



MATERIAL GROUPS

According to DIN / ISO 513 and VDI 3323

ISO	Material	Condition	Tensile Strength [N/mm²]	Hardness [HB]	Material Group No.	V [m/min]	MM HCD...60° Chamfering				
							D=8.0-9.9	D=10.0-12.9	D=13.0-15.9	D=16.0-17.9	D=18.0-25.4
							Fz (mm/tooth)				
P	non-alloy steel and cast steel, free cutting steel	<0.25% C	annealed	420	125	1	100-160-220	0.03	0.04	0.05	0.06
		≥0.25% C	annealed	650	190	2		0.06	0.07	0.08	0.09
		<0.55% C	quenched and tempered	850	250	3		0.11	0.14	0.16	0.19
		≤0.55% C	annealed	750	220	4					
		≥0.55% C	quenched and tempered	1000	300	5					
	low alloy and cast steel (less than 5% of alloying elements)	annealed	600	200	6	100-140-200	0.03	0.04	0.05	0.06	
			930	275	7		0.06	0.07	0.08	0.09	
			1000	300	8		0.08	0.11	0.14	0.17	
			1200	350	9						
M	high alloyed steel, cast steel and tool steel	annealed	680	200	10	80-130-180	0.03	0.04	0.05	0.06	
		quenched and tempered	1100	325	11		0.05	0.06	0.07	0.08	
							0.07	0.09	0.11	0.14	
	stainless steel and cast steel	ferritic / martensitic	680	200	12		0.09	0.03	0.05	0.06	
		martensitic	820	240	13		0.04	0.05	0.06	0.07	
		austenitic, duplex	600	180	14		0.06	0.07	0.08	0.09	
K	gray cast iron (GG)	ferritic / pearlitic		180	15	100-160-230	0.09	0.03	0.05	0.06	
		pearlitic / martensitic		260	16		0.04	0.05	0.06	0.07	
		ferritic		160	17		0.06	0.07	0.08	0.09	
		pearlitic		250	18						
		ferritic		130	19						
	nodular cast iron (GGG)	pearlitic		230	20						

■ Recommended cutting data

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According to DIN / ISO 513 and VDI 3323

ISO	Material	Condition	Tensile Strength [N/mm²]	Hardness [HB]	Material Group No.	V [m/min]	MM HCD...60° Drilling & Countersinking				
							D=8.0-9.9	D=10.0-12.9	D=13.0-15.9	D=16.0-17.9	D=18.0-25.4
							Frev (mm/rev)				
P	non-alloy steel and cast steel, free cutting steel	<0.25% C	annealed	420	125	1	100-160-220	0.03	0.04	0.05	0.06
		≥0.25% C	annealed	650	190	2		0.06	0.07	0.08	0.09
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		pearlitic / martensitic		260	16		0.04	0.05	0.06	0.07	
		ferritic		160	17		0.06	0.07	0.08	0.09	
		pearlitic		250	18						
		ferritic		130	19						
	nodular cast iron (GGG)	pearlitic		230	20						

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