

## Special Metals NIMONIC® Alloy 80A

Category : Metal , Nonferrous Metal , Nickel Alloy , Superalloy

### Material Notes:

A nickel-chromium alloy similar to NIMONIC alloy 75 but made precipitation hardenable by additions of aluminum and titanium. The alloy has good corrosion and oxidation resistance and high tensile and creep-rupture properties at temperatures to 1500°F (815°C). Used for gas-turbine components (blades, rings, and discs), bolts, tube supports in nuclear steam generators, die-casting inserts and cores, and exhaust valves in internal-combustion engines. Standard product forms are round, hexagon, flats, extruded section, tube, plate, sheet, and wire. Data provided by the manufacturer, Special Metals.

Order this product through the following link:

[http://www.lookpolymers.com/polymer\\_Special-Metals-NIMONIC-Alloy-80A.php](http://www.lookpolymers.com/polymer_Special-Metals-NIMONIC-Alloy-80A.php)

Physical Properties	Metric	English	Comments
Density	8.19 g/cc	0.296 lb/in <sup>3</sup>	

Mechanical Properties	Metric	English	Comments
Tensile Strength, Ultimate	1030 MPa	149000 psi	Precipitation Hardened prior to test
	@Temperature 650 °C	@Temperature 1200 °F	
Tensile Strength, Yield	1250 MPa	181000 psi	Precipitation Hardened. Value at room temperature
	@Temperature 23.0 °C	@Temperature 73.4 °F	
Elongation at Break	780 MPa	113000 psi	Precipitation Hardened prior to test
	@Strain 0.200 %	@Strain 0.200 %	
Elongation at Break	710 MPa	103000 psi	Precipitation Hardened prior to test.
	@Strain 0.200 %, Temperature 650 °C	@Strain 0.200 %, Temperature 1200 °F	
Elongation at Break	30 %	30 %	Precipitation Hardened
	30 %	30 %	
Elongation at Break	30 %	30 %	Precipitation Hardened prior to test.
	@Temperature 650 °C	@Temperature 1200 °F	

Thermal Properties	Metric	English	Comments
CTE, linear	12.7 µm/m-°C	7.06 µin/in-°F	
	@Temperature 20.0 - 100 °C	@Temperature 68.0 - 212 °F	
Specific Heat Capacity	0.448 J/g-°C	0.107 BTU/lb-°F	

Thermal Properties	Metric	English	Comments
Melting Point	1320 - 1365 Å°C	2410 - 2489 Å°F	
Solidus	1320 Å°C	2410 Å°F	
Liquidus	1365 Å°C	2489 Å°F	

Component Elements Properties	Metric	English	Comments
Aluminum, Al	1.0 - 1.8 %	1.0 - 1.8 %	
Boron, B	<= 0.0080 %	<= 0.0080 %	
Carbon, C	<= 0.10 %	<= 0.10 %	
Chromium, Cr	18 - 21 %	18 - 21 %	
Cobalt, Co	<= 2.0 %	<= 2.0 %	
Copper, Cu	<= 0.20 %	<= 0.20 %	
Iron, Fe	<= 3.0 %	<= 3.0 %	
Manganese, Mn	<= 1.0 %	<= 1.0 %	
Nickel, Ni	69 %	69 %	As remainder
Silicon, Si	<= 1.0 %	<= 1.0 %	
Sulfur, S	<= 0.015 %	<= 0.015 %	
Titanium, Ti	1.8 - 2.7 %	1.8 - 2.7 %	
Zirconium, Zr	<= 0.15 %	<= 0.15 %	

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.000124 ohm-cm	0.000124 ohm-cm	
Magnetic Permeability	1.0006	1.0006	at 200 oersted (15.9 kA/m)

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