

Haynes Hastelloy® G-35® Nickel Alloy Plate, Annealed at 2075°F (1135°C)

Category : Metal , Nonferrous Metal , Nickel Alloy

Material Notes:

Known for its corrosion performance, HASTELLOY® G-35® alloy was designed to resist "wet process" phosphoric acid, which is widely used in the production of fertilizers. Tests indicate that it is far superior to HASTELLOY® G-30® alloy and stainless steels, in this chemical. It was also designed to resist localized attack in the presence of chlorides, since under-deposit attack is a potential problem in evaporators used to concentrate "wet process" phosphoric acid. As a result of its high-chromium content, G-35 alloy is extremely resistant to other oxidizing acids, such as nitric, and mixtures containing nitric acid. It possesses moderate resistance to reducing acids, as a result of its appreciable molybdenum content, and, unlike other nickel-chromium-molybdenum alloys, it is very resistant to "caustic dealloying" in hot sodium hydroxide. Finally, G-35 alloy is much less susceptible to chloride-induced stress corrosion cracking than the high chromium stainless steels and nickel-chromium-iron alloys traditionally used in "wet process" phosphoric acid. G-35 alloy is available in the form of plate, sheet, strip, billet, bar, wire, covered electrodes, pipe, and tubing. Potential Applications: "Wet process" phosphoric acid evaporators. Pickling in nitric and hydrofluoric acids. Chemical process industry systems involving nitric and chlorides. Caustic neutralizing systems. Systems requiring resistance to high temperature corrosion at 800-1200°F. G-35 alloy is covered by ASME, ASTM, and DIN specifications. Welding: The weldability of G-35 alloy is similar to that of C-276 alloy. To weld G-35 alloy, three processes are commonly used. For sheet welds and plate root passes, gas tungsten arc (GTAW) welding is favored. For plate welds, the gas metal arc (GMAW) process is preferred. For field welding, the shielded metal arc process, using coated electrodes, is favored. Submerged arc welding is not recommended as this process is characterized by high heat input to the base metal and slow cooling of the weld. To minimize the precipitation of second phases in regions affected by the heat of welding, a maximum interpass temperature of 93°C (200°F) is recommended for G-35 alloy. Also, welding of cold-worked materials is strongly discouraged, since they sensitize more quickly and induce residual stresses. A full solution anneal, followed by water quenching, is recommended for cold-worked structures, prior to welding. Joining Base Metal Preparation: The joint surface and adjacent area should be thoroughly cleaned before welding. All grease, oil crayon marks, sulfur compounds, and other foreign matter should be removed. Filler Metal Selections: For gas tungsten arc and gas metal arc welding, G-35 filler wire is suggested. For shielded metal arc welding, G-35 covered electrodes are suggested. Heat Treatment: Wrought forms of HASTELLOY G-35 alloy are furnished in the solution annealed condition, unless otherwise specified. The standard solution annealing treatment consists of heating to 1121°C (2050°F) followed by rapid air-cooling or water quenching. Parts which have been hot formed should be solution annealed prior to final fabrication or installation. Forming: G-35 alloy has excellent forming characteristics, and cold forming is the preferred method of shaping. The alloy can be easily cold worked due to its good ductility. The alloy is generally stiffer than the austenitic stainless steels; therefore, more energy is required during cold forming. Data provided by the manufacturer, Haynes International, Inc.

Order this product through the following link:

http://www.lookpolymers.com/polymer_Haynes-Hastelloy-G-35-Nickel-Alloy-Plate-Annealed-at-2075F-1135C.php

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

Mechanical Properties	Metric	English	Comments
-----------------------	--------	---------	----------

Mechanical Properties Tensile Strength, Ultimate	483 MPa Metric	70100 psi English	Comments
	@Temperature 649 Å°C	@Temperature 1200 Å°F	
	501 MPa	72700 psi	
	@Temperature 593 Å°C	@Temperature 1100 Å°F	
	521 MPa	75600 psi	
	@Temperature 538 Å°C	@Temperature 1000 Å°F	
	543 MPa	78800 psi	
	@Temperature 482 Å°C	@Temperature 900 Å°F	
	561 MPa	81400 psi	
	@Temperature 427 Å°C	@Temperature 801 Å°F	
	570 MPa	82700 psi	
	@Temperature 371 Å°C	@Temperature 700 Å°F	
	583 MPa	84600 psi	
	@Temperature 316 Å°C	@Temperature 601 Å°F	
	600 MPa	87000 psi	
	@Temperature 260 Å°C	@Temperature 500 Å°F	
	623 MPa	90400 psi	
	@Temperature 204 Å°C	@Temperature 399 Å°F	
	656 MPa	95100 psi	
	@Temperature 149 Å°C	@Temperature 300 Å°F	
	692 MPa	100000 psi	
	@Temperature 93.0 Å°C	@Temperature 199 Å°F	
	689 MPa	99900 psi	
	@Thickness 12.7 mm, Temperature 25.0 Å°C	@Thickness 0.500 in, Temperature 77.0 Å°F	
	703 MPa	102000 psi	
	@Thickness 6.40 mm, Temperature 25.0 Å°C	@Thickness 0.252 in, Temperature 77.0 Å°F	
Tensile Strength, Yield	318 MPa	46100 psi	0.2% Offset
	@Thickness 12.7 mm, Temperature 25.0 Å°C	@Thickness 0.500 in, Temperature 77.0 Å°F	

Mechanical Properties	Metric ^{MPa}	English ^{psi}	Comments
	@Thickness 6.40 mm, Temperature 25.0 Â°C	@Thickness 0.252 in, Temperature 77.0 Â°F	0.2% Offset
	184 MPa	26700 psi	
	@Strain 0.200 %, Temperature 649 Â°C	@Strain 0.200 %, Temperature 1200 Â°F	
	185 MPa	26800 psi	
	@Strain 0.200 %, Temperature 593 Â°C	@Strain 0.200 %, Temperature 1100 Â°F	
	194 MPa	28100 psi	
	@Strain 0.200 %, Temperature 538 Â°C	@Strain 0.200 %, Temperature 1000 Â°F	
	204 MPa	29600 psi	
	@Strain 0.200 %, Temperature 482 Â°C	@Strain 0.200 %, Temperature 900 Â°F	
	215 MPa	31200 psi	
	@Strain 0.200 %, Temperature 427 Â°C	@Strain 0.200 %, Temperature 801 Â°F	
	217 MPa	31500 psi	
	@Strain 0.200 %, Temperature 371 Â°C	@Strain 0.200 %, Temperature 700 Â°F	
	219 MPa	31800 psi	
	@Strain 0.200 %, Temperature 316 Â°C	@Strain 0.200 %, Temperature 601 Â°F	
	232 MPa	33600 psi	
	@Strain 0.200 %, Temperature 260 Â°C	@Strain 0.200 %, Temperature 500 Â°F	
	248 MPa	36000 psi	
	@Strain 0.200 %, Temperature 204 Â°C	@Strain 0.200 %, Temperature 399 Â°F	
	278 MPa	40300 psi	
	@Strain 0.200 %, Temperature 149 Â°C	@Strain 0.200 %, Temperature 300 Â°F	
	313 MPa	45400 psi	
	@Strain 0.200 %, Temperature 93.0 Â°C	@Strain 0.200 %, Temperature 199 Â°F	
Elongation at Break	67.9 %	67.9 %	

Mechanical Properties	@Temperature 260 Â°C Metric	@Temperature 500 Â°F English	Comments
	68.2 %	68.2 %	
	@Temperature 149 Â°C	@Temperature 300 Â°F	
	68.8 %	68.8 %	
	@Temperature 316 Â°C	@Temperature 601 Â°F	
	69.3 %	69.3 %	
	@Temperature 93.0 Â°C	@Temperature 199 Â°F	
	69.5 %	69.5 %	
	@Temperature 204 Â°C	@Temperature 399 Â°F	
	70.2 %	70.2 %	
	@Temperature 649 Â°C	@Temperature 1200 Â°F	
	71 %	71 %	
	@Temperature 482 Â°C	@Temperature 900 Â°F	
	72 %	72 %	
	@Temperature 593 Â°C	@Temperature 1100 Â°F	
	72.3 %	72.3 %	
	@Temperature 371 Â°C	@Temperature 700 Â°F	
	72.7 %	72.7 %	
	@Temperature 538 Â°C	@Temperature 1000 Â°F	
	72.8 %	72.8 %	
	@Temperature 427 Â°C	@Temperature 801 Â°F	
	66 %	66 %	
	@Thickness 6.40 mm, Temperature 25.0 Â°C	@Thickness 0.252 in, Temperature 77.0 Â°F	
	72 %	72 %	
	@Thickness 12.7 mm, Temperature 25.0 Â°C	@Thickness 0.500 in, Temperature 77.0 Â°F	
Modulus of Elasticity	170 GPa	24700 ksi	Dynamic
	@Temperature 649 Â°C	@Temperature 1200 Â°F	
	177 GPa	25700 ksi	

Mechanical Properties	@Temperature 538 Â°C Metric	@Temperature 1000 English	Dynamic Comments
	183 GPa	26500 ksi	Dynamic
	@Temperature 427 Â°C	@Temperature 801 Â°F	
	189 GPa	27400 ksi	Dynamic
	@Temperature 316 Â°C	@Temperature 601 Â°F	
	204 GPa	29600 ksi	Dynamic
	@Temperature 25.0 Â°C	@Temperature 77.0 Â°F	

Thermal Properties	Metric	English	Comments
CTE, linear	12.3 Âµm/m-Â°C	6.83 Âµin/in-Â°F	
	@Temperature 21.0 - 100 Â°C	@Temperature 69.8 - 212 Â°F	
	12.6 Âµm/m-Â°C	7.00 Âµin/in-Â°F	
	@Temperature 21.0 - 200 Â°C	@Temperature 69.8 - 392 Â°F	
	13.2 Âµm/m-Â°C	7.33 Âµin/in-Â°F	
	@Temperature 21.0 - 300 Â°C	@Temperature 69.8 - 572 Â°F	
	13.4 Âµm/m-Â°C	7.44 Âµin/in-Â°F	
	@Temperature 21.0 - 400 Â°C	@Temperature 69.8 - 752 Â°F	
	13.6 Âµm/m-Â°C	7.56 Âµin/in-Â°F	
	@Temperature 21.0 - 500 Â°C	@Temperature 69.8 - 932 Â°F	
	14.4 Âµm/m-Â°C	8.00 Âµin/in-Â°F	
	@Temperature 21.0 - 600 Â°C	@Temperature 69.8 - 1110 Â°F	
Specific Heat Capacity	0.450 J/g-Â°C	0.108 BTU/lb-Â°F	
	@Temperature 25.0 Â°C	@Temperature 77.0 Â°F	
	0.470 J/g-Â°C	0.112 BTU/lb-Â°F	
	@Temperature 100 Â°C	@Temperature 212 Â°F	
	0.490 J/g-Â°C	0.117 BTU/lb-Â°F	
	@Temperature 200 Â°C	@Temperature 392 Â°F	
	0.510 J/g-Â°C	0.122 BTU/lb-Â°F	

Thermal Properties	Metric	English	Comments
	0.530 J/g-Â°C @Temperature 300 Â°C	0.127 BTU/lb-Â°F @Temperature 572 Â°F	
	@Temperature 400 Â°C	@Temperature 752 Â°F	
	0.530 J/g-Â°C @Temperature 500 Â°C	0.127 BTU/lb-Â°F @Temperature 932 Â°F	
	0.600 J/g-Â°C @Temperature 600 Â°C	0.143 BTU/lb-Â°F @Temperature 1110 Â°F	
Thermal Conductivity	10.0 W/m-K @Temperature 25.0 Â°C	69.4 BTU-in/hr-ftÂ²-Â°F @Temperature 77.0 Â°F	
	12.0 W/m-K @Temperature 100 Â°C	83.3 BTU-in/hr-ftÂ²-Â°F @Temperature 212 Â°F	
	14.0 W/m-K @Temperature 200 Â°C	97.2 BTU-in/hr-ftÂ²-Â°F @Temperature 392 Â°F	

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.000118 ohm-cm @Temperature 25.0 Â°C	0.000118 ohm-cm @Temperature 77.0 Â°F	
	0.000119 ohm-cm @Temperature 100 Â°C	0.000119 ohm-cm @Temperature 212 Â°F	
	0.000120 ohm-cm @Temperature 200 Â°C	0.000120 ohm-cm @Temperature 392 Â°F	
	0.000121 ohm-cm @Temperature 300 Â°C	0.000121 ohm-cm @Temperature 572 Â°F	
	0.000122 ohm-cm @Temperature 400 Â°C	0.000122 ohm-cm @Temperature 752 Â°F	
	0.000124 ohm-cm @Temperature 500 Â°C	0.000124 ohm-cm @Temperature 932 Â°F	
	0.000125 ohm-cm	0.000125 ohm-cm @Temperature 1110	

Electrical Properties	@Temperature 600 A°C Metric	A°F English	Comments
-----------------------	--------------------------------	----------------	----------

Contact Songhan Plastic Technology Co.,Ltd.

Website : www.lookpolymers.com

Email : sales@lookpolymers.com

Tel : +86 021-51131842

Mobile : +86 13061808058

Skype : lookpolymers

Address : United North Road 215,Fengxian District, Shanghai City,China