

AISI 304 (L)

Grade: AISI 304 (L) UNS S30400, ASTM A182, ASTM A276, ASTM A479, BS EN 10088)

NACE MR-0175/ISO 15156

Type: Austenitic stainless steel delivered in the solution annealed condition

Also stocked in H grade (high carbon variant typically used at higher temperatures). UNS S30409.

Nominal Composition	
Element	Weight %
Carbon	0.08*
Silicon	1.0 max
Manganese	2.0 max
Phosphorus	0.045 max
Sulphur	0.03 max***
Molybdenum	2.0 – 3.0 max
Chromium	18.0-20.0**
Nickel	8.0 – 10.5 max
Nitrogen	0.1 max

Notes

*L grade limits %C content to 0.03% max. H grade %C content is 0.04% - 0.10% max.

**L grade limits %Ni content to 12% max

*** For machinability a controlled sulphur content of 0.015-0.030% is recommended and permitted.

Grade Selection

304 is used where good corrosion resistance is required up to a temperature of approximately 870 degrees centigrade. As long as service exposure is intermittent. If continuous exposure is required then 304L is recommended instead due to the grade's resistance to carbide precipitation. Where high strength is also required at increased temperatures up to 800 degrees maximum, 304H is preferred for use. 304H is used for high or low temperature applications and for fasteners.

Mechanical Properties Condition

Solution annealed at around 1050°C and water quenched

Property	Values
Ultimate Tensile Strength *	75 min KSI (515 N/mm ²)
0.2 % Yield Strength *	30 min KSI (205 N/mm ²)
Elongation	30 % min
Reduction of Area	50 % min
Charpy Impact Toughness	135 J at -75° C
Hardness	237 HBW max (22 HRC)

Notes:

The impact toughness shown is typically achieved.

304 stainless steel is not hardened by heat treatment. The material supplied in either the solution treated or annealed condition. The grade may be strengthened by cold working, but this reduces the corrosion resistance. Cold worked grades are not acceptable to NACE MR0175/ ISO 15156.



304 has good machinability. The grade has low strength and good corrosion resistance. The molybdenum content gives it particularly good seawater corrosion resistance. Hence it is used for small fittings, gaskets and small bore tubing.

The grade is prone to chloride stress corrosion cracking, and therefore NACE MR0175/ ISO 15156 states it should not be used at or above 60 degrees C.

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