

Special Metals INCONEL® 706 Precipitation Hardening Alloy, Forged Disc, Solution Treated

Category : Metal , Nonferrous Metal , Nickel Alloy , Superalloy , Iron Base

Material Notes:

Tensile strength (ultimate and yield), reduction of area, and elongation values reported here are typical for Forged Disc, Solution Treated samples. Density and magnetic permeability are typical of annealed INCONEL® alloy 706. Other property values are typical of INCONEL® alloy 706. For optimum creep and rupture properties, the alloy receives a three part heat treatment as follows: Solution treat 1700-1850°F (925-1010°C) for a time commensurate with section size, then air cool. Stabilizing treatment 1550°F (845°C)/3 hr, air cool. Precipitation treatment 1325°F (720°C)/8 hr, furnace cool at 100°F (55°C)/hr to 1150°F (620°C)/8 hr, air cool. For tensile-limited applications, the alloy receives a two part heat treatment as follows: Solution treat 1700-1850°F (925-1010°C) for a time commensurate with section size, then air cool. Precipitation treatment 1350°F (730°C)/8 hr, furnace cool at 100°F (55°C)/hr to 1150°F (620°C)/8 hr, air cool. Data provided by the manufacturer, Inco Alloys International.

Order this product through the following link:

http://www.lookpolymers.com/polymer_Special-Metals-INCONEL-706-Precipitation-Hardening-Alloy-Forged-Disc-Solution-Treated.php

Physical Properties	Metric	English	Comments
Density	8.05 g/cc	0.291 lb/in ³	Annealed

Mechanical Properties	Metric	English	Comments
Tensile Strength, Ultimate	745 MPa	108000 psi	
Tensile Strength, Yield	288 MPa @Strain 0.200 %	41700 psi @Strain 0.200 %	
Elongation at Break	50 %	50 %	
Reduction of Area	55 %	55 %	
Modulus of Elasticity	210 GPa	30500 ksi	Precipitation Hardened, Dynamic Method
Poissons Ratio	0.382	0.382	Precipitation Hardened, Calculated by mfr.
Shear Modulus	76.0 GPa	11000 ksi	Precipitation Hardened, Dynamic Method

Thermal Properties	Metric	English	Comments
CTE, linear	13.46 $\mu\text{m/m-}\text{^\circ}\text{C}$	7.478 $\mu\text{in/in-}\text{^\circ}\text{F}$	Mean
	@Temperature 24.0 - 100 $\text{^\circ}\text{C}$	@Temperature 75.2 - 212 $\text{^\circ}\text{F}$	
	15.08 $\mu\text{m/m-}\text{^\circ}\text{C}$	8.378 $\mu\text{in/in-}\text{^\circ}\text{F}$	Mean
	@Temperature 24.0 -	@Temperature 75.2 -	

Thermal Properties	300 Å°C Metric	572 Å°F English	Comments
	15.59 Åµm/m-Å°C	8.661 Åµin/in-Å°F	Mean
	@Temperature 24.0 - 500 Å°C	@Temperature 75.2 - 932 Å°F	
	16.42 Åµm/m-Å°C	9.122 Åµin/in-Å°F	Mean
	@Temperature 21.0 - 700 Å°C	@Temperature 69.8 - 1290 Å°F	
Specific Heat Capacity	0.444 J/g-Å°C	0.106 BTU/lb-Å°F	
Thermal Conductivity	12.5 W/m-K	86.8 BTU-in/hr-ftÅ²-Å°F	
Melting Point	1334 - 1371 Å°C	2433 - 2500 Å°F	
Solidus	1334 Å°C	2433 Å°F	
Liquidus	1371 Å°C	2500 Å°F	

Component Elements Properties	Metric	English	Comments
Aluminum, Al	<= 0.060 %	<= 0.060 %	
Boron, B	<= 0.0060 %	<= 0.0060 %	
Carbon, C	<= 0.30 %	<= 0.30 %	
Chromium, Cr	14.5 - 17.5 %	14.5 - 17.5 %	
Cobalt, Co	<= 1.0 %	<= 1.0 %	
Copper, Cu	<= 0.35 %	<= 0.35 %	
Iron, Fe	38 %	38 %	As remainder
Manganese, Mn	<= 0.35 %	<= 0.35 %	
Nickel, Ni	39 - 44 %	39 - 44 %	Including Cobalt
Niobium, Nb (Columbium, Cb)	2.5 - 3.3 %	2.5 - 3.3 %	Includes Ta
Phosphorous, P	<= 0.020 %	<= 0.020 %	
Silicon, Si	<= 0.35 %	<= 0.35 %	
Sulfur, S	<= 0.015 %	<= 0.015 %	
Titanium, Ti	<= 0.40 %	<= 0.40 %	

Electrical Properties	Metric	English	Comments

Electrical Resistivity Electrical Properties	0.0000985 ohm-cm Metric	0.0000985 ohm-cm English	Comments
Magnetic Permeability	1.011	1.011	at 200 Oersted (15.9 kA/m);Annealed
Curie Temperature	<= -78.0 Â°C	<= -108 Â°F	

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