

**MSS SP-75-2004**

# Specification for High-Test, Wrought, Butt-Welding Fittings

**Standard Practice**

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This MSS Standard Practice was developed under the consensus of the MSS Technical Committee 113 and the MSS Coordinating Committee. The content of this Standard Practice is the result of the efforts of competent and concerned volunteers to provide an effective, clear, and non-exclusive specification that will benefit the industry as a whole. This MSS Standard Practice is intended as a basis for common practice by the manufacturer, the user, and the general public. The existence of an MSS Standard Practice does not in itself preclude the manufacture, sale, or use of products not conforming to the Standard Practice. Mandatory conformance is established only by reference in a code, specification, sales contract, or public law, as applicable.

Unless otherwise specifically noted in this MSS SP, any standard referred to herein is identified by the date of issue that was applicable to the referenced standard(s) at the date of issue of this MSS SP. (See Annex A.)

In this Standard Practice all notes, annexes, tables, and figures are construed to be essential to the understanding of the message of the standard, and are considered part of the text unless noted as "supplemental". All appendices appearing in this document are construed as "supplemental". "Supplemental" information does not include mandatory requirements.

Substantive changes in this 2004 edition are "flagged" by parallel bars as shown on the margins of this paragraph. The specific detail of the change may be determined by comparing the material flagged with that in the previous edition.

Non-toleranced dimensions in this Standard Practice are nominal, and, unless otherwise specified, shall be considered "for reference only".

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## SPECIFICATION FOR HIGH-TEST, WROUGHT, BUTT-WELDING FITTINGS

### 1. SCOPE

1.1 This specification covers factory-made, seamless and electric fusion-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 and marking for high-test, 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, return bends, caps, tees, single-or multiple-outlet extruded headers, reducers, and factory-welded extensions and transition sections.<sup>(1)</sup>

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.

### 2. PRESSURE RATING

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.

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 is the internal design pressure, psig;

S is the specified minimum yield strength of the pipe, psi;

t is the nominal wall thickness of the pipe, in inches;

D is the outside diameter of the pipe, in inches.

2.3 By agreement between the manufacturer and the purchaser, fittings may be tested at a higher pressure providing the manufacturer is notified of the test pressure to be used.

2.4 The design shall take into consideration performance requirements prescribed above as well as additional factors dictated by the shape of the part.

2.5 The design of fittings may be established by mathematical analyses contained in nationally recognized pressure vessel or piping codes or, at the manufacturer's option, by proof testing in accordance with Section 4. The design of fittings that cannot be qualified by mathematical analyses shall be established by proof testing in accordance with Section 4.

<sup>(1)</sup> Lengths of extensions and transitions as agreed upon by purchaser and manufacturer.