

# Machining Recommendations

Ground Brazed Solid Drill Heads DSD-E0, DSD-E1, DSD-E2/E3, DDD-E3							Ground Brazed Solid Drill Heads DSD-E0, DSD-E1, DSD-E2/E3, DDD-E3					
ISO	Material	Condition	Tensile Strength [N/mm <sup>2</sup> ]	Hardness HB	Material Group No. <sup>(1)</sup>	Dia. Range	8.00-20.00	15.60-20.00	20.01-31.00	31.01-43.00	43.01-65.00	
						V <sub>c</sub> (m/min)	Feed Rate f (mm/rev)					
P	non-alloy steel and cast steel, free cutting steel	<0.25% C	annealed	420	125	1	70-120	0.05-0.13	0.08-0.15	0.10-0.17	0.13-0.20	0.16-0.30
		≥0.25% C	annealed	650	190	2	70-120	0.05-0.13	0.08-0.15	0.10-0.17	0.13-0.20	0.16-0.30
		<0.55% C	quenched and tempered	850	250	3	40-70	0.05-0.13	0.08-0.15	0.10-0.17	0.13-0.20	0.16-0.30
		≥0.55% C	annealed	750	220	4	70-120	0.05-0.13	0.08-0.15	0.10-0.17	0.13-0.20	0.16-0.30
			quenched and tempered	1000	300	5	55-100	0.05-0.10	0.08-0.12	0.10-0.15	0.13-0.17	0.15-0.28
	low alloy and cast steel (less than 5% of alloying elements)	annealed	600	200	6	70-100	0.05-0.13	0.08-0.15	0.10-0.17	0.13-0.20	0.16-0.30	
		quenched and tempered	930	275	7	55-100	0.05-0.10	0.08-0.12	0.10-0.15	0.13-0.17	0.15-0.28	
			1000	300	8	55-100	0.05-0.10	0.08-0.12	0.10-0.15	0.13-0.17	0.15-0.28	
			1200	350	9	55-100	0.05-0.10	0.08-0.12	0.10-0.15	0.13-0.17	0.15-0.28	
	high alloyed steel, cast steel and tool steel	annealed	680	200	10	50-85	0.05-0.13	0.08-0.15	0.10-0.17	0.13-0.20	0.16-0.30	
		quenched and tempered	1100	325	11	55-100	0.05-0.10	0.08-0.12	0.10-0.15	0.13-0.17	0.15-0.28	
	stainless steel and cast steel	ferritic/martensitic	680	200	12	60-100	0.05-0.13	0.08-0.15	0.10-0.28	0.13-0.30	0.16-0.35	
		martensitic	820	240	13	60-100	0.05-0.13	0.08-0.15	0.10-0.28	0.13-0.30	0.16-0.35	
	M	stainless steel and cast steel	austenitic, duplex	600	180	14	60-100	0.05-0.12	0.05-0.12	0.08-0.25	0.10-0.28	0.15-0.33
K	grey cast iron (GG)	ferritic/pearlitic		180	15	80-100	0.05-0.13	0.08-0.15	0.10-0.17	0.13-0.20	0.16-0.30	
		pearlitic/martensitic		260	16	80-100	0.05-0.13	0.08-0.15	0.10-0.17	0.13-0.20	0.16-0.30	
	nodular cast iron (GGG)	ferritic		160	17	60-100	0.05-0.13	0.06-0.13	0.08-0.18	0.10-0.20	0.15-0.25	
		pearlitic		250	18	60-100	0.05-0.13	0.06-0.13	0.08-0.18	0.10-0.20	0.15-0.25	
	malleable cast iron	ferritic		130	19	50-100	0.05-0.13	0.06-0.13	0.08-0.18	0.10-0.20	0.15-0.25	
		pearlitic		230	20	50-100	0.05-0.13	0.06-0.13	0.08-0.18	0.10-0.20	0.15-0.25	
N	aluminum-wrought alloys	not hardenable		60	21	65-130	0.05-0.13	0.08-0.15	0.10-0.20	0.15-0.25	0.16-0.30	
		hardenable		100	22	65-100	0.05-0.13	0.08-0.15	0.10-0.20	0.15-0.25	0.16-0.30	
	aluminum-cast alloys	≤12% Si	not hardenable		75	23	65-130	0.05-0.13	0.08-0.15	0.10-0.20	0.15-0.25	0.16-0.30
			hardenable		90	24	65-130	0.05-0.13	0.08-0.15	0.10-0.20	0.15-0.25	0.16-0.30
	>12% Si	high temperature		130	25	65-130	0.05-0.13	0.08-0.15	0.10-0.20	0.15-0.25	0.16-0.30	
	copper alloys	>1% Pb	free cutting		110	26	65-130	0.05-0.13	0.08-0.15	0.10-0.20	0.15-0.25	0.16-0.30
		brass		90	27	65-130	0.05-0.13	0.08-0.15	0.10-0.20	0.15-0.25	0.16-0.30	
	non-metallic	electrolytic copper		100	28	65-130	0.05-0.13	0.08-0.15	0.10-0.20	0.15-0.25	0.16-0.30	
		duroplastics, fiber plastics			29							
hard rubber				30								
S	high temp. alloys	Fe based	annealed		200	31	10-50	0.05-0.12	0.06-0.12	0.08-0.15	0.12-0.18	0.15-0.25
			hardened		280	32	10-50	0.05-0.12	0.06-0.12	0.08-0.15	0.12-0.18	0.15-0.25
		Ni or Co based	annealed		250	33	10-50	0.05-0.12	0.06-0.12	0.08-0.15	0.12-0.18	0.15-0.25
			hardened		350	34	10-50	0.05-0.12	0.06-0.12	0.08-0.15	0.12-0.18	0.15-0.25
			cast		320	35	10-50	0.05-0.12	0.06-0.12	0.08-0.15	0.12-0.18	0.15-0.25
	titanium alloys	pure	400		36	30-50	0.05-0.10	0.05-0.10	0.08-0.12	0.10-0.15	0.12-0.20	
		alpha+beta alloys hardened	1050		37	30-50	0.05-0.10	0.05-0.10	0.08-0.12	0.10-0.15	0.12-0.20	
H	hardened steel	hardened		55 HRC	38	30-50	0.05-0.10	0.05-0.10	0.08-0.12	0.10-0.15	0.12-0.20	
		hardened		60 HRC	39	30-50	0.05-0.10	0.05-0.10	0.08-0.12	0.10-0.15	0.12-0.20	
	chilled cast iron	cast	400		40	30-50	0.05-0.10	0.05-0.10	0.08-0.12	0.10-0.15	0.12-0.20	
	cast iron	hardened		55 HRC	41	30-50	0.05-0.10	0.05-0.10	0.08-0.12	0.10-0.15	0.12-0.20	

<sup>(1)</sup> Based on ISO 513 and VDI 3323 standards