

MSS SP-119-2003

Factory-Made Wrought Belled End Socket-Welding Fittings

Standard Practice
Developed and Approved by the
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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.

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

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)

This document has been substantially revised from the previous 1996 edition. 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.

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FORWARD

ASME B16.9 is the American Standard for steel butt-welding fittings and although not *so* stated, it is implied that its scope deals primarily with standard (Schedule **40**) wall and heavier *as* it was developed for carbon steel and those grades of alloy steel piping that are selected for pressure and temperature considerations. In **1949** **ASME** approved standard **B36.19** for Stainless Steel Pipe in which Schedule **10S** was established. Schedule **5S** pipe was recognized in the **1952** publication of **B36.19**. The companion fittings for Schedule **10S** pipe used **B16.9** shapes and proportions and were standardized by **MSS SP-43** which was first published in **1950**. In anticipation, the original **1950** edition of **MSS SP-43** also standardized Schedule **5S** fittings.

Since **1950** the use of lighter than standard wall stainless steel piping in new construction has become predominant. The reasons for this evolution include the rapid expansion of the process industries in the fields of chemicals, plastics, textiles, paper, etc.

Coincident with the greater utilization of light wall pipe and of more capable metal forming machinery, the need to reduce pipe assembly fabrication times brought about by world market competition led to the development of belled end socket welding fittings. *As* with the development of **MSS SP-43**, the shapes and proportions for **B16.9** were reused for the belled end fitting bodies to the maximum extent possible.

In **1992** first work on belled end fittings for this standard included socket proportions, socket to fitting body transition geometry, fitting thickness, and the ability of **U.S.** industry to support manufacturing. Some of this work only standardized service proven relationships used in belled end fittings made for the pulp and paper industry without standards for over **20** years. In **1994** the **U.S.** Navy funded burst and fatigue testing prototype fittings in the first of a two-phase program. The second phase was for an increased thickness fitting and was never done. In **1995** mid-way through testing, the Navy directed that these belled end fittings be used *on* ship systems in new construction followed shortly thereafter by direction to use them on the repair of ship systems. The quality and configuration control of these fittings was done by an interim document, the requirements of which, with some improvements, are contained herein.

In keeping with recent trends wherein military procurement activities have been using more commercial material standards and because of recognized fabrication economies related to the use of these fittings, the **U.S.** Navy sponsored the writing of this Standard Practice in cooperation with fitting manufacturers.

This Standard Practice establishes dimensional uniformity for light wall belled end socket welding fitting designs qualified by burst and fatigue testing for Military Service and qualified by burst testing for Commercial Code Practice.

The most significant changes in the **2003** revision include the following: **1)** A new definition for allowable pressure ratings *for* MP fittings (Section **6**), which adopts the **B16.9** format rating *the* fitting the same as the connecting pipe of the same schedule. **2)** The addition of titanium *and* aluminum fitting materials, and **3)** The addition of the Supplementary Requirements (Section **18**), which supports the Navy and their needs for special dimensions.

TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
1 SCOPE.....	1
2 REFERENCES.....	1
3 SPECIAL CONSIDERATIONS.....	1
4 DEFINITIONS.....	1
5 CLASSIFICATIONS.....	2
6 PRESSURE RATINGS.....	2
7 FITTING DESIGN.....	3
8 MANUFACTURING METHOD PROOF TESTING.....	3
9 PRODUCTION TESTING.....	4
10 MATERIALS.....	5
11 WELDING AND WELD INSPECTIONS.....	5
12 TOLERANCES AND DIMENSIONS.....	6
13 SOCKET AND COUPLING END FACES.....	6
14 PIPE JOINT FILLET WELD.....	6
15 FINISH.....	6
16 STRESS RELIEVING TREATMENT	7
17 MARKING.....	7
18 SUPPLEMENTARY REQUIREMENTS.....	8
 FIGURE 1	 6
 TABLE 1 Fitting Material Classes.....	 10
2 Tolerances and Minimum Wall Thickness.....	11
3 Socket Dimensions.....	12
4 Long (Standard) Radius Elbow Dimensions.....	13
5 Short Radius Elbow Dimensions.....	14
6 Long (Standard) Radius Street Elbow Dimensions.....	15
7 Short Radius Street Elbow Dimensions.....	16
8 Straight Tee Dimensions.....	17
9 Reducing Tee Dimensions.....	18
10 Straight Thermowell Tee Dimensions.....	19
11 Angle Thermowell Tee Dimensions.....	20
12 Concentric Reducer Dimensions.....	21
13 Concentric Street Reducer Dimensions.....	22
14 Eccentric Reducer Dimensions.....	23
15 Cap Dimensions.....	24
16 Standard Coupling Dimensions.....	25
17 Closure Coupling Dimensions.....	26
18 Closure Repair Coupling Dimensions.....	27
 ANNEXA Referenced Standards and Applicable Dates.....	 28

FACTORY-MADE WROUGHT BELLED END SOCKET-WELDING FITTINGS

1. SCOPE

1.1 This Standard Practice covers stainless steel, copper nickel and titanium, *NPS* 1/4 through 12, and aluminum *NPS* 1/2 through 12 belled end socket welding fittings, including dimensions, tolerances, materials, socket end details, heat treating and marking requirements for use with the following pipe standards:

- a) ASTM A 312
- b) ASTM B 466
- c) ASTM B 467
- d) MIL-T-16420
- e) ASTM B 861 or B 862
- f) ASTM B 241

1.2 Design and manufacturing requirements are specified for factory-made, wrought, thin wall pipe fittings formed from either tubular sections or flat material. All fittings made to this Standard Practice are one of two thicknesses: Class 200, if copper-nickel, or Schedule 10 if made of any other material.

2. REFERENCES

2.1 Standards and specifications adopted by reference in this standard are shown in Annex A, for convenience of identifying edition number, date and source of supply.

3. SPECIAL CONSIDERATIONS

3.1 Partial Compliance Fittings may be made by agreement between the manufacturer and the purchaser. Special considerations include, but are not limited to, dimensions - such as unlisted reducing tees, sizes - such as *NPS* 3 1/2, shapes - such as a street end tee, tolerances different from those listed in Table 2, or of wrought materials other than those covered by this Standard Practice. When such fittings meet all other stipulations of this Standard Practice, they shall be considered as being in partial compliance herewith, provided they are appropriately marked (see Section 17.4).

3.2 Laterals, wyes, mitered elbows, and tees of notch and point or saddle weld constructions are not covered by this standard.

4. DEFINITIONS

4.1 Belled End Socket Welding Fittings are a family of relatively thin wall wrought fittings, which extend the advantages of socket welded joints through the common sizes of thin walled pipes. In this Standard Practice, "wrought" is used to denote fittings formed from tubular or flat starting materials as opposed to those that are either forged or cast to their final shape or machined from forgings or castings.

4.2 CuNi is a notation representing copper nickel alloy.