

## Carlson C 825 Nickel-Iron-Chromium Alloy

Category : Metal , Nonferrous Metal , Nickel Alloy , Superalloy

### Material Notes:

**General Description** Carlson Alloy C 825 is a nickel-iron-chromium alloy, developed for use in extremely corrosive environments. The nickel content of this alloy makes it resistant to chloride-ion stress corrosion cracking; and in combination with its molybdenum and copper content, endows C 825 with resistance to oxidizing environments. When heated in the critical sensitization temperature range of 1200°F to 1400° (650°C to 760°C), C 825 resists pitting and intergranular attack.

**Applications** C 825 is utilized in numerous corrosive environments, including the processing and storage of reducing acids such as sulfuric and phosphoric solution. It is also used in various oxidizing environments, including nitric and acid solutions, nitrates and oxidizing salts. C 825 offers excellent resistance to corrosion by sea water.

**Chemical Processing** – heat exchangers, evaporators, pumps, piping, valves, vessels, expansion bellows, tank trucks, scrubbers, condensers, tank and vessel linings; and for processing and handling sulfuric acid, phosphoric acids, hydrofluoric acid, nitric acid, nitrates and oxidizing salts.

**Pulp and Paper** – wet scrubber linings in systems using sodium sulfite and sodium bisulfate solutions.

**Pickling Processes** – tank heaters and hooks

**Ore Processing** – hydrometallurgy and plate heat exchangers in copper refining.

**Pollution Control** – Hopper bottoms and trays in electrostatic precipitators; ducts and dampers, stack-gas reheaters, waste heat recovery exchangers, stack liners and other wet scrubber components; sludge-incinerator wet scrubbers; marine inert-gas scrubbers; radwaste evaporator systems.

Information provided by Carlson

Order this product through the following link:

[http://www.lookpolymers.com/polymer\\_Carlson-C-825-Nickel-Iron-Chromium-Alloy.php](http://www.lookpolymers.com/polymer_Carlson-C-825-Nickel-Iron-Chromium-Alloy.php)

Physical Properties	Metric	English	Comments
Density	8.14 g/cc	0.294 lb/in <sup>3</sup>	

Mechanical Properties	Metric	English	Comments
Tensile Strength at Break	>= 586 MPa	>= 85000 psi	
Tensile Strength, Yield	>= 241 MPa	>= 35000 psi	
	@Strain 0.200 %	@Strain 0.200 %	
Elongation at Break	>= 30 %	>= 30 %	
Modulus of Elasticity	195 GPa	28300 ksi	
	119 GPa	17300 ksi	
	@Temperature 982 °C	@Temperature 1800 °F	
	164 GPa	23800 ksi	
	@Temperature 538 °C	@Temperature 1000 °F	

Thermal Properties	Metric	English	Comments
CTE, linear	14.0 µm/m-°C	7.80 µin/in-°F	

Thermal Properties	Metric @Temperature 26.7 - 99.9 °C	English @Temperature 80.0 - 200 °F	Comments
	15.3 µm/m-°C	8.50 µin/in-°F	
	@Temperature 26.7 - 760 °C	@Temperature 80.0 - 1400 °F	
	17.1 µm/m-°C	9.50 µin/in-°F	
	@Temperature 26.7 - 427 °C	@Temperature 80.0 - 800 °F	
Melting Point	1370 - 1400 °C	2500 - 2550 °F	
Solidus	1370 °C	2500 °F	
Liquidus	1400 °C	2550 °F	

Component Elements Properties	Metric	English	Comments
Aluminum, Al	<= 0.20 %	<= 0.20 %	
Carbon, C	<= 0.050 %	<= 0.050 %	
Chromium, Cr	19.5 - 23.5 %	19.5 - 23.5 %	
Copper, Cu	1.5 - 3.0 %	1.5 - 3.0 %	
Iron, Fe	>= 22 %	>= 22 %	
Manganese, Mn	<= 1.0 %	<= 1.0 %	
Molybdenum, Mo	2.5 - 3.5 %	2.5 - 3.5 %	
Nickel, Ni	38 - 46 %	38 - 46 %	
Silicon, Si	<= 0.50 %	<= 0.50 %	
Sulfur, S	<= 0.030 %	<= 0.030 %	
Titanium, Ti	0.60 - 1.2 %	0.60 - 1.2 %	

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.000113 ohm-cm	0.000113 ohm-cm	
	@Temperature 25.6 °C	@Temperature 78.0 °F	
	0.000118 ohm-cm	0.000118 ohm-cm	
	@Temperature 204 °C	@Temperature 400 °F	
	0.000127 ohm-cm	0.000127 ohm-cm	
	@Temperature 538 °C	@Temperature 1000 °F	

Electrical Properties	$0.000130 \text{ ohm-cm}$ Metric	$0.000130 \text{ ohm-cm}$ English	Comments
	@Temperature 982 °C	@Temperature 1800 °F	
Magnetic Permeability	1.005	1.005	200 Oersted
Curie Temperature	<= -195.56 °C	<= -320.01 °F	

## Contact Songhan Plastic Technology Co.,Ltd.

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