

Carlson C 601 Nickel-Chromium-Iron Alloy

Category : Metal , Nonferrous Metal , Nickel Alloy , Superalloy

Material Notes:

General Description Carlson Alloy C 6021 is a nickel-chromium alloy, developed specifically for high – temperature service. This alloy exhibits outstanding resistance to both cyclic and static oxidation at temperatures up to 2300°F (1260°C). It has good resistance to aqueous corrosion and high mechanical strength. The high chromium and nickel content of C 601 provide a substantial degree of resistance to carburizing, nitriding and sulfur containing environments. The nickel-base also assures good resistance to stress corrosion cracking. C 601 exhibits excellent tensile and yield strengths and good creep-rupture strength. It will not become embrittled by extended exposure to high temperatures. **Applications** Thermal Processing – baskets, trays and fixtures for annealing, carburizing, carbonitriding, nitriding and other heat treating applications: radiant tubes, muffles, retorts, flame shields and burner nozzles in industrial furnaces; furnace atmosphere generators; infrared radiant shields. **Chemical Processing** – process heaters and insulating cans in ammonia reformers; combustion components and catalyst grid supports in nitric acid production; catalyst regenerators and air preheaters in polyethylene production. **Pollution Control** – combustion chambers in solid waste incinerators **Power Generation** – superheater tube supports, grid barriers and ash-handling systems. **Gas Turbines** – containment rings
Information provided by Carlson

Order this product through the following link:

http://www.lookpolymers.com/polymer_Carlson-C-601-Nickel-Chromium-Iron-Alloy.php

Physical Properties	Metric	English	Comments
Density	8.11 g/cc	0.293 lb/in ³	

Mechanical Properties	Metric	English	Comments
Tensile Strength at Break	>= 552 MPa	>= 80000 psi	
Tensile Strength, Yield	>= 207 MPa @Strain 0.200 %	>= 30000 psi @Strain 0.200 %	
Elongation at Break	>= 35 %	>= 35 %	
Creep Strength	1.379 MPa @Temperature 1090 °C, Time 3.60e+7 sec	200.0 psi @Temperature 2000 °F, Time 10000 hour	1% creep
	4.826 MPa @Temperature 982 °C, Time 3.60e+7 sec	700.0 psi @Temperature 1800 °F, Time 10000 hour	1% creep
	8.9632 MPa @Temperature 871 °C, Time 3.60e+7 sec	1300.0 psi @Temperature 1600 °F, Time 10000 hour	1% creep
Modulus of Elasticity	206 GPa	29900 ksi	Tension
Poissons Ratio	0.267	0.267	

Mechanical Properties	Metric	English	Comments
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Thermal Properties	Metric	English	Comments
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CTE, linear	17.1 $\mu\text{m}/\text{m}\cdot^{\circ}\text{C}$ @Temperature 21.1 - 871 $^{\circ}\text{C}$	9.50 $\mu\text{in}/\text{in}\cdot^{\circ}\text{F}$ @Temperature 70.0 - 1600 $^{\circ}\text{F}$	
Specific Heat Capacity	0.448 J/g- $^{\circ}\text{C}$	0.107 BTU/lb- $^{\circ}\text{F}$	
Melting Point	1302 - 1368 $^{\circ}\text{C}$	2375 - 2495 $^{\circ}\text{F}$	
Solidus	1302 $^{\circ}\text{C}$	2375 $^{\circ}\text{F}$	
Liquidus	1368 $^{\circ}\text{C}$	2495 $^{\circ}\text{F}$	

Component Elements Properties	Metric	English	Comments
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Aluminum, Al	1.0 - 1.7 %	1.0 - 1.7 %	
Boron, B	≤ 0.0060 %	≤ 0.0060 %	
Carbon, C	≤ 0.10 %	≤ 0.10 %	
Chromium, Cr	21 - 25 %	21 - 25 %	
Copper, Cu	≤ 1.0 %	≤ 1.0 %	
Iron, Fe	7.079 - 19.9 %	7.079 - 19.9 %	
Manganese, Mn	≤ 1.0 %	≤ 1.0 %	
Nickel, Ni	58 - 63 %	58 - 63 %	
Silicon, Si	≤ 0.50 %	≤ 0.50 %	
Sulfur, S	≤ 0.015 %	≤ 0.015 %	
Titanium, Ti	0.10 - 0.60 %	0.10 - 0.60 %	

Electrical Properties	Metric	English	Comments
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Electrical Resistivity	0.000119 ohm-cm	0.000119 ohm-cm	
Curie Temperature	≤ -195.56 $^{\circ}\text{C}$	≤ -320.01 $^{\circ}\text{F}$	

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