

F304 Austenitic Stainless Steel

Related Specifications

ASTM A182 F304

ASTM A276 304

UNS S30400

W.Nr. 1.4301

BS EN 10088-3 1.4301

F304 is an Austenitic Cr-Ni stainless steel. This is the most versatile and widely used of all the stainless steels and is commonly referred to as 18/8 which is derived from the nominal chemical composition of 18% Cr and 8% Ni. The Material is not hardenable by heat treatment and therefore always supplied in the Solution Annealed condition. This material can be severely deep drawn resulting in this material being the dominant grade used in applications such as sinks and kitchenware, but also applications in the brewing, food processing, dairy and pharmaceutical industries amongst others.

Typical Chemical composition

Carbon	0.08% Max
Silicon	0.75% Max
Manganese	2.00% Max
Phosphorous	0.045% Max
Sulphur	0.030% Max
Chromium	18.00-20.00%
Nickel	8.00-12.00%
Nitrogen	0.10% Max

Mechanical Property Requirements - Solution Annealed condition

Yield	Tensile Strength	Elongation	Hardness
205 Mpa Min	515 Mpa Min	30% Min	215 HB Max

Forging

This alloy can be readily forged at temperatures 1000 - 1200Deg.C

Hot working below 927Deg.C should be avoided.

The low carbon content of these alloys ensures no heavy scale but excessive soak times should still be avoided to avoid enlarged grain size, suggest 15minutes per inch (25mm) of maximum ruling section

Heat Treatment

This alloy is not hardenable by heat treatment and is therefore supplied in the Annealed condition.

Anneal 1040Deg.C minimum, ensuring that sufficient time is allowed for the centre to achieve furnace temperature and hold for a time commensurate with the ruling section, followed by rapid cooling in Water.

Machining

F304 is readily machinable in the annealed condition by milling, drilling, turning, etc as required.

Cutting edges should be kept sharp and cuts should be kept light but deep enough to avoid work hardening. Coolants and lubricants should be used in large quantity.

Corrosion Resistance

This alloy exhibits excellent resistance to a wide range of atmospheric, chemical, textile, petroleum and food industry exposures, however pitting and crevice corrosion can occur in environments containing chlorides. Stress corrosion cracking can also occur at temperatures above 60Deg.C.

Oxidation Resistance

F304 has good resistance to oxidation in continuous service upto 925Deg.C. However continuous use at 425 - 860Deg.C is not recommended if corrosion resistance in water is required. In this case the lower Carbo derivative F304L would be more suitable due to its resistance to carbide precipitation.

Welding

Austenitic stainless steels are generally considered to be weldable by the common fusion and resistance techniques but special consideration is required to avoid hot cracking of the weld metal.