Carpenter Custom 630 (17-Cr-4Ni) Precipitation Hardening Stainless Steel, Condition H 1100 (Heated 593°C)

Category : Metal , Ferrous Metal , Stainless Steel , Precipitation Hardening Stainless , T S10000 Series Stainless Steel

Material Notes:

Data provided by Carpenter Technology Corporation.Custom 630 (17Cr-4Ni) is a martensitic precipitation/age-hardening stainless steel offering high strength and hardness along with excellent corrosion resistance. It has good fabricating characteristics and can be age hardened by a single-step, low temperature treatment. It has been used for a variety of applications including oil field valve parts, chemical process equipment, aircraft fittings, fasteners, pump shafts, nuclear reactor components, gears, paper mill equipment, missile fittings, and jet engine parts. Project 70® stainless Custom 630 is an improved machinability modification.

Order this product through the following link:
http://www.lookpolymers.com/polymer_Carpenter-Custom-630-17-Cr-4Ni-Precipitation-Hardening-Stainless-Steel-Condition-H-1100-Heated-593C.php

Physical Properties	Metric	English	Comments
Density	7.81 g/cc	0.282 lb/in³	

Mechanical Properties	Metric	English	Comments
Tensile Strength, Ultimate	1034 MPa	150000 psi	
	1331 MPa @Temperature 0.000 °C	193000 psi @Temperature 32.0 °F	
	1440 MPa @Temperature -40.0 °C	209000 psi @Temperature -40.0 °F	
	1441 MPa @Temperature -62.0 °C	209000 psi @Temperature -79.6 °F	
	1710 MPa @Temperature -196 °C	248000 psi @Temperature -321 °F	
Tensile Strength, Yield	931 MPa @Strain 0.200 %	135000 psi @Strain 0.200 %	
	1262 MPa @Strain 0.200 %, Temperature 0.000 °C	183000 psi @Strain 0.200 %, Temperature 32.0 °F	
	1303 MPa @Strain 0.200 %, Temperature -40.0 °C	189000 psi @Strain 0.200 %, Temperature -40.0 °F	
	1351 MPa	195900 psi	

Mechanical Properties	Metric	English	Comments
	@Strain 0.200 %, Temperature -62.0 °C	@Strain 0.200 %, Temperature -79.6 °F	
	1675 MPa @Strain 0.200 %, Temperature -196 °C	242900 psi @Strain 0.200 %, Temperature -321 °F	
Elongation at Break	17 %	17 %	In 50 mm
	8.0 % @Temperature -196 °C	8.0 % @Temperature -321 °F	In 50 mm
	15 % @Temperature -62.0 °C	15 % @Temperature -79.6 °F	In 50 mm
	16 % @Temperature -40.0 °C	16 % @Temperature -40.0 °F	In 50 mm
	16 % @Temperature 0.000 °C	16 % @Temperature 32.0 °F	In 50 mm
Modulus of Elasticity	197 GPa	28600 ksi	
Poissons Ratio	0.272	0.272	
Shear Modulus	77.4 GPa	11200 ksi	Calculated

Thermal Properties	Metric	English	Comments
CTE, linear	11.5 µm/m-°C @Temperature 21.0 - 93.0 °C	6.39 µin/in-°F @Temperature 69.8 - 199 °F	
	12.2 µm/m-°C @Temperature 21.0 - 316 °C	6.78 µin/in-°F @Temperature 69.8 - 601 °F	
	12.5 µm/m-°C @Temperature 21.0 - 427 °C	6.94 µin/in-°F @Temperature 69.8 - 801 °F	
Specific Heat Capacity	0.419 J/g-°C @Temperature 0.000 - 100 °C	0.100 BTU/lb-°F @Temperature 32.0 - 212 °F	condition H 900
Thermal Conductivity	17.9 W/m-K @Temperature 149 °C	124 BTU-in/hr-ft²-°F @Temperature 300 °F	condition H 900
	22.6 W/m-K	157 BTU-in/hr-ft²-°F	

Thermal Properties	Metric	English	Comments
	@Temperature 482 °C	@Temperature 900 °F	condition H 900

Component Elements Properties	Metric	English	Comments
Carbon, C	<= 0.070 %	<= 0.070 %	
Chromium, Cr	15 - 17.5 %	15 - 17.5 %	
Copper, Cu	3.0 - 5.0 %	3.0 - 5.0 %	
Iron, Fe	73 %	73 %	as remainder
Manganese, Mn	<= 1.0 %	<= 1.0 %	
Nb + Ta	0.15 - 0.45 %	0.15 - 0.45 %	
Nickel, Ni	3.0 - 5.0 %	3.0 - 5.0 %	
Niobium, Nb (Columbium, Cb)	<= 0.45 %	<= 0.45 %	
Phosphorous, P	<= 0.040 %	<= 0.040 %	
Silicon, Si	<= 1.0 %	<= 1.0 %	
Sulfur, S	<= 0.030 %	<= 0.030 %	
Tantalum, Ta	<= 0.45 %	<= 0.45 %	

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.0000770 ohm-cm	0.0000770 ohm-cm	for condition H 900

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