Carlson C 800 Nickel-Iron-Chromium Alloy

Category : Metal , Nonferrous Metal , Nickel Alloy , Superalloy

Material Notes:

General DescriptionCarlson Alloy C 800 is a nickel-iron-chromium alloy, combining high strength with excellent resistance to oxidation and carburization at elevated temperatures. This alloy resists sulfur attack, internal oxidation, scaling and corrosion in a wide variety of industrial atmospheres.The high chromium content of C 800 assures good resistance to oxidation, while the nickel content imparts a fair degree of resistance to stress corrosion cracking.Carlson Alloy C 800H is essentially the same alloy as C 800 except the carbon content is restricted to the upper portion of the specified range. C 800H also receives a solution-anneal which produces a coarser grain structure. This assures higher creep and rupture strengths, enabling C 800H to be used in applications that require prolonged exposure at elevated temperatures and/or in corrosive environments.ApplicationsChemical Processing – heat exchangers for nitric acid production; calciners, dryers and recuperators in soda ash plants; process equipment in fiberglass and ore processing plants.Petroleum and Petrochemical – tubing for hydrotreaters and effluent coolers; tubing, manifolds, pigtails and quench lines in hydrogen reformers; flare tips for incinerating waste gasses in refineries; reformer tubing, catalyst grid supports and converters for ammonia production; ethylene furnaces; tubing, bends and flanges for vinyl chloride production; steam superheaters for styrene production.Power Generation – boiler superheaters and reheater tubes and shields; gas turbine combustion cans, transition liners and diffusers.Thermal Processing – baskets and boxes, fixtures and radiant tubes for heat treat furnaces.Steel Production – coke plat quench-car liners and process piping; steam methane reformers and recuperators for direct reduction of iron ore.Information provided by Carlson

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http://www.lookpolymers.com/polymer_Carlson-C-800-Nickel-Iron-Chromium-Alloy.php

Physical Properties	Metric	English	Comments
Density	7.94 g/cc	0.287 lb/in³	

Mechanical Properties	Metric	English	Comments
Tensile Strength at Break	>= 517 MPa	>= 75000 psi	
Tensile Strength, Yield	>= 207 MPa @Strain 0.200 %	>= 30000 psi @Strain 0.200 %	
Elongation at Break	>= 30 %	>= 30 %	
Modulus of Elasticity	197 GPa	28500 ksi	
	132 GPa @Temperature 871 °C	19200 ksi @Temperature 1600 °F	
	169.9 GPa @Temperature 427 °C	24640 ksi @Temperature 800 °F	

Thermal Properties	Metric	English	Comments

Thermal Properties	Metric	English	Comments
CTE, linear	18.4 µm/m-°C @Temperature 21.1 - 871 °C	10.2 µin/in-°F @Temperature 70.0 - 1600 °F	
Melting Point	1357 - 1385 °C	2475 - 2525 °F	
Solidus	1357 °C	2475 °F	
Liquidus	1385 °C	2525 °F	

Component Elements Properties	Metric	English	Comments
Aluminum, Al	0.15 - 0.60 %	0.15 - 0.60 %	
Carbon, C	<= 0.010 %	<= 0.010 %	
Chromium, Cr	19 - 23 %	19 - 23 %	
Copper, Cu	<= 0.75 %	<= 0.75 %	
Iron, Fe	>= 39.5 %	>= 39.5 %	
Manganese, Mn	<= 1.5 %	<= 1.5 %	
Nickel, Ni	30 - 35 %	30 - 35 %	
Silicon, Si	<= 1.0 %	<= 1.0 %	
Sulfur, S	<= 0.015 %	<= 0.015 %	
Titanium, Ti	0.15 - 0.60 %	0.15 - 0.60 %	

Electrical Properties	Metric	English	Comments
Magnetic Permeability	1.014	1.014	200 Oersted
Curie Temperature	-115 °C	-175 °F	

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