Alloy 718 is a high strength nickel base superalloy used for cryogenic temperatures up to long term service at 1200°F. The alloy is readily fabricated and may be welded in either the annealed or precipitation (age) hardened condition. Anneal 1700-1850°F, air cool or faster. Age 1325°F 8 hours, furnace cool to hold at 1150°F, for a total aging time of 18 hours, air cool. Alloy 718 will show a contraction of 0.0008 inch/inch after precipitation hardening.

Specifications

UNS: N07718 **W. Nr./EN:** 2.4668 **ASTM:** B 637, B 670 **AMS:** 5596, 5662, 5663, 5832 **GE:** B50TF14, B50TF15, B50T69A
ASME: SFA-5.14, Case 2222-1

Chemical Composition, %

	Ni+Co	Cr	Cb+Ta	Mo	Ti	Al	Co	C	Mn	Si	P	S	B	Cu	Fe
MIN	50.0	17.0	4.75	2.8	0.65	0.2	–	–	–	–	–	–	–	–	–
MAX	55.0	21.0	5.5	3.3	1.15	0.8	1.0	0.08	0.35	0.35	0.015	0.015	0.006	0.3	balance

Features

- Good mechanical properties: tensile, fatigue and creep-rupture
- Excellent welding characteristics, resistant to postweld age cracking
- Oxidation resistant throughout its useful temperature range

Applications

- Gas turbine engine parts
- Liquid fuel rocket motor components
- Springs, fasteners
- Cryogenic tanks

Physical Properties

Density: 0.296 lb/in^3 annealed, 0.274 lb/in^3 aged **Melting Range:** 2410 - 2540°F

Temperature, °F	-320	70	200	400	600	1000	1200	1400
Coefficient* of Thermal Expansion, in/in°F x 10^{-6}	5.9	–	7.3	7.5	7.7	8.1	8.4	8.9
Thermal Conductivity Btu • ft/ft2 • hr • °F	–	6.4	7.2	8.2	9.3	11.3	12.3	13.3
Modulus of Elasticity Dynamic, psi x 10^6	–	29	28	27	26	25	24	22

** 70°F to indicated temperature.*

Mechanical Properties

Typical Room Temperature Properties, 1800°F Annealed Condition

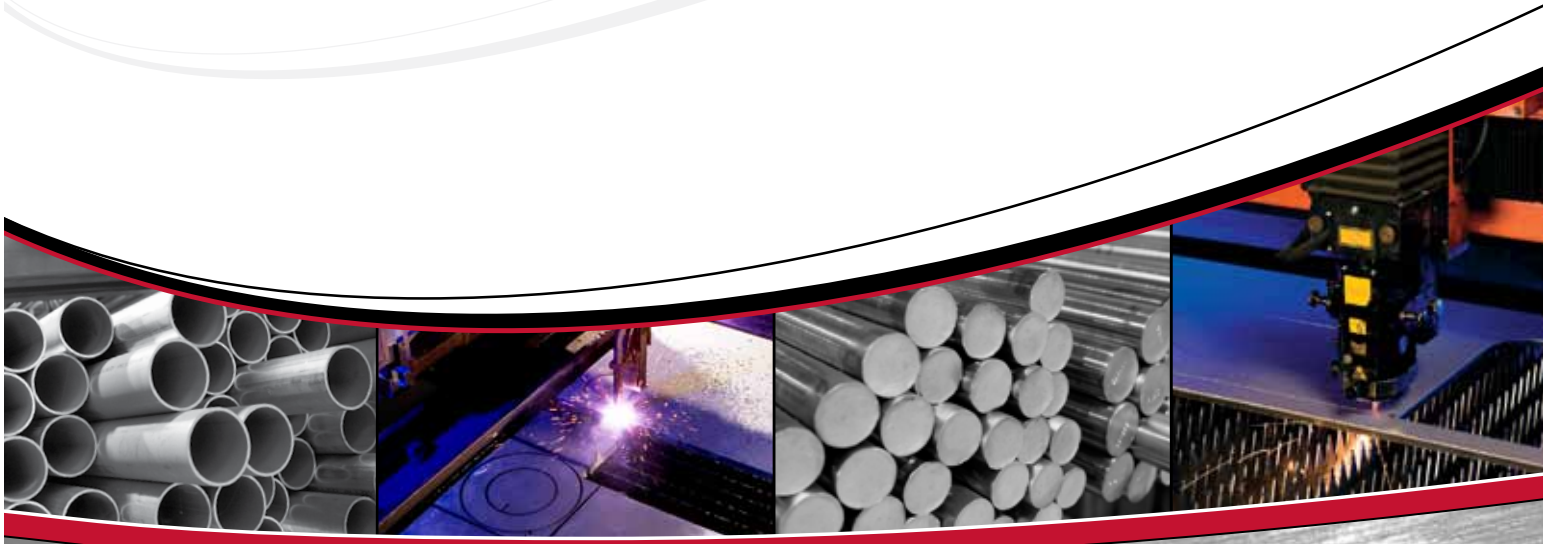
Ultimate Tensile Strength, ksi	135
0.2% Yield Strength, ksi	70
Elongation, %	45
Hardness, Rockwell B	100

Average Tensile Properties, ½" Bar Annealed 1800°F, Aged 1325/1150°F

Temperature, °F	70	400	800	1000	1200	1400
Ultimate Tensile Strength, ksi	210	198	191	185	168	111
0.2% Yield Strength, ksi	175	163	156	155	149	110
Elongation, %	22	20	19	18	19	27
Hardness, Rockwell C	42-44	–	–	40-41	40-41	33-34

Typical Stress Rupture, Bar, Annealed 1800°F, Aged 1325/1150°F

Temperature, °F	1100	1200	1300	1400
100 Hours, ksi	170	110	75	44
1,000 Hours, ksi	130	85	55	25



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