

## Alloy 321 Stainless Steel

UNS N32100  
W. Nr 1.4541

### Applicable Specifications

Wire & Bar | AMS 5689, 5645, ASTM A313, ASTM A580, NACE MR0175/ISO 15156

**Description:** Type 321 is a stabilized austenitic stainless steel, similar to type 304, but alloyed with titanium for use in applications involving continuous or intermittent service at 800-1500°F (427-816°C). 321 stainless has excellent resistance to oxidation and intergranular corrosion, while also possessing good creep strength compared to other 300 series stainless steels. The alloy is strengthened only through cold work and can be fabricated, machined, and welded via most conventional processes.

**Applications include:** Annealing covers, High-temperature tempering equipment, Diesel and heavy-duty automotive exhaust, Firewalls, Stack liners, Boiler casings, Welded pressure vessels, Aircraft components, Bellows, Oil refinery equipment, Fasteners, Springs

**Industries supplied include:** Aerospace, Oil & Gas, Chemical Processing, Food Processing, Waste Treatment

### Nominal Composition

	C	Mn	P	S	Si	Ni	Cr	Ti	N	Fe
min	-	-	-	-	-	9.00	17.00	5*(C+N)	-	Bal
max	0.08	2.00	0.045	0.030	0.75	12.00	19.00	0.70	0.10	-

### Physical Properties

	At 70°F	At 20°C
Density	0.290 lb/in <sup>3</sup>	8.09 g/cm <sup>3</sup>
Modulus of Elasticity (E)	28.0 x 10 <sup>3</sup> ksi	193 GPa
Modulus of Rigidity (G)	11.2 x 10 <sup>3</sup> ksi	78 GPa
Coefficient of Expansion	11.2 μin/in-°F (32-1500°F)	20.2 μm/m-°C (0-871°C)
Electrical Resistivity	28.4 μohm-in	72 μohm-cm
Thermal Conductivity	111 Btu-in/ft <sup>2</sup> -hr-°F (212°F)	16.0 W/m-°C (100°C)

### Typical Mechanical Properties

Condition	Heat Treatment	Tensile Strength	Suggested Operating Conditions
Annealed	1750-2050°F (954-1121°C)	80-110 ksi (552-758 MPa)	Up to 1500°F (816°C)
Spring	Stress Relieve 600-900°F (316-482°C)	200 ksi min (1379 MPa)	Up to 550°F (288°C)

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