Recommended Cutting Conditions for XCMT-MF Inserts (Metric) - Based on ISO 513 and VDI 3323 Standards

ISO	Material		Condition	Tensile Strength [N/mm²]	Hardness HB	Material Group No.	Cutting Parameters					
							Drilling		Turning & Boring		Grooving	
							v_c (m/min)	Feed (mm/rev)	v_c (m/min)	Feed (mm/rev)	v_c (m/min)	Feed (mm/rev)
P	non-alloy steel and cast steel, free cutting steel	<0.25% C	annealed	420	125	1	120-260	0.05-0.06	140-280	0.04-0.14	120-250	0.04-0.25
		≥0.25% C	annealed	650	190	2	80-190	0.05-0.15	90-200	0.04-0.12	80-180	
		<0.55% C	quenched and tempered	850	250	3	100-280	0.06-0.18	100-200	0.04-0.15		
		≥0.55% C	annealed	750	220	4						
			quenched and tempered	1000	300	5						
	low alloy and cast steel (less than 5% of alloying elements)		annealed	600	200	6	100-280	0.06-0.18	100-200	0.04-0.15	80-180	
			quenched and tempered	930	275	7	60-180	0.04-0.15	80-180	0.07-0.12	60-160	
				1000	300	8						
				1200	350	9						
	high alloyed steel, cast steel and tool steel		annealed	680	200	10	80-190	0.04-0.15	80-200	0.04-0.12	80-160	
			quenched and tempered	1100	325	11	50-150	0.04-0.14	60-150		50-120	
	stainless steel and cast steel		ferritic / martensitic	680	200	12	50-210	0.04-0.15	60-230	0.07-0.12	50-200	
			martensitic	820	240	13						
M	stainless steel and cast steel		austenitic, duplex	600	180	14	50-210	0.04-0.15	60-230	0.07-0.12	50-200	0.04-0.25
K	gray cast iron (GG)		ferritic / pearlitic		180	15	100-300	0.06-0.23	120-230	0.07-0.20	100-200	0.04-0.25
			pearlitic / martensitic		260	16						
	nodular cast iron (GGG)		ferritic		160	17						
			pearlitic		250	18						
	malleable cast iron		ferritic		130	19	100-200	0.06-0.15		0.04-0.13		
			pearlitic		230	20						
N	aluminum-wrought alloys		not hardenable		60	21	120-500	0.05-0.30	120-700	0.04-0.25	100-700	0.04-0.25
			hardenable		100	22						
	aluminum-cast alloys	≤12% Si	not hardenable		75	23						
			hardenable		90	24						
		>12% Si	high temperature		130	25						
	copper alloys	>1% Pb	free cutting		110	26	80-380	0.05-0.23	80-500	0.04-0.20	80-350	
			brass		90	27						
			electrolytic copper		100	28						
	non metallic		duroplastics, fiber plastics		70 Shore D	29	50-140	0.04-0.14	50-160	0.04-0.12	50-140	
			hard rubber		55 Shore D	30						
S	high temperature alloys	Fe based	annealed		200	31	20-50	0.04-0.05	20-80	0.04-0.05	20-50	0.04-0.25
			hardened		280	32						
		Ni or Co based	annealed		250	33						
			hardened		350	34						
			cast		320	35						
	titanium alloys		pure	400	190	36	30-60		30-100		30-80	
			alpha+beta alloys, hardened	1050	310	37						
H	hardened steel		hardened		55 HRC	38	20-40	0.04-0.05	20-70	0.04-0.05	20-50	0.04-0.05
			hardened		60 HRC	39						
	chilled cast iron		cast		400	40						
	cast iron		hardened		55 HRC	41						

- Steel
- Stainless steel
- Cast iron
- Non-ferrous metals
- Superalloys and titanium
- Hard materials