

# ASTM A182 F304 / F304L Forging Specification for Flanges & Fittings

Keywords: ASTM A182 F304, ASTM A182 F304L, stainless steel forging, forged flanges, forged fittings

## ASTM A182 Standard Introduction

ASTM A182 / ASME SA182 covers forged or rolled alloy steel and stainless steel pipe flanges, forged fittings, valves, and parts for high-temperature service and general corrosive applications. Grades F304 and F304L are widely used austenitic stainless steel forgings.

## ASTM A182 F304 / F304L Material Description

ASTM A182 F304 and F304L are austenitic stainless steels offering excellent corrosion resistance, good toughness, and reliable mechanical properties. F304L features lower carbon content, improving resistance to intergranular corrosion after welding.

## Equivalent Grades

| Standard | DIN / Werkstoff | UNS    | JIS      | BS     | GOST     | AFNOR     | EN                       |
|----------|-----------------|--------|----------|--------|----------|-----------|--------------------------|
| F304     | 1.4301          | S30400 | SUS 304  | 304S31 | 08■18■10 | Z7CN18-09 | X5CrNi18-10              |
| F304L    | 1.4306 / 1.4307 | S30403 | SUS 304L | 304S11 | 03■18■11 | Z3CN18-10 | X2CrNi18-9 / X2CrNi19-11 |

## Chemical Composition (wt.%)

| Grade | C max | Mn max | Si max | P max | S max | Cr        | Ni       | N max |
|-------|-------|--------|--------|-------|-------|-----------|----------|-------|
| F304  | 0.08  | 2.00   | 0.75   | 0.045 | 0.030 | 18.0–20.0 | 8.0–10.5 | 0.10  |
| F304L | 0.03  | 2.00   | 0.75   | 0.045 | 0.030 | 18.0–20.0 | 8.0–12.0 | 0.10  |

## Mechanical Properties

| Grade | Tensile MPa min | Yield 0.2% MPa min | Elongation % min | HRB max | HB max |
|-------|-----------------|--------------------|------------------|---------|--------|
| F304  | 515             | 205                | 40               | 92      | 201    |
| F304L | 485             | 170                | 40               | 92      | 201    |

## Heat Treatment

ASTM A182 F304 and F304L forgings are typically supplied in the solution annealed condition. Solution annealing is performed at 1040–1120 °C (1900–2050 °F), followed by rapid cooling such as water quenching or air cooling. This heat treatment dissolves chromium carbides, restores corrosion resistance, and ensures a uniform austenitic microstructure. Due to its low carbon content, F304L generally does not require post-weld heat treatment.

## Product Range

Weld Neck Flanges,

Slip On Flanges,

Blind Flanges,

Socket Weld Flanges,

Threaded Flanges,

Forged Fittings,

## Product Marking

Products are marked with ASTM A182 grade designation, size, pressure class, heat number, and manufacturer identification to ensure full traceability.

## Typical Applications

Chemical processing equipment, petrochemical and refinery piping systems, oil and gas pipelines, food and pharmaceutical plants, water treatment facilities, and general corrosion-resistant pressure systems.

