

Type Analysis

Element	Min	Max
Carbon	--	0.10
Nickel	72.0 min	
Chromium	14.0	17.0
Iron	6.00	10.00
Silicon	--	0.50
Manganese	--	1.00
Sulfur	--	0.015
Copper	--	0.50

Average Physical Properties

Physical Properties	°F	British Units	°C	Metric Units
Density	Room	0.304 lb./cubic in.	Room	8.43g/cubic cm
Electrical Resistivity	70	40.6 microhm-in.	21	1.03 microhm-m
	200	40.9	93	1.04
	400	41.5	204	1.05
	600	42.2	316	1.07
	800	43.0	427	1.09
Mean Coefficient of Thermal Expansion	70-200	7.4 microinches/in.-°F	21-93	13.3 x 10 ⁽⁻⁶⁾ m/m·K
	70-400	7.7	21-204	13.9
	70-600	7.9	21-316	14.2
	70-800	8.1	21-427	14.6

Thermal Conductivity	70	103 Btu-in./ft ² -hr.-°F	21	14.8 W/m·K
	200	109	93	15.7
	400	121	204	17.4
	600	133	316	19.2
	800	145	427	20.9
Modulus of Elasticity	Room	30.0 x 10(6) psi	Room	207 GPa

Typical Mechanical Properties

Typical Mechanical Properties

Various forms and conditions

Form and Condition	Tensile Strength		0.2% Yield Strength		% Elongation in 2"	% Reduction of Area	Rockwell Hardness
	ksi	MPa	ksi	MPa			
Rod and Bar							
Cold-drawn							
Annealed	80-100	552-689	25-50	172-345	55-35	70-60	65-85B
As-drawn	105-150	724-1034	80-125	552-862	30-10	60-30	90B-30C
Hot rolled							
Annealed	80-100	552-689	30-50	207-345	55-35	70-60	65-85B
As-rolled	85-120	586-827	35-90	241-621	50-30	65-50	75-95B
Hot-finished	80-120	586-827	35-90	241-621	50-30	65-50	75-95B
Strip							
Annealed	80-100	552-689	30-45	207-310	55-35	----	84B max.

Average Room Temperature Tensile Data

Form	Condition	Ultimate Tensile Strength, Ksi (MPa)	Yield Strength at 0.2% offset, Ksi (MPa)	Elongation in 2 in. (50.8mm) or 4D, percent
Sheet	Annealed	98 (676)	42 (290)	40
Plate	Annealed	95 (655)	41 (283)	45
Bar/Billet	Annealed	95 (655)	41 (283)	45
Sheet, Plate, Strip, Bar	Annealed	80 (550)*	35 (240)*	30*

- - minimum

Typical Elevated Temperature Tensile Properties

Temperature		Tensile Strength		0.2% Yield Strength		% Elongation in 2"
°F	°C	ksi	MPa	ksi	MPa	
600	316	90.5	624	31.0	214	46
800	427	88.5	610	29.5	203	49
1000	538	84.0	579	28.5	196	47
1200	649	65.0	448	26.5	183	39
1400	760	27.5	190	17.0	117	46
1600	871	15.0	103	9.0	62	80
1800	982	7.5	52	4.0	28	118

Stress Rupture Properties

Temperature		Stress to Produce Rupture in:					
°F	°C	10 hours		100 hours		1000 hours	
		ksi	MPa	ksi	MPa	ksi	MPa
Cold Drawn, Annealed-3 Hours/1750°F (954°C)/Air Cooled							
1000	538	74	510	50	345	34	234
1200	649	34	234	23	159	14.5	100
1400	760	13	90	8.4	58	5.6	39
1600	871	7.5	52	4.8	33	3	21
1800	982	4.4	30	2.8	19	1.8	12
2000	1093	2.1	14	2.4	17	--	--
Hot Rolled, Annealed-2 Hours/1650°F (899°C)							
1350	732	20	138	13.5	93	9.2	63
1600	871	8.1	56	5.3	37	--	--
1800	982	4.4	30	2.8	19	1.8	12
2000	1093	2.1	14	1.4	10	--	--
Solution Annealed-20 Hours/2050°F (1121°C)/Air Cooled							
1350	732	19	131	14	97	9.8	68
1500	816	11.5	79	8	55	5.6	39
1600	871	8	55	5.3	37	--	--
1800	982	4.4	30	2.8	19	1.8	12
2000	1093	2.1	14	1.4	10	--	--