

Carlson Nitronic® 60® Austenitic Stainless Steel

Category : Metal , Ferrous Metal , Austenitic , Stainless Steel

Material Notes:

General Description Nitronic 60 is an anti-galling and wear resistant austenitic stainless steel. It provides a significantly lower cost alternative to combat wear and galling when compared with cobalt-bearing and high nickel alloys. The uniform corrosion resistance of Nitronic 60 is superior to 304 in most media. Chloride pitting resistance is superior to 316. Room temperature Nitronic 60 also possesses excellent high temperature oxidation resistance and low temperature impact resistance. Due to its grain structure, the galling resistance of Nitronic 60 is superior to that of any other stainless steel. It resists wear, tearing or freeze up of both the primary and contact materials over a wide range of service temperatures. The elevated temperature wear resistance of Nitronic 60 is excellent despite its relatively low hardness when compared with cobalt and nickel-base wear alloys. It also performs well in metal-to-metal wear in nominally inert atmospheres. The cavitation erosion resistance of Nitronic 60 is superior to the austenitic stainless steels as well as high strength duplex (ferritic-austenitic) stainless steels. The general corrosion resistance of Nitronic 60 falls between 304 and 316. However, in a wear system, a galling or seizure failure occurs first followed by dimensional loss due to wear and finally corrosion. Although the general corrosion resistance of Nitronic 60 is not as good as 316, it does offer better chloride pitting, stress corrosion cracking and crevice corrosion resistance. In high temperature service, Nitronic 60 exhibits carburization superior to 316L and 309. Its oxidation resistance is far superior to 304 and 316 and comparable to 309. **Applications** Infrastructure bridge pin and hanger expansion joints, parking deck expansion joint wear plates. Hydroelectric Power – stems, wicket gate wear rings Oil and Gas Production – pump wear rings, bushings, valve trim, seals, fittings, logging equipment and screens. Food processing and Pharmaceuticals – galling resistant applications in sanitary equipment where lubricants can not be used Chemical and Petrochemical – process valve stems, seats and trim, pump wear rings. Information provided by Carlson

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http://www.lookpolymers.com/polymer_Carlson-Nitronic-60-Austenitic-Stainless-Steel.php

Physical Properties	Metric	English	Comments
Density	7.62 g/cc	0.275 lb/in ³	

Mechanical Properties	Metric	English	Comments
Hardness, Brinell	<= 241	<= 241	
Hardness, Rockwell B	<= 100	<= 100	
Tensile Strength at Break	631 MPa	91500 psi	Carburized
	>= 655 MPa	>= 95000 psi	
Tensile Strength, Yield	>= 345 MPa	>= 50000 psi	
	@Strain 0.200 %	@Strain 0.200 %	
	400 MPa	58000 psi	Carburized
	@Strain 0.200 %	@Strain 0.200 %	

Elongation at Break Mechanical Properties	Metric	English	Comments
	>= 35 %	>= 35 %	
Reduction of Area	21.5 %	21.5 %	Carburized
Modulus of Elasticity	181 GPa	26200 ksi	
Taber Abrasion, mg/1000 Cycles	3.2	3.2	vs. Nitronic 32
	6.0	6.0	vs. 304
Bend Radius, Minimum	1.5 t	1.5 t	Carburized; 100°

Thermal Properties	Metric	English	Comments
CTE, linear	15.8 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$	8.80 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$	
	@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 $^\circ\text{F}$	
	18.5 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$	10.3 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$	
	@Temperature 25.6 - 649 $^\circ\text{C}$	@Temperature 78.0 - 1200 $^\circ\text{F}$	
	19.8 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$	11.0 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$	
	@Temperature 25.6 - 982 $^\circ\text{C}$	@Temperature 78.0 - 1800 $^\circ\text{F}$	

Component Elements Properties	Metric	English	Comments
Carbon, C	<= 0.10 %	<= 0.10 %	
Chromium, Cr	16 - 18 %	16 - 18 %	
Iron, Fe	59.13 - 65.42 %	59.13 - 65.42 %	
Manganese, Mn	7.0 - 9.0 %	7.0 - 9.0 %	
Nickel, Ni	8.0 - 9.0 %	8.0 - 9.0 %	
Nitrogen, N	0.080 - 0.18 %	0.080 - 0.18 %	
Phosphorous, P	<= 0.060 %	<= 0.060 %	
Silicon, Si	3.5 - 4.5 %	3.5 - 4.5 %	
Sulfur, S	<= 0.030 %	<= 0.030 %	

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.0000982 ohm-cm	0.0000982 ohm-cm	

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