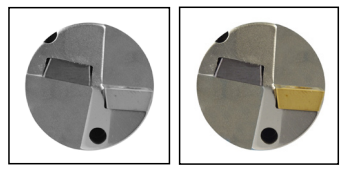

Machining Data for DR Drills

ISO	Material		Condition	Tensile Strength [N/mm²]	Hardness HB	Mat. No.	Cutting Speed (1) V_c m/min IC808 / 908 / 08 central / external	V_c m/min IC8080 / 9080 external	V_c m/min IC5500 external	Feed vs. Insert Size mm/rev DR-04 AL/DT/HD	DR-05 GF/DT/AL/HD	DR-06 GF/DT/AL/HD	DR-07 GF/DT/AL/HD	DR-09/10 GF/DT/AL/HD	DR-11/12 GF/DT/AL/HD	DR-14/16 GF/DT/AL/HD
P	non-alloy steel and cast steel, free cutting steel	<0.25% C	annealed	420	125	1	200-300	260-390	150-240	0.04-0.08 0.02-0.06	0.06-0.10 0.10-0.15 0.04-0.08	0.07-0.12 0.10-0.16 0.04-0.08	0.08-0.12 0.12-0.18 0.05-0.10	0.10-0.15 0.14-0.22 0.05-0.10	0.12-0.16 0.15-0.25 0.08-0.15	0.14-0.17 0.16-0.26 0.08-0.15
		≥0.25% C	annealed	650	190	2										
		<0.55% C	quenched and tempered	850	250	3	150-200	190-260								
		≥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	150-220	190-290	120-200		0.06-0.10 0.10-0.15 0.04-0.08	0.07-0.12 0.10-0.15 0.04-0.08	0.08-0.12 0.10-0.16 0.05-0.10	0.10-0.14 0.14-0.20 0.05-0.10	0.12-0.15 0.14-0.22 0.08-0.15	0.14-0.16 0.15-0.24 0.08-0.15
			quenched and tempered	930	275	7	120-180	160-230								
				1000	300	8										
				1200	350	9										
	high alloyed steel, cast steel and tool steel		annealed	680	200	10	120-190	160-250			0.06-0.10 0.10-0.14 0.08-0.112	0.06-0.10 0.10-0.14 0.08-0.112	0.06-0.10 0.10-0.14 0.08-0.112	0.08-0.12 0.12-0.18 0.096-0.144	0.10-0.15 0.14-0.20 0.112-0.160	0.14-0.17 0.16-0.24 0.128-0.192
			quenched and tempered	1100	325	11	100-160	210-310								
	stainless steel and cast steel		ferritic / martensitic	680	200	12	160-240	210-310	150-240		0.06-0.10 0.048-0.08	0.06-0.10 0.048-0.08	0.06-0.12 0.048-0.096	0.08-0.12 0.064-0.096	0.10-0.14 0.08-0.112	0.12-0.20 0.096-0.160
			martensitic	820	240	13										
M	stainless steel and cast steel		austenitic, duplex	600	180	14	160-240	210-310		0.04-0.08	0.06-0.10	0.06-0.10	0.06-0.12	0.08-0.12	0.10-0.14	0.12-0.20
K	gray cast iron (GG)		ferritic / pearlitic		180	15	150-250	190-320		0.08-0.16	0.10-0.22	0.10-0.22	0.10-0.22	0.15-0.25	0.18-0.30	0.20-0.34
			pearlitic / martensitic		260	16										
	nodular cast iron (GGG)		ferritic		160	17	120-180	160-230								
			pearlitic		250	18										
	malleable cast iron		ferritic		130	19										
			pearlitic		230	20										
N	aluminum-wrought alloys		not hardenable		60	21	150-300	190-390		0.08-0.24	0.12-0.25	0.12-0.25	0.12-0.25	0.20-0.30	0.2-0.35	0.28-0.45
			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										
			brass		90	27										
			electrolytic copper		100	28										
	non metallic		duroplastics, fiber plastics			29										
			hard rubber			30										
S	high temperature alloys	Fe based	annealed		200	31	20-50	30-60		0.03-0.07	0.04-0.08	0.04-0.08	0.05-0.09	0.07-0.10	0.08-0.12	0.10-0.14
			hardened		280	32										
		Ni or Co based	annealed		250	33										
			hardened		350	34										
			cast		320	35										
	titanium alloys		pure	400		36	50-60	60-80								
			alpha+beta alloys, hardened	1050		37										
H	hardened steel		hardened		55 HRC	38	20-50	30-60		0.04-0.08	0.05-0.08	0.05-0.08	0.06-0.09	0.07-0.10	0.08-0.12	0.10-0.14
			hardened		60 HRC	39										
	chilled cast iron		cast		400	40										
	cast iron		hardened		55 HRC	41										

- Grades: First choice IC808/IC8080
- Chipformer to be selected based on recommendation per material or cutting feed
- When using external coolant supply, decrease cutting speed by 10%
- Use internal coolant supply when machining austenitic stainless steel

- (1) The center insert must be PVD coated (IC908/IC808)
- This table refers to 2/3xD drill lengths only, for 4xD and 5xD drills, decrease cutting parameters by 15-25%
- PVD grade (IC908/IC808) can be used with both peripheral and center inserts
- CVD grade (IC9080/IC8080/IC5500) to be used for peripheral inserts, not recommended to be used as center insert
- Mixing chipbreakers can be used to improve chip formation, i.e. peripheral insert „DT“ and center insert „HD“