

ASTM A182 904L Specification Overview

ASTM A182 is the standard specification for **forged or rolled alloy and stainless steel pipe flanges, forged fittings, valves, and parts for high-temperature service.**

904L (UNS N08904) is a high-alloy, austenitic stainless steel known for its excellent corrosion resistance, particularly in aggressive environments such as sulfuric acid, chloride, and seawater conditions.

ASTM A182 904L introduction

- **UNS Number:** N08904
- **Standard:** ASTM A182 (for forged products), ASTM B625 (for plate), ASTM B649 (for bar)
- **Type:** Austenitic stainless steel
- **Form:** Forged flanges, forged fittings, and valve parts
- **Condition:** Typically supplied in solution-annealed condition

Chemical Composition (% by weight)

Element	Composition (%)
Carbon (C)	≤ 0.020
Manganese (Mn)	≤ 2.00
Phosphorus (P)	≤ 0.045
Sulfur (S)	≤ 0.035
Silicon (Si)	≤ 1.00
Nickel (Ni)	23.0 - 28.0
Chromium (Cr)	19.0 - 23.0
Molybdenum (Mo)	4.0 - 5.0
Copper (Cu)	1.0 - 2.0
Iron (Fe)	Balance

904L Heat treatment as per ASTM A182

Grade	Heat Treat Type	Austenitizing/Solutioning Temperature, Minimum or Range, °F [°C] ⁴	Cooling Media	Quenching Cool Below °F [°C]	Tempering Temperature, Minimum or Range, °F [°C]
F 904L	solution treat and quench	1920 - 2100 [1050 - 1150]	liquid ^E	500 [260]	^B

904L ASTM A182 Mechanical Properties

Grade Symbol	Tensile Strength, min, ksi [MPa]	Yield Strength, min, ksi [MPa] ⁸	Elongation in 2 in. [50 mm] or 4D, min, %	Reduction of Area, min, %	Brinell Hardness Number, HBW, unless otherwise indicated
F 904L	71 [490]	31 [215]	35

Corrosion Resistance

- Excellent resistance to **sulfuric acid**, **chloride-induced pitting**, and **stress corrosion cracking**
- Superior performance compared to 316L and 317L in highly aggressive environments

Applications

- Chemical processing (especially in sulfuric acid environments)
- Pulp and paper industry
- Marine and offshore engineering
- Gas scrubbers and seawater cooling systems

- Heat exchangers and pressure vessels
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Weldability

- Good weldability using most standard methods (TIG, MIG)
- Use filler metals such as **ERNiCrMo-3** or **ER385 (904L)** for corrosion resistance matching

Production :

- ASTM A182 904L **Welding Neck Flange (WN)**
- ASTM A182 904L **Slip-On Flange (SO)**
- ASTM A182 904L **Socket Weld (SW)**
- ASTM A182 904L **Blind Flange (BL)**
- ASTM A182 904L **Threaded (TH)**
- **Lap Joint (LJ)**

Standard:ASME B16. 5 ASME B16. 47, EN 1092-1