ASME B16.42-2021
(Revision of ASME B16.42-2016)

Ductile Iron Pipe Flanges and Flanged Fittings

Classes 150 and 300

AN AMERICAN NATIONAL STANDARD

The American Society of Mechanical Engineers

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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

In 1921, the American Engineering Standards Committee, later the American Standards Association (ASA), now the American National Standards Institute (ANSI), authorized the organization of a Sectional Committee on the Standardization of Pipe Flanges and Flanged Fittings, with the following organizations as joint sponsors: Heating, Piping, and Air Conditioning Contractors National Association [later the Mechanical Contractors Association of America (MCAA)], Manufacturers Standardization Society of the Valves and Fittings Industry (MSS), and The American Society of Mechanical Engineers (ASME). Cast iron flanges and flanged fittings are within the scope of Subcommittee No. 1 (now Subcommittee A), with standards approved by ASA as early as 1928.

In 1957, piping components of ductile iron (also called nodular iron and, in Europe, spheroidal graphite iron) first appeared on the market. Controversy immediately developed over proper pressure–temperature ratings, and this was further aggravated by the use of casting patterns for both gray iron and carbon steel for producing the components.

Conflicting philosophies, which emerged from that controversy, thwarted efforts by MSS to develop standard practices in the early 1960s; the conflicts persisted during a study of ratings, starting in 1966 by American National Standards Committee B16 (as the Sectional Committee was called after reorganization of ASA as ANSI). The conflict continued to delay acceptance and approval of this Standard, which ultimately originated with a draft developed by MSS (taking advantage of earlier efforts) and submitted to Subcommittee A in 1977. Combining that draft with the rating basis developed in the B16 Committee, the first edition of this Standard was found acceptable and was approved by the Standards Committee, cosecretariat organizations, and ANSI, and was published with the designation ANSI B16.42-1979.

In 1982, American National Standards Committee B16 was reorganized as an ASME Committee operating under procedures accredited by ANSI. The 1987 edition of the Standard updated the referenced standards and specifications, and established U.S. Customary units as the standard. Following approval by the Standards Committee and ASME, ANSI granted its approval of the edition as an American National Standard on July 13, 1987, with the new designation ASME/ANSI B16.42-1987.

In the 1998 edition of ASME B16.42, reference standards were updated, a quality system program annex was added, and several editorial revisions were made. Following approval by ASME B16 Subcommittee B and the B16 Standards Committee, ANSI approved the American National Standard on November 20, 1998.

Metric units were provided as an independent but parallel alternative standard to the U.S. Customary units in the 2011 edition. Following approval by the Standards Committee and the ASME Board on PTCS, the revision to the 1998 edition of this Standard was approved as an American National Standard by ANSI on August 9, 2011, with the new designation ASME B16.42-2011.

In the 2016 edition, revisions were made to table and appendix references. Following approval by the ASME B16 Standards Committee, ANSI approved ASME B16.42-2016 on November 7, 2016.

In ASME B16.42-2021, 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 Appendix has been redesignated. Cross-references have been updated accordingly. Also in this edition, Table 3.1-1 (formerly Table 1), Table 3.1-1C (formerly Table I-1), Table 7.1.1-1 (formerly Tables 3 and I-3), Table 7.1.1-2 (formerly Tables 4 and I-4), para. 3.1, and sections 5 and 6 have been revised, and the references in Mandatory Appendix I (formerly Mandatory Appendix II) have been updated. Following approval by the ASME B16 Standards Committee, ASME B16.42-2021 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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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 B16.42-2021
SUMMARY OF CHANGES

Following approval by the ASME B16 Standards Committee and ASME, and after public review, ASME B16.42-2021 was approved by the American National Standards Institute on December 10, 2021.

In ASME B16.42-2021, 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 Appendix has been redesignated. Cross-references have been updated accordingly. In addition, this edition 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 (Record Number)*
2	3.1	Revised *(19-922)*
3	5	Subparagraph (b) revised *(19-922)*
3	6.1	Revised *(19-922)*
6	Table 3.1-1	Seventh row and Note (1) added *(19-922)*
6	Table 3.1-1C	Note (1) added *(19-922)*
8	Table 7.1.1-1	(1) 45-deg Lateral, Reducer, Eccentric Reducer, and True Y illustrations revised *(19-920)* (2) Face-to-Face Lateral column added, and subsequent three column heads revised *(19-920)*
10	Table 7.1.1-2	(1) 45-deg Lateral, Reducer, Eccentric Reducer, and True Y illustrations revised *(19-920)* (2) Face-to-Face Lateral column added, and subsequent three column heads revised *(19-920)*
22	Mandatory Appendix I	Former Mandatory Appendix II updated *(21-621)*

LIST OF CHANGES IN RECORD NUMBER ORDER

Record Number	Change
19-920	Added face-to-face lateral dimensions to Table 7.1.1-1 (former Tables 3 and I-3) and Table 7.1.1-2 (former Tables 4 and I-4).
19-922	Added ductile iron, ASTM A536 Grade 65-45-12 material.
21-621	Updated references in Mandatory Appendix I (former Mandatory Appendix II).

DUCTILE IRON PIPE FLANGES AND FLANGED FITTINGS
Classes 150 and 300

1 SCOPE

This Standard covers minimum requirements for Classes 150 and 300 cast ductile iron pipe flanges and flanged fittings. The requirements covered are as follows:

(a) pressure–temperature ratings
(b) sizes and method of designating openings of reducing fittings
(c) marking
(d) material
(e) dimensions and tolerances
(f) bolts, nuts, and gaskets
(g) tests

2 GENERAL

2.1 References

Standards and specifications adopted by reference in this Standard are shown in Mandatory Appendix I, which is part of this Standard. It is not considered practical to identify in the text the specific edition of each referenced standard and specification. Instead, the specific editions are identified in Mandatory Appendix I.

2.2 Quality Systems

Requirements relating to the product manufacturers' quality system programs are described in Nonmandatory Appendix A.

2.3 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 only expressed in inch units. 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 diameters of bolts and flange bolt holes, combining values from the two systems constitutes nonconformance with the Standard.

2.4 Service

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

2.5 Convention

For determining conformance with this Standard, the convention for fixing significant digits where limits (maximum and minimum values) are specified shall be as defined in ASTM E29. This requires that an observed or calculated value be rounded off to the nearest unit in the last right-hand digit used for expressing the limit. Decimal values and tolerances do not imply a particular method of measurement.

2.6 Denotation

2.6.1 Pressure Rating Designation. Class, followed by a dimensionless number, is the designation for pressure–temperature ratings, as follows:

(a) Class 150
(b) Class 300

2.6.2 Size. NPS, followed by a dimensionless number, is the designation for nominal flange or flanged fitting size. NPS is related to the referenced nominal diameter, DN, used in metric units. The relationship is typically as follows:

NPS	DN
1	25
1¼	32
1½	40
2	50
2½	65
3	80
3½	90
4	100

For NPS ≥ 4, the related DN = 25 × NPS.