

## F304L Austenitic Stainless Steel

### Related Specifications

ASTM A182 F304L

ASTM A276 304L

W.Nr. 1.4307

BS EN 10088-3 1.4307

F304L is an Austenitic Cr-Ni stainless steel. It is the low carbon derivative of F304. 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. F304L is generally used in heavier gauge applications than standard F304 because of its improved weldability.

It is usual to purchase this material dual certified as F304/F304L

### Typical Chemical composition

Carbon	0.03% 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
170 Mpa Min	485 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

F304L 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

The lower carbon content of F304L makes this alloy more suitable for continuous use at 425 - 860Deg.C in wet environments than its higher carbon brother F304 since it is more resistant to carbide precipitation. Where high strength is required at high temperatures (Above 500Deg.C) alloy F304H is recommended, this alloy will retain aqueous corrosion resistance.

### 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.