Special Metals NIMONICÂ® Alloy 81

Category : Metal , Nonferrous Metal , Nickel Alloy , Superalloy

Material Notes:

A precipitation-hardenable nickel-chromium alloy with enhanced resistance to high-temperature corrosion. The excellent hot-corrosion resistance of the alloy results from its high chromium content of 30%. The alloy also has good tensile and rupture strength and creep resistance at elevated temperatures. Used for gas turbines, piston-engine exhaust valves, and furnace equipment subject to attack by deposits resulting from combustion of impure fuels, particularly those containing alkali metal sulfates and chlorides. The standard product form is round.Data provided by the manufacturer, Special Metals.

Order this product through the following link:
http://www.lookpolymers.com/polymer_Special-Metals-NIMONIC-Alloy-81.php

Physical Properties	Metric	English	Comments
Density	8.06 g/cc	0.291 lb/inÂ³	

Mechanical Properties	Metric	English	Comments
Tensile Strength, Ultimate	830 MPa @Temperature 650 Â°C	120000 psi @Temperature 1200 Â°F	Precipitation Hardened prior to test
	1050 MPa @Temperature 23.0 Â°C	152000 psi @Temperature 73.4 Â°F	
Tensile Strength, Yield	600 MPa @Strain 0.200 %	87000 psi @Strain 0.200 %	Precipitation Hardened. Value at room temperature
	520 MPa @Strain 0.200 %, Temperature 650 Â°C	75400 psi @Strain 0.200 %, Temperature 1200 Â°F	Precipitation Hardened prior to test
Elongation at Break	40 %	40 %	Precipitation Hardened
	30 % @Temperature 650 Â°C	30 % @Temperature 1200 Â°F	Precipitation Hardened prior to test.

Thermal Properties	Metric	English	Comments
CTE, linear	11.1 Âµm/m-Â°C @Temperature 20.0 - 100 Â°C	6.17 Âµin/in-Â°F @Temperature 68.0 - 212 Â°F	
Specific Heat Capacity	0.461 J/g-Â°C	0.110 BTU/lb-Â°F	

Thermal Properties	Metric	English	Comments
Thermal Conductivity	10.9 W/m-K	75.6 BTU-in/hr-ftÂ²-Â°F	
Melting Point	1305 - 1375 Â°C	2381 - 2507 Â°F	
Solidus	1305 Â°C	2381 Â°F	
Liquidus	1375 Â°C	2507 Â°F	

Component Elements Properties	Metric	English	Comments
Aluminum, Al	0.90 %	0.90 %	
Boron, B	0.0030 %	0.0030 %	
Carbon, C	<= 0.050 %	<= 0.050 %	
Chromium, Cr	<= 30 %	<= 30 %	
Cobalt, Co	<= 2.0 %	<= 2.0 %	
Copper, Cu	<= 0.20 %	<= 0.20 %	
Iron, Fe	<= 1.0 %	<= 1.0 %	
Manganese, Mn	<= 0.50 %	<= 0.50 %	
Molybdenum, Mo	<= 0.30 %	<= 0.30 %	
Nickel, Ni	63 %	63 %	As remainder
Silicon, Si	<= 0.50 %	<= 0.50 %	
Sulfur, S	<= 0.015 %	<= 0.015 %	
Titanium, Ti	1.8 %	1.8 %	
Zirconium, Zr	0.060 %	0.060 %	

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.000127 ohm-cm	0.000127 ohm-cm	
Magnetic Permeability	1.0004	1.0004	at 200 oersted (15.9 kA/m)

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