

# ASTM A815 WP S31803 Butt Weld Fittings Specification Duplex Stainless Steel (UNS S31803) Technical Datasheet

Keywords: ASTM A815, WP S31803, UNS S31803, Duplex Stainless Steel, Butt Weld Fittings, Elbow, Tee, Reducer, Cap, Duplex 2205

## 1. ASTM A815 Standard Overview

ASTM A815 is the standard specification for forged duplex stainless steel butt welding fittings used in pressure piping systems. It covers ferritic/austenitic stainless steel grades with enhanced mechanical strength and superior corrosion resistance. WP S31803 (UNS S31803), commonly known as Duplex 2205, is one of the most widely used grades under ASTM A815.

## 2. WP S31803 (UNS S31803) Duplex Stainless Steel

UNS S31803 is a duplex stainless steel with approximately 50% ferrite and 50% austenite microstructure. It provides excellent resistance to chloride stress corrosion cracking (SCC), high mechanical strength, and good weldability. ASTM A815 WP S31803 butt weld fittings are extensively used in oil & gas, offshore, petrochemical, chemical processing, and desalination industries.

## 3. Chemical Composition of ASTM A815 WP S31803 (wt. %)

Grade	C	Mn	Si	P	S	Cr	Ni	Mo	N
WP S31803	≤0.03	≤2.00	≤1.00	≤0.030	≤0.020	21.0–23.0	4.5–6.5	2.5–3.5	0.08–0.20

## 4. Mechanical Properties, Hardness & PREN

Property	ASTM A815 WP S31803
Tensile Strength	≥ 620 MPa
Yield Strength (0.2%)	≥ 450 MPa
Elongation	≥ 25 %
Hardness	≤ 28 HRC.
PREN Value	≈ 34 – 35

## 5. ASTM A815 UNS S31803 Butt Weld Fittings Product Range

- ASTM A815 UNS S31803 Elbow (45° / 90° / 180°)
- ASTM A815 UNS S31803 Tee (Equal Tee / Reducing Tee)
- ASTM A815 UNS S31803 Reducer (Concentric / Eccentric)
- ASTM A815 UNS S31803 Cap
- ASTM A815 UNS S31803 Customized Butt Weld Pipe Fittings

## 6. Size Range, Wall Thickness & Dimensional Standards

Size Range: 1/2" NB – 48" NB (DN15 – DN1200)

Wall Thickness: SCH 10 / SCH 20 / SCH 40 / STD / XS / SCH 80 / SCH 160

Dimensional Standards: ASME B16.9, ASME B16.28, MSS SP-43

Manufacturing Process: Hot Forming, Cold Forming, Welding, Solution Annealing

## 7. Inspection, Testing & Quality Control

- Chemical Analysis & PMI Test
- Mechanical Testing
- Hardness Test
- Ferrite Content Test
- Non-Destructive Testing (UT, RT, PT)
- Dimensional & Visual Inspection

## 8. Certification & Documentation

- EN 10204 3.1 / 3.2 Mill Test Certificate (MTC)
- Manufacturer Test Report (MTR)
- Third Party Inspection (SGS, BV, TUV, DNV)
- Certificate of Origin (CO)

## 9. S31803 vs S32205 Duplex Stainless Steel Comparison

Item	UNS S31803	UNS S32205
Standard	ASTM A815	ASTM A815
PREN	≈ 34 – 35	≈ 35 – 36
Nitrogen Content	0.08 – 0.20 %	0.14 – 0.20 %
Corrosion Resistance	Excellent	Slightly Higher
Mechanical Strength	High	Slightly Higher
Typical Applications	General Duplex Service	More Severe Corrosive Environments

