ASME B16.24-2021
(Revision of ASME B16.24-2016)

Cast Copper Alloy Pipe Flanges, Flanged Fittings, and Valves

Classes 150, 300, 600, 900, 1500, and 2500

AN AMERICAN NATIONAL STANDARD

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Two Park Avenue • New York, NY • 10016 USA

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ASME issues written replies to inquiries concerning interpretations of technical aspects of this Standard. Periodically certain actions of the ASME B16 Committee may be published as Cases. Cases and interpretations are published on the ASME website under the Committee Pages at http://cstools.asme.org as they are issued.

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The American Society of Mechanical Engineers
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FOREWORD

The development of the first Bronze Flanged Standard began in 1910 to eliminate the confusion prevailing in the trade with respect to bronze flange dimensions and service ratings. The work culminated and was published in 1914 under the title "1914 Brass Standard Flange Dimensions" for 150-lb and 250-lb (now Class 150 and Class 250) steam pressures.

This was superseded in 1928 by the Manufacturers Standardization Society of Valves and Fittings Industry (MSS) "Standard Practice" SP-2, which contained changes to provide inter-changeability with the American Cast-Iron Flange Standards for 125-lb (now Class 125) and Class 250 stream pressures. Subsequent revisions were issued in 1930 and 1936. In the latter, a new column of thickness for 300-lb (now Class 300) flanges was added.

In the 1937 edition, illustrations and dimensions of bronze-flanged fittings were added. This was edited and reprinted in 1943 to conform to the U.S. Department of Commerce, National Bureau of Standards, Simplified Practice Recommendation R-183-42, and to the War Production Board Limitation Order L-252, dated January 23, 1943.

In the 1946 edition, the pressure–temperature ratings were added for the Class 150 and Class 300 standards and the dimensions for that reference to the Class 250 standard were omitted. Limitation Order L-252 was canceled on April 28, 1945. The period of government prohibition of manufacture and civilian use of the Class 250 standard (during the life of Order L-252) caused no hardship on the part of either the manufacturer or the consumer, indicating that this pressure class in bronze products did not warrant being recognized as a standard.

This Standard was reviewed and reaffirmed in 1949. In October 1951, MSS ceded it to Sectional Committee B16 on Pipe Flanges and Flanged Fittings for review and possible approval as an American Standard.

Following approval of the sectional committee and sponsor organizations, it was sent to the American Standards Association (ASA), now the American National Standards Institute (ANSI), for approval and designation as an American Standard. This was granted on February 27, 1953.

In 1961, following the organization of Subcommittee No. 11 (now Subcommittee J), the 1953 edition was revised. Chief among the changes recommended was the deletion of reference to brass. This resulted from an action of ASTM redefining the alloys that could properly be called bronze. Several other changes that brought the Standard up to date were also approved by the B16 Committee, with approval designation as an American Standard being granted on July 20, 1962.

Subcommittee J, in keeping with regulations of ANSI, reviewed the Standard in 1969. Only minor changes were made. Among these were the presentation of pressure–temperature ratings in tabular form, and the gasket-retaining grooves being made permissible rather than recommended. Final approval of the changes was granted by ANSI on January 27, 1971.

A revision was undertaken in 1977, and several changes were proposed. Foremost among these was the addition of metric equivalents and the elimination of the optional gasket-retaining grooves. In addition, the Standard was extensively revised editorially. Following approvals by Subcommittee J and the Standards Committee, ANSI granted its approval on June 26, 1979.

In 1982, the American National Standard Committee B16 was reorganized as an ASME Committee, operating under procedures accredited by ANSI.

In 1991, the scope of the Standard was changed from bronze pipe flanges and fittings to cast copper alloy flanges and flanged fittings, and it was expanded to include class designations 150, 300, 600, 900, 1500, and 2500. The 1991 edition also established U.S. Customary units as the standard, and editorial revisions were made to improve the text. Following approval by the Standards Committee and ASME, the 1991 edition of the Standard was approved as an American National Standard by ANSI on February 1, 1991, with the new designation ASME B16.24-1991 and the new title "Cast Copper Alloy Pipe Flanges and Flanged Fittings."

In 2001, the Standard was revised to include Nonmandatory Appendix A, Quality System Program. Editorial revisions were made for clarification. Following approval by the B16 Standards Committee and the ASME Supervisory Board, the Standard was approved as an American National Standard by ANSI on October 24, 2001.

In the 2006 edition, metric units became the primary reference units while maintaining U.S. Customary units in either parenthetical or separate forms. Requirements for Class 400 flanges were omitted from the Standard. In addition, several editorial revisions were made for clarity. Following approval by the Standards Committee and the ASME Board, ASME B16.24-2006, Cast Copper Alloy Pipe Flanges and Flanged Fittings: Classes 150, 300, 600, 900, 1500, and 2500 was approved as an American National Standard by ANSI on November 9, 2006.

In the 2011 edition, references to ASME Standards were revised to no longer list specific edition years; the latest edition of ASME publications applies unless stated otherwise. Materials manufactured to other editions of the referenced ASTM standards have been permitted to be used to manufacture fittings meeting the requirements of this Standard as long as the fitting manufacturer verifies the material meets the requirements of the referenced edition. Following approval by the Standards Committee and the ASME Board on PTCS, the 2011 revision was approved as an American National Standard by ANSI on August 9, 2011, with the designation ASME B16.24-2011.

In the 2016 edition, provisions were made to revise the scope and table readings, and a new Mandatory Appendix and a new Nonmandatory Appendix were added. Following approval by the ASME B16 Standards Committee, approval was given by ANSI on September 23, 2016, with the new designation ASME B16.24-2016 and the new title "Cast Copper Alloy Pipe Flanges, Flanged Fittings, and Valves: Classes 150, 300, 600, 900, 1500, and 2500."

In ASME B16.24-2021, the U.S. Customary tables in former Mandatory Appendix I have been merged with the SI tables in the main text. The tables and figures have been redesignated, former Mandatory Appendix I has been deleted, and the subsequent Mandatory Appendices have been redesignated. Cross-references have been updated accordingly. Also in this edition, paras. 3.1(c), 5.1.2, 6.2.3, 7.1.2, I-0(c), and I-4.3 have been revised, illustrations for "True Y" in Tables 8.1.2-1 and 8.1.2-2 have been revised, Table 3.1-4 has been added, and the references in Mandatory Appendix II (formerly Mandatory Appendix III) have been updated. Following approval by the ASME B16 Standards Committee, ASME B16.24-2021 was approved by ANSI on December 10, 2021.

ASME B16 COMMITTEE
Standardization of Valves, Flanges, Fittings, and Gaskets

(The following is the roster of the Committee at the time of approval of this Standard.)

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CORRESPONDENCE WITH THE B16 COMMITTEE

General. ASME Standards are developed and maintained with the intent to represent the consensus of concerned interests. As such, users of this Standard may interact with the Committee by requesting interpretations, proposing revisions or a case, and attending Committee meetings. Correspondence should be addressed to:

Secretary, B16 Standards Committee
The American Society of Mechanical Engineers
Two Park Avenue
New York, NY 10016-5990
http://go.asme.org/Inquiry

Proposing Revisions. Revisions are made periodically to the Standard to incorporate changes that appear necessary or desirable, as demonstrated by the experience gained from the application of the Standard. Approved revisions will be published periodically.

The Committee welcomes proposals for revisions to this Standard. Such proposals should be as specific as possible, citing the paragraph number(s), the proposed wording, and a detailed description of the reasons for the proposal, including any pertinent documentation.

Proposing a Case. Cases may be issued to provide alternative rules when justified, to permit early implementation of an approved revision when the need is urgent, or to provide rules not covered by existing provisions. Cases are effective immediately upon ASME approval and shall be posted on the ASME Committee web page.

Requests for Cases shall provide a Statement of Need and Background Information. The request should identify the Standard and the paragraph, figure, or table number(s), and be written as a Question and Reply in the same format as existing Cases. Requests for Cases should also indicate the applicable edition(s) of the Standard to which the proposed Case applies.

Interpretations. Upon request, the B16 Standards Committee will render an interpretation of any requirement of the Standard. Interpretations can only be rendered in response to a written request sent to the Secretary of the B16 Standards Committee.

Requests for interpretation should preferably be submitted through the online Interpretation Submittal Form. The form is accessible at http://go.asme.org/InterpretationRequest. Upon submittal of the form, the Inquirer will receive an automatic e-mail confirming receipt.

If the Inquirer is unable to use the online form, he/she may e-mail the request to the Secretary of the B16 Standards Committee at SecretaryB16@asme.org, or mail it to the above address. The request for an interpretation should be clear and unambiguous. It is further recommended that the Inquirer submit his/her request in the following format:

Subject:	Cite the applicable paragraph number(s) and the topic of the inquiry in one or two words.
Edition:	Cite the applicable edition of the Standard for which the interpretation is being requested.
Question:	Phrase the question as a request for an interpretation of a specific requirement suitable for general understanding and use, not as a request for an approval of a proprietary design or situation. Please provide a condensed and precise question, composed in such a way that a “yes” or “no” reply is acceptable.
Proposed Reply(ies):	Provide a proposed reply(ies) in the form of “Yes” or “No,” with explanation as needed. If entering replies to more than one question, please number the questions and replies.
Background Information:	Provide the Committee with any background information that will assist the Committee in understanding the inquiry. The Inquirer may also include any plans or drawings that are necessary to explain the question; however, they should not contain proprietary names or information.

Requests that are not in the format described above may be rewritten in the appropriate format by the Committee prior to being answered, which may inadvertently change the intent of the original request.

Moreover, ASME does not act as a consultant for specific engineering problems or for the general application or understanding of the Standard requirements. If, based on the inquiry information submitted, it is the opinion of the Committee that the Inquirer should seek assistance, the inquiry will be returned with the recommendation that such assistance be obtained.

ASME procedures provide for reconsideration of any interpretation when or if additional information that might affect an interpretation is available. Further, persons aggrieved by an interpretation may appeal to the cognizant ASME Committee or Subcommittee. ASME does not "approve," "certify," "rate," or "endorse" any item, construction, proprietary device, or activity.

Attending Committee Meetings. The B16 Standards Committee regularly holds meetings and/or telephone conferences that are open to the public. Persons wishing to attend any meeting and/or telephone conference should contact the Secretary of the B16 Standards Committee.

ASME B16.24-2021
SUMMARY OF CHANGES

Following approval by the ASME B16 Standards Committee and ASME, and after public review, ASME B16.24-2021 was approved by the American National Standards Institute on December 10, 2021.

In ASME B16.24-2021, the U.S. Customary tables in former Mandatory Appendix I have been merged with the SI tables in the main text. The tables and figures have been redesignated, former Mandatory Appendix I has been deleted, and the subsequent Mandatory Appendices have been redesignated. Cross-references have been updated accordingly. In addition, ASME B16.24-2021 includes the following changes identified by a margin note, **(21)**. The Record Numbers listed below are explained in more detail in the "List of Changes in Record Number Order" following this Summary of Changes.

Page	*Location*	*Change*
2	3.1	Subparagraph (c) updated *(17-2586)*
4	Table 3.1-4	Added *(17-2586)*
3	5.1.2	Revised *(17-2586)*
6	6.2.3	Revised *(17-2586)*
7	7.1.2	Revised *(17-2586)*
10	Table 8.1.2-1	Illustration for "True Y" revised *(18-1179)*
12	Table 8.1.2-2	Illustration for “True Y” revised *(18-1179)*
16	I-0	Subparagraph (c) revised *(17-2586)*
16	I-4.3	Subparagraph (c) revised *(17-2586)*
19	Mandatory Appendix II	Updated *(20-2565)*

LIST OF CHANGES IN RECORD NUMBER ORDER

Record Number	Change
20-2565	Updated references.
18-1179	Revised error in Table 8.1.2-1 (former Tables 3 and I-3) and Table 8.1.2-2 (former Tables 5 and I-5) illustrations.
17-2586	Revised paras. 3.1(c), 5.1.2, 6.2.3, 7.1.2, I-0(c), and I-4.3(c), and added Table 3.1-4.

CAST COPPER ALLOY PIPE FLANGES, FLANGED FITTINGS, AND VALVES
Classes 150, 300, 600, 900, 1500, and 2500

1 SCOPE

1.1 Inclusions

This Standard covers the following cast copper alloy:

(a) threaded pipe flanges and blind flanges having class designations 150, 300, 600, 900, 1500, and 2500

(b) flanged fittings having rating class designations 150 and 300

(c) threaded and flanged valves having rating class designations 150, 300, 600, 1500, and 2500

1.2 Dimensional Requirements

This Standard establishes requirements for

(a) pressure–temperature ratings

(b) size and method of designating openings for reduced fittings

(c) markings

(d) materials

(e) dimensions

(f) bolting and gaskets

(g) tolerances

(h) nondestructive examination for valves

(i) tests

1.3 MSS SP-80 Requirements

This Standard also provides dimensional requirements for flanged ends of valves conforming to MSS SP-80.

1.4 ASTM B148 Requirements

ASME B16.24 requirements and the supplemental requirements of Mandatory Appendix I shall apply for the construction of valves under this Standard that are made from ASTM B148 materials.

2 GENERAL

2.1 Relevant Units

This Standard states values in both SI (Metric) and U.S. Customary units. As an exception, diameters of bolts and flange bolt holes are expressed in U.S. Customary units only. These systems of units are to be regarded separately as standard. In this Standard, the U.S. Customary units are shown in parentheses or in separate tables following the SI tables. The values stated in each system are not exact equivalents; therefore, it is required that each system of units be used independently of the other. Except for the diameter of bolts and flange bolt holes, combining values from the two systems constitutes nonconformance with the Standard.

2.2 References

Codes, standards, and specifications containing provisions to the extent referenced herein constitute requirements of this Standard. These references are listed in Mandatory Appendix II.

2.3 Quality Systems

Guidelines relating to the product manufacturer's quality system program are described in Nonmandatory Appendix A.

2.4 Service Conditions

Criteria for selection of material suitable for particular fluid service are not within the scope of this Standard.

2.5 User Accountability

This Standard cites duties and responsibilities that are to be assumed by the flange or flange fitting and valve user in the following areas:

(a) application

(b) installation

(c) system hydrostatic testing

(d) operation

(e) material selection

2.6 Time of Purchase, Manufacture, or Installation

The pressure–temperature ratings in this Standard are applicable upon its publication to all flanges, flanged fittings, and valves within its scope that otherwise meet its requirements. For unused flanges, flanged fittings, and valves maintained in inventory, the manufacturer of the flanges, flanged fittings, and valves may certify conformance to this edition, provided that it can be demonstrated that all requirements of this edition have been met. Where such components were installed