MSS SP-43-2019

Wrought and Fabricated Butt-Welding Fittings for Low Pressure, Corrosion Resistant Applications

Standard Practice
Developed and Approved by the
Manufacturers Standardization Society of the
Valve and Fittings Industry, Inc.
127 Park Street, NE
Vienna, Virginia 22180-4602
Phone: (703) 281-6613
Fax: (703) 281-6671
E-mail: standards@msshq.org

www.msshq.org

This MSS Standard Practice was developed under the consensus of the MSS Technical Committee 113, *Wrought Welding Fittings,* and the MSS Coordinating Committee. The content of this Standard Practice is the resulting efforts of knowledgeable and experienced industry volunteers to provide an effective, clear, and non-exclusive standard that will benefit the industry as a whole. This MSS Standard Practice describes minimal requirements and is intended as a basis for common practice by the manufacturer, the user, and the industry at large. It is the responsibility of the user of this Standard Practice to establish appropriate safety and health practices and determine the applicability of regulatory requirements prior to use. 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 to this Standard Practice is established only by reference in other documents such as a code, specification, sales contract, or public law, as applicable. MSS has no power, nor does it undertake, to enforce or certify compliance with this document. Any certification or other statement of compliance with the requirements of this Standard Practice shall not be attributable to MSS and is solely the responsibility of the certifier or maker of the statement.

"Unless indicated otherwise within this MSS Standard Practice, other standards documents referenced to herein are identified by the date of issue that was applicable to this Standard Practice at the date of approval of this MSS Standard Practice (see Annex A). This Standard Practice shall remain silent on the validity of those other standards of prior or subsequent dates of issue even though applicable provisions may not have changed."

By publication of this Standard Practice, no position is taken with respect to the validity of any potential claim(s) or of any patent rights in connection therewith. MSS shall not be held responsible for identifying any patent rights. Users are expressly advised that determination of patent rights and the risk of infringement of such rights are entirely their responsibility.

For all MSS Standard Practices, the term "shall" means "must" and "shall not" means "must not".

In this Standard Practice, all text, notes, annexes, tables, figures, and references are construed to be "normative" and essential to understand the standard's message. All appendices and footnotes, or any other information denoted as "supplemental", that may be included within this Standard Practice, DO NOT involve mandatory or normative requirements.

> Substantive changes in this 2019 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 2010 edition.

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

Originally Approved: October 1950
Current Edition Approved: January(April) 2019
Current Edition Published: December 2019

FOREWORD

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 the schedules of wall thicknesses which are common to carbon steel and the grades of alloy steel piping that are selected for pressure and temperature considerations.

The rapid expansion of the process industries in the field of chemicals, plastics, textiles, etc., has created a demand for a class of pipe referred to as stainless piping, using this word in its generic sense. This field employs the use of the austenitic stainless steels and also nickel and its related alloys. This stainless piping is used for resistance to corrosion, elimination of product contamination, or combination of the two as the principle reason for material selection. Pressure is seldom, if ever, a critical consideration.

When pressure is a consideration, reference is made to ASME B16.9.

Mechanical strength, resistance to vacuum, and economy, are the most usual criteria in the selection of pipe thickness in this field, and for this reason the wall thicknesses employed in the field of corrosion resistant pipe are lighter than those in common usage with carbon steel piping.

In 1949, the American Standards Association, now known as the American National Standards Institute or ANSI, approved B36.19, Stainless Steel Pipe, as an American Standard. The B36.19 standard was developed by the ASA B36 Standards Committee, which included MSS as a participant. In this American Standard, a schedule of wall thickness was established and designated as Schedule 10S. Numerous companies were also using a wall thickness lighter than Schedule 10S for services where contamination rather than corrosion was the prime consideration. These lighter wall thicknesses were designated Schedule 5S and the original 1950 edition of MSS SP-43 established a series of Schedule 5S fittings. The 5S thicknesses were published in MSS SP-43 and were developed in cooperation with representatives of the various principal chemical companies and processing industries. In 1952, the B36.19 Stainless Steel Pipe Standard was revised to recognize the Schedule 5S wall thickness pipe as an American Standard. MSS and the ASA endorsed this inclusion.

The purpose of this Standard Practice is to provide industry with a set of dimensional standards for butt-welding fittings that can be used with these light wall pipes of corrosion resisting materials. The center-to-end dimensions of all fittings are identical with those in ASME B16.9, which give to industry the advantage of uniform design room practice and a maximum utilization of existing die equipment. The only departure from this is in the lap-joint stub end, where for purposes of economy, the face-to-end of the product has been reduced for use with thin wall piping.

The advantage of longer center-to-end dimensions of size 3/4 elbows resulted in a change to the tables that would permit a gradual changeover, thus providing manufacturers ample time to deplete existing stock, re-tool, and replenish their stock.

The 1991 revision of MSS SP-43 involved the deletion of metric equivalents.

The 2001 Reaffirmation had no technical changes. There were minor editorial changes. The precedence of the longer dimensions for 3/4 elbows was made in accordance with ASME B16.9. Referenced standards were brought up to date. The title of 180-degree returns was clarified.

In the 2008 edition, a minimal pressure rating was established to correspond with the ASTM CR designation.

The 2013 edition was revised to include a new section on welding, a revision of Table 1 to include angularity tolerances, a revision of Section 6.1 to update AISI/SAE fitting grade types, data corrections were made to Tables 4, 5, and 6, referenced standards in Annex A were updated, and numerous formatting and editorial corrections were made. In addition, the drawings for Section 10 and 11, and Tables 2, 3, and 5 have been redone in this current revision although not “flagged” given there were no substantive changes. Note that various Table corrections contained within an Errata Sheet issued in 2010 were also incorporated.

This 2019 edition was revised to include: (1) incorporation of changes to Section 3 and Annex A as contained in the 2015 Amendment; (2) updates to the Scope; (3) update to Section 3 involving pressure ratings; (4) clarification of figures and nomenclature; (6) update of Table 1 Tolerances, (7) clarification of table drawings; (8) update of Table 4 headings; (9) other editorial and conforming revisions; (10) update to Annex A References.

TABLE OF CONTENTS

SECTION

TABLE

FIGURE

ANNEX

This Page Intentionally Left Blank

Manufacturers Standardization Society of the Valve and Fittings Industry

MSS Standard Practices (SPs) related to or referenced in this publication:

ANSI/MSS SP-25	***Standard Marking System for Valves, Fittings, Flanges, and Unions***
ANSI/MSS SP-96	***Terminology for Valves, Fittings, and Their Related Components***

American National Standards Published by MSS, an ANSI-accredited Standards Developer:

ANSI/MSS SP-25	***Standard Marking System for Valves, Fittings, Flanges, and Unions***
ANSI/MSS SP-44	***Steel Pipeline Flanges***
ANSI/MSS SP-55	***Quality Standard for Steel Castings for Valves, Flanges, Fittings, and Other Piping Components – Visual Method for Evaluation of Surface Irregularities***
ANSI/MSS SP-58	***Pipe Hangers and Supports – Materials, Design, Manufacture, Selection, Application, and Installation***
ANSI/MSS SP-96	***Terminology for Valves, Fittings, and Their Related Components***
ANSI/MSS SP-114	***Corrosion Resistant Pipe Fittings Threaded and Socket Welding Class 150 and 1000***
ANSI/MSS SP-122	***Plastic Industrial Ball Valves***
ANSI/MSS SP-134	***Valves for Cryogenic Service, including Requirements for Body/Bonnet Extensions***
ANSI/MSS SP-135	***High Pressure Knife Gate Valves***
ANSI/MSS SP-138	***Quality Standard Practice for Oxygen Cleaning of Valves and Fittings***
ANSI/MSS SP-144	***Pressure Seal Bonnet Valves***

About MSS

The Manufacturers Standardization Society (MSS) of the Valve and Fittings Industry is a non-profit technical association organized for development and improvement of industry, national and international codes and standards for Valves, Valve Actuators, Valve Modifications, Pipe Fittings, Flanges, Pipe Hangers and Supports, and Associated Seals. Since its establishment in 1924, MSS has been dedicated to developing standards for national and global applications, in cooperation with other standardizing bodies and regulatory authorities. **MSS is an American National Standards Institute (ANSI)-accredited standards developer.**

For more information on membership and eligibility requirements, visit: http://msshq.org/Store/Membership.cfm

Manufacturers Standardization Society of the Valve and Fittings Industry, Inc.
127 Park Street, NE, Vienna, VA 22180-4620 • Phone (703) 281-6613 • Fax (703) 281-6671

"The Technical Voice of the Industry"