

Haynes Hastelloy® G-30® alloy, 12.7 mm (1/2 in.) thick plate, GTAW short arc weld 1.1 mm diameter filler wire

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-127-mm-12-in-thick-plate-GTAW-short-arc-weld-11-mm-diameter-filler-wire.php

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

Mechanical Properties	Metric	English	Comments
Tensile Strength, Ultimate	696 MPa	101000 psi	
	372 MPa	54000 psi	
	@Temperature 760 °C	@Temperature 1400 °F	
Tensile Strength, Yield	503 MPa	73000 psi	
	@Temperature 538 °C	@Temperature 1000 °F	
	365 MPa	52900 psi	
Tensile Strength, Yield	@Strain 0.200 %	@Strain 0.200 %	
	200 MPa	29000 psi	
	@Strain 0.200 %, Temperature 760 °C	@Strain 0.200 %, Temperature 1400 °F	
Tensile Strength, Yield	228 MPa	33100 psi	
	@Strain 0.200 %, Temperature 538 °C	@Strain 0.200 %, Temperature 1000 °F	

Elongation at Break Mechanical Properties	55 % Metric	55 % English	in 50.8 mm Comments
	27 %	27 %	in 50.8 mm
	@Temperature 760 °C	@Temperature 1400 °F	
	59 %	59 %	in 50.8 mm
	@Temperature 538 °C	@Temperature 1000 °F	
Reduction of Area	62 %	62 %	Fracture in base metal.
	15 - 26 %	15 - 26 %	Fracture in base metal.
	@Temperature 760 °C	@Temperature 1400 °F	
	32 - 64 %	32 - 64 %	Fracture in base metal.
	@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	
	194 GPa	28100 ksi	plate heat treated to 1177°C and rapid quenched
	@Temperature 316 °C	@Temperature 601 °F	
	196 GPa	28400 ksi	plate heat treated to 1177°C and rapid quenched
	@Temperature 204 °C	@Temperature 399 °F	

Thermal Properties	Metric	English	Comments
CTE, linear	14.4 µm/m-°C	8.00 µin/in-°F	
	@Temperature 30.0 - 316 °C	@Temperature 86.0 - 601 °F	
	14.9 µm/m-°C	8.28 µin/in-°F	
	@Temperature 30.0 - 427 °C	@Temperature 86.0 - 801 °F	
	15.5 µm/m-°C	8.61 µin/in-°F	
	@Temperature 30.0 - 538 °C	@Temperature 86.0 - 1000 °F	
	16.0 µm/m-°C	8.89 µin/in-°F	
	@Temperature 30.0 - 760 °C	@Temperature 86.0 - 1400 °F	

Thermal Properties	Metric	English	Comments
	@Temperature 30.0 - 649 °C	@Temperature 86.0 - 1200 °F	
Thermal Conductivity	10.2 W/m-K	70.8 BTU-in/hr-ft²-°F	
	@Temperature 24.0 °C	@Temperature 75.2 °F	
	11.9 W/m-K	82.6 BTU-in/hr-ft²-°F	
	@Temperature 100 °C	@Temperature 212 °F	
	14.4 W/m-K	99.9 BTU-in/hr-ft²-°F	
	@Temperature 200 °C	@Temperature 392 °F	
	16.7 W/m-K	116 BTU-in/hr-ft²-°F	
	@Temperature 300 °C	@Temperature 572 °F	
	18.7 W/m-K	130 BTU-in/hr-ft²-°F	
	@Temperature 400 °C	@Temperature 752 °F	
	20.3 W/m-K	141 BTU-in/hr-ft²-°F	
	@Temperature 500 °C	@Temperature 932 °F	
	21.4 W/m-K	149 BTU-in/hr-ft²-°F	
	@Temperature 600 °C	@Temperature 1110 °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 %	

Component Elements Properties	Metric	English	Comments
Longshore 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 °C	@Temperature 75.2 °F	
	0.000117 ohm-cm	0.000117 ohm-cm	
	@Temperature 100 °C	@Temperature 212 °F	
	0.000119 ohm-cm	0.000119 ohm-cm	
	@Temperature 200 °C	@Temperature 392 °F	
	0.000119 ohm-cm	0.000119 ohm-cm	
	@Temperature 300 °C	@Temperature 572 °F	
	0.000123 ohm-cm	0.000123 ohm-cm	
	@Temperature 400 °C	@Temperature 752 °F	
	0.000124 ohm-cm	0.000124 ohm-cm	
	@Temperature 500 °C	@Temperature 932 °F	
	0.000125 ohm-cm	0.000125 ohm-cm	
	@Temperature 600 °C	@Temperature 1110 °F	

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