

# ASTM A182 F304/F304L Forging Specification

ASTM A182 F304 and F304L are forged austenitic stainless steel grades widely used for pressure-containing components such as flanges, valves, fittings, and forged parts. These grades offer excellent corrosion resistance, high strength, and good weldability.

- F304 = standard 18-8 stainless steel (18% Cr, 8% Ni)
- F304L = low carbon version of F304 (max 0.035% C) to improve weldability and prevent intergranular corrosion

## Chemical Composition (ASTM A182)

Material	C	Mn	P	S	Si	Ni	Cr
A182 F304	Max 0.08	2	0.045	0.03	1	8.0-11.0	18.0-20.0
A182 F304L	Max 0.03	2	0.045	0.03	1	8.0-13.0	18.0-20.0

## Mechanical Properties

Property	F304	F304L
Tensile Strength	≥515 MPa	≥485 MPa
Yield Strength	≥205 MPa	≥170 MPa
Elongation	≥30%	≥30%
Hardness (HB)	≤192	≤192

## Heat Treatment

- Supplied in **annealed** condition
- No hardening by heat treatment (non-hardenable austenitic structure)
- Solution annealing temperature: ~1040 - 1100° C

## Common Tests Required

- Chemical composition analysis
- Mechanical property tests
- Intergranular corrosion (IGC) test (especially for F304L)
- PMI (Positive Material Identification)
- NDT (UT/RT/MT) upon request

## Typical Product Forms

- Forged flanges (Weld Neck, Blind, Slip-On, Threaded)
- Forged fittings (Elbows, Tees, Couplings, Nipples)
- Custom forged blocks and rings
- Forged valves or valve components

## Key Features & Benefits

- Excellent resistance to **oxidation and corrosion** in a wide range of environments
- Ideal for **food processing, chemical, and petrochemical** industries
- **F304L** preferred for welded structures to avoid carbide precipitation
- Good formability and fabrication properties

## Standards & Dimensions

- **ASTM A182 / ASME SA182**
- Flange standards: ASME B16.5 / B16.47 / B16.36
- Forged fittings: ASME B16.11
- Compatible with piping per ASTM A312 (TP304 / TP304L)

## Equivalent Grades

Standard	F304 Equivalent	F304L Equivalent
EN	X5CrNi18-10 (1.4301)	X2CrNi19-11 (1.4306 / 1.4307)
UNS	S30400	S30403
JIS	SUS 304	SUS 304L
ISO	304	304L

## Typical Applications

- Heat exchangers and condensers
- Pressure vessels and boilers
- Water treatment and desalination systems
- Oil & gas piping systems
- Food-grade processing equipment
- Pharmaceutical and chemical facilities

