

MSS SP-75-2019

High-Strength, Wrought, Butt-Welding Fittings

Standard Practice
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This Standard Practice has been substantially revised from the previous 2014 edition with input from the API task group on low strength fittings and flanges, CSA materials group, U.S. DOT PHMSA, and several transmission companies that use this document extensively. Consensus of all concerned was gained through multiple iterations of this document and addressed revisions to the design, proof testing, materials, chemistries, heat treatment, impact testing, and quality control. The intent of this revision is to clarify the requirements and help ensure consistent material properties, along with records required to demonstrate compliance with that intent. It is suggested that if the user is interested in knowing what changes have been made, that direct page by page comparison should be made of this document and that of the previous edition.

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HIGH-STRENGTH, WROUGHT, BUTT-WELDING FITTINGS

1. SCOPE

1.1 This Standard Practice covers factory-made, seamless and electric welded carbon and low-alloy steel, butt-welding fittings for use in high pressure gas and oil transmission and distribution systems; including pipelines, compressor stations, metering and regulating stations, and mains.

1.2 This Standard Practice governs dimensions, tolerances, ratings, testing, materials, chemical and tensile properties, heat treatment, notch toughness properties, manufacture, inspection, certification, and marking for high-strength, butt-welding fittings NPS 60 and smaller. Dimensional requirements for NPS 14 and smaller are provided by reference to ASME B16.9.

1.3 The term “welding fittings” applies to butt-welding fittings such as elbows, segments of elbows, reducing elbows, caps, tees, single or multiple-outlet extruded headers, reducers, and extensions and transition sections⁽¹⁾. Hot induction bends are outside the scope of this Standard Practice. Girth weld requirements are outside the scope of this Standard Practice and are covered by the applicable ASME B31 Code for Pressure Piping and/or customer specifications.

1.4 Fittings may be made to special dimensions, sizes, shapes, and tolerances, or of wrought materials other than those covered by this Standard Practice by agreement between the manufacturer and the purchaser. When such fittings meet all other stipulations of this Standard Practice they shall be considered as being in partial compliance therewith, providing they are appropriately marked.

1.4.1 Fittings manufactured in partial compliance, as provided in Section 1.4, shall be identified with “Part” following the respective grade designation.

1.5 Fittings specified as “PSL2” will automatically invoke the additional requirements of SR-24 which are intended to be complementary to PSL2 line pipe in the API 5L Specification.

2. PRESSURE RATINGS

2.1 The allowable internal-pressure ratings for pipe fittings designed in accordance with this Standard Practice shall be calculated as for straight seamless pipe (or welded pipe with a joint efficiency factor of 1.0) of equivalent grade, diameter and wall thickness in accordance with the rules established in the applicable sections of ASME B31 Codes.

2.2 All fittings produced in accordance with this Standard Practice shall be designed to withstand a field hydrostatic test pressure, after installation, at a pressure level equivalent to that required to develop a hoop stress equal to the specified minimum yield strength for pipe of equivalent grade and wall thickness based on Barlow’s Formula, without failure, leakage, or impairment of serviceability. Barlow’s formula is defined as:

$$P = \frac{2St}{D}$$

Where:

P = internal design pressure, psig;

S = specified minimum yield strength of the mating pipe, psi;

t = nominal wall thickness of the mating pipe, inches;

D = outside diameter of the mating pipe, inches.

NOTE: (1) Lengths of extensions and transitions as agreed upon by purchaser and manufacturer.