

ASTM A182 F53 Forging Flange - Specification

Standard Overview

ASTM A182 F53 refers to forged or rolled alloy and stainless steel piping components intended for high-temperature or corrosive service. F53 is the ASTM grade designation for UNS S32750, a super duplex stainless steel known for its exceptional corrosion resistance and high strength.

- **UNS Designation:** S32750
- **Equivalent Standard:** EN 1.4410, X2CrNiMoN25-7-4
- **Product Forms:** Flanges, fittings, forged bars, and valve parts
- **Typical Applications:** Offshore platforms, desalination, oil & gas, petrochemical plants, chemical processing, seawater systems

Chemical Composition (% by weight)

Element	Content (%)
Chromium (Cr)	24.0 - 26.0
Nickel (Ni)	6.0 - 8.0
Molybdenum (Mo)	3.0 - 5.0
Nitrogen (N)	0.24 - 0.32
Manganese (Mn)	≤ 1.20
Silicon (Si)	≤ 0.80
Carbon (C)	≤ 0.030
Phosphorus (P)	≤ 0.035
Sulfur (S)	≤ 0.020
Iron (Fe)	Balance

Mechanical Properties (Solution Annealed Condition)

Property	Value (≤ 50 mm thick)	Value (> 50 mm thick)
Tensile Strength	≥ 730 MPa	≥ 600 MPa
Yield Strength (0.2%)	≥ 550 MPa	≥ 515 MPa
Elongation (50 mm)	$\geq 15\%$	$\geq 15\%$
Hardness	≤ 310 HB	≤ 310 HB
Impact Toughness	≥ 40 J (at -46° C typical)	Optional/Project spec

Heat Treatment

- **Solution Annealing:**
 - Heating temperature: $\geq 1020^\circ$ C
 - Rapid quenching in water or air to retain duplex structure
- **Cooling:** Fast cooling to avoid intermetallic phase formation
- **Forging Temperature Range:** 1100° C to 1250° C
- **Post-Forging:** Mandatory solution annealing required after hot working

Testing Requirements

Test Type	Requirement / Standard
Tensile Test	Per ASTM A370
Hardness Test	Brinell (≤ 310 HB) or Rockwell C scale
Chemical Analysis	Per ASTM E415 or equivalent
Intergranular Corrosion (IGC)	Optional per project requirement
Ultrasonic Examination	As per ASTM A388 (if specified)
Pitting Resistance Equivalent (PREn)	≥ 40 (Cr + 3.3Mo + 16N)

Available Product Range

Forged Flanges

- Types: Weld Neck, Blind, Slip-On, Threaded, Socket Weld, Lap Joint
- Standards: ASME B16.5, B16.47, EN 1092-1, MSS SP-44, API 6A
- Sizes: ½" to 48", PN6 to PN400 / Class 150 to 2500

Forged Fittings

- Types: Elbows, Tees, Couplings, Reducers, Caps
- Standards: ASME B16.11, MSS SP-79/83/97
- Sizes: ½" to 4", Pressure Class 3000/6000/9000

Forged Bars

- Diameter: 20 mm - 800 mm
- Lengths: up to 6 meters
- Shapes: Round, square, hollow, machined per drawing



Certifications & Compliance

- ASTM A182 / ASME SA182
- NACE MR0175 / ISO 15156
- EN 10204 3.1 / 3.2 certificates
- ISO 9001:2015 / PED / AD2000
- Third-party inspection: SGS, BV, TUV, DNV available upon request

Packaging & Delivery

- Export-grade wooden boxes or crates
- End protection, barcoded tagging, and full traceability
- Color-coded marking (e.g., yellow/white stripe for F53)
- Global shipping by sea/air freight