



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											
														03-0106	03-0107	03-0108	03-0109	03-0110	03-0111
								SFM	SIZE	10.8 mm	11.5 mm	15/32"	12.2 mm	1/2"	13.7 mm				
P	1	Non-alloy steel	About 0.15% C	Annealed	125														
P	2		About 0.45% C	Annealed	190	●	329	RPM	3180	3180	3180	2650	2510	2510					
P	3		About 0.45% C	Quenched & tempered	250	25	●	329	FEED	.0079-.0102	.0079-.0102	.0079-.0102	.0071-.011	.0071-.011	.0071-.011	.0071-.011			
P	6	Low alloy steel	About 0.45% C	Annealed	180	10	●	329	RPM	3180	3180	3180	2650	2510	2510				
P	7			Quenched & tempered	275	29	○	230	FEED	.0079-.0102	.0079-.0102	.0079-.0102	.0071-.011	.0071-.011	.0071-.011	.0071-.011			
M	12		Stainless steel	Ferritic / Martensitic	Annealed	200	15	●	165	RPM	1590	1590	1590	1330	1260	1260			
M	13	Martensitic		Quenched & Tempered	240	23	●	132	FEED	.0039-.0059	.0039-.0059	.0039-.0059	.0043-.0063	.0043-.0063	.0043-.0063	.0043-.0063			
M	14	Austenitic			180	10	●	198	RPM	1910	1910	1910	1590	1510	1510				
N	21	Aluminum-wrought alloy	Not Curable		60		●	659	FEED	.0043-.0063	.0043-.0063	.0043-.0063	.0047-.0067	.0047-.0067	.0047-.0067	.0047-.0067			
N	22		Curable	Hardened	100		●	659	RPM	6370	6370	6370	5310	5030	5030				
N	23							○	593	FEED	.0114-.0138	.0114-.0138	.0114-.0138	.0114-.0138	.0114-.0138	.0114-.0138	.0114-.0138		
N	24	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		○	593	RPM	5730	5730	5730	4770	4530	4530				
N	24		≤ 12% Si, Curable	Hardened	90		○	593	FEED	.0114-.0138	.0114-.0138	.0114-.0138	.0114-.0138	.0114-.0138	.0114-.0138	.0114-.0138	.0114-.0138		
N	25		> 12% Si, Not Curable		130		○	494	RPM	4770	4770	4770	3980	3770	3770				
S	36	Titanium Alloys	Pure Titanium		400 Rm				FEED	.0094-.0118	.0094-.0118	.0094-.0118	.0094-.0118	.0094-.0118	.0094-.0118	.0094-.0118			
S	37		Alpha + Beta Alloys	Hardened	1050 Rm		○	132	RPM	1270	1270	1270	1060	1010	1010				
S									FEED	.0035-.0055	.0035-.0055	.0035-.0055	.0039-.0059	.0039-.0059	.0039-.0059				

●	Optimal
○	Secondary