

Special Metals NILO® Alloy 42 Controlled-Expansion Alloy

Category : Metal , Superalloy , Iron Base

Material Notes:

Inflection point 370°C. A nickel-iron controlled-expansion alloy containing 42% nickel. It has a low and nominally constant coefficient of thermal expansion from room temperature to about 570°F (300°C). Used for semiconductor lead frames in integrated circuits, bi-metal thermostat strip, thermostat rods, for ceramic-to-metal seals with alumina ceramics, and various glass-to-metal seals such as the core of copper-clad wire for sealing into glass envelopes of electric bulbs, radio valves, television tubes, and fluorescent lights. Standard product forms are tube, sheet, strip, and wire. Data provided by the manufacturer, Special Metals.

Order this product through the following link:

http://www.lookpolymers.com/polymer_Special-Metals-NILO-Alloy-42-Controlled-Expansion-Alloy.php

Physical Properties	Metric	English	Comments
Density	8.11 g/cc	0.293 lb/in ³	

Mechanical Properties	Metric	English	Comments
Tensile Strength, Ultimate	490 MPa	71100 psi	Annealed prior to test
	430 MPa @Temperature 300 °C	62400 psi @Temperature 572 °F	Annealed prior to test
Tensile Strength, Yield	250 MPa @Strain 0.200 %	36300 psi @Strain 0.200 %	Annealed prior to test
	120 MPa @Strain 0.200 %, Temperature 300 °C	17400 psi @Strain 0.200 %, Temperature 572 °F	Annealed prior to test
Elongation at Break	42 %	42 %	Annealed prior to test.
	42 % @Temperature 300 °C	42 % @Temperature 572 °F	Annealed prior to test.

Thermal Properties	Metric	English	Comments
CTE, linear	5.30 µm/m-°C @Temperature 20.0 - 100 °C	2.94 µin/in-°F @Temperature 68.0 - 212 °F	
	4.50 - 6.50 µm/m-°C @Temperature 20.0 - 300 °C	2.50 - 3.61 µin/in-°F @Temperature 68.0 - 572 °F	
Thermal Conductivity	10.5 W/m-K	72.9 BTU-in/hr-ft ² -°F	

Thermal Properties	Metric	English	Comments
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Component Elements Properties	Metric	English	Comments
Aluminum, Al	<= 0.15 %	<= 0.15 %	
Carbon, C	<= 0.050 %	<= 0.050 %	
Chromium, Cr	<= 0.25 %	<= 0.25 %	
Cobalt, Co	<= 1.0 %	<= 1.0 %	
Iron, Fe	55 %	55 %	As remainder
Manganese, Mn	<= 0.80 %	<= 0.80 %	
Nickel, Ni	42 %	42 %	nominal; adjustable to meet expansion requirements
Phosphorous, P	<= 0.025 %	<= 0.025 %	
Silicon, Si	<= 0.30 %	<= 0.30 %	
Sulfur, S	<= 0.025 %	<= 0.025 %	

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.0000610 ohm-cm	0.0000610 ohm-cm	

Contact Songhan Plastic Technology Co.,Ltd.

Website : www.lookpolymers.com

Email : sales@lookpolymers.com

Tel : +86 021-51131842

Mobile : +86 13061808058

Skype : lookpolymers

Address : United North Road 215,Fengxian District, Shanghai City,China