Inconel 718

Description

A Nickel-Chromium alloy being precipitation hardenable and having high creep-rupture strength at high temperatures to about 700°C (1290°F). It has higher strength than Inconel X-750 and better mechanical properties at lower temperatures than Nimonic 90 and Inconel X-750.

Uses: Inconel is often encountered in extreme environments. It is common in gas turbine blades, seals, and combustors, as well as turbocharger rotors and seals, electric submersible well pump motor shafts, high temperature fasteners, chemical processing and pressure vessels, heat exchanger tubing, steam generators and core components in nuclear pressurized water reactors, natural gas processing with contaminants such as H2S and CO2, firearm sound suppressor blast baffles, and Formula One, NASCAR, NHRA, and APR, LLC exhaust systems.

Chemical Composition

Element	%
C	0.08
Mn	0.35
Si	0.35
P	0.015
S	0.015
Cr	21.00
Ni	55.00
Mo	3.30
Nb/Cb	5.50
Ti	1.15
Al	0.80
Co	1.00
Ta	0.05
B	0.006
Cu	0.30
Pb	0.0005
Bi	0.00003
Se	0.0003
Fe	Remaining

Density	8.19g/cm^3	0.296 lb/in^3
Melting Point	1336°C	2437°F
Coefficient of Expansion	13.0 µm/m °C (20 - 100°C)	7.2 x 10^{-6} in/in °F (70 - 212°F)
Modulus of Rigidity	77.2 kN/mm^2	11197 ksi
Modulus of Elasticity	204.9 kN/mm^2	29719 ksi

Heat Treatment

Condition	Type	Temperature	
		°C	°F
Spring Temper (for ISO 15156-3 / NACE MR 0175)	Anneal Age Harden	1010 790	1850 1455

Properties

Condition	Approximate Tensile Strength		Approximate Operating Temperature	
	N/mm^2	ksi	°C	°F
Spring Temper (for ISO 15156-3 / NACE MR 0175)	1250 - 1450	181 - 210	-200 to +550	-330 to +1020

*Information compiled using Alloy Wire International as source.