



## Recommended Drilling Conditions Yellow

Material	Typical Grades	Hardness (HRC)	Speed SFM													
				Size	1mm	2mm	3mm	4mm	5mm	6mm	8mm	10mm	12mm	14mm	16mm	
Carbon Steels	1020 1025 1040 1045 1050 1055 1060 1090	<25	80-100	rpm	7960	3980	2650	1990	1590	1330	990	800	660	570	500	
				FEED ipr	0.0008	0.0016	0.0032	0.0035	0.0043	0.005	0.006	0.0078	0.009	0.0095	0.010	
Alloy Steels	1435 4140 4615 5140	<25	65-80	rpm	6370	3180	2120	1590	1270	1060	800	640	530	450	400	
				FEED ipr	0.0008	0.0016	0.0032	0.0035	0.0043	0.006	0.007	0.0083	0.01	0.01	0.011	
Tool Steels	A2 A6 L7 01 02 06	<35	50-55	rpm	4770	2390	1590	1190	950	800	600	480	400	340	300	
High Speed	M1, M2 D2, P20			FEED ipr	0.0008	0.0016	0.002	0.0024	0.0028	0.0032	0.0035	0.0043	0.005	0.006	0.0078	
Cast Irons	SOFT	<15	115-135	rpm	11780	5890	3930	2940	2360	1960	1470	1180	980	840	740	
				FEED ipr	0.0008	0.0032	0.0032	0.0039	0.0047	0.006	0.007	0.009	0.01	0.011	0.012	
	HARD	<23	65-85	rpm	7000	3500	2330	1750	1400	1170	880	700	580	500	440	
				FEED ipr	0.0008	0.0032	0.0032	0.0039	0.0047	0.006	0.007	0.009	0.01	0.011	0.012	
	MALLEABLE	<23	80-100	rpm	5890	4300	2860	2150	1720	1430	1070	860	720	610	540	
				FEED ipr	0.0008	0.002	0.0032	0.0032	0.0035	0.0039	0.005	0.006	0.007	0.0085	0.009	
Aluminium Alloys, Cast			200-215	rpm	19740	9870	6580	4930	3950	3290	2470	1970	1640	1410	1230	
				FEED ipr	0.0008	0.0032	0.0032	0.0043	0.006	0.007	0.0083	0.01	0.011	0.012	0.0136	
<b>STAINLESS STEELS</b>																
Ferretic, Martensitic 13-25% Cr	430F 405 434 436 442 443 446 449 409	<28	55-65	rpm	5410	2710	1800	1350	1080	900	680	540	450	390	340	
				FEED ipr	0.0008	0.0016	0.002	0.0024	0.0032	0.0039	0.005	0.006	0.007	0.008	0.009	
Austenitic Ni > 8%, 18-25% Cr	201 202 301 302 303 304 304L 305 321 347 348	<28	50-60	rpm	4470	2390	1590	1190	950	800	600	480	400	340	300	
				FEED ipr	0.0008	0.0024	0.0032	0.0035	0.0047	0.006	0.007	0.009	0.01	0.0106	0.011	
Austenitic Ni < 8%, 18-25% Cr	302B 309 309S 310 310S 314 316 316L 317 318 329 330	<20	30-40	rpm	2860	1430	950	720	570	480	360	290	240	200	180	
				FEED ipr	0.0008	0.0016	0.002	0.0024	0.0032	0.0039	0.005	0.006	0.007	0.008	0.009	
Martensitic quenched & tempered > 0.12% C	416 416F 410 414 422 431 420 501 440A 440B 440C	<45	50-60	rpm	4770	2390	1590	1190	950	800	600	480	400	340	300	
				FEED ipr	0.0008	0.0016	0.002	0.0024	0.0032	0.0039	0.005	0.006	0.007	0.008	0.009	

# SPEEDS AND FEEDS FOR ORANGE RING



## Recommended Drilling Conditions Orange

Material	Typical Grades	Hardness (HRC)	Speed SFM									
				Size	3mm	4mm	5mm	6mm	8mm	10mm	12mm	13mm
<b>Ferretic, Martensitic 13-25% Cr</b>	430F 405 434 436 442 443 446 449 409	<28	50-66	SPEED rpm	1860	1390	1110	930	700	560	460	430
				FEED inches per revolution	0.0016 0.0024	0.0024 0.003	0.003 0.004	0.0035 0.005	0.005 0.0063	0.006 0.008	0.007 0.0095	0.008 0.01
<b>Austenitic Ni &gt; 8% 18-25% Cr</b>	201 202 301 302 303 304 304L 305 321 347 348	<28	40-60	SPEED rpm	1590	1190	950	800	600	480	400	370
				FEED inches per revolution	0.0024 0.0035	0.003 0.005	0.004 0.006	0.005 0.007	0.006 0.0095	0.008 0.011	0.0095 0.013	0.01 0.014
<b>Austenitic Ni &lt; 8% 18-25% Cr</b>	302B 309 309S 310 310S 314 316 316L 317 318 329 330	<20	30-50	SPEED rpm	1380	1030	830	690	520	410	340	320
				FEED inches per revolution	0.001 0.002	0.0015 0.0024	0.002 0.003	0.0023 0.0032	0.003 0.004	0.004 0.005	0.005 0.006	0.006 0.007
<b>Martensitic quenched &amp; tempered &gt;0.12% C</b>	416 1416F 410 414 422 431 440A 440B 440C	<45	50-66	SPEED rpm	1860	1390	1110	930	700	560	460	430
				FEED inches per revolution	0.0024 0.0035	0.003 0.005	0.0039 0.005	0.005 0.007	0.006 0.0095	0.008 0.011	0.009 0.013	0.01 0.014
<b>Precipitation hardened</b>	S13800 S15500 S17400 S17700	<45	20-45	SPEED rpm	1060	800	640	530	400	320	270	240
				FEED inches per revolution	0.0015 0.0024	0.0024 0.003	0.003 0.004	0.0035 0.005	0.005 0.006	0.006 0.008	0.007 0.0095	0.008 0.01
<b>Aluminium Alloys Si &lt; 12% Max.</b>	5052, 6061		130-330	SPEED rpm	7960	5970	4770	3980	2980	2390	1990	1840
				FEED inches per revolution	0.0024 0.007	0.003 0.0095	0.004 0.011	0.005 0.014	0.006 0.017	0.008 0.022	0.009 0.026	0.01 0.028
<b>Copper Alloys</b>		<10	80-165	SPEED rpm	4030	3020	2420	2020	1510	1210	1010	930
				FEED inches per revolution	0.0024 0.0035	0.003 0.005	0.004 0.006	0.005 0.006	0.006 0.008	0.008 0.01	0.009 0.011	0.01 0.012
<b>Low Carbon Steels, Mild Steels</b>		<25	100-135	SPEED rpm	3400	2550	2050	1700	1250	1000	850	800
				FEED inches per revolution	0.004 0.005	0.004 0.006	0.005 0.007	0.006 0.0075	0.007 0.0095	0.008 0.011	0.009 0.0135	0.01 0.014