Special Metals INCONEL® Alloy X-750

Subcategory: Metal; Nickel Base; Superalloy

Key Words: MIL-N-7786, MIL-N-8550, MIL-S-23192, MIL-N-24114; NACE MR-01-75; AFNOR NC 15 FeT, SAE AMS 5542, 5582, 5583, 5598, 5667 - 5671, 5698, 5699, 5747, 7246, UNS N07750; BS HR505; ASTM B 637; ASME SB-637, Boiler Code Section III; Werkstoff Nr. 2.4669

Component	Wt. %	Component	Wt. %	Component	Wt. %
Al	0.4 - 1	Cu	Max 0.5	Ni	Min 70
C	Max 0.08	Fe	5 - 9	S	Max 0.01
Co	Max 1	Mn	Max 1	Si	Max 0.5
Cr	14 - 17	Nb	0.7 - 1.2	Ti	2.25 - 2.75

Material Notes:

Nickel content above includes cobalt; Nb content above includes Ta. A nickel-chromium alloy similar to INCONEL alloy 600 but made precipitation hardenable by additions of aluminum and titanium. The alloy has good resistance to corrosion and oxidation along with high tensile and creep-rupture properties at temperatures to about 1300°F (700°C). Its excellent relaxation resistance is useful for high-temperature springs and bolts. Used in gas turbines, rocket engines, nuclear reactors, pressure vessels, tooling, and aircraft structures. Standard product forms are round, flats, extruded section, forging stock, plate, sheet, strip, pipe, tube, and wire.

Data provided by the manufacturer, Special Metals.

Physical Properties	Metric	English	Comments
Density	8.28 g/cc	0.299 lb/in³	
Mechanical Properties			
Tensile Strength, Ultimate	1250 MPa	181000 psi	Precipitation Hardened. Value at room temperature.
Tensile Strength, Ultimate at Elevated Temperature	1120 MPa	162000 psi	Precipitation Hardened prior to test; 550°C
Tensile Strength, Yield	850 MPa	123000 psi	Precipitation Hardened. Value at room temperature; 0.2% offset.

Tensile Strength, Yield at Elevated Temperature	760 MPa	110000 psi	Precipitation Hardened prior to test; 0.2% offset; 550°C
Elongation at Break	30 %	30 %	Precipitation Hardened
Elongation at Break at Elevated Temperature	22 %	22 %	Precipitation Hardened prior to test.; 550°C

Electrical Properties

Electrical Resistivity	0.000122 ohm-cm	0.000122 ohm-cm	
Magnetic Permeability	1.0035	1.0035	at 200 oersted (15.9 kA/m)
Curie Temperature	-125 °C	-193 °F	

Thermal Properties

CTE, linear 20°C	12.6 µm/m-°C	7 µin/in-°F	20-100°C
Specific Heat Capacity	0.431 J/g-°C	0.103 BTU/lb-°F	
Thermal Conductivity	12 W/m-K	83.3 BTU-in/hr-ft²-°F	
Melting Point	1390 - 1430 °C	2530 - 2610 °F	
Solidus	1390 °C	2530 °F	
Liquidus	1430 °C	2610 °F	

Some of the values displayed above may have been converted from their original units and/or rounded in order to display the information in a consistent format. Users requiring more precise data for scientific or engineering calculations can click on the property value to see the original value as well as raw conversions to equivalent units. We advise that you only use the original value or one of its raw conversions in your calculations to minimize rounding error.