

Haynes Multimet® alloy, 6.15 mm hot-rolled bar, 10% cold reduction

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-615-mm-hot-rolled-bar-10-cold-reduction.php

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

Mechanical Properties	Metric	English	Comments
Hardness, Brinell	232	232	Converted from Rockwell C hardness.
Hardness, Knoop	245	245	Converted from Rockwell C hardness.
Hardness, Rockwell C	19	19	
Hardness, Vickers	237	237	Converted from Rockwell C hardness.
Tensile Strength, Ultimate	855 MPa	124000 psi	
Tensile Strength, Yield	709 MPa	103000 psi	
	@Strain 0.200 %	@Strain 0.200 %	
Elongation at Break	35 %	35 %	in 50.8 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
CTE, linear	15.3 $\mu\text{m}/\text{m}\cdot^{\circ}\text{C}$	8.50 $\mu\text{in}/\text{in}\cdot^{\circ}\text{F}$	
	@Temperature 23.0 - 300 $^{\circ}\text{C}$	@Temperature 73.4 - 572 $^{\circ}\text{F}$	
	15.6 $\mu\text{m}/\text{m}\cdot^{\circ}\text{C}$	8.67 $\mu\text{in}/\text{in}\cdot^{\circ}\text{F}$	
	@Temperature 23.0 - 400 $^{\circ}\text{C}$	@Temperature 73.4 - 752 $^{\circ}\text{F}$	
	16.0 $\mu\text{m}/\text{m}\cdot^{\circ}\text{C}$	8.89 $\mu\text{in}/\text{in}\cdot^{\circ}\text{F}$	
	@Temperature 23.0 - 500 $^{\circ}\text{C}$	@Temperature 73.4 - 932 $^{\circ}\text{F}$	
	16.7 $\mu\text{m}/\text{m}\cdot^{\circ}\text{C}$	9.28 $\mu\text{in}/\text{in}\cdot^{\circ}\text{F}$	
	@Temperature 23.0 - 600 $^{\circ}\text{C}$	@Temperature 73.4 - 1110 $^{\circ}\text{F}$	
	17.2 $\mu\text{m}/\text{m}\cdot^{\circ}\text{C}$	9.56 $\mu\text{in}/\text{in}\cdot^{\circ}\text{F}$	
	@Temperature 23.0 - 700 $^{\circ}\text{C}$	@Temperature 73.4 - 1290 $^{\circ}\text{F}$	
Specific Heat Capacity	17.5 $\mu\text{m}/\text{m}\cdot^{\circ}\text{C}$	9.72 $\mu\text{in}/\text{in}\cdot^{\circ}\text{F}$	
	@Temperature 23.0 - 800 $^{\circ}\text{C}$	@Temperature 73.4 - 1470 $^{\circ}\text{F}$	
	17.8 $\mu\text{m}/\text{m}\cdot^{\circ}\text{C}$	9.89 $\mu\text{in}/\text{in}\cdot^{\circ}\text{F}$	
	@Temperature 23.0 - 1000 $^{\circ}\text{C}$	@Temperature 73.4 - 1830 $^{\circ}\text{F}$	
	17.8 $\mu\text{m}/\text{m}\cdot^{\circ}\text{C}$	9.89 $\mu\text{in}/\text{in}\cdot^{\circ}\text{F}$	
	@Temperature 23.0 - 900 $^{\circ}\text{C}$	@Temperature 73.4 - 1650 $^{\circ}\text{F}$	
	18.4 $\mu\text{m}/\text{m}\cdot^{\circ}\text{C}$	10.2 $\mu\text{in}/\text{in}\cdot^{\circ}\text{F}$	
	@Temperature 23.0 - 1100 $^{\circ}\text{C}$	@Temperature 73.4 - 2010 $^{\circ}\text{F}$	
	0.435 $\text{J}/\text{g}\cdot^{\circ}\text{C}$	0.104 $\text{BTU}/\text{lb}\cdot^{\circ}\text{F}$	
	@Temperature ≥ 100 $^{\circ}\text{C}$	@Temperature ≥ 212 $^{\circ}\text{F}$	
Thermal Conductivity	15.9 $\text{W}/\text{m}\cdot\text{K}$	110 $\text{BTU}\cdot\text{in}/\text{hr}\cdot\text{ft}^2\cdot^{\circ}\text{F}$	
	@Temperature 300 $^{\circ}\text{C}$	@Temperature 572 $^{\circ}\text{F}$	
	17.3 $\text{W}/\text{m}\cdot\text{K}$	120 $\text{BTU}\cdot\text{in}/\text{hr}\cdot\text{ft}^2\cdot^{\circ}\text{F}$	
@Temperature 400 $^{\circ}\text{C}$	@Temperature 752 $^{\circ}\text{F}$		
18.6 $\text{W}/\text{m}\cdot\text{K}$	129 $\text{BTU}\cdot\text{in}/\text{hr}\cdot\text{ft}^2\cdot^{\circ}\text{F}$		

Thermal Properties	@Temperature 500 °C Metric	@Temperature 932 °F English	Comments
	20.0 W/m-K	139 BTU-in/hr-ft ² -°F	
	@Temperature 600 °C	@Temperature 1110 °F	
	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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