Cutting data for solid carbide drills without internal cooling

= cutting data for wet machining
= dry machining is possible, cutting data must be selected from TEC

E = emulsion
O = oil
M = MQL
L = dry

v_c = cutting speed
VCRR = v_c rating chart from page B 382
VRR = feed rating chart from page B 384

Material group	Workpiece material			Brinell hardness HB	Tensile strength R_m N/mm²	Machining group [1]	Drilling depth 3 x D_c							
	Designation						K3164TIN				A3265TFL A3865TFL			
	Type						Alpha® 2				Alpha® 2			
	Dimensions						Walter standard				DIN 6537 K			
	Dia. range (mm)						3,30 – 14,50				3,00 – 20,00			
	Cutting tool material						K30F				K30F			
	Coating						TiN				TFL			
	Page						B 139				B 61/B 98			
							v_c	VRR			v_c	VRR		
P	Non-alloyed steel	C ≤ 0.25 %	annealed	125	428	P1	95	12	E O	M L	100	12	E O	M L
		C > 0.25... ≤ 0.55 %	annealed	190	639	P2	90	12	E O	M L	95	12	E O	M L
		C > 0.25... ≤ 0.55 %	tempered	210	708	P3	85	12	E O	M L	90	12	E O	M L
		C > 0.55 %	annealed	190	639	P4	90	12	E O	M L	95	12	E O	M L
		C > 0.55 %	tempered	300	1013	P5	63	9	E O	M L	67	9	E O	M L
		machining steel (short-chipping)	annealed	220	745	P6	95	12	E O	M L	100	12	E O	M L
	Low alloy steel	annealed		175	591	P7	90	12	E O	M L	95	12	E O	M L
		tempered		300	1013	P8	63	9	E O	M L	67	9	E O	M L
		tempered		380	1282	P9	40	6	O E		45	6	O E	
		tempered		430	1477	P10	32	4	O E		34	4	O E	
	High-alloyed steel and high-alloyed tool steel	annealed		200	675	P11	56	9	E O		60	9	E O	
		hardened and tempered		300	1013	P12	48	7	E O		53	7	E O	
		hardened and tempered		400	1361	P13	32	4	O E		34	4	O E	
	Stainless steel	ferritic/martensitic, annealed		200	675	P14	56	9	E O		60	9	E O	
		martensitic, tempered		330	1114	P15	40	6	E O		42	6	E O	
M	Stainless steel	austenitic, quench hardened		200	675	M1								
		austenitic, precipitation hardened (PH)		300	1013	M2	42	5	E O		45	5	E O	
		austenitic/ferritic, duplex		230	778	M3								
K	Malleable cast iron	ferritic		200	675	K1	80	16	E O	M L	85	16	E O	M L
		pearlitic		260	867	K2	63	16	E O	M L	67	16	E O	M L
	grey cast iron	low tensile strength		180	602	K3	95	16	E O	M L	100	16	E O	M L
		high tensile strength/austenitic		245	825	K4	80	16	E O	M L	85	16	E O	M L
	Cast iron with spheroidal graphite	ferritic		155	518	K5	80	16	E O	M L	85	16	E O	M L
		pearlitic		265	885	K6	63	16	E O	M L	67	16	E O	M L
	GGV (CGI)			200	675	K7	71	16	E O	M L	75	16	E O	M L
N	Aluminium wrought alloys	cannot be hardened		30	–	N1	250	10	E O					
		hardenable, hardened		100	343	N2	250	10	E O					
	Cast aluminium alloys	≤ 12 % Si, not precipitation hardenable		75	260	N3	200	16	E O		220	16	E O	
		≤ 12 % Si, precipitation hardenable, precipitation hardened		90	314	N4	180	16	E O		200	16	E O	
		> 12 % Si, not precipitation hardenable		130	447	N5	140	12	E O		160	12	E O	
	Magnesium alloys			70	250	N6								
	Copper and copper alloys (bronze/brass)	non-alloyed, electrolytic copper		100	343	N7	180	7	E O	M	190	7	E O	M
		brass, bronze, red brass		90	314	N8	150	12	E O		160	12	E O	
		Cu-alloys, short-chipping		110	382	N9	160	16	E O	M L	180	16	E O	M L
		high-strength, Ampco		300	1013	N10	63	9	E O	M L	67	9	E O	M L
S	Heat-resistant alloys	Fe-based	annealed	200	675	S1								
			hardened	280	943	S2								
		Ni or Co base	annealed	250	839	S3								
			hardened	350	1177	S4								
			cast	320	1076	S5								
	Titanium alloys	pure titanium		200	675	S6	36	5	O E		40	5	O E	
		α and β alloys, hardened		375	1262	S7	30	4	O E		34	4	O E	
		β alloys		410	1396	S8								
	Tungsten alloys			300	1013	S9	63	9	E O		67	9	E O	
	Molybdenum alloys			300	1013	S10	63	9	E O		67	9	E O	
H	Hardened steel	hardened and tempered		50 HRC	–	H1	24	3	O E		26	3	O E	
		hardened and tempered		55 HRC	–	H2	20	3	O E		22	3	O E	
		hardened and tempered		60 HRC	–	H3								
	Hardened cast iron	hardened and tempered		55 HRC	–	H4	20	3	O E		22	3	O E	
O	Thermoplasts	without abrasive fillers				O1	90	16	E O					
	Thermosetting plastics	without abrasive fillers				O2								
	Plastic, glass-fibre reinforced	GFRP				O3								
	Plastic, carbon fibre reinforced	CFRP				O4								
	Plastic, aramide fibre reinforced	AFRP				O5								
	Graphite (technical)			80 Shore		O6								

[1] The machining groups are assigned from page H 8 onwards.