		Hardened	330	60-100	0.07-0.25
	17	Stainless Steel Cast Austenitic	Austenitic	200	80-140	0.07-0.3
	18		Hardened	330	60-100	0.07-0.25
<b>K</b> Cast Iron	28	Malleable Cast Iron	Ferritic (short chips)	130	50-70	0.07-0.3
	29		Pearlitic (long chips)	230	80-140	0.07-0.25
	30	Grey Cast Iron	Low Tensile Strength	180	80-140	0.07-0.3
	31		High Tensile Strength	260	60-110	0.07-0.25
	32	Nodular Sg Iron	Ferritic	160	60-100	0.07-0.3
33	Pearlitic		260	60-100	0.07-0.3	
<b>N(K)</b> Non-Ferrous Metals	34	Aluminium Alloys Wrought	Non Aging	60	80-300	0.07-0.3
	35		Aged	100	100-250	0.07-0.3
	36	Aluminium Alloys	Cast	75	100-200	0.07-0.3
	37		Cast & Aged	90	100-220	0.07-0.3
	38		Cast Si 13-22%	130	80-300	0.07-0.25
	39	Copper and Copper Alloys	Brass	90	80-300	0.07-0.3
	40		Bronze and Non Leaded Copper	100	100-200	0.07-0.25
<b>S(M)</b> Heat Resistant Material	23	Titanium Alloys	Pure 99.5 Ti	400Rm	40-80	0.07-0.13
	24		A+Ss Alloys	1050Rm	20-50	0.07-0.13

## Grades and Their Application

Grade	Application Type	Sample
<b>VBX</b>	TiCN coated carbide grade. Excellent grade for steels and general use.	
<b>VTX</b>	TiAlN coated carbide grade. Ideal for Stainless Steels.	



## For Medium Applications

### SGM Ordering Code System

#### Inserts

<b>4</b>	<b>W</b>	<b>GM</b>	<b>1.6</b>	<b>C</b>	<b>-</b>	<b>D3770</b>	<b>S</b>	<b>-</b>	<b>1.38</b>	<b>VKX</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>		<b>6</b>	<b>7</b>		<b>8</b>	<b>9</b>

<b>1 - Insert Size</b>
4 - IC1/2"

<b>2 - Insert Style</b>
W - Vertical Wide Inserts

<b>3 - System</b>
GM - Groove Milling

<b>4 - Groove Std. Width</b>
1.1 - 3.15

<b>5 - Profile Shape</b>
C - With Chamfer

<b>6 - Groove Standard</b>
CIRC - Circlip DIN471/472 DIN3770D DIN3770S BS1806 BS4518

<b>7 - Groove Type</b>
D - Dynamic S - Static DP - Dynamic pneumatic DH - Dynamic hydraulic

<b>8 - Groove Depth</b>
0.3 - 3.8

<b>9 - Carbide Grade</b>
VKX

#### Shell Groove Mill

<b>SGM</b>	<b>-</b>	<b>D48</b>	<b>-</b>	<b>25</b>	<b>-</b>	<b>4</b>
<b>1</b>		<b>2</b>		<b>3</b>		<b>4</b>

<b>1 - System</b>
SGM - Shell Groove Milling

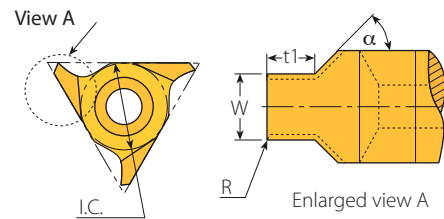
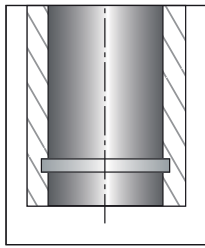
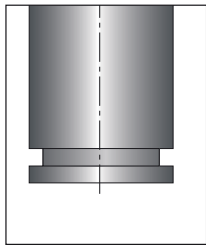
<b>2 - Cutting Dia.</b>
48, 63, 80

<b>3 - Drive Hole Dia.</b>
22, 25, 27

<b>4 - Insert Size</b>
4 - IC1/2"

## SGM - Circlip Non Standard

External / Internal



Vertical SGM

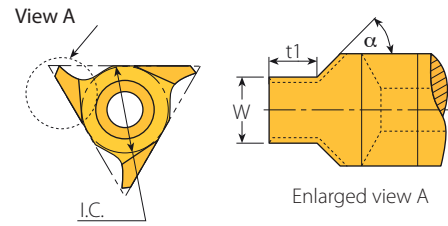
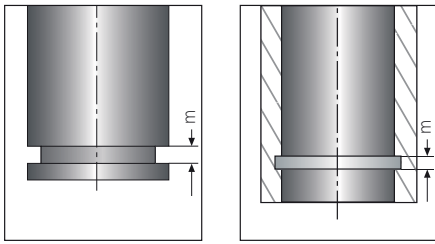
### Vertical SGM

Insert Size		Ordering Code	Dimensions mm			$\alpha$	Toolholder
IC	L mm		W	R	t1		
1/2"	22	4WGM1.25C-CIRC-1.5...	1.25	0.2	1.3	45°	SGM-D...-4
		4WGM1.35C-CIRC-1.5...	1.35	0.2	1.3		
		4WGM1.45C-CIRC-1.5...	1.45	0.2	1.3		
		4WGM1.50C-CIRC-1.5...	1.50	0.2	1.3		
		4WGM1.65C-CIRC-2.0...	1.65	0.2	1.8		
		4WGM1.75C-CIRC-2.0...	1.75	0.2	1.8		
		4WGM1.85C-CIRC-2.50...	1.85	0.2	2.3		
		4WGM2.00C-CIRC-2.50...	2.00	0.2	2.3		
		4WGM2.20C-CIRC-3.50...	2.20	0.2	3.3		
		4WGM2.30C-CIRC-3.50...	2.30	0.2	3.3		
		4WGM2.50C-CIRC-3.50...	2.50	0.3	3.3		
		4WGM2.65C-CIRC-3.50...	2.65	0.3	3.3		
		4WGM2.70C-CIRC-3.50...	2.70	0.3	3.3		
		4WGM2.80C-CIRC-3.50...	2.80	0.3	3.3		
		4WGM3.00C-CIRC-3.50...	3.00	0.3	3.3		
		4WGM3.20C-CIRC-3.50...	3.20	0.3	3.3		
		4WGM3.30C-CIRC-3.50...	3.30	0.3	3.3		
		4WGM3.50C-CIRC-4.00...	3.50	0.3	3.8		
		4WGM3.70C-CIRC-4.00...	3.70	0.3	3.8		
		4WGM3.90C-CIRC-4.00...	3.90	0.3	3.8		
4WGM4.00C-CIRC-4.00...	4.00	0.3	3.8				



## SGM - Circlip DIN 471/472

External / Internal



Vertical SGM

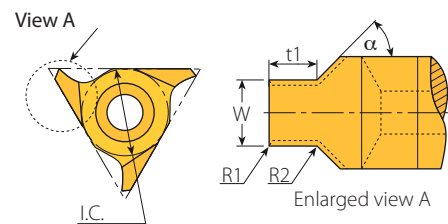
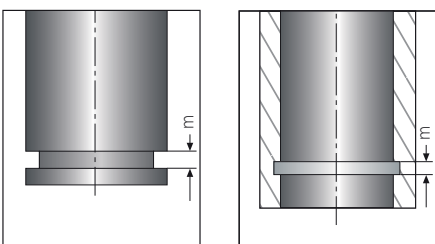
### SGM

Insert Size		Ordering Code	Groove Std.			α	Toolholder
IC	L mm		m(H13)	W	t1		
1/2"	22	4WGM1.1C-D471/472-0.35...	1.10	1.19	0.3	45°	SGM-D...-4
		4WGM1.1C-D471/472-0.40...	1.10	1.19	0.4		
		4WGM1.3C-D471/472-0.50...	1.30	1.39	0.4		
		4WGM1.3C-D471/472-0.55...	1.30	1.39	0.5		
		4WGM1.6C-D471/472-0.70...	1.60	1.69	0.6		
		4WGM1.6C-D471/472-0.85...	1.60	1.69	0.8		
		4WGM1.6C-D471/472-1.00...	1.60	1.69	0.9		
		4WGM1.85C-D471/472-1.25...	1.85	1.94	1.1		
		4WGM1.85C-D471/472-1.00...	1.85	1.94	0.9		
		4WGM2.15C-D471/472-1.50...	2.15	2.24	1.4		
		4WGM2.65C-D471/472-1.50...	2.65	2.74	1.4		
		4WGM2.65C-D471/472-1.75...	2.65	2.74	1.6		
		4WGM3.15C-D471/472-1.75...	3.15	3.24	1.6		



## SGM - O Ring DIN 3770

External / Internal



Vertical SGM

### SGM

Insert Size		Ordering Code	Groove Std.					α	Toolholder	
IC	L mm	St.Dy	m(H13)	W	t	R1	R2			
1/2"	22	St.	4WGM1.6C-D3770S-1.38...	1.60	1.97	1.38	0.25	0.10	75°	SGM-D...-4
			4WGM2.0C-D3770S-1.72...	2.00	2.37	1.72	0.25	0.10		
			4WGM2.5C-D3770S-2.15...	2.50	3.02	2.15	0.25	0.10		
			4WGM3.15C-D3770S-2.70...	3.15	3.77	2.70	0.60	0.20		
		Dy.	4WGM1.6C-D3770D-1.47...	1.60	1.97	1.47	0.25	0.10		
			4WGM2.0C-D3770D-1.83...	2.00	2.37	1.83	0.25	0.10		

St. = Static      Dy. = Dynamic

## SGM - O Ring BS 1806, DIN3601, DIN 3771

External / Internal

Vertical SGM

### SGM



Insert Size		Ordering Code			Groove Std.				α	Toolholder
IC	L mm	St.D	m(H13)	W	t	R1	R2			
1/2"	22	St.	4WGM1.80C-BS1806S-1.3...	1.80	2.37	1.30	0.6	0.2	75°	SGM-D.-.-4
			4WGM2.65C-BS1806S-2.0...	2.65	3.57	2.00	0.6	0.2		
		Dy.	4WGM1.80C-BS1806D-1.57...	1.80	2.37	1.55	0.6	0.2		
			4WGM2.65C-BS1806D-2.38...	2.65	3.57	2.30	0.6	0.2		

St. = Static  
Dy. = Dynamic

## SGM - BS 4518

External / Internal

Vertical SGM

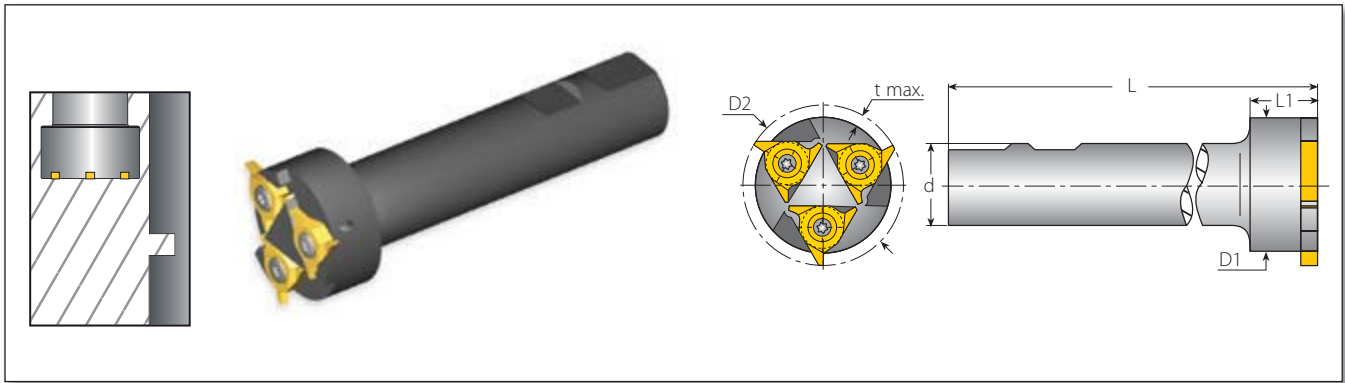
### SGM





Insert Size		Ordering Code			Groove Std.				α	Toolholder
IC	L mm	St.Dy	m(H13)	W	t	R1	R2			
1/2"	22	St.	4WGM1.6C-BS4518S-1.25...	1.60	2.37	1.25	0.5	0.2	75°	SGM-D.-.-4
			4WGM2.4C-BS4518S-1.95...	2.40	3.17	1.95	0.5	0.2		
			4WGM3.0C-BS4518S-2.51...	3.00	3.77	2.51	1.0	0.2		
		DyP	4WGM2.4C-BS4518DP-2.20...	2.40	3.27	2.20	0.5	0.2		
			4WGM3.0C-BS4518DP-2.77...	3.00	4.07	2.77	1.0	0.2		
			DyH	4WGM2.4C-BS4518DH-2.09...	2.40	3.27	2.09	0.5		
4WGM3.0C-BS4518DH-2.60...	3.00	4.07		2.60	1.0	0.2				

St. = Static  
DyP = Dynamic pneumatic  
DyH = Dynamic hydraulic

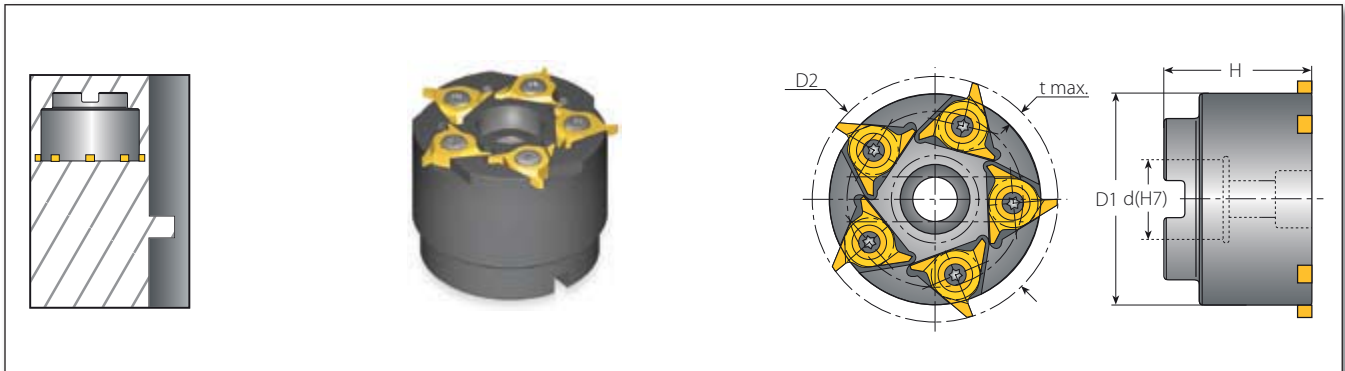
## SGM - Toolholders






### Multi Insert Holders (3)

Insert Size	Ordering Code	Dimensions mm						Spare Parts	
IC		D2	t max	L	L1	d	D1		
1/2"	SGM-D48-25-4	48	3.5	125	20	25	40	SN4T-90	HK4T

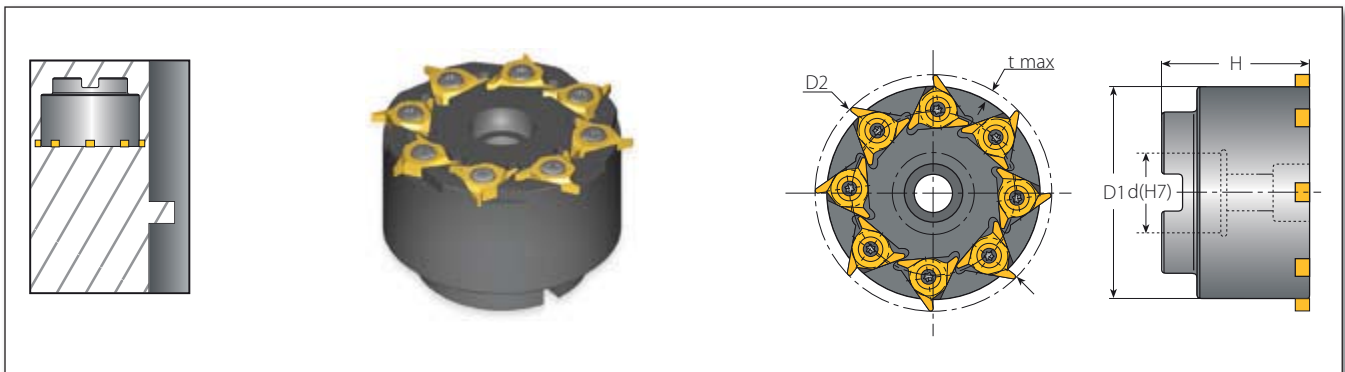
## SGM - Toolholders






### Multi Insert Holders (5)

Insert Size	Ordering Code	Dimensions mm					Spare Parts		
IC		D2	t max	d(H7)	D1	H			
1/2"	SGM-D63-22-4	63	3.5	22	54.0	41	SN4T-90	HK4T	M10x1.5x35

## SGM - Toolholders



### Multi Insert Holders (8)


Insert Size	Ordering Code	Dimensions mm					Spare Parts		
IC		D2	t max	d(H7)	D1	H			
1/2"	SGM-D80-27-4	80	3.5	27	72	50	SN4T-90	HK4T	M12x1.75x40

# SGM Groove Milling Technical Data

Recommended Grades, Cutting Speeds Vc [m/min], Feed f [mm/tooth]

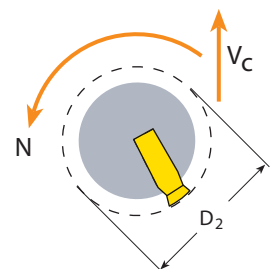
Material Group	Vargus No.	Material	Hardness Brinell HB	Vc [m/min]	Peripheral Feed	
				VKX	f [mm/tooth]	
<b>P</b> Steel	1	Unalloyed Steel	Low Carbon (C=0.1-0.25%)	125	100-220	0.05-0.15
	2		Medium Carbon (C=0.25-0.55%)	150	100-170	0.03-0.12
	3		High Carbon (C=0.55-0.85%)	170	100-160	0.02-0.09
	4	Low Alloy Steel (alloying elements ≤5%)	Non Hardened	180	80-150	0.05-0.15
	5		Hardened	275	70-140	0.03-0.12
	6		Hardened	350	70-130	0.02-0.09
	7	High Alloy Steel (alloying elements >5%)	Annealed	200	70-120	0.03-0.12
	8		Hardened	325	70-100	0.03-0.09
	9	Cast Steel	Low Alloy (alloying elements <5%)	200	70-110	0.03-0.09
	10		High Alloy (alloying elements >5%)	225	50-80	0.02-0.09
<b>M</b> Stainless Steel	11	Stainless Steel Ferritic	Non Hardened	200	80-150	0.03-0.12
	12		Hardened	330	80-150	0.03-0.09
	13	Stainless Steel Austenitic	Austenitic	180	60-120	0.03-0.12
	14		Super Austenitic	200	60-120	0.03-0.09
	15	Stainless Steel Cast Ferritic	Non Hardened	200	60-120	0.02-0.09
	16		Hardened	330	60-120	0.01-0.06
	17	Stainless Steel Cast Austenitic	Austenitic	200	50-100	0.03-0.09
	18		Hardened	330	50-100	0.01-0.06
<b>K</b> Cast Iron	28	Malleable Cast Iron	Ferritic (short chips)	130	60-110	0.02-0.09
	29		Pearlitic (long chips)	230	50-100	0.01-0.06
	30	Grey Cast Iron	Low Tensile Strength	180	60-110	0.03-0.12
	31		High Tensile Strength	260	50-80	0.03-0.09
	32	Nodular Sg Iron	Ferritic	160	50-100	0.03-0.09
	33		Pearlitic	260	40-70	0.03-0.09
<b>N(K)</b> Non-Ferrous Metals	34	Aluminium Alloys Wrought	Non Aging	60	100-200	0.07-0.25
	35		Aged	100	100-150	0.03-0.09
	36	Aluminium Alloys Cast	Cast	75	100-180	0.07-0.25
	37		Cast & Aged	90	60-120	0.05-0.15
	38	Aluminium Alloys Cast Si 13-22%	130	100-150	0.05-0.15	
	39	Copper and Copper Alloys	Brass	90	60-120	0.05-0.15
	40		Bronze and Non Leaded Copper	100	50-100	0.3-0.15
<b>S(M)</b> Heat Resistant Material	19	High Temperature Alloys	Annealed (iron based)	200	20-45	0.01-0.06
	20		Aged (iron based)	280	20-30	0.01-0.06
	21		Annealed (nickel or cobalt based)	250	10-20	0.01-0.06
	22		Aged (nickel or cobalt based)	350	10-15	0.01-0.06
	23	Titanium Alloys	Pure 99.5 Ti	400Rm	60-120	0.02-0.09
	24		A+B Alloys	1050Rm	20-50	0.01-0.06
<b>H(K)</b> Hardned Material	25	Extra Hard Steel	Hardened & Tempered	45-50HRC	15-45	0.05-0.15
	26			51-55HRC	15-40	0.05-0.15

## Grades and Their Application

Grade	Application Type	Sample
VKX	Excellent for general use TiN coated	

$$N = \frac{1000 \times V_c}{\pi \times D} \quad V_c = \frac{N \times \pi \times D}{1000}$$

- N - Rotational Velocity [R.P.M.]
- V - Cutting Speed [m/min]
- D2 - Toolholder Cutting Dia. [mm]
- F1 - Tool Feed Rate at the Cutting Edge [m/min]
- z - No. of Cutting Edges
- f - Feed per Tooth per Rotation [mm/tooth]





# Groove Milling

Innovative Grooving Solutions

# GROOVEX

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