

## Carlson C 800AT Nickel-Iron-Chromium Alloy

Category : Metal , Nonferrous Metal , Nickel Alloy , Superalloy

### Material Notes:

**General Description** Carlson Alloy C 800AT is a modification of Carlson Alloy C 800, exhibiting higher creep and rupture strengths. This nickel-iron-chromium alloy has a carbon content restricted to a range of 0.06 to 0.10%. The aluminum plus titanium content of this alloy is also maintained in the upper portion of the standard range (0.85 to 1.20%). C 800AT is solution-annealed at 2100°F (1500°C). That heat treatment and the compositional restrictions are responsible for this alloy's improved creep and rupture strengths. Since the chemistry of C 800AT falls within the range of C 800, there are no significant differences in physical and thermal properties. The major differences between the alloys are in the mechanical properties. (Generally C 800 exhibits higher mechanical properties at room temperature and during short-term exposure to elevated temperatures.) C 800AT displays superior and rupture strengths over long-term exposure to elevated temperatures. C 800AT offers higher ASME boiler and pressure vessel design stress allowables in creep and rupture test ranges than C 800H.

**Applications** Chemical and Petrochemical – piping, tubing, pigtails and outlet manifolds in steam/hydrocarbon reforming; tubing for ethylene production; tubing and heaters for oxo-alcohol production; hydrodealkylation units; tubing, flanges and bends for production of vinyl chloride monomer.

**Thermal Processing** – tubing, muffles, retorts and fixtures in heat treating furnaces.

**Power Generation** – tubing in power plant superheaters and reheaters.

Information provided by Carlson

Order this product through the following link:

[http://www.lookpolymers.com/polymer\\_Carlson-C-800AT-Nickel-Iron-Chromium-Alloy.php](http://www.lookpolymers.com/polymer_Carlson-C-800AT-Nickel-Iron-Chromium-Alloy.php)

Physical Properties	Metric	English	Comments
Density	7.94 g/cc	0.287 lb/in <sup>3</sup>	

Mechanical Properties	Metric	English	Comments
Tensile Strength at Break	>= 448 MPa	>= 65000 psi	
Tensile Strength, Yield	>= 172 MPa @Strain 0.200 %	>= 25000 psi @Strain 0.200 %	
Elongation at Break	>= 30 %	>= 30 %	
Modulus of Elasticity	197 GPa	28500 ksi	
Poissons Ratio	0.339	0.339	
Shear Modulus	73.6 GPa	10700 ksi	Calculated

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	

<b>Solidus Thermal Properties</b>	<b>1357 °C Metric</b>	<b>2475 °F English</b>	<b>Comments</b>
Liquidus	1385 °C	2525 °F	

<b>Component Elements Properties</b>	<b>Metric</b>	<b>English</b>	<b>Comments</b>
Aluminum, Al	0.15 - 0.60 %	0.15 - 0.60 %	
Carbon, C	0.060 - 0.10 %	0.060 - 0.10 %	
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 %	

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

## Contact Songhan Plastic Technology Co.,Ltd.

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