

Carlson C 200 Commercially Pure Nickel

Category : Metal , Nonferrous Metal , Nickel Alloy , Superalloy , Pure Element

Material Notes:

General Description Carlson Alloy C 200 is commercially pure nickel, combining good mechanical properties with excellent resistance to many corrosive environments. This alloy retains its strength at high temperatures. It is tough and ductile at sub-zero temperatures. C 200 is ferromagnetic and has one of the largest magnetostrictive effects of any commercial material. Its thermal and electrical conductivities are considerably higher than other stainless steels of nickel alloys. Carlson C 201 is a restricted carbon (0.02% max.) version of C 200. It is preferred for exposure to temperatures above 600°F (315°C); and it is superior whenever creep strength is an important criterion. **Applications** C200 and C 201 provide excellent corrosion resistance to hot concentrated alkali (except ammonium hydroxide). These alloys exhibit good corrosion resistance to dry chlorine, fluorine, hydrogen chloride and hydrogen fluoride up to moderately elevated temperatures. The corrosion resistance of both alloys make them particularly useful for maintaining product purity in food processing and in the production or processing of synthetic fibers, alkalis, fatty acids, soaps and detergents. **Chemical Processing** – caustic processing and storage, chemical shipping containers, synthetic fiber productions, fluorine electrolysis. **Food Processing Equipment** Magnetostrictive Devices **Aerospace and Missile components** – rocket motor cases. Information provided by Carlson

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http://www.lookpolymers.com/polymer_Carlson-C-200-Commercially-Pure-Nickel.php

Physical Properties	Metric	English	Comments
Density	8.89 g/cc	0.321 lb/in ³	

Mechanical Properties	Metric	English	Comments
Tensile Strength at Break	>= 379 MPa	>= 55000 psi	
Tensile Strength, Yield	>= 103 MPa @Strain 0.200 %	>= 15000 psi @Strain 0.200 %	
Elongation at Break	>= 40 %	>= 40 %	
Modulus of Elasticity	193 GPa	28000 ksi	Tension
Poissons Ratio	0.29	0.29	
Shear Modulus	75.2 GPa	10900 ksi	

Thermal Properties	Metric	English	Comments
CTE, linear	13.0 µm/m-°C @Temperature 27.0 - 100 °C	7.22 µin/in-°F @Temperature 80.6 - 212 °F	
Specific Heat Capacity	0.4535 J/g-°C @Temperature 0.000 °C	0.1084 BTU/lb-°F @Temperature 32.0 °F	

Thermal Properties	60.7 W/m-K Metric	420 BTU-in/hr-ft ² -°F English	Comments
Thermal Conductivity	@Temperature 27.0 - 100 °C	@Temperature 80.6 - 212 °F	
Melting Point	1435 - 2002 °C	2615 - 3635 °F	
Solidus	1435 °C	2615 °F	
Liquidus	2002 °C	3635 °F	

Component Elements Properties	Metric	English	Comments
Carbon, C	<= 0.15 %	<= 0.15 %	
Copper, Cu	<= 0.25 %	<= 0.25 %	
Iron, Fe	<= 0.40 %	<= 0.40 %	
Manganese, Mn	<= 0.35 %	<= 0.35 %	
Nickel, Ni	>= 99 %	>= 99 %	
Silicon, Si	<= 0.35 %	<= 0.35 %	
Sulfur, S	<= 0.010 %	<= 0.010 %	

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.0000118 ohm-cm	0.0000118 ohm-cm	
Curie Temperature	360 °C	680 °F	

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