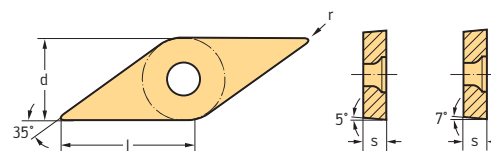










# Positive rhombic 35° VCGT / VCMT / VBG T / VBMT / VCMW

## Tiger-tec® Silver



### Indexable inserts

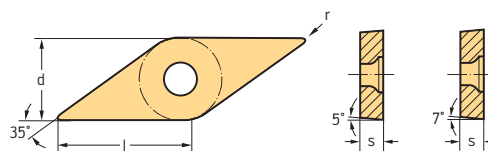
	Designation	l mm	r mm	f mm	a <sub>p</sub> mm	P HC				M HC						K HC		N HC HW		S HC						
						WPP01	WPP10S	WPP20S	WPP30S	WMP20S	WMP20S	WSM10S	WSM20S	WSM30S	WSM10	WSM20	WSM30	WKK10S	WKK20S	WXN10	WK1	WSM10S	WSM20S	WSM30S	WSM10	WSM20
	VCGT110301-PF2	11,07	0,1	0,02–0,06	0,1–1,5																					
	VCGT110302-PF2	11,07	0,2	0,05–0,12	0,2–2,0																					
	VCGT110304-PF2	11,07	0,4	0,08–0,25	0,2–2,5																					
	VCGT160402-PF2	16,61	0,2	0,05–0,12	0,2–2,0																					
	VCGT160404-PF2	16,61	0,4	0,08–0,25	0,2–2,5																					
	VCGT160408-PF2	16,61	0,8	0,10–0,30	0,3–3,0																					
	VCMT110302-FM4	11,07	0,2	0,04–0,12	0,1–1,0																					
	VCMT110304-FM4	11,07	0,4	0,05–0,16	0,1–1,5																					
	VCMT160402-FM4	16,61	0,2	0,04–0,12	0,1–1,0																					
	VCMT160404-FM4	16,61	0,4	0,05–0,16	0,1–1,5																					
	VCMT160408-FM4	16,61	0,8	0,08–0,20	0,1–1,5																					
	VCMT110302-FP4	11,07	0,2	0,04–0,12	0,1–1,0																					
	VCMT110304-FP4	11,07	0,4	0,05–0,16	0,1–1,5																					
	VCMT160402-FP4	16,61	0,2	0,04–0,12	0,1–1,0																					
	VCMT160404-FP4	16,61	0,4	0,05–0,16	0,1–1,5																					
	VCMT160408-FP4	16,61	0,8	0,08–0,20	0,1–1,5																					
	VCMT110302-PF4	11,07	0,2	0,04–0,12	0,1–1,0																					
	VCMT110304-PF4	11,07	0,4	0,05–0,16	0,1–1,5																					
	VCMT160402-PF4	16,61	0,2	0,04–0,12	0,1–1,0																					
	VCMT160404-PF4	16,61	0,4	0,05–0,16	0,1–1,5																					
	VCMT160408-PF4	16,61	0,8	0,08–0,20	0,1–1,5																					
	VBGT110302-PF5	11,07	0,2	0,04–0,10	0,1–0,6																					
	VBGT110304-PF5	11,07	0,4	0,06–0,12	0,2–0,6																					
	VBMT110304-PS5	11,07	0,4	0,06–0,18	0,3–2,0																					
	VBMT110308-PS5	11,07	0,8	0,10–0,20	0,5–2,0																					
	VBMT160404-PS5	16,61	0,4	0,08–0,20	0,3–2,0																					
	VBMT160408-PS5	16,61	0,8	0,10–0,25	0,5–2,0																					
	VBMT160412-PS5	16,61	1,2	0,12–0,30	0,6–2,0																					
	VBMT110304-FP6	11,07	0,4	0,06–0,18	0,3–2,0																					
	VBMT110308-FP6	11,07	0,8	0,10–0,20	0,5–2,0																					
	VBMT160404-FP6	16,61	0,4	0,08–0,20	0,3–2,0																					
	VBMT160406-FP6	16,61	0,6	0,10–0,25	0,4–2,0																					
	VBMT160408-FP6	16,61	0,8	0,10–0,25	0,5–2,0																					
	VBMT160412-FP6	16,61	1,2	0,12–0,30	0,6–2,0																					
	VBMT110304-FK6	11,07	0,4	0,06–0,18	0,3–2,0																					
	VBMT110308-FK6	11,07	0,8	0,10–0,20	0,5–2,0																					
	VBMT160404-FK6	16,61	0,4	0,08–0,20	0,3–2,0																					
	VBMT160406-FK6	16,61	0,6	0,10–0,25	0,4–2,0																					
	VBMT160408-FK6	16,61	0,8	0,10–0,25	0,5–2,0																					

See the ISO 1832 designation key for dimensions







 HC = Coated carbide  
 HW = Uncoated carbide


# Positive rhombic 35° VCGT / VCMT / VBGt / VBMT / VCMW

## Tiger-tec® Silver



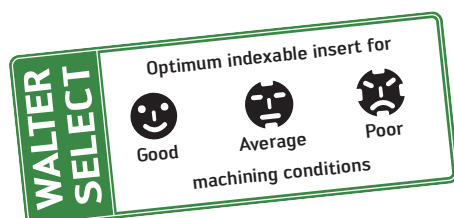
### Indexable inserts

	Designation	l mm	r mm	f mm	a <sub>p</sub> mm	P				M							K		N		S						
						HC				HC							HC		HC	HW	HC						
						WPP01	WPP10S	WPP20S	WPP30S	WMP20S	WMP20S	WSM10S	WSM20S	WSM30S	WSM10	WSM20	WSM30	WKK10S	WKK20S	WXN10	WK1	WSM10S	WSM20S	WSM30S	WSM10	WSM20	WSM30
	VCGT110301-PM2	11,07	0,1	0,02–0,06	0,5–1,5																☺	☺					
	VCGT110302-PM2	11,07	0,2	0,05–0,12	0,5–2,0																☺	☺	☺				
	VCGT110304-PM2	11,07	0,4	0,08–0,25	0,6–2,5																☺	☺	☺				
	VCGT110308-PM2	11,07	0,8	0,10–0,35	0,8–3,0																☺	☺	☺				
	VCGT130301-PM2	13,1	0,1	0,02–0,06	0,5–1,5																☺	☺	☺				
	VCGT130302-PM2	13,1	0,2	0,05–0,12	0,5–2,0																☺	☺	☺				
	VCGT130304-PM2	13,1	0,4	0,08–0,25	0,6–3,0																☺	☺	☺				
	VCGT160404-PM2	16,61	0,4	0,08–0,25	0,6–3,5																☺	☺	☺				
	VCGT160408-PM2	16,61	0,8	0,10–0,35	0,8–3,5																☺	☺	☺				
	VCGT160412-PM2	16,61	1,2	0,10–0,45	1,0–3,5																☺	☺					
	VBMT110304-MM4	11,07	0,4	0,08–0,20	0,4–1,5					☺	☺		☺											☺			
	VBMT110308-MM4	11,07	0,8	0,12–0,25	0,5–1,5								☺											☺	☺		
	VBMT160404-MM4	16,61	0,4	0,08–0,20	0,4–2,0					☺	☺	☺	☺										☺	☺			
	VBMT160408-MM4	16,61	0,8	0,12–0,30	0,5–2,0					☺	☺	☺	☺										☺	☺			
	VBMT160412-MM4	16,61	1,2	0,12–0,32	0,5–2,0							☺	☺										☺	☺			
	VBMT110304-MP4	11,07	0,4	0,08–0,20	0,4–1,5	☺	☺																				
	VBMT110308-MP4	11,07	0,8	0,12–0,25	0,5–1,5	☺	☺																				
	VBMT160404-MP4	16,61	0,4	0,08–0,20	0,4–2,0	☺	☺																				
	VBMT160406-MP4	16,61	0,6	0,12–0,25	0,5–2,0	☺	☺																				
	VBMT160408-MP4	16,61	0,8	0,12–0,30	0,5–2,0	☺	☺																				
	VBMT160412-MP4	16,61	1,2	0,12–0,32	0,5–2,0	☺	☺																				
	VBMT110304-MK4	11,07	0,4	0,08–0,20	0,4–1,5													☺	☺								
	VBMT110308-MK4	11,07	0,8	0,12–0,25	0,5–1,5													☺	☺								
	VBMT160404-MK4	16,61	0,4	0,08–0,20	0,4–2,0													☺	☺								
	VBMT160408-MK4	16,61	0,8	0,12–0,30	0,5–2,0													☺	☺								
	VBMT160412-MK4	16,61	1,2	0,12–0,32	0,5–2,0														☺								
	VCMT110304-RM4	11,07	0,4	0,12–0,20	0,4–2,5					☺	☺	☺	☺	☺									☺	☺	☺		
	VCMT110308-RM4	11,07	0,8	0,16–0,25	0,6–3,0								☺	☺										☺	☺	☺	
	VCMT160404-RM4	16,61	0,4	0,12–0,25	0,4–2,5					☺	☺	☺	☺	☺									☺	☺	☺	☺	
	VCMT160408-RM4	16,61	0,8	0,16–0,30	0,6–3,0					☺	☺	☺	☺	☺									☺	☺	☺	☺	
	VCMT160412-RM4	16,61	1,2	0,20–0,35	0,8–4,0								☺	☺										☺	☺		
	VCMT110304-RP4	11,07	0,4	0,12–0,20	0,4–2,5	☺	☺	☺	☺																		
	VCMT110308-RP4	11,07	0,8	0,16–0,25	0,6–3,0	☺	☺	☺	☺																		
	VCMT160404-RP4	16,61	0,4	0,12–0,25	0,4–2,5	☺	☺	☺	☺																		
	VCMT160406-RP4	16,61	0,6	0,15–0,25	0,6–3,0	☺	☺	☺	☺																		
	VCMT160408-RP4	16,61	0,8	0,16–0,30	0,6–3,0	☺	☺	☺	☺																		
	VCMT160412-RP4	16,61	1,2	0,20–0,35	0,8–3,0	☺	☺	☺	☺																		

See the ISO 1832 designation key for dimensions





HC = Coated carbide

HW = Uncoated carbide



## Cutting data for turning inserts – Positive basic shape

### Carbide grades

Material group	 = Cutting data for wet machining  = Dry machining is possible		Overview of the main material groups and code letters		Brinell hardness HB	Tensile strength $R_m$ N/mm <sup>2</sup>	Machining group <sup>1</sup>	 	Cutting material grades		
									Starting values for cutting speed $v_c$ [m/min]		
									HC		
									WPP01 f [mm/rev]		
									0,10	0,20	0,30
<b>P</b>	Non-alloyed steel	C ≤ 0.25%	Annealed	125	430	P1	●●	●	490	460	430
		C > 0.25 to ≤ 0.55%	Annealed	190	640	P2	●●	●	400	370	350
		C > 0.25 to ≤ 0.55%	Heat-treated	210	710	P3	●●	●	290	260	250
		C > 0.55%	Annealed	190	640	P4	●●	●	350	330	320
		C > 0.55%	Heat-treated	300	1010	P5	●●	●	240	210	190
		Free cutting steel (short-chipping)	Annealed	220	750	P6	●●	●	460	430	420
	Low-alloyed steel	Annealed		175	590	P7	●●	●	360	330	320
		Heat-treated		285	960	P8	●●	●	210	180	170
		Heat-treated		380	1280	P9	●●	●	130	120	100
		Heat-treated		430	1480	P10	●●	●	90	80	60
	High-alloyed steel and high-alloyed tool steel	Annealed		200	680	P11	●●	●	340	310	300
		Hardened and tempered		300	1010	P12	●●	●	230	200	180
		Hardened and tempered		380	1280	P13	●●	●	80	70	60
	Stainless steel	Ferritic/martensitic, annealed		200	680	P14	●●	●			
		Martensitic, heat-treated		330	1110	P15	●●	●			
<b>M</b>	Stainless steel	Austenitic, quench hardened		200	680	M1	●●	●			
		Austenitic, precipitation hardened (PH)		300	1010	M2	●●	●			
		Austenitic/ferritic, duplex		230	780	M3	●●	●			
<b>K</b>	Malleable cast iron	Ferritic		200	400	K1	●●	●	270	240	220
		Pearlitic		260	700	K2	●●	●	230	200	180
	Grey cast iron	Low tensile strength		180	200	K3	●●	●	520	490	470
		High tensile strength/austenitic		245	350	K4	●●	●	270	240	220
	Cast iron with spheroidal graphite	Ferritic		155	400	K5	●●	●	290	260	240
		Pearlitic		265	700	K6	●●	●	200	170	150
	GGV (CGI)			230	400	K7	●●	●			
<b>N</b>	Wrought aluminium alloys	Not hardenable		30	–	N1	●●	●			
		Hardenable, hardened		100	340	N2	●●	●			
	Cast aluminium alloys	≤ 12% Si, not hardenable		75	260	N3	●●	●			
		≤ 12% Si, hardenable, hardened		90	310	N4	●●	●			
		> 12% Si, not hardenable		130	450	N5					
	Magnesium-based alloys			70	250	N6					
<b>S</b>	Heat-resistant alloys	Fe-based	Annealed	200	680	S1	●●	●			
			Hardened	280	940	S2	●●	●			
		Ni or Co base	Annealed	250	840	S3	●●	●			
			Hardened	350	1180	S4	●●	●			
			Cast	320	1080	S5	●●	●			
	Titanium alloys	Pure titanium		200	680	S6	●●	●			
		α and β alloys, hardened		375	1260	S7	●●	●			
		β alloys		410	1400	S8	●●	●			
	Tungsten alloys			300	1010	S9					
	Molybdenum alloys			300	1010	S10					
<b>H</b>	Hardened steel	Hardened and tempered		50 HRC	–	H1	●	●●			
		Hardened and tempered		55 HRC	–	H2	●	●●			
		Hardened and tempered		60 HRC	–	H3	●	●●			
	Hardened cast iron	Hardened and tempered		55 HRC	–	H4	●	●●			
<b>O</b>	Thermoplastics	Without abrasive fillers				O1					
	Thermosetting plastics	Without abrasive fillers				O2					
	Plastic, glass fibre reinforced	GFRP				O3					
	Plastic, carbon fibre reinforced	CFRP				O4					
	Plastic, aramid fibre reinforced	AFRP				O5					
	Graphite (technical)			80 Shore		O6					

- Recommended application (the specified cutting data is regarded as starting values for the recommended application)
- Possible application

#### Note:

If dry machining is possible, the tool life is reduced by 20–30% on average.



<sup>1</sup> The classification of the machining groups can be found from page A 468 onwards.

[illegible]

Technical information – ISO turning A 239

## Cutting data for turning inserts – Positive basic shape

### Carbide grades

Material group	Overview of the main material groups and code letters			Brinell hardness HB	Tensile strength R <sub>m</sub> N/mm <sup>2</sup>	Machining group <sup>1</sup>			Cutting material grades				
									Starting values for cutting speed v <sub>c</sub> [m/min]				
									HC				
									WSM10				
									f [mm/rev]				
									0,10	0,20	0,40		
P	Non-alloyed steel	C ≤ 0.25%	Annealed	125	430	P1	●●	●	250	240			
		C > 0.25 to ≤ 0.55%	Annealed	190	640	P2	●●	●	200	180			
		C > 0.25 to ≤ 0.55%	Heat-treated	210	710	P3	●●	●	160	150			
		C > 0.55%	Annealed	190	640	P4	●●	●	170	150			
		C > 0.55%	Heat-treated	300	1010	P5	●●	●					
		Free cutting steel (short-chipping)	Annealed	220	750	P6	●●	●	220	200			
	Heat-treated		285	960	P8	●●	●						
	Heat-treated		380	1280	P9	●●	●						
	Heat-treated		430	1480	P10	●●	●						
	Hardened and tempered		300	1010	P12	●●	●						
	Hardened and tempered		380	1280	P13	●●	●						
	Martensitic, heat-treated		330	1110	P15	●●	●						
	M	Stainless steel	Austenitic, quench hardened		200	680	M1	●●	●	220	200	130	
			Austenitic, precipitation hardened (PH)		300	1010	M2	●●	●	160	140		
			Austenitic/ferritic, duplex		230	780	M3	●●	●	170	150	110	
K	Malleable cast iron	Ferritic		200	400	K1	●●	●					
		Pearlitic		260	700	K2	●●	●					
	High tensile strength/austenitic		245	350	K4	●●	●						
	Pearlitic		265	700	K6	●●	●						
		GGV (CGI)			230	400	K7	●●	●				
	N	Wrought aluminium alloys	Not hardenable		30	–	N1	●●	●				
Hardenable, hardened				100	340	N2	●●	●					
≤ 12% Si, hardenable, hardened			90	310	N4	●●	●						
> 12% Si, not hardenable			130	450	N5								
Brass, bronze, red brass			90	310	N8	●●	●						
Cu-alloys, short-chipping			110	380	N9	●●	●						
High-tensile, Ampco			300	1010	N10								
S		Heat-resistant alloys	Fe-based	Annealed	200	680	S1	●●	●	100	70		
				Hardened	280	940	S2	●●	●	80	60		
	Ni or Co base		Annealed	250	840	S3	●●	●	80	60			
			Hardened	350	1180	S4	●●	●	70	50			
			Cast	320	1080	S5	●●	●	60	40			
	α and β alloys, hardened		375	1260	S7	●●	●						
	β alloys		410	1400	S8	●●	●						
	Tungsten alloys			300	1010	S9							
	Molybdenum alloys			300	1010	S10							
	H	Hardened steel	Hardened and tempered		50 HRC	–	H1	●	●●				
Hardened and tempered				55 HRC	–	H2	●	●●					
Hardened and tempered				60 HRC	–	H3	●	●●					
Hardened cast iron		Hardened and tempered		55 HRC	–	H4	●	●●					
O	Thermoplastics	Without abrasive fillers				O1							
	Thermosetting plastics	Without abrasive fillers				O2							
	Plastic, glass fibre reinforced	GFRP				O3							
	Plastic, carbon fibre reinforced	CFRP				O4							
	Plastic, aramid fibre reinforced	AFRP				O5							
	Graphite (technical)			80 Shore		O6							

- Recommended application (the specified cutting data is regarded as starting values for the recommended application)
- Possible application

#### Note:

If dry machining is possible, the tool life is reduced by 20–30% on average.

<sup>1</sup> The classification of the machining groups can be found from page A 468 onwards.

Cutting material grades																							
Starting values for cutting speed $v_c$ [m/min]																							
HC																		HW					
WSM20			WSM21			WSM30			WKK10S			WKK20S			WXN10			WK1			WS10		
f [mm/rev]			f [mm/rev]			f [mm/rev]			f [mm/rev]			f [mm/rev]			f [mm/rev]			f [mm/rev]			f [mm/rev]		
0,10	0,20	0,40	0,10	0,20	0,40	0,10	0,20	0,40	0,10	0,20	0,40	0,10	0,20	0,40	0,10	0,20	0,40	0,10	0,20	0,40	0,10	0,20	0,40
230	210		200	190		200	190					490	430	370									
170	150		150	140		150	140					400	350	280									
130	120		120	100		120	100					270	240	210									
140	120		120	110		120	110					330	300	240									
												250	220	190									
180	160		160	140		160	140					360	330	280									
120	100					110	80					240	200	150									
												210	190	160									
												140	130	90									
												80	60										
130	100					100	80					240	200	140									
												150	130	60									
												70	60										
												270	240	220									
												160	140	120									
200	180	110	180	140	90	180	140	90							220	200							
140	120		110	90		110	90								100	80							
150	130	80	130	110	70	130	110	70							170	130							
									310	280	210	240	220	170									
									290	260	190	220	200	150									
									560	500	370	500	450	290									
									350	320	240	270	240	190									
									370	330	270	290	260	210									
									270	240	210	210	190	160									
									310	260	210												
															3000	2400	1800	2400	1800	1300			
															900	720	360	750	600	300			
															960	540	360	800	450	300			
															600	360	240	500	300	200			

Technical information – ISO turning A 241