

Haynes 625SQ[®] Nickel Alloy Sheet

Category : Metal , Nonferrous Metal , Nickel Alloy

Material Notes:

Haynes 625SQ alloy is a solid-solution strengthened superalloy. It is a modification of Haynes 625 alloy designed to enhance resistance to fatigue at temperatures up to approximately 1200[°]F (649[°]C). The alloy composition is tightly controlled to very low levels of carbon, silicon, and nitrogen. Primary melting is by vacuum induction melting, followed by consumable electrode practice using electroslag remelting. During processing, the grain size is controlled to ASTM #5 or finer. Haynes 625SQ alloy sheet and strip meet the requirements of AMS 5879 and AMS 5599 specifications. Haynes 625SQ alloy is readily fabricated and welded using practices common to Haynes 625 alloy. Haynes 625SQ alloy sheet and strip find application in aerospace, automotive, and chemical process industry bellows, expansion joints, and fabrications where fatigue resistance, strength, and corrosion resistance are required. Data provided by the manufacturer, Haynes International, Inc.

Order this product through the following link:

http://www.lookpolymers.com/polymer_Haynes-625SQ-Nickel-Alloy-Sheet.php

Physical Properties	Metric	English	Comments
Density	8.44 g/cc	0.305 lb/in ³	

Mechanical Properties	Metric	English	Comments
Tensile Strength, Ultimate	497 MPa	72100 psi	AMS 5879
	@Temperature 760 [°] C	@Temperature 1400 [°] F	
	646 MPa	93700 psi	AMS 5879
	@Temperature 705 [°] C	@Temperature 1300 [°] F	
	776 MPa	113000 psi	AMS 5879
	@Temperature 425 [°] C	@Temperature 797 [°] F	
	776 MPa	113000 psi	AMS 5879
	@Temperature 540 [°] C	@Temperature 1000 [°] F	
	787 MPa	114000 psi	AMS 5879
	@Temperature 650 [°] C	@Temperature 1200 [°] F	
	809 MPa	117000 psi	AMS 5879
	@Temperature 315 [°] C	@Temperature 599 [°] F	
	895 MPa	130000 psi	AMS 5879
	@Temperature 25.0 [°] C	@Temperature 77.0 [°] F	

Mechanical Properties	Metric ^{MPa}	English ^{psi}	Comments
Tensile Strength, Yield	@Strain 0.200 %, Temperature 705 Â°C	@Strain 0.200 %, Temperature 1300 Â°F	AMS 5879
	323 MPa	46800 psi	AMS 5879
	@Strain 0.200 %, Temperature 650 Â°C	@Strain 0.200 %, Temperature 1200 Â°F	AMS 5879
	339 MPa	49200 psi	AMS 5879
	@Strain 0.200 %, Temperature 425 Â°C	@Strain 0.200 %, Temperature 797 Â°F	AMS 5879
	344 MPa	49900 psi	AMS 5879
	@Strain 0.200 %, Temperature 540 Â°C	@Strain 0.200 %, Temperature 1000 Â°F	AMS 5879
	353 MPa	51200 psi	AMS 5879
	@Strain 0.200 %, Temperature 315 Â°C	@Strain 0.200 %, Temperature 599 Â°F	AMS 5879
	452 MPa	65600 psi	AMS 5879
	@Strain 0.200 %, Temperature 25.0 Â°C	@Strain 0.200 %, Temperature 77.0 Â°F	AMS 5879
	3223 MPa	467500 psi	AMS 5879
	@Strain 0.200 %, Temperature 760 Â°C	@Strain 0.200 %, Temperature 1400 Â°F	AMS 5879
	51.7 %	51.7 %	2-inch (51 mm) sample; AMS 5879
Elongation at Break	@Temperature 25.0 Â°C	@Temperature 77.0 Â°F	2-inch (51 mm) sample; AMS 5879
	60.9 %	60.9 %	2-inch (51 mm) sample; AMS 5879
	@Temperature 425 Â°C	@Temperature 797 Â°F	2-inch (51 mm) sample; AMS 5879
	64.1 %	64.1 %	2-inch (51 mm) sample; AMS 5879
	@Temperature 315 Â°C	@Temperature 599 Â°F	2-inch (51 mm) sample; AMS 5879
	81.4 %	81.4 %	2-inch (51 mm) sample; AMS 5879
	@Temperature 650 Â°C	@Temperature 1200 Â°F	2-inch (51 mm) sample; AMS 5879
	88.8 %	88.8 %	2-inch (51 mm) sample; AMS 5879
	@Temperature 760 Â°C	@Temperature 1400 Â°F	2-inch (51 mm) sample; AMS 5879
	90.5 %	90.5 %	2-inch (51 mm) sample; AMS 5879
	@Temperature 540 Â°C	@Temperature 1000 Â°F	2-inch (51 mm) sample; AMS 5879

Mechanical Properties	Metric	English	Comments
	103.9%		
	@Temperature 705 Â°C	@Temperature 1300 Â°F	2-inch (51 mm) sample; AMS 5879
Modulus of Elasticity	126 GPa	18300 ksi	Dynamic
	@Temperature 1000 Â°C	@Temperature 1830 Â°F	
	142 GPa	20600 ksi	Dynamic
	@Temperature 900 Â°C	@Temperature 1650 Â°F	
	153 GPa	22200 ksi	Dynamic
	@Temperature 800 Â°C	@Temperature 1470 Â°F	
	163 GPa	23600 ksi	Dynamic
	@Temperature 700 Â°C	@Temperature 1290 Â°F	
	171 GPa	24800 ksi	Dynamic
	@Temperature 600 Â°C	@Temperature 1110 Â°F	
	186 GPa	27000 ksi	Dynamic
	@Temperature 400 Â°C	@Temperature 752 Â°F	
	199 GPa	28900 ksi	Dynamic
	@Temperature 200 Â°C	@Temperature 392 Â°F	
	208 GPa	30200 ksi	Dynamic
	@Temperature 20.0 Â°C	@Temperature 68.0 Â°F	

Thermal Properties	Metric	English	Comments
CTE, linear	14.2 Âµm/m-Â°C	7.89 Âµin/in-Â°F	
	@Temperature 20.0 - 500 Â°C	@Temperature 68.0 - 932 Â°F	
	14.8 Âµm/m-Â°C	8.22 Âµin/in-Â°F	
	@Temperature 20.0 - 600 Â°C	@Temperature 68.0 - 1110 Â°F	
	15.4 Âµm/m-Â°C	8.56 Âµin/in-Â°F	
	@Temperature 20.0 - 700 Â°C	@Temperature 68.0 - 1290 Â°F	
	16.1 Âµm/m-Â°C	8.94 Âµin/in-Â°F	

Thermal Properties	Metric	English	Comments
	@Temperature 20.0 - 800 Â°C	@Temperature 68.0 - 1470 Â°F	
	16.8 Âµm/m-Â°C	9.33 Âµin/in-Â°F	
	@Temperature 20.0 - 900 Â°C	@Temperature 68.0 - 1650 Â°F	
	17.4 Âµm/m-Â°C	9.67 Âµin/in-Â°F	
	@Temperature 20.0 - 1000 Â°C	@Temperature 68.0 - 1830 Â°F	
Thermal Conductivity	15.3 W/m-K	106 BTU-in/hr-ftÂ²-Â°F	
	@Temperature 400 Â°C	@Temperature 752 Â°F	
	18.3 W/m-K	127 BTU-in/hr-ftÂ²-Â°F	
	@Temperature 600 Â°C	@Temperature 1110 Â°F	
	19.8 W/m-K	137 BTU-in/hr-ftÂ²-Â°F	
	@Temperature 700 Â°C	@Temperature 1290 Â°F	
	21.5 W/m-K	149 BTU-in/hr-ftÂ²-Â°F	
	@Temperature 800 Â°C	@Temperature 1470 Â°F	
	23.4 W/m-K	162 BTU-in/hr-ftÂ²-Â°F	
	@Temperature 900 Â°C	@Temperature 1650 Â°F	
	25.6 W/m-K	178 BTU-in/hr-ftÂ²-Â°F	
	@Temperature 1000 Â°C	@Temperature 1830 Â°F	
Melting Point	1290 - 1350 Â°C	2350 - 2460 Â°F	
Solidus	1290 Â°C	2350 Â°F	
Liquidus	<= 1350 Â°C	<= 2460 Â°F	

Component Elements Properties	Metric	English	Comments
Aluminum, Al	<= 0.40 %	<= 0.40 %	
Carbon, C	<= 0.030 %	<= 0.030 %	
Cb + Ta	3.7 %	3.7 %	
Chromium, Cr	21 %	21 %	
Cobalt, Co	<= 1.0 %	<= 1.0 %	

Component Elements Properties	Metric	English	Comments
Manganese, Mn	<= 0.50 %	<= 0.50 %	
Molybdenum, Mo	9.0 %	9.0 %	
Nickel, Ni	>= 62 %	>= 62 %	as balance
Nitrogen, N	<= 0.020 %	<= 0.020 %	
Silicon, Si	<= 0.15 %	<= 0.15 %	
Titanium, Ti	<= 0.40 %	<= 0.40 %	

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.000134 ohm-cm	0.000134 ohm-cm	
	@Temperature 200 Â°C	@Temperature 392 Â°F	
	0.0001348 ohm-cm	0.0001348 ohm-cm	
	@Temperature 1000 Â°C	@Temperature 1830 Â°F	
	0.0001356 ohm-cm	0.0001356 ohm-cm	
	@Temperature 400 Â°C	@Temperature 752 Â°F	
	0.0001356 ohm-cm	0.0001356 ohm-cm	
	@Temperature 900 Â°C	@Temperature 1650 Â°F	
	0.0001365 ohm-cm	0.0001365 ohm-cm	
	@Temperature 800 Â°C	@Temperature 1470 Â°F	
	0.0001375 ohm-cm	0.0001375 ohm-cm	
	@Temperature 700 Â°C	@Temperature 1290 Â°F	
	0.0001379 ohm-cm	0.0001379 ohm-cm	
	@Temperature 600 Â°C	@Temperature 1110 Â°F	

Processing Properties	Metric	English	Comments
Annealing Temperature	>= 871 Â°C	>= 1600 Â°F	Bright Anneal; AMS 5879

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