MSS SP-119
2025 Edition

Factory-Made Wrought Belled-End Pipe Fittings for Socket-Welding

Standard Practice developed and approved by the Manufacturers Standardization Society of the Valve and Fittings Industry, Inc.

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Manufacturers Standardization Society

OF THE VALVE AND FITTINGS INDUSTRY

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U.S. customary units in this Standard Practice are the standard; the SI (metric) units are based on common equivalencies and are for reference only. Combining or converting values between the system of measurement utilized and "reference" values may result in non-conformance with this Standard Practice.

This Standard Practice has been substantively revised from the previous 2010 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 and that of the previous edition.

Non-toleranced dimensions in this Standard Practice are nominal unless otherwise specified.

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Foreword

ASME B16.9 is the American Standard for steel butt-welding fittings and although not so stated, it implied that its scope dealt 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 ASME B36.19 for Stainless Steel Pipe in which Schedule 10S was established. Schedule 5S pipe was recognized in the 1952 publication of ASME B36.19. The companion fittings for Schedule 10S pipe used ASME 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 ASME 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 Practice included defining socket proportions, socket to fitting body transition geometry, fitting thickness, and determining 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 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 the 1996 edition of this Standard Practice in cooperation with fitting manufacturers.

This Standard Practice established 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 included the following: 1) A new definition for allowable pressure ratings for MP fittings (Section 6), which adopts the ASME 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, now 17), which supports Navy special requirements.

The most significant changes in the 2010 revision included the following: 1) The extension of the SCOPE to include heavier wall fittings; 2) The relocation of the CR fitting requirements from the body of the Standard Practice to that of a Supplementary Requirement; 3) The addition of all the combinations of reducing fittings included in ASME B16.9; and, 4) The addition of a reference line on the socket end to enable inspectors to measure the installation weld length – as a Supplementary Requirement. The title of the 2010 revised Standard Practice was also amended.

The most significant change in this 2024 revision is the addition of 0.25 in. to the reducing outlet branch length in reducing branch tees with run sizes of 2, $2^1/_2$ and 3, which tees are shown in Table 9. This change will enhance fabrication quality by removing the branch weld from the forming area. The remaining revisions to this Standard Practice mostly involve maintenance, format updating and editorial or clarifying corrections, rather than substantive changes, and do not affect form, fit, function, materials, or inventory.

Preface

Technical Committee Membership

The MSS Technical Committee 113, *Wrought Welding Fittings*, has primary responsibility for this Standard Practice and included the following voting and non-voting members at the time of approval:

Chair: ***Tim Warren**, Core Pipe Products, Inc.*
Vice-Chair: ***David Taylor**, Trident Maritime Systems*

***Daniel Amire**, Alloy Piping Products*
***Rod Bayard**, Bestweld, Inc.*
***Patrick Benavides**, Tube Forgings of America, Inc.*
***Tracie Black**, Galperti, Inc.*
***Nathan Blackwood**, Parker Hannifin Corporation*
***Ray Bojarczuk**, Weldbend Corporation*
***Virginia Brodd**, Dynamic Products, Inc.*
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***Ignacio Lopez**, FloWorks USA LP*
***Scot Marshall**, Tube Forgings of America, Inc.*
***Jeff Matson**, Viega LLC*
***Sheryl Michalak**, Welding Outlets, Inc.*
***Rock Powell**, Mueller Co. LLC*
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In addition, the technical committee chair and MSS convey particular recognition to ***Kim Burton**, Burton Consulting*, for his distinct contribution and participation in the development of this Standard Practice.

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