

Haynes Multimet® alloy, 12.7-50.8 mm hot-rolled bar, 1185°C heat treatment, water quenched

Category : Metal , Superalloy , Iron Base

Material Notes:

Recommended for use in applications involving high stress at temperatures up to 816°C (1500°F), and moderate stresses up to 1093°C (2000°F). Excellent oxidation resistance, good ductility, and is readily fabricated. Current applications include aircraft, including tailpipes and tailcones, afterburner parts, exhaust manifolds, combustion chambers, turbine blades, buckets and nozzles. Excellent service for high temperature bolts. Data provided by the manufacturer, Haynes International, Inc.

Order this product through the following link:

http://www.lookpolymers.com/polymer_Haynes-Multimet-alloy-127-508-mm-hot-rolled-bar-1185C-heat-treatment-water-quenched.php

Physical Properties	Metric	English	Comments
Density	8.20 g/cc	0.296 lb/in ³	

Mechanical Properties	Metric	English	Comments
Hardness, Brinell	190	190	
Hardness, Knoop	211	211	Converted from Brinell hardness.
Hardness, Vickers	199	199	Converted from Brinell hardness.
Tensile Strength, Ultimate	767 MPa	111000 psi	
Tensile Strength, Yield	372 MPa	54000 psi	
	@Strain 0.200 %	@Strain 0.200 %	
Elongation at Break	57 %	57 %	in 25.4 mm
Poissons Ratio	0.298	0.298	RT
	0.315	0.315	
	@Temperature 426 °C	@Temperature 799 °F	
	0.319	0.319	
	@Temperature -78.0 °C	@Temperature -108 °F	
	0.325	0.325	
	@Temperature 650 °C	@Temperature 1200 °F	
	0.339	0.339	
	@Temperature 816 °C	@Temperature 1500 °F	

Thermal Properties	Metric	English	Comments
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Thermal Properties	15.3 $\mu\text{m}/\text{m}^{\circ}\text{C}$ Metric	8.50 $\mu\text{in}/\text{in}^{\circ}\text{F}$ English	Comments
CTE, linear	@Temperature 23.0 - 300 $^{\circ}\text{C}$	@Temperature 73.4 - 572 $^{\circ}\text{F}$	
	15.6 $\mu\text{m}/\text{m}^{\circ}\text{C}$	8.67 $\mu\text{in}/\text{in}^{\circ}\text{F}$	
	@Temperature 23.0 - 400 $^{\circ}\text{C}$	@Temperature 73.4 - 752 $^{\circ}\text{F}$	
	16.0 $\mu\text{m}/\text{m}^{\circ}\text{C}$	8.89 $\mu\text{in}/\text{in}^{\circ}\text{F}$	
	@Temperature 23.0 - 500 $^{\circ}\text{C}$	@Temperature 73.4 - 932 $^{\circ}\text{F}$	
	16.7 $\mu\text{m}/\text{m}^{\circ}\text{C}$	9.28 $\mu\text{in}/\text{in}^{\circ}\text{F}$	
	@Temperature 23.0 - 600 $^{\circ}\text{C}$	@Temperature 73.4 - 1110 $^{\circ}\text{F}$	
	17.2 $\mu\text{m}/\text{m}^{\circ}\text{C}$	9.56 $\mu\text{in}/\text{in}^{\circ}\text{F}$	
	@Temperature 23.0 - 700 $^{\circ}\text{C}$	@Temperature 73.4 - 1290 $^{\circ}\text{F}$	
	17.5 $\mu\text{m}/\text{m}^{\circ}\text{C}$	9.72 $\mu\text{in}/\text{in}^{\circ}\text{F}$	
	@Temperature 23.0 - 800 $^{\circ}\text{C}$	@Temperature 73.4 - 1470 $^{\circ}\text{F}$	
	17.8 $\mu\text{m}/\text{m}^{\circ}\text{C}$	9.89 $\mu\text{in}/\text{in}^{\circ}\text{F}$	
	@Temperature 23.0 - 1000 $^{\circ}\text{C}$	@Temperature 73.4 - 1830 $^{\circ}\text{F}$	
	17.8 $\mu\text{m}/\text{m}^{\circ}\text{C}$	9.89 $\mu\text{in}/\text{in}^{\circ}\text{F}$	
	@Temperature 23.0 - 900 $^{\circ}\text{C}$	@Temperature 73.4 - 1650 $^{\circ}\text{F}$	
	18.4 $\mu\text{m}/\text{m}^{\circ}\text{C}$	10.2 $\mu\text{in}/\text{in}^{\circ}\text{F}$	
	@Temperature 23.0 - 1100 $^{\circ}\text{C}$	@Temperature 73.4 - 2010 $^{\circ}\text{F}$	
Specific Heat Capacity	0.435 J/g- $^{\circ}\text{C}$	0.104 BTU/lb- $^{\circ}\text{F}$	
	@Temperature ≥ 100 $^{\circ}\text{C}$	@Temperature ≥ 212 $^{\circ}\text{F}$	
Thermal Conductivity	15.9 W/m-K	110 BTU-in/hr-ft 2 - $^{\circ}\text{F}$	
	@Temperature 300 $^{\circ}\text{C}$	@Temperature 572 $^{\circ}\text{F}$	
	17.3 W/m-K	120 BTU-in/hr-ft 2 - $^{\circ}\text{F}$	
	@Temperature 400 $^{\circ}\text{C}$	@Temperature 752 $^{\circ}\text{F}$	
	18.6 W/m-K	129 BTU-in/hr-ft 2 - $^{\circ}\text{F}$	
	@Temperature 500 $^{\circ}\text{C}$	@Temperature 932 $^{\circ}\text{F}$	
	20.0 W/m-K	139 BTU-in/hr-ft 2 - $^{\circ}\text{F}$	

Thermal Properties	Metric @ Temperature 600 °C	English @ Temperature 1110 °F	Comments
	20.0 W/m-K	139 BTU-in/hr-ft ² -°F	
	@Temperature 200 °C	@Temperature 392 °F	
Melting Point	1288 - 1354 °C	2350 - 2469 °F	
Solidus	1288 °C	2350 °F	
Liquidus	1354 °C	2469 °F	

Optical Properties	Metric	English	Comments
Emissivity (0-1)	0.88	0.88	Oxidized
	@Temperature 1090 °C	@Temperature 1990 °F	

Component Elements Properties	Metric	English	Comments
Carbon, C	0.080 - 0.16 %	0.080 - 0.16 %	
Cb + Ta	0.75 - 1.25 %	0.75 - 1.25 %	
Chromium, Cr	20 - 22.5 %	20 - 22.5 %	
Cobalt, Co	18.5 - 21 %	18.5 - 21 %	
Iron, Fe	33 %	33 %	As remainder
Manganese, Mn	1.0 - 2.0 %	1.0 - 2.0 %	
Molybdenum, Mo	2.5 - 3.5 %	2.5 - 3.5 %	
Nickel, Ni	19 - 21 %	19 - 21 %	
Nitrogen, N	0.10 - 0.20 %	0.10 - 0.20 %	
Silicon, Si	<= 1.0 %	<= 1.0 %	
Tungsten, W	2.0 - 3.0 %	2.0 - 3.0 %	

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.0000930 ohm-cm	0.0000930 ohm-cm	
	@Temperature 22.0 °C	@Temperature 71.6 °F	

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