

STAINLESS STEEL FINDER

AUSTENITIC/CHROME-NICKEL (Non-Hardening)

	303	304	304L	309	310	316	316L	321
Chemical Comp. (%)								
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
Physical Data								
Melting—°F	2550	2550	2550	2550	2550	2550	2550	2550
Density—lb./in. ³	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
Specific heat—								
Btu/°F lb (32-212°F)	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Thermal conductivity—								
BTU/ft ² /hr/°F in.								
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 ⁶								
68-212°F	9.2	9.2	9.2	8.7	8.0	9.2	9.2	8.3
68 to indicated—F	11.0	11.0	11.0	10.9	10.9	10.7	10.7	10.6
	(1600)	(1600)	(1600)	(2100)	(2100)	(1600)	(1600)	(1700)
Electrical Prop.								
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	—
Heat Resist.								
Max. operating °F:								
Intermittent	1400	1600	1600	1800	1900	1600	1600	1600
Continuous	1700	1700	1700	2000	2100	1700	1700	1700
Temperatures—°F								
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								
Mech. Prop (nominal) and.								
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. ² × 10 ⁶	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)