



# 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 #	03-0090	03-0091	03-0092	03-0093	03-0094	03-0095	03-0096	03-0097		
								Drill Diameter									
								SFM	SIZE	3/16"	5.1 mm	5.5 mm	7/32"	1/4"	6.7 mm	7 mm	9/32"
P	1	Non-alloy steel	About 0.15% C	Annealed	125												
P	2		About 0.45% C	Annealed	190	●	329	RPM	6370	6370	6370	6370	5310	5310	5310	5310	
P	3		About 0.45% C	Quenched & tempered	250	25	●	329	FEED	.0047-.0071	.0047-.0071	.0047-.0071	.0047-.0071	.0055-.0079	.0055-.0079	.0055-.0079	.0055-.0079
P	6	Low alloy steel	About 0.45% C	Annealed	180	10	●	329	RPM	6370	6370	6370	6370	5310	5310	5310	5310
P	7			Quenched & tempered	275	29	○	230	FEED	.0047-.0071	.0047-.0071	.0047-.0071	.0047-.0071	.0055-.0079	.0055-.0079	.0055-.0079	.0055-.0079
M	12		Stainless steel	Ferritic / Martensitic	Annealed	200	15	●	165	RPM	4460	4460	4460	4460	3710	3710	3710
M	13	Martensitic		Quenched & Tempered	240	23	●	132	FEED	.0047-.0071	.0047-.0071	.0047-.0071	.0047-.0071	.0055-.0079	.0055-.0079	.0055-.0079	.0055-.0079
M	14	Austenitic			180	10	●	198	RPM	3180	3180	3180	3180	2650	2650	2650	2650
N	21	Aluminum-wrought alloy	Not Curable		60		●	659	FEED	.0028-.0043	.0028-.0043	.0028-.0043	.0028-.0043	.0035-.0051	.0035-.0051	.0035-.0051	.0035-.0051
N	22		Curable	Hardened	100		●	659	RPM	2550	2550	2550	2550	2120	2120	2120	2120
N	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		○	593	FEED	.0031-.0047	.0031-.0047	.0031-.0047	.0031-.0047	.0039-.0055	.0039-.0055	.0039-.0055	.0039-.0055
N	24		≤ 12% Si, Curable	Hardened	90		○	593	RPM	12730	12730	12730	12730	10610	10610	10610	10610
N	25		> 12% Si, Not Curable		130		○	494	FEED	.0079-.0102	.0079-.0102	.0079-.0102	.0079-.0102	.0087-.011	.0087-.011	.0087-.011	.0087-.011
S	36	Titanium Alloys	Pure Titanium		400 Rm				RPM	11460	11460	11460	11460	9550	9550	9550	9550
S	37		Alpha + Beta Alloys	Hardened	1050 Rm		○	132	FEED	.0079-.0102	.0079-.0102	.0079-.0102	.0079-.0102	.0087-.011	.0087-.011	.0087-.011	.0087-.011
S									RPM	2550	2550	2550	2550	2120	2120	2120	2120
									FEED	.0067-.0091	.0067-.0091	.0067-.0091	.0067-.0091	.0075-.0098	.0075-.0098	.0075-.0098	.0075-.0098

- Optimal
- Secondary