

Special Metals INCONEL® 706 Precipitation Hardening Alloy, Forged Disc, 3 Part Heat Treatment

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, 3 Part Heat Treatment samples. Density and magnetic permeability are typical of precipitation hardened 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. Data provided by the manufacturer, Special Metals.

Order this product through the following link:

http://www.lookpolymers.com/polymer_Special-Metals-INCONEL-706-Precipitation-Hardening-Alloy-Forged-Disc-3-Part-Heat-Treatment.php

Physical Properties	Metric	English	Comments
Density	8.08 g/cc	0.292 lb/in ³	Precipitation Hardened

Mechanical Properties	Metric	English	Comments
Tensile Strength, Ultimate	1245 MPa	180500 psi	
Tensile Strength, Yield	979 MPa @Strain 0.200 %	142000 psi @Strain 0.200 %	
Elongation at Break	17 %	17 %	
Reduction of Area	19 %	19 %	
Modulus of Elasticity	210 GPa	30500 ksi	Dynamic Method
Poissons Ratio	0.382	0.382	Calculated by mfr.
Shear Modulus	76.0 GPa	11000 ksi	Dynamic Method

Thermal Properties	Metric	English	Comments
CTE, linear	13.46 Âµm/m-Â°C @Temperature 24.0 - 100 Â°C	7.478 Âµin/in-Â°F @Temperature 75.2 - 212 Â°F	Mean
	15.08 Âµm/m-Â°C @Temperature 24.0 - 300 Â°C	8.378 Âµin/in-Â°F @Temperature 75.2 - 572 Â°F	Mean
	15.59 Âµm/m-Â°C	8.661 Âµin/in-Â°F	Mean

Thermal Properties	Metric @Temperature 24.0 - 300 Â°C	English @Temperature 75.2 - 532 Â°F	Comments
	16.42 Âµm/m-Â°C	9.122 Âµin/in-Â°F	Mean
	@Temperature 21.0 - 700 Â°C	@Temperature 69.8 - 1290 Â°F	
Specific Heat Capacity	0.444 J/g-Â°C	0.106 BTU/lb-Â°F	
Thermal Conductivity	12.5 W/m-K	86.8 BTU-in/hr-ftÂ²- Â°F	
Melting Point	1334 - 1371 Â°C	2433 - 2500 Â°F	
Solidus	1334 Â°C	2433 Â°F	
Liquidus	1371 Â°C	2500 Â°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	0.0000985 ohm-cm	0.0000985 ohm-cm	
Magnetic Permeability	1.01	1.01	at 200 Oersted (15.9 kA/m);Annealed

Curie Temperature Electrical Properties	$\leq -78.0\text{ }^{\circ}\text{C}$ Metric	$\leq -108\text{ }^{\circ}\text{F}$ English	Comments
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