

Haynes Hastelloy® G-30® alloy, plate and bar

Category : Metal , Nonferrous Metal , Nickel Alloy , Superalloy

Material Notes:

HASTELLOY® G-30® alloy is a high chromium nickel-base alloy which shows superior corrosion resistance in commercial phosphoric acids as well as many complex environments containing highly oxidizing acids such as nitric/hydrochloric, nitric/hydrofluoric and sulfuric acids. The resistance of G-30 alloy to the formation of grain boundary precipitates in the heat-affected zone makes it suitable for use in most chemical process applications in the as-welded condition. HASTELLOY G-30 alloy is available in the form of plate, sheet, strip, billet, bar, wire, covered electrodes, pipe and tubing. Typical Applications: Phosphoric Acid Service Sulfuric Acid Service Nitric Acid Service Nuclear Fuel Reprocessing Nuclear Waste Processing Pickling Operations Petrochemicals Fertilizer Manufacture Pesticide Manufacture Gold Ore Extraction Heat Treatment: The standard solution heat treatment consists of heating to 2150°F (1177°C) followed by rapid air-cooling or water quenching. Parts which have been hot formed should be solution heat-treated prior to final fabrication or installation. Forming: G-30 alloy has excellent forming characteristics and cold forming is the preferred method of forming. Because of its good ductility, it can be easily cold-worked. The alloy is generally stiffer than the austenitic stainless steels so more energy is required during cold forming. Data provided by the manufacturer, Haynes International, Inc.

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http://www.lookpolymers.com/polymer_Haynes-Hastelloy-G-30-alloy-plate-and-bar.php

Physical Properties	Metric	English	Comments
Density	8.22 g/cc	0.297 lb/in ³	

Mechanical Properties	Metric	English	Comments
Tensile Strength, Ultimate	710 MPa	103000 psi	
	524 MPa	76000 psi	
	@Temperature 538 °C	@Temperature 1000 °F	
	552 MPa	80100 psi	
	@Temperature 427 °C	@Temperature 801 °F	
	572 MPa	83000 psi	
	@Temperature 316 °C	@Temperature 601 °F	
	607 MPa	88000 psi	
	@Temperature 204 °C	@Temperature 399 °F	
	655 MPa	95000 psi	
	@Temperature 93.0 °C	@Temperature 199 °F	
Tensile Strength, Yield	338 MPa	49000 psi	
	@Strain 0.200 %	@Strain 0.200 %	

Mechanical Properties	Metric	English	Comments
	@Strain 0.200 %, Temperature 538 °C	@Strain 0.200 %, Temperature 1000 °F	
	214 MPa	31000 psi	
	@Strain 0.200 %, Temperature 427 °C	@Strain 0.200 %, Temperature 801 °F	
	228 MPa	33100 psi	
	@Strain 0.200 %, Temperature 316 °C	@Strain 0.200 %, Temperature 601 °F	
	248 MPa	36000 psi	
	@Strain 0.200 %, Temperature 204 °C	@Strain 0.200 %, Temperature 399 °F	
	290 MPa	42100 psi	
	@Strain 0.200 %, Temperature 93.0 °C	@Strain 0.200 %, Temperature 199 °F	
Elongation at Break	53 %	53 %	in 50.8 mm
	54 %	54 %	in 50.8 mm
	@Temperature 93.0 °C	@Temperature 199 °F	
	59 %	59 %	in 50.8 mm
	@Temperature 204 °C	@Temperature 399 °F	
	59 %	59 %	in 50.8 mm
	@Temperature 316 °C	@Temperature 601 °F	
	60 %	60 %	in 50.8 mm
	@Temperature 427 °C	@Temperature 801 °F	
	62 %	62 %	in 50.8 mm
	@Temperature 538 °C	@Temperature 1000 °F	
Modulus of Elasticity	202 GPa	29300 ksi	plate heat treated to 1177°C, rapid quenched
	184 GPa	26700 ksi	plate heat treated to 1177°C and rapid quenched
	@Temperature 538 °C	@Temperature 1000 °F	
	192 GPa	27800 ksi	plate heat treated to 1177°C and rapid quenched
	@Temperature 427 °C	@Temperature 801 °F	

Mechanical Properties	194 GPa Metric	28100 ksi English	plate heat treated to 1177°C and rapid quenched
	@Temperature 316 Å°C	@Temperature 601 Å°F	
	196 GPa	28400 ksi	plate heat treated to 1177Å°C and rapid quenched
	@Temperature 204 Å°C	@Temperature 399 Å°F	
Charpy Impact	353 J	260 ft-lb	mill annealed

Thermal Properties	Metric	English	Comments
CTE, linear	14.4 Åµm/m-Å°C	8.00 Åµin/in-Å°F	
	@Temperature 30.0 - 316 Å°C	@Temperature 86.0 - 601 Å°F	
	14.9 Åµm/m-Å°C	8.28 Åµin/in-Å°F	
	@Temperature 30.0 - 427 Å°C	@Temperature 86.0 - 801 Å°F	
	15.5 Åµm/m-Å°C	8.61 Åµin/in-Å°F	
	@Temperature 30.0 - 538 Å°C	@Temperature 86.0 - 1000 Å°F	
Thermal Conductivity	16.0 Åµm/m-Å°C	8.89 Åµin/in-Å°F	
	@Temperature 30.0 - 760 Å°C	@Temperature 86.0 - 1400 Å°F	
	16.0 Åµm/m-Å°C	8.89 Åµin/in-Å°F	
	@Temperature 30.0 - 649 Å°C	@Temperature 86.0 - 1200 Å°F	
	10.2 W/m-K	70.8 BTU-in/hr-ftÅ²-Å°F	
	@Temperature 24.0 Å°C	@Temperature 75.2 Å°F	
	11.9 W/m-K	82.6 BTU-in/hr-ftÅ²-Å°F	
	@Temperature 100 Å°C	@Temperature 212 Å°F	
	14.4 W/m-K	99.9 BTU-in/hr-ftÅ²-Å°F	
	@Temperature 200 Å°C	@Temperature 392 Å°F	
	16.7 W/m-K	116 BTU-in/hr-ftÅ²-Å°F	
	@Temperature 300 Å°C	@Temperature 572 Å°F	
	18.7 W/m-K	130 BTU-in/hr-ftÅ²-Å°F	
	@Temperature 400 Å°C	@Temperature 752 Å°F	
	20.3 W/m-K	141 BTU-in/hr-ftÅ²-Å°F	

Thermal Properties	Metric	English	Comments
	@Temperature 500 Å°C	@Temperature 932 Å°F	
	21.4 W/m-K	149 BTU-in/hr-ftÅ²-Å°F	
	@Temperature 600 Å°C	@Temperature 1110 Å°F	

Component Elements Properties	Metric	English	Comments
Carbon, C	<= 0.030 %	<= 0.030 %	
Chromium, Cr	28 - 31.5 %	28 - 31.5 %	
Cobalt, Co	<= 5.0 %	<= 5.0 %	
Copper, Cu	1.0 - 2.4 %	1.0 - 2.4 %	
Iron, Fe	13 - 17 %	13 - 17 %	
Manganese, Mn	<= 1.5 %	<= 1.5 %	
Molybdenum, Mo	4.0 - 6.0 %	4.0 - 6.0 %	
Nb + Ta	0.30 - 1.5 %	0.30 - 1.5 %	
Nickel, Ni	43 %	43 %	As Remainder
Phosphorous, P	<= 0.040 %	<= 0.040 %	
Silicon, Si	0.80 %	0.80 %	
Sulfur, S	<= 0.020 %	<= 0.020 %	
Tungsten, W	1.5 - 4.0 %	1.5 - 4.0 %	

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.000116 ohm-cm	0.000116 ohm-cm	
	@Temperature 24.0 Å°C	@Temperature 75.2 Å°F	
	0.000117 ohm-cm	0.000117 ohm-cm	
	@Temperature 100 Å°C	@Temperature 212 Å°F	
	0.000119 ohm-cm	0.000119 ohm-cm	
	@Temperature 200 Å°C	@Temperature 392 Å°F	
Electrical Resistivity	0.000119 ohm-cm	0.000119 ohm-cm	
	@Temperature 300 Å°C	@Temperature 572 Å°F	
Electrical Resistivity	0.000123 ohm-cm	0.000123 ohm-cm	

Electrical Properties	@Temperature 400 Â°C Metric	@Temperature 752 Â°F English	Comments
	0.000124 ohm-cm	0.000124 ohm-cm	
	@Temperature 500 Â°C	@Temperature 932 Â°F	
	0.000125 ohm-cm	0.000125 ohm-cm	
	@Temperature 600 Â°C	@Temperature 1110 Â°F	

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