



Machining Data for DR Drills

ISO	Material	Condition	Tensile Strength [Ksi]	Hardness HB	Mat. No	Cutting Speed ⁽¹⁾			Feed vs. (IPR)															
						V _c SFM IC808 / 908/08 central / external	V _c SFM IC8080 / 9080 external	V _c SFM IC5500 external	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	61	125	1	660-980	850-1280	490-785	.0016-.0031	.002-.004	.0028-.005	.0031-.005	.004-.006	.005-.0063	.0055-.0067								
		≥0.25% C	annealed	94	190	2					.004-.006	.004-.0063	.005-.007	.0055-.0087	.006-.010	.0063-.010								
		<0.55% C	quenched and tempered	123	250	3	490-660	620-850			.0016-.0031	.0016-.0031	.0020-.0039	.0020-.0039	.0031-.0059	.0031-.0059								
		annealed	109	220	4	.002-.004					.0028-.005	.0031-.005	.004-.0055	.005-.006	.0055-.0063									
		quenched and tempered	145	300	5	.004-.0055					.004-.006	.004-.0063	.0055-.008	.0055-.009	.006-.0097									
	low alloy and cast steel (less than 5% of alloying elements)	annealed	87	200	6	490-720	620-950	395-655			.0016-.0031 .0008-.0024	.004-.0055	.004-.006	.004-.0063	.0055-.008	.0055-.009	.006-.0097							
		quenched and tempered	135	275	7	390-590	520-820					.0016-.0031	.0016-.0031	.0020-.0039	.0020-.0039	.0031-.0059	.0031-.0059							
			174	350	9							.002-.004	.002-.004	.002-.004	.0031-.005	.004-.006	.0055-.0067							
	high alloyed steel, cast steel and tool steel	annealed	99	200	10	390-620	520-820	.004-.0055				.004-.0055	.004-.0055	.005-.007	.0055-.008	.0063-.0094								
		quenched and tempered	160	325	11	330-520	690-1020	.0032-.0044				.0032-.0044	.0032-.0044	.004-.0056	.0044-.0064	.0051-.0075								
	stainless steel and cast steel	ferritic / martensitic	99	200	12	520-790	690-1020	490-785				.002-.004	.002-.004	.002-.005	.0031-.005	.004-.0055	.005-.008							
		martensitic	119	240	13							.0016-.0032	.0016-.0032	.0016-.004	.0025-.004	.0032-.0044	.004-.0064							
	M	stainless steel and cast steel	austenitic, duplex	87	180	14	520-790	690-1020					.0016-.0031	.002-.004	.002-.004	.002-.005	.0031-.005	.004-.0055	.005-.008					
K	gray cast iron (GG)	ferritic / pearlitic		180	15	490-820	620-1050																	
		pearlitic / martensitic		260	16																			
	nodular cast iron (GGG)	ferritic		160	17	390-590	520-750											.0031-.0062	.004-.009	.004-.009	.004-.009	.006-.010	.007-.012	.008-.013
		pearlitic		250	18																			
	malleable cast iron	ferritic		130	19																			
pearlitic			230	20																				
N	aluminum-wrought alloys	not hardenable		60	21	490-980	620-1280		.0031-.0062	.005-.010	.005-.010	.005-.010	.008-.012	.010-.014	.011-.018									
		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	65-160	100-200		.0012-.0028	.0016-.0031	.0016-.0031	.002-.0035	.0028-.004	.0031-.005	.004-.0055									
			hardened	280	32																			
		Ni or Co based	annealed	250	33																			
			hardened	350	34																			
			cast	320	35																			
	titanium alloys	pure	58	36																				
alpha+beta alloys, hardened		152	37																					
H	hardened steel	hardened		55 HRC	38	65-160	100-200		.0016-.0031	.002-.0031	.002-.0031	.002-.0035	.0028-.004	.0031-.005	.004-.0055									
		hardened		60 HRC	39																			
	chilled cast iron	cast	400	40																				
	cast iron	hardened		55 HRC	41																			

(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"

- 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