

# STAINLESS STEEL FINDER

## AUSTENITIC/CHROME-NICKEL (Non-Hardening)

	303	304	304L	309	310	316	316L	321
<b>Chemical Comp. (%)</b>								
Chromium	17-19	18-20	18-20	22-24	24-26	16-18	16-18	17-19
Nickel	8-10	8-11	8-11	12-15	19-22	10-14	10-14	9-12
Other elements (a)	5.15-4.0	—	—	—	—	Mo 2-3	Mo 2-3	Ti5xCmin
Carbon	.15 max	.08 max	.03 max	.20 max	.25 max	.08 max	.03 max	.08 max
Manganese	2 max	2 max	2 max	2 max	2 max	2 max	2 max	2 max
Silicon	1 max	1 max	1 max	1 max	1.5 max	1 max	1 max	1 max
Machinability rating	70	48	48	—	—	45	45	50
<b>Physical Data</b>								
Melting—°F	2550	2550	2550	2550	2550	2550	2550	2550
Density—lb./in. <sup>3</sup>	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
Specific heat— Btu°F/lb.(32-212F)	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Thermal conductivity— BTU/ft <sup>2</sup> /hr/°F/ft:								
212 F	9.4	9.4	9.4	9.0	8.0	9.4	9.4	9.3
932 F	12.4	12.4	12.4	10.8	10.8	12.4	12.4	12.8
Mean Coeff. of exp.— in/in/°F × 10 <sup>6</sup>								
68-212F	9.2	9.2	9.2	8.7	8.0	9.2	9.2	8.3
68 to indicated—F	11.0 (1600)	11.0 (1600)	11.0 (1600)	10.9 (2100)	10.9 (2100)	10.7 (1600)	10.7 (1600)	10.8 (1700)
<b>Electrical Prop.</b>								
Magnetic perm	1.02	1.02	1.02	1.02	1.01	1.02	1.02	1.02
Electrical resistivity—								
68 F	72.0	72.0	72.0	78.0	78.0	74.0	72.0	72.0
1200 F	116.0	116.0	116.0	114.8	—	116.0	116.0	—
<b>Heat Resist.</b>								
Max. operating °F:								
Intermittent	1400	1600	1600	1800	1900	1600	1600	1600
Continuous	1700	1700	1700	2000	2100	1700	1700	1700
<b>Temperatures—°F</b>								
Forging—start	2250	2200	2200	2150	2150	2200	2200	2200
Forging—finish	1700	1700	1700	1800	1800	1700	1700	1700
Annealing—Ranges	1800- 2000	1800- 1950	1800- 1950	2050- 2150	2050- 2150	1975- 2150	1800- 2000	1800- 2000
Annealing—cooling (b)	WQ	WQ(AC)	AC	WQ(AC)	WQ(AC)	WQ(AC)	AC	WQ(AC)
Hardening—ranges				Hardenable only by cold working				
Quenching (O) Oil, (A) Air								
Tempering—for hardness								
Drawing—for stress relieving								
<b>Mech. Prop (nominal) anid.</b>								
Structure annealed (SA)	A	A	A	A	A	A	A	A
Yield strength-KSI-min	35	35	30	40	30	35	30	35
Ultimate strength KSI—min	90	85	80	95	75	85	75	85
Elong—% in 2 inches—min	50	55	55	45	40	60	60	55
Red. in area—% min	55	70	70	65	50	70	70	65
Mod. of elast — lb./in. <sup>2</sup> × 10 <sup>6</sup>	29	29	29	29	30	29	29	29
Hardness—Brinell (max)	160 mm	180	180	200	180	200	180	200
Hardness—Rockwell (max)	B80 mm	B90	B90	B95	B90	B95	B90	B95
Impact values—Izod —ft-lb (min)	60	85	80	80	80	70	80	80

(Continued)