



HIGH-PERFORMANCE COOLANT-FED CARBIDE DRILLS

Stainless Steel / Aluminum / Titanium Alloys
Feeds & Speeds

HaasTooling.com

RPM : rev/min
FEED : inch/rev

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment	HB	HRC		HAAS PN #	Drill Diameter												
								Drill Diameter												
								SFM	SIZE	5/16"	8 mm	8.5 mm	11/32"	9.4 mm	3/8"	9.9 mm	13/32"			
P	1	Non-alloy steel	About 0.15% C	Annealed	125															
P	2		About 0.45% C	Annealed	190	13	●	329	RPM	5310	3980	3980	3980	3980	3980	3180	3180	3180		
P	3		About 0.45% C	Quenched & tempered	250	25	●	329	FEED	.0055-.0079	.0063-.0087	.0063-.0087	.0063-.0087	.0063-.0087	.0063-.0087	.0079-.0102	.0079-.0102	.0079-.0102		
P	6	Low alloy steel		Annealed	180	10	●	329	RPM	5310	3980	3980	3980	3980	3980	3180	3180	3180		
P	7			Quenched & tempered	275	29	○	230	FEED	.0055-.0079	.0063-.0087	.0063-.0087	.0063-.0087	.0063-.0087	.0063-.0087	.0079-.0102	.0079-.0102	.0079-.0102		
										RPM	3710	2790	2790	2790	2790	2230	2230	2230		
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	●	165	FEED	.0035-.0051	.0035-.0051	.0035-.0051	.0035-.0051	.0035-.0051	.0039-.0059	.0039-.0059	.0039-.0059			
M	13		Martensitic	Quenched & Tempered	240	23	●	132	RPM	2650	1990	1990	1990	1990	1590	1590	1590			
M	14		Austenitic		180	10	●	198	FEED	.0035-.0051	.0035-.0051	.0035-.0051	.0035-.0051	.0035-.0051	.0039-.0059	.0039-.0059	.0039-.0059			
N	21	Aluminum-wrought alloy	Not Curable		60		●	659	RPM	3180	2390	2390	2390	2390	1910	1910	1910			
N	22		Curable	Hardened	100		●	659	FEED	.0087-.011	.0094-.0118	.0094-.0118	.0094-.0118	.0094-.0118	.0114-.0138	.0114-.0138	.0114-.0138			
N	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		○	593	RPM	10610	7960	7960	7960	7960	6370	6370	6370			
N	24		≤ 12% Si, Curable	Hardened	90		○	593	FEED	.0087-.011	.0094-.0118	.0094-.0118	.0094-.0118	.0094-.0118	.0114-.0138	.0114-.0138	.0114-.0138			
N	25		> 12% Si, Not Curable		130		○	494	RPM	9550	7160	7160	7160	7160	5730	5730	5730			
S	36	Titanium Alloys	Pure Titanium		400 Rm				FEED	.0087-.011	.0094-.0118	.0094-.0118	.0094-.0118	.0094-.0118	.0114-.0138	.0114-.0138	.0114-.0138			
S	37		Alpha + Beta Alloys	Hardened	1050 Rm		○	132	RPM	2120	1590	1590	1590	1590	1270	1270	1270			
S									FEED	.0031-.0047	.0031-.0047	.0031-.0047	.0031-.0047	.0031-.0047	.0031-.0047	.0031-.0047	.0031-.0047	.0031-.0047	.0031-.0047	.0031-.0047

- Optimal
- Secondary