

Carlson Nitronic® 50® Austenitic Stainless Steel

Category : Metal , Ferrous Metal , Austenitic , Stainless Steel

Material Notes:

General Description Nitronic 50 is a nitrogen-strengthened austenitic stainless steel that possesses corrosion resistance superior to 316, 316L, 317 and 317L plus approximately twice the yield strength at room temperature. It has very good mechanical properties at both elevated and sub-zero temperatures. The alloy retains low magnetic permeability even after severe cold working or exposure to sub-zero temperatures and excellent mechanical properties up to 1200°F (649°C). Nitronic 50 provides outstanding corrosion resistance in many process streams. Annealed at 2025°F, Nitronic 50 exhibits excellent resistance to highly corrosive environments where the material will be used in the as-welded condition. It has outstanding resistance to sulfide stress cracking and to intergranular attack. Nitronic 50 will withstand prolonged exposure to marine atmospheres. It has also been found to perform somewhat better than C400 (UNS N04400) in quiet seawater. Like most stainless steels, Nitronic 50 may suffer stress corrosion cracking in hit chloride environments. It is ranked between 304 and 316 in resistance to cracking. Nitronic 50 does not become magnetic when severely cold worked. This makes it useful for applications requiring a combination of excellent corrosion resistance and low magnetic permeability. Although the magnetic permeability of Nitronic 50 remains very low at cryogenic temperatures, it does not approach the levels of Nitronic 33 and Nitronic 40. Nitronic 50 is considerably stronger than the conventional 300 series stainless steels but the same fabrication equipment and techniques are utilized. **Applications** Nitronic 50 is ideal where 316, 316L, 317 and 317L are marginal. It has found wide use in the petroleum, petrochemical, chemical, pulp and paper, textile, food, nuclear and marine industries. **Marine** – seawater pumps, gate valves for seawater ballast systems on tankers, high-pressure (microbial) deep-sea sampler and incubation chambers and underwater robotic arms. **Chemical** – urea production, ammonium carbamate pumps, pressure vessels, tanks, heat exchangers, piping, fittings, valves and pumps. **Pump & Paper** – Valves for sulfite liquors **Nuclear Waste Disposal** – waste calcination systems, aqueous fluoride handling systems and waste canisters. **Oil & Gas Production** – oil field production and down-hole equipment **Information provided by Carlson**

Order this product through the following link:

http://www.lookpolymers.com/polymer_Carlson-Nitronic-50-Austenitic-Stainless-Steel.php

Physical Properties	Metric	English	Comments
Density	7.89 g/cc	0.285 lb/in ³	

Mechanical Properties	Metric	English	Comments
Hardness, Brinell	<= 241	<= 241	
Hardness, Rockwell B	<= 100	<= 100	
Tensile Strength at Break	>= 689 MPa	>= 100000 psi	
Tensile Strength, Yield	>= 379 MPa @Strain 0.200 %	>= 55000 psi @Strain 0.200 %	
Elongation at Break	>= 35 %	>= 35 %	
Modulus of Elasticity	193 GPa	28000 ksi	
Taber Abrasion, mg/1000 Cycles	8.3	8.3	vs. Nitronic 32

Mechanical Properties	Metric	English	Comments
			vs. 204

Thermal Properties	Metric	English	Comments
CTE, linear	16.2 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$	9.00 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$	
	@Temperature 25.6 - 93.3 $^\circ\text{C}$	@Temperature 78.0 - 200 $^\circ\text{F}$	
	17.3 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$	9.60 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$	
	@Temperature 25.6 - 316 $^\circ\text{C}$	@Temperature 78.0 - 600 $^\circ\text{F}$	
	18.9 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$	10.5 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$	
	@Temperature 25.6 - 649 $^\circ\text{C}$	@Temperature 78.0 - 1200 $^\circ\text{F}$	
	20.0 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$	11.1 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$	
	@Temperature 25.6 - 871 $^\circ\text{C}$	@Temperature 78.0 - 1600 $^\circ\text{F}$	

Component Elements Properties	Metric	English	Comments
Carbon, C	$\leq 0.060\%$	$\leq 0.060\%$	
Chromium, Cr	20.5 - 23.5 %	20.5 - 23.5 %	
Iron, Fe	52.12 - 62.1 %	52.12 - 62.1 %	
Manganese, Mn	4.0 - 6.0 %	4.0 - 6.0 %	
Molybdenum, Mo	1.5 - 3.0 %	1.5 - 3.0 %	
Nickel, Ni	11.5 - 13.5 %	11.5 - 13.5 %	
Niobium, Nb (Columbium, Cb)	0.10 - 0.30 %	0.10 - 0.30 %	
Nitrogen, N	0.20 - 0.40 %	0.20 - 0.40 %	
Phosphorous, P	$\leq 0.040\%$	$\leq 0.040\%$	
Silicon, Si	$\leq 0.75\%$	$\leq 0.75\%$	
Sulfur, S	$\leq 0.030\%$	$\leq 0.030\%$	
Vanadium, V	0.10 - 0.30 %	0.10 - 0.30 %	

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.0000820 ohm-cm	0.0000820 ohm-cm	
Magnetic Permeability			50-200 Oersteds

Electrical Properties	1.004 Metric	1.004 English	Comments
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