UNITED PERFORMANCE METALS
QUALITY SOLUTIONS. TRUSTED PARTNERS.
AN ONI COMPANY

Stainless 301

Type 301 (S30100) is an austenitic stainless steel with a nominal composition of 17% chromium and 7% nickel. The high strengths of this grade of steel in the six available conditions or tempers, its resistance to atmosphere corrosion and its bright, attractive surface make it an excellent choice for decorative structural applications. By varying the chemical composition within the limits set by the ASTM specifications and by temper rolling, a broad range of magnetic and mechanical properties can be obtained for a variety of applications.

Specifications

ASTM: A167, A177, A554, A666

UNS: S30100

AMS: 5901

Chemical Composition, %

	Cr	Mn	Si	Ni	P	S	C	N
MIN	16.00	–	–	6.00	–	–	–	–
MAX	18.00	2.00	1.00	8.00	0.045	0.030	0.15	0.10

Resistance to Corrosion: Type 301 is resistant to a variety of corrosive media. However, the corrosion properties are not as good as the 18-8 chromium-nickel steels. Its susceptibility to carbide precipitation during welding restricts its use in many applications in favor of Types 304 or 304L.

Resistance to Oxidation: Type 301 possesses good resistance to oxidation at temperatures up to 1550°F (840°C). At 1600°F (871°C) it exhibits an oxidation weight gain of 10mg/cm² in 1,000 hours. Therefore, this stainless steel is not suggested for use at 1600°F or above.

Features

- Provides good strength and ductility when cold worked
- Has excellent corrosion resistance
- Well suited to welding and forming and drawing
- Attractive surface

Applications

- Aircraft Structural Parts
- Trailer Bodies
- Architectural (roof drainage/door frames, etc.)
- Auto body trim wheel covers
- Utensils and tablewear

UNITED PERFORMANCE METALS
QUALITY SOLUTIONS. TRUSTED PARTNERS.
AN ONI COMPANY

Stainless 301

Physical Properties

Melting Range: 2550-2590°F (1399-1421°C) **Specific Gravity**: 0.285 lb/in³
Density: 0.285 lb/in³ **Modulus of Elasticity in Tension**: 28 x 10^6 psi (193 GPa)

Linear Coefficient of Thermal Expansion

Temperature Range		Coefficients	
°C	°F	cm/cm·°C	in/in/°F
20-100	62-212	16.6 x 10^{-6}	9.2 x 10^{-6}
50-300	68-572	17.6 x 10^{-6}	9.8 x 10^{-6}
20-500	68-932	18.6 x 10^{-6}	10.3 x 10^{-6}
20-700	68-1292	19.5 x 10^{-6}	10.8 x 10^{-6}
20-871	68-1600	19.8 x 10^{-6}	11.0 x 10^{-6}

Thermal Conductivity

Temperature Range			
°C	°F	W/m·K	Btu/ft²/hr/°F/ft
20-100	62-212	16.3	9.4
20-500	62-932	21.4	12.4

Electrical Resistivity (Annealed Condition)

Temperature Range			
°C	°F	Microhm-cm	Microhm-in
20	68	72	28.3
100	212	78	30.7
200	392	86	33.8
400	752	100	39.4
600	1112	111	43.7
800	1472	121	47.6
900	1652	126	49.6

Specific Heat

Temperature Range			
°C	°F	J/kg°K	Btu/lb/°F
0-100	32-212	500	0.12

UNITED PERFORMANCE METALS
QUALITY SOLUTIONS. TRUSTED PARTNERS.
AN ONI COMPANY

Stainless 301

Magnetic Permeability

H/M Annealed: 1.02 Max @ 200 H

Mechanical Properties

Type 301 is used in the annealed and cold rolled conditions. In the work-hardened condition, Type 301 develops higher tensile strength than the other stable austenitic grades. Minimum properties for plate, sheet and strip per ASTM A240 and A666 follow.

Minimum Room Temperature Mechanical Properties, ASTM A240 and A666 Specifications

	Tensile Strength, Min		0.2% Yield Strength, Min.		Elong. In 2" (50mm)
Condition	Ksi	(Mpa)	Ksi	(Mpa)	%, min.
Annealed	75	(515)	30	(205)	40
1/4 Hard	125	(862)	75	(517)	25
1/2 Hard	150	(1,034)	110	(758)	18*
3/4 Hared	175	(1,207)	135	(931)	12*
Full Hard	185	(1,276)	140	(965)	9*

*Value shown for thickness greater than 0.015 in. (.038mm)