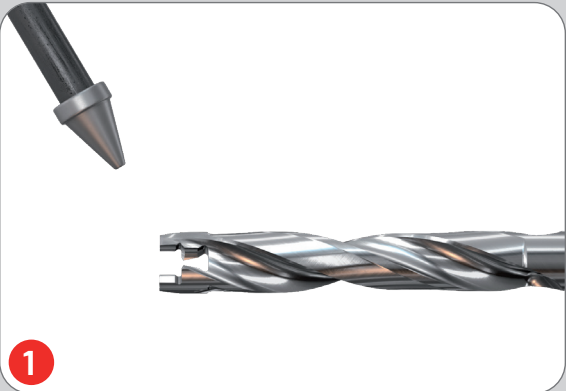



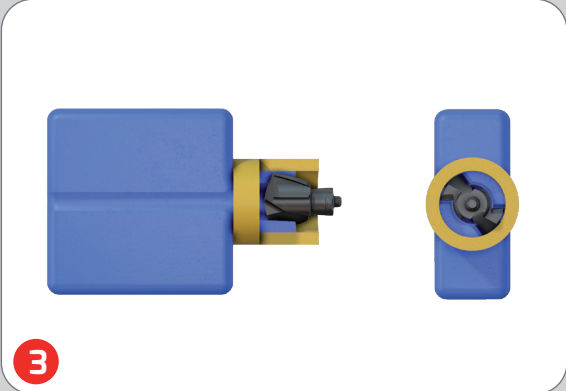
Drilling Head Mounting Procedure



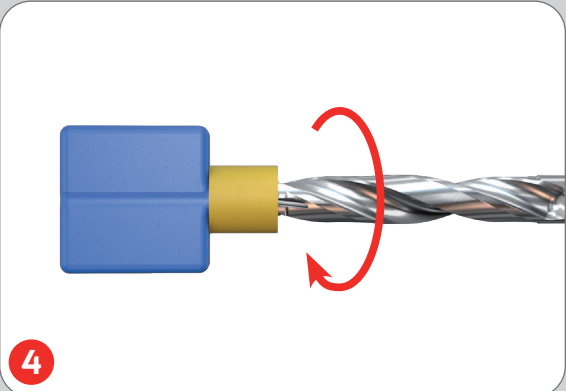
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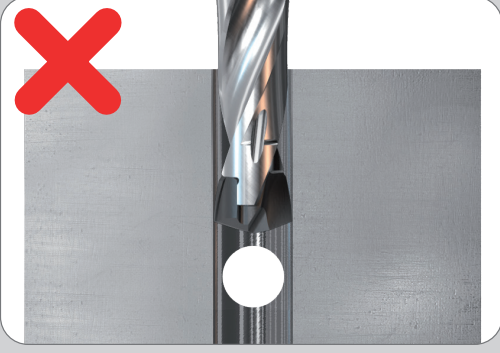





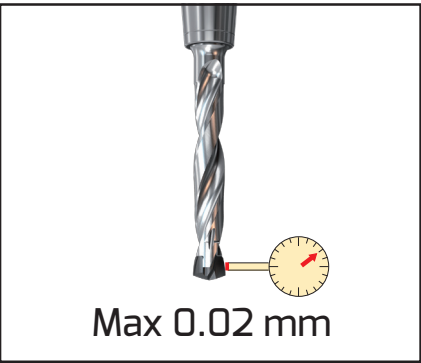
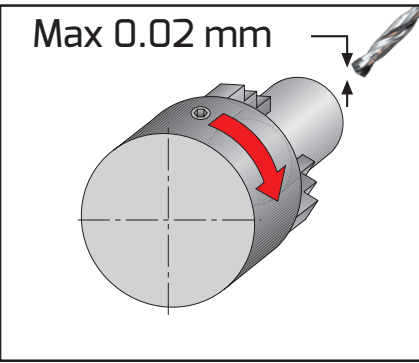
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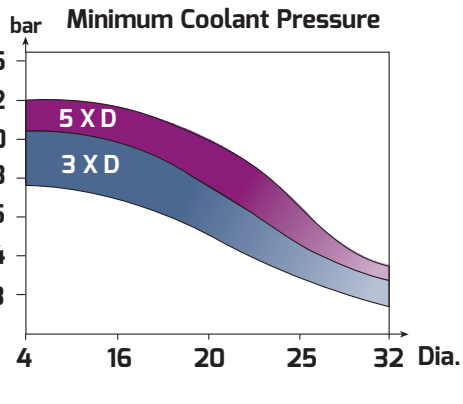
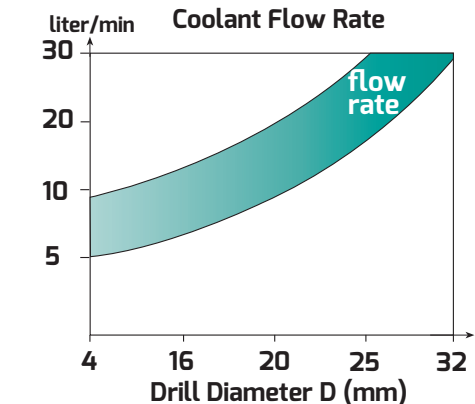


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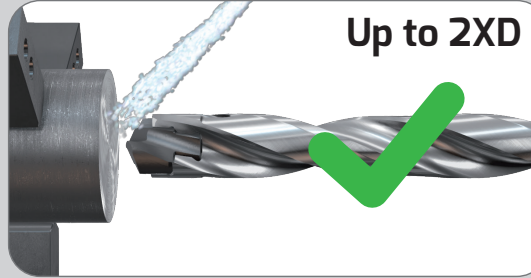
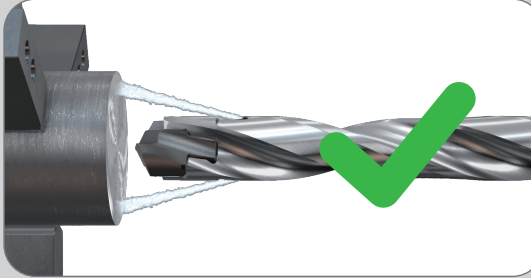

Drilling Limitations







Coolant Recommendations



Material Groups			Recommended Machining Conditions									
ISO	Material		Condition	Tensile Strength [N/mm2]	Hardness HB	Mtl. No.	V m/min	SUMOCHAM				
								Feed vs. Drill Diameter				
								D=4-4.9	D=5-5.9	D=6-7.9	D=8-9.9	
mm/rev												
P	Non-alloy steel and cast steel, free cutting steel	< 0.25 %C	Annealed	420	125	1	80-110-140	0.04 0.06 0.08	0.07 0.09 0.11	0.09 0.11 0.13	0.12 0.17 0.22	
		>= 0.25 %C	Annealed	650	190	2	80-105-130					
		< 0.55 %C	Quenched and tempered	850	250	3	80-100-120					
		>= 0.55 %C	Annealed	750	220	4	70-90-110					
			Quenched and tempered	1000	300	5	50-70-90					
	Low alloy steel and cast steel (less than 5% of alloying elements)		Annealed	600	200	6	80-100-120	0.04 0.06 0.08	0.07 0.10 0.13	0.09 0.12 0.15	0.12 0.18 0.25	
		Quenched and tempered		930	275	7	70-90-110					
				1000	300	8	50-70-90					
				1200	350	9	40-55-70					
	High alloyed steel, cast steel, and tool steel		Annealed	680	200	10	50-70-90	0.06 0.07 0.08	0.07 0.09 0.10	0.09 0.11 0.12	0.12 0.16 0.20	
			Quenched and tempered	1100	325	11	40-60-80					
	Stainless steel and cast steel		Ferritic/martensitic	680	200	12	40-55-70	0.05 0.06 0.07	0.06 0.07 0.08	0.08 0.09 0.10	0.10 0.12 0.15	
			Martensitic	820	240	13	40-55-70					
M	Stainless steel		Austenitic	600	180	14	30-50-70	0.05 0.06 0.07	0.06 0.07 0.08	0.08 0.09 0.10	0.10 0.12 0.15	
K	Grey cast iron (GG)		Ferritic/pearlitic		180	15	90-125-160	0.04 0.06 0.08	0.10 0.13 0.15	0.12 0.15 0.18	0.15 0.22 0.30	
			Pearlitic		260	16	80-110-140					
	Nodular cast iron (GGG)		Ferritic		160	17	90-135-180					
			Pearlitic		250	18	80-110-140					
	Malleable cast iron		Ferritic		130	19	90-125-160					
			Pearlitic		230	20	80-110-140					
N	Aluminum-wrought alloy		Not cureable		60	21	90-155-220				0.20 0.27 0.35	
			Cured		100	22						
	Aluminum-cast, alloyed	<=12% Si		Not cureable		75						23
			Cured		90	24						
	Copper alloys	>12% Si		High temperature		130	25					80-120-160
		>1% Pb		Free cutting		110	26					90-155-220
				Brass		90	27					
		Electrolitic copper		100	28							
	Non-metallic		Duroplastics, fiber plastics			29						
		Hard rubber			30							
S	High temp. alloys	Fe based	Annealed		200	31	30-45-60			0.05 0.06 0.07	0.06 0.08 0.11	
			Cured		280	32	20-35-50					
		Ni or Co based	Annealed		250	33						
			Cured		350	34						
			Cast		320	35						
	Titanium Ti alloys			RM 400		36	20-35-50			0.05 0.06 0.07	0.06 0.09 0.12	
			Alpha+beta alloys cured		RM 1050							37
H	Hardened steel		Hardened		55 HRC	38	20-35-50			0.05 0.06 0.07	0.06 0.09 0.12	
			Hardened		60 HRC	39						

■ Recommended cutting data  
■ Machining Stainless Steel is not recommended with QCP & HCP geometry