

# TECHNICAL DATA

## TAPPING GUIDE FOR HIGH-PERFORMANCE TAPS Based On 65–75% Threads, 1–2X Diameter, Through Hole



Material	Condition	Hardness		SFM	Suggested Style						
		BHN	HRC		XLT XHP	TIN	XCM	XEN	XET	XDN	
<b>Group 1—Ferritic Stainless Steel, Wrought</b>											
405, 409, 430, 434, 436, 442, 446, 502	Annealed	<185	<12	25-40	●	●				●	
<b>Group 2—Austenitic Stainless Steel, Wrought</b>											
201, 202, 301, 302, 303, 304, 305, 308, 309, 310, 314, 316, 317, 321, 330, 347, 384, 385	Annealed	<185	<12	18-25	●	●				●	
	Cold Drawn	<275	<30	12-20	●	●				●	
Nitronic	Annealed	<250	<25	12-20	●	●		○			
	Cold Drawn	<375	<41	7-15		○		●		●	
<b>Group 3—Martensitic Stainless Steel, Wrought</b>											
403, 410, 420, 422, 501, 502	Annealed	<175	<9	25-40	●	●		○		●	
	Annealed	<225	<21	18-30	●	●		○		●	
	Hardened	<325	<35	18-25	○	●		●		●	
	Hardened	<425	<45	10-18		○		●			
414, 431 Greek Ascoly	Annealed	<275	<30	18-25	○	○		●			
	Hardened	<325	<35	12-20	○	○		●			
	Hardened	<425	<45	7-15				●			
440A, 440B, 440C	Annealed	<275	<30	12-20	○	○		●			
	Hardened	<325	<35	10-18		○		●			
	Hardened	<425	<45	7-15				●			
<b>Group 4—Precipitation Hardening Stainless Steel, Wrought</b>											
15-5PH, 16-6PH, 17-4PH, 17-7PH, AF71, AM350, AM355, PH13-8MO, PH14-8MO, PH15-7MO, Custom 450 HNM	Annealed	<200	<16	18-30	●	●		○		●	
	Hardened	<325	<35	15-25		○		●		○	
	Hardened	<375	<41	12-20				●			
	Hardened	<440	<47	6-12				●			
<b>Group 5—Titanium Alloys, Wrought</b>											
Commercial Pure	Annealed	<170	<7	40-60	○	●			●	●	
	Annealed	<200	<16	30-50	○	○			●	○	
	Annealed	<275	<30	25-40		○			●	○	
Ti-5AL-2.5Sn	Annealed	<340	<37	15-25					●		
Ti-6AL-4V	Annealed	<350	<38	15-20					●		
	Treated	<380	<40	10-15					●		
Ti-6AL-6V-2Sn	Annealed	<370	<41	7-10					●		
	Treated	<440	<46	5-7					●		
<b>Group 6—Nickel Alloys, Wrought and Cast</b>											
Nickel 200–Nickel 270, Monel 400, 401, 404, MonelR405, Monel 502, Monel K500, Perma Nickel 300, Duranickel 301	Annealed	<170	<7	15-25	○	●	●	●	○	●	
	Annealed	<170	<23	15-20			●	●	○		
	Treated	<360	<39	3-5				●	○		
					●	RECOMMENDED					
					○	ALTERNATE					

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<b>Group 7—Exotic Nickel, Base Alloys, Wrought and Cast</b>										
Inconel 625,702,706,718,721,722, Inconel X-759,751,907, Haynes 263, M252, Nimonic 75,80, Waspaloy	Annealed		<33	7-10			●	●	○	
	Treated		<43	4-7			●	●	○	
Astrology, Inconel 700, Nimonic 90,95, Rene 41,63, Udimet 500,700,710	Treated		<33	5-8				●	○	
	Treated		<43	3-5				●	○	
AF2-1DA, Rene 77, Rene 95, Unitemp 1753 Hastelloy B,C,G,S,X, Incoloy 804, Incoloy 825 Inconel 600, Inconel 601, Udimet 630, Retractaloy 26	Treated		<43	4-7				●	○	
	Treated		<49	3-5				●	○	
	Annealed		<20	7-10				●	○	
	Cold Drawn		<34	4-7				●	○	
M252, Rene 80, Rene 125, B-1900, GMR-235, IN-100, IN-738, MAR-M200, 246, 421, 432, Inconel 718, Udimet 500, 700	As cast or Cast/Aged		<34	3-5				●	○	
<b>Group 8—Exotic Cobalt , Base Alloys, Wrought and Cast</b>										
AiResist 213, V36, S-816, Haynes 25 (L-605), Stellite, Haynes 188, MAR-M905,918, AiResist 3,215,X45,HS-6,HS-21,	Treated		<22	5-8	○			●		
	Treated/ Aged		<34	3-5				●	○	
HS-31,HS-51, HOWMET 3, NASA-Co-W-Re, MAR-M302,M322,M509,W1-52	Cast/Aged		<32	3-5				●	○	
<b>Group 9—Exotic Iron, Base Alloys, Wrought</b>										
A-286, Discaloy, N-155, V57,W-545, Incoloy 800, Incoloy 801, Incoloy 802, 16-25-6,19-90L	Treated		<22	10-15	○	○		●		
	Treated/ Aged		<34	7-10				●	○	
<b>Group 10—Tool Steels, Wrought</b>										
H10,H11,H12,H13,H14, H19,H21,H26,H42, D2,D3,D4,D5,D7,A7, P2,P4,P5,P6, P20,P21	Annealed		<25	15-25	○	●	●			●
	Hardened		<41	15-20			●	○		
	Annealed			30-45	●	○	●			
	Annealed		<25	10-15	○		●			
	Annealed		<16	25-35	○	○	●			
<b>Group 11—Armor Plate, Wrought</b>										
HY80,HY100, MIL-S-12560, MIL-S-16216	Annealed		<25	25-35	○	○	○	●		●
	Hardened		<33	18-30	○		○	●		
	Hardened		<38	15-25			○	●		
<b>Group 12—High Strength, Steels, Wrought</b>										
300M, 4340, D6AC, 4340Si, 98BV40	Normalized		<38	15-20		○		●		○
	Normalized		<43	10-15			○	●		
	Hardened		<48	5-7				●		
HP9-4-20, HP25, HP30, HP45	Annealed		<41	10-15			○	●		
	Hardened		<48	7-10				●		
<b>Group 13—Maraging Steels, Wrought</b>										
200 Grade, 250 Grade, 300 Grade, 350 Grade, HY230	Annealed		<35	15-20			○	●		○
120 Grade, 180 Grade	Annealed		<35	25-35			○	●		○
	Maraged		<45	7-10				●		
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<b>Low Carbon Steel, Wrought</b>										
1005-1029, 1513-1522	Normalized	<175	<9	75-100	●	●			●	
	Cold Drawn	<276	<30	40-60	●	●			●	
<b>Medium Carbon Steel, Wrought</b>										
1030-1055, 1525-1552	Normalized	<250	<25	30-50	●	●			●	
	Hardened	<350	<38	15-25			●	●	●	
<b>High Carbon Steel, Wrought</b>										
1060-1069, 1070-1078 1080-1086, 1095, 1561	Annealed	<275	<30	30-50	●	●			●	
	Hardened	<350	<38	15-25				●		
<b>Low Carbon Alloy Steel, Wrought</b>										
4023, 4320, 5120 8115, 8622	Normalized	<250	<25	30-45		●			●	
	Hardened	<350	<38	25-35			●	●		
<b>Medium Carbon Alloy Steel, Wrought</b>										
4032, 4130 5135, 8630	Normalized	<250	<25	25-35		●			●	
	Hardened	<350	<38	15-20			●	●		
<b>Aluminum Alloys, Wrought</b>										
2011-2025, 5050 6061, 7075	Cold Drawn	<80		95-125		●			●	
	Treated	<150		75-100		●			●	
<b>Aluminum Die Cast</b>	As Cast	<100		100-150		●			●	
	Treated	<125		70-100		●			●	
<b>High Silicon Aluminum</b>	Si>10%	<125		25-40		●			●	
<b>Brass, Cast</b>				50-70		●			●	
<b>Bronze, Cast</b>				40-60		●			●	
<b>Copper</b>				30-50		●			●	
<b>Copper, Beryllium</b>				35-80		●			●	
<b>Magnesium Alloys</b>		<100		100-150		●			●	
<b>Ductile Iron</b>		<250		30-40		●			●	
<b>Nodular Cast Iron</b>		<220		30-40						●
<b>Gray Cast Iron</b>		<220		30-40						●

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