Allegheny Ludlum Stainless Steel Type 301, annealed (UNS S30100)

Subcategory: Ferrous Metal; Metal; Stainless Steel; T 300 Series Stainless Steel

Key Words: ASTM A240; ASTM A666

Component	Wt. %	Component	Wt. %	Component	Wt. %
C	Max 0.15	Mn	Max 2	P	Max 0.045
Cr	16 - 18	N	Max 0.1	S	Max 0.03
Fe	75	Ni	6 - 8	Si	Max 0.75

Material Notes:

Iron content above calculated as balance.

Allegheny Ludlum Type 301 is a high strength grade of steel available in six conditions or tempers, its resistance to atmosphere corrosion and its bright, attractive surface make it an excellent choice for decorative structural applications.

Applications include automobile molding and trim, wheel cover, conveyor belts, kitchen equipment, roof draining systems, hose clamps, springs, truck and trailer bodies, railway and subway cars. 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.

Information provided by Allegheny Ludlum Corporation.

Physical Properties	Metric	English	Comments
Density	8.03 g/cc	0.29 lb/in³	
Mechanical Properties			
Hardness, Brinell	165	165	
Hardness, Rockwell B	85	85	
Tensile Strength, Ultimate	Min 515 MPa	Min 74700 psi	
Tensile Strength, Yield	Min 205 MPa	Min 29700 psi	0.2% offset
Elongation at Break	Min 40 %	Min 40 %	in 2" (50 mm)

Modulus of Elasticity	211 GPa	30600 ksi	transverse
Modulus of Elasticity	214 GPa	31000 ksi	longitudinal
Compressive Yield Strength	262 MPa	38000 psi	longitudinal
Compressive Yield Strength	262 MPa	38000 psi	transverse
Charpy Impact	150 J	111 ft-lb	at 23°C; 150 J at -73°; 150J at 196°
Fatigue Strength	241 MPa	35000 psi	endurance limit; test details not reported

Electrical Properties

Electrical Resistivity	7.2e-005 ohm-cm	7.2e-005 ohm-cm	
Magnetic Permeability	Max 1.02	Max 1.02	typically < 1.02 at 200H; increases with cold work.

Thermal Properties

CTE, linear 20°C	16.6 µm/m-°C	9.22 µin/in-°F	Range 20° - 100°C
CTE, linear 250°C	17.6 µm/m-°C	9.78 µin/in-°F	Range 20° - 300°C
CTE, linear 500°C	18.6 µm/m-°C	10.3 µin/in-°F	Range 20°- 500°C; 19.5 µm/m-°C Range 20° - 700°C
Specific Heat Capacity	0.5 J/g-°C	0.12 BTU/lb-°F	between 0° -100° C
Thermal Conductivity	16.3 W/m-K	113 BTU-in/hr-ft²-°F	at 100°C; 21.4 W/m*K at 500°C
Melting Point	1399 - 1421 °C	2550 - 2590 °F	
Solidus	1399 °C	2550 °F	
Liquidus	1421 °C	2590 °F	

Some of the values displayed above may have been converted from their original units and/or rounded in order to display the information in a consistent format. Users requiring more precise data for scientific or engineering calculations can click on the property value to see the original value as well as raw conversions to equivalent units. We advise that you only use the original value or one of its raw conversions in your calculations to minimize rounding error.