

Haynes HR-160® alloy, hot rolled and solution annealed plate

Category : Metal , Nonferrous Metal , Nickel Alloy , Superalloy

Material Notes:

Outstanding resistance to various forms of high-temperature corrosion attack, excellent resistance to sulfidation and chloride attack in both reducing and oxidizing atmospheres. Excellent forming and welding characteristics. Applications include a variety of fabricated components in municipal, industrial, hazardous, and nuclear waste heat recovery systems. Also suitable for utility boilers, sulfur plants, high-temperature furnaces, kilns, calciners, resource recovery units, cement kilns, pulp and paper recovery boilers, coal gasification systems, and fluidized-bed-combustion systems. Data provided by the manufacturer, Haynes International, Inc.

Order this product through the following link:

http://www.lookpolymers.com/polymer_Haynes-HR-160-alloy-hot-rolled-and-solution-annealed-plate.php

Physical Properties	Metric	English	Comments
Density	8.08 g/cc	0.292 lb/in ³	

Mechanical Properties	Metric	English	Comments
Tensile Strength, Ultimate	767 MPa	111000 psi	
	30.0 MPa	4350 psi	
	@Temperature 1204 °C	@Temperature 2199 °F	
	41.0 MPa	5950 psi	
	@Temperature 1149.0 °C	@Temperature 2100.2 °F	
	74.0 MPa	10700 psi	
	@Temperature 1093 °C	@Temperature 1999 °F	
	140 MPa	20300 psi	
	@Temperature 982 °C	@Temperature 1800 °F	
	264 MPa	38300 psi	
	@Temperature 871 °C	@Temperature 1600 °F	
	428 MPa	62100 psi	
	@Temperature 760 °C	@Temperature 1400 °F	
	523 MPa	75900 psi	
	@Temperature 649 °C	@Temperature 1200 °F	

Mechanical Properties	Metric	English	Comments
	@Temperature 538 Â°C	@Temperature 1000 Â°F	
	605 MPa	87700 psi	
	@Temperature 427 Â°C	@Temperature 801 Â°F	
	634 MPa	92000 psi	
	@Temperature 316 Â°C	@Temperature 601 Â°F	
	675 MPa	97900 psi	
	@Temperature 204 Â°C	@Temperature 399 Â°F	
	717 MPa	104000 psi	
	@Temperature 93.0 Â°C	@Temperature 199 Â°F	
Tensile Strength, Yield	314 MPa	45500 psi	
	@Strain 0.200 %	@Strain 0.200 %	
	11.0 MPa	1600 psi	
	@Strain 0.200 %, Temperature 1204 Â°C	@Strain 0.200 %, Temperature 2199 Â°F	
	16.0 MPa	2320 psi	
	@Strain 0.200 %, Temperature 1149 Â°C	@Strain 0.200 %, Temperature 2100 Â°F	
	34.0 MPa	4930 psi	
	@Strain 0.200 %, Temperature 1093 Â°C	@Strain 0.200 %, Temperature 1999 Â°F	
	74.0 MPa	10700 psi	
	@Strain 0.200 %, Temperature 982 Â°C	@Strain 0.200 %, Temperature 1800 Â°F	
	152 MPa	22000 psi	
	@Strain 0.200 %, Temperature 871 Â°C	@Strain 0.200 %, Temperature 1600 Â°F	
	170 MPa	24700 psi	
	@Strain 0.200 %, Temperature 760 Â°C	@Strain 0.200 %, Temperature 1400 Â°F	
	176 MPa	25500 psi	
	@Strain 0.200 %, Temperature 538 Â°C	@Strain 0.200 %, Temperature 1000 Â°F	
	177 MPa	25700 psi	

Mechanical Properties	Metric	English	Comments
	@Strain 0.200 %, Temperature 649 Â°C	@Strain 0.200 %, Temperature 1200 Â°F	
	179 MPa	26000 psi	
	@Strain 0.200 %, Temperature 427 Â°C	@Strain 0.200 %, Temperature 801 Â°F	
	190 MPa	27600 psi	
	@Strain 0.200 %, Temperature 316 Â°C	@Strain 0.200 %, Temperature 601 Â°F	
	233 MPa	33800 psi	
	@Strain 0.200 %, Temperature 204 Â°C	@Strain 0.200 %, Temperature 399 Â°F	
	279 MPa	40500 psi	
	@Strain 0.200 %, Temperature 93.0 Â°C	@Strain 0.200 %, Temperature 199 Â°F	
Elongation at Break	68 %	68 %	in 34.0 mm
	69 %	69 %	in 34.0 mm
	@Temperature 93.0 Â°C	@Temperature 199 Â°F	
	70 %	70 %	in 34.0 mm
	@Temperature 649 Â°C	@Temperature 1200 Â°F	
	71 %	71 %	in 34.0 mm
	@Temperature 204 Â°C	@Temperature 399 Â°F	
	73 %	73 %	in 34.0 mm
	@Temperature 760 Â°C	@Temperature 1400 Â°F	
	74 %	74 %	in 34.0 mm
	@Temperature 316 Â°C	@Temperature 601 Â°F	
	76 %	76 %	in 34.0 mm
	@Temperature 427 Â°C	@Temperature 801 Â°F	
	76 %	76 %	in 34.0 mm
	@Temperature 538 Â°C	@Temperature 1000 Â°F	
	85 %	85 %	in 34.0 mm
	@Temperature 871 Â°C	@Temperature 1600 Â°F	

Mechanical Properties	90 % Metric	90 % English	Comments
	@Temperature 1093 Â°C	@Temperature 1999 Â°F	in 34.0 mm
	90 %	90 %	
	@Temperature 982 Â°C	@Temperature 1800 Â°F	in 34.0 mm
	110 %	110 %	
	@Temperature 1204 Â°C	@Temperature 2199 Â°F	in 34.0 mm
	113 %	113 %	
	@Temperature 1149.0 Â°C	@Temperature 2100.2 Â°F	in 34.0 mm
Reduction of Area	73 %	73 %	
	64 %	64 %	
	@Temperature 760 Â°C	@Temperature 1400 Â°F	
	67 %	67 %	
	@Temperature 649 Â°C	@Temperature 1200 Â°F	
	68 %	68 %	
	@Temperature 427 Â°C	@Temperature 801 Â°F	
	69 %	69 %	
	@Temperature 538 Â°C	@Temperature 1000 Â°F	
	70 %	70 %	
	@Temperature 316 Â°C	@Temperature 601 Â°F	
	74 %	74 %	
	@Temperature 93.0 Â°C	@Temperature 199 Â°F	
	74 %	74 %	
	@Temperature 204 Â°C	@Temperature 399 Â°F	
	84 %	84 %	
	@Temperature 871 Â°C	@Temperature 1600 Â°F	
	94 %	94 %	
	@Temperature 1204	@Temperature 2199	

Mechanical Properties	°C Metric	°F English	Comments
	94 %	94 %	
	@Temperature 1149.0 °C	@Temperature 2100.2 °F	
	98 %	98 %	
	@Temperature 982 °C	@Temperature 1800 °F	
	98 %	98 %	
	@Temperature 1093 °C	@Temperature 1999 °F	
Modulus of Elasticity	211 GPa	30600 ksi	
	137 GPa	19900 ksi	
	@Temperature 980 °C	@Temperature 1800 °F	
	145 GPa	21000 ksi	
	@Temperature 925 °C	@Temperature 1700 °F	
	150 GPa	21800 ksi	
	@Temperature 870 °C	@Temperature 1600 °F	
	154 GPa	22300 ksi	
	@Temperature 815 °C	@Temperature 1500 °F	
	158 GPa	22900 ksi	
	@Temperature 760 °C	@Temperature 1400 °F	
	163 GPa	23600 ksi	
	@Temperature 705 °C	@Temperature 1300 °F	
	168 GPa	24400 ksi	
	@Temperature 650 °C	@Temperature 1200 °F	
	173 GPa	25100 ksi	
	@Temperature 595 °C	@Temperature 1100 °F	
	177 GPa	25700 ksi	
	@Temperature 540 °C	@Temperature 1000 °F	

Mechanical Properties	Metric	English	Comments
	180 GPa	26000 ksi	
	@Temperature 480 Â°C	@Temperature 896 Â°F	
	183 GPa	26500 ksi	
	@Temperature 425 Â°C	@Temperature 797 Â°F	
	187 GPa	27100 ksi	
	@Temperature 370 Â°C	@Temperature 698 Â°F	
	192 GPa	27800 ksi	
	@Temperature 315 Â°C	@Temperature 599 Â°F	
	197 GPa	28600 ksi	
	@Temperature 260 Â°C	@Temperature 500 Â°F	
	201 GPa	29200 ksi	
	@Temperature 205 Â°C	@Temperature 401 Â°F	
	204 GPa	29600 ksi	
	@Temperature 150 Â°C	@Temperature 302 Â°F	
	208 GPa	30200 ksi	
	@Temperature 90.0 Â°C	@Temperature 194 Â°F	
	210 GPa	30500 ksi	
	@Temperature 40.0 Â°C	@Temperature 104 Â°F	

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.0001112 ohm-cm	0.0001112 ohm-cm	
	0.0001231 ohm-cm	0.0001231 ohm-cm	
	@Temperature 700 Â°C	@Temperature 1290 Â°F	
	0.0001238 ohm-cm	0.0001238 ohm-cm	
	@Temperature 800 Â°C	@Temperature 1470 Â°F	
	0.0001245 ohm-cm	0.0001245 ohm-cm	
	@Temperature 900 Â°C	@Temperature 1650 Â°F	

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