ASTM A403/A403M-26 — Specification & Tolerance Matrix

Product: Stainless Steel Pipe Fittings · Values and clauses from ASTM A403/A403M-26

Grades commonly supplied: WP304, WP304L, WP316, WP316L, WP321, WP347, WP904L · Dimensional standards: ASME B16.9 (NPS 1/2–48), ASME B16.11

Table 1 — Fitting classes for WP grades

Class	Construction	Nondestructive examination
S	Seamless	None
W	Welded	Radiography or ultrasonic
WX	Welded	Radiography of all welds
WU	Welded	Ultrasonic of all welds

Table 4 — Solution anneal, selected grades

Grade WP	UNS	Solution anneal, min °F [°C]	Quench
WP304 / WP304L	S30400 / S30403	1900 [1038]	Water or other rapid cool
WP316 / WP316L	S31600 / S31603	1900 [1038]	Water or other rapid cool
WP321	S32100	1900 [1038]	Water or other rapid cool
WP347	S34700	1900 [1038]	Water or other rapid cool
WP904L	N08904	1985–2100 [1085–1149]	Water or other rapid cool

Table 5 — Tensile requirements, selected grades

Grade	Yield strength min, ksi [MPa]	Tensile strength min, ksi [MPa]
304, 316, 347; 321 (except seamless t > 3/8 in.)	30 [205]	75 [515]
321 seamless (A312 tubular), t > 3/8 in.	25 [170]	70 [485]
304L, 316L	25 [170]	70 [485]
N08904 (904L)	31 [215]	71 [490]

Elongation, all WP and CR grades: 28% longitudinal or 20% transverse minimum in 4D (standard round, small proportional or strip specimen).

- **Scope (§1):** Wrought austenitic stainless steel piping fittings. WP grades follow ASME B16.9 and B16.11; CR grades follow MSS SP-43 and have no classes (§1.2, §1.3). Cast fittings are excluded (§1.6). Duplex 2205 fittings are not an A403 grade and are ordered to ASTM A815; nickel alloy fittings to ASTM B366.
- **Manufacture (§5):** Forging or shaping by hammering, pressing, piercing, extruding, upsetting, rolling, bending, fusion welding, machining, or a combination (§5.1). Fittings machined from bar are restricted to NPS 4 or smaller; elbows, return bends, tees and header tees may not be machined directly from bar (§5.12). After final heat treatment, H-grade fittings shall have a grain size of 7 or coarser (§5.16).
- **Heat treatment (§6):** All fittings are furnished heat treated. H grades require separate solution heat treatment; in-process heat treatment is not a substitute (§6.1).
- **Hydrostatic tests (§9):** Not required by the specification. WP fittings shall withstand the test pressure prescribed for the matching pipe (§9.2); CR fittings per MSS SP-43 ratings, tees with intersection welds at 70% of those ratings (§9.3).
- **Surface finish (§10):** Discontinuities deeper than 5% of nominal wall removed (§10.3); surface checks (fish scale) deeper than 0.02 in. [0.5 mm] removed (§10.4); mechanical marks deeper than 0.06 in. [1.5 mm] removed (§10.5); wall at least 87.5% of nominal after removal; fittings free of scale and passivated (§10.7).
- **Repair by welding (§11):** Not permitted where defect depth exceeds 33 1/3% of nominal wall or defect area exceeds 10% of the fitting surface (§11.1); procedures and welders to ASME BPVC Section IX; cavities and repairs liquid-penetrant examined to E165/E165M.
- **Dimensions (§12):** Sizes, shapes and dimensions as specified in ASME B16.9, B16.11, MSS SP-43, SP-79, SP-83, SP-95 or SP-97; other sizes or shapes under Supplementary Requirement S58 of A960/A960M (§12.1).
- **Certification (§14):** Test reports required for all fittings: chemistry and tensile results of the starting materials, weld-metal analysis where filler is added, construction method and weld procedure, heat-treatment type, results of all NDE, and supplementary tests ordered.
- **Mill test certificate:** EN 10204 3.1 certificate issued by the producing maker with every shipment; 3.2 with third-party witness on request.