UNITED PERFORMANCE METALS
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AN ONI COMPANY

321 STAINLESS STEEL

UNS S32100 / AMS 5510 / AMS 5645

321 stainless steel is a titanium stabilized austenitic stainless steel that features improved resistance to intergranular corrosion. This grade is suitable for high-temperature applications up to 1500°F (815°C), where the addition of titanium stabilizes the material against chromium carbide formation.

While corrosion resistance is similar to 304 and 304L in the annealed condition, it features higher creep and stress rupture properties. These properties make it ideal for industrial applications ranging from heat exchangers to aircraft exhaust stacks. 321 stainless steel is non-magnetic and heat resistant for continuous service at elevated temperatures.

321 Chemical Composition

- C – Carbon – 8.00%
- Mn – Manganese - 2.00%
- Si – Silicon - 1.00%
- Cr – Chromium - 17.00 - 19.00%
- Ni – Nickel - 9.00 - 12.00%
- P – Phosphorous - 0.040%
- S – Sulfur - 0.030%
- N – Nitrogen - 0.10%
- Fe – Iron - Balance
- Ti – Titanium - 5x(C+N) - 0.70

Maximum unless range is specified

Other Inventory Specifications

- PWA-LCS
- GE Aircraft Engine (GT193)
- RR SABRe Edition 2
- DFARS Compliant
- EN 1.4541

Standard Inventory Specifications

- UNS S32100
- UNS S32109
- AMS 5510
- AMS 5645
- ASTM A 167
- ASTM A 240
- ASTM A 276
- ASTM A 479
- ASME SA 167
- ASME SA 240
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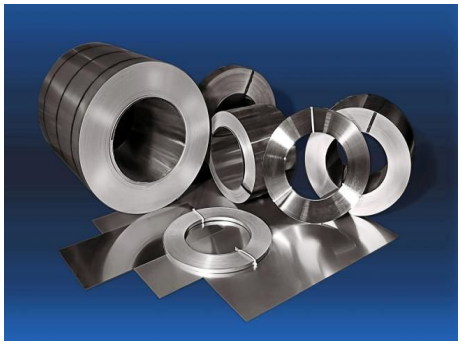
Forms Stocked

- Bar - 0.375” – 9.000” thick
- Hex Bar – 0.250” – 1.125” thick
- Coil - 0.010” - 0.125” thick
- Sheet - 0.010” - 0.125” thick
- Thin Strip - 0.0008” - 0.012”
- Plate – 0.1875” – 0.250”

Applications

- Aircraft exhaust stacks
- Manifolds
- Chemical processing equipment
- Welded equipment
- Jet engine parts
- Heat Exchangers



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Or click here to view our product page and request a quote on 321 stainless

Features

- Advantageous for high temperature service
- Higher creep and stress rupture properties than Type 304
- High resistance to corrosion

The technical data provided is for information only and not for design purposes. It is not warranted or guaranteed.

Resistance to Corrosion: Types 321 and 347 alloys offer similar resistance to general, overall corrosion as the unstabilized chromium nickel Type 304. Heating for long periods of time in the chromium carbide precipitation range may affect the general resistance of Types 321 and 347 in severe corrosive media.

Physical Properties

- Melting Range: 2550-2635°F (1398-1446°C)
- Density: 0.286 lb/in³ (7.92 g/cm³)
- Modulus of Elasticity in Tension: 28 x 10^6 psi (193 GPa)

Linear Coefficient of Thermal Expansion

Temperature Range		Mean Coefficient of thermal Expansion	
°C	°F	cm/cm°C	in/in/°F
20-100	68-212	$16.6 \cdot 10^{-6}$	$9.2 \cdot 10^{-6}$
20-600	68-912	$18.9 \cdot 10^{-6}$	$10.5 \cdot 10^{-6}$
20-1000	68-1832	$20.5 \cdot 10^{-6}$	$101.4 \cdot 10^{-6}$

Thermal Conductivity

Temperature Range		Coefficients	
°C	°F	W/m·K	Btu/(hr/ft²/hr/°F/ft)
20-100	68-212	16.3	112.5
20-500	68-932	21.4	147.7

Specific Heat

Temperature Range		J/kg°K	Btu/lb/°F
°C	°F		
20	32-212	500	0.12

Magnetic Permeability

H/m annealed
1.02 Max

Electrical resistivity (Annealed Condition)

Temperature Range		microhm-in
°C	°F	
20	68	72
100	213	78
200	392	86
400	752	100
600	1112	111
800	1472	121
900	1652	126

Mechanical Properties

Typical mechanical properties for annealed type 321 austenitic stainless steel sheet and strip – cold flattened

Grade	Tensil Strength, Min.		0.2% Yield Strength, Min.		Elong. In 2” (50mm)	Hardness, Max.	
	psi	MPa	psi	MPa	%, Min.	Brinell	RB
321	75000	515	30000	205	40	217	95