ASME B16.34-2025

(Revision of ASME B16.34-2020)

Valves — Flanged, Threaded, and Welding End

AN AMERICAN NATIONAL STANDARD

The American Society of Mechanical Engineers

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FOREWORD

In December 1969, American National Standards Committee B16 changed its name from Standardization of Pipe Flanges and Fittings to Standardization of Valves, Fittings, and Gaskets, reflecting American National Standards Institute (ANSI) approval of a broadened scope for the B16 Committee. At the same meeting, the committee approved a plan for the organization of a subcommittee to develop a new standard for steel valves with other than flanged ends. Subsequently, B16 Subcommittee 15 was appointed and held its first meeting in December 1970.

Historically, in the development of standards and pressure–temperature ratings for steel valves, the various rating classes for flanges provided an obviously logical basis for valve ratings. Steel valves with flanges of standard dimensions, many also offered in buttwelding-end versions, were given the same pressure–temperature ratings as the flanges. In 1949, a new edition of the Standard, then designated B16e-1949, was published, in which a table covering wall thickness requirements for weld end valves had been added. In 1964, the Manufacturer's Standardization Society of the Valve and Fittings Industry (MSS) developed and published Standard Practice SP-66, covering pressure–temperature ratings of steel buttwelding-end valves. MSS SP-66 introduced a new method for establishing ratings by making ratings a function of the mechanical strength properties of the body material at all temperatures. Following the publication of MSS SP-66, B16 activated Subcommittee 4 for the purpose of studying the general subject of pressure–temperature ratings and developing rational criteria for such ratings.

In the B16 charge to Subcommittee 15, it was established that the new Standard would replace MSS SP-66 and also remove the reference to buttwelding-end valves from B16.5. Flanged-end valves would continue to be covered in B16.5 but on a fully specified basis, rather than as an add-on.

As the work of the subcommittee got underway, concurrent action was initiated in Subcommittee 3 for revision of B16.5. Subsequent operations of Subcommittees 3 and 15 were closely coordinated to provide assurance that the new Standard and the revised B16.5 would be compatible.

A key and basic issue of mutual concern in this coordination was the matter of pressure–temperature ratings. It was necessary to incorporate the SP-66-type ratings in the new Standard, but at the same time also to provide ratings equivalent to those in B16.5 covering the buttwelding equivalents of flanged-end valves. Subcommittee 4 had made definitive recommendations for revisions in the flange ratings and it was obviously desirable to rationalize the two types of ratings as they would appear side by side in the new Standard.

The results of these efforts appear herein in the form of pressure–temperature ratings tables. The method of computing the ratings is detailed in Nonmandatory Appendix B. The ratings differ from the pre-1968 B16.5 ratings because they are now calculated as a function of the mechanical properties of the pressure boundary materials, in contrast to the empirical basis used previously. A change in the SP-66–type rating (herein designated Special Class) discontinues the application of a plasticity factor at elevated temperatures which, in the opinion of the committee, could not be justified in dimension-sensitive valves.

Other innovations include the coverage of forged or fabricated body valves and an increase in detailed coverage by pressure–temperature ratings from 17 materials in B16.5 to 24 material groups in the new Standard and in the revised B16.5. Dimensional requirements were refined and augmented to give the designer more latitude and the user more assurance of adequacy. A number of the innovations have had trial use and at least some degree of acceptance, as they have been taken from the section on valve requirements developed and published by the ASME Boiler and Pressure Vessel Code to cover valves used in nuclear power plants. A section on valve testing eliminates uncertainties on such points as seat test requirements and stem seal testing.

Approval for the 1973 edition of the Standard was granted by ANSI in October 1973.

In December 1973, a reorganization of the subcommittee structure for B16 was approved. Subcommittee 15 was redesignated as Subcommittee N and was assigned responsibility for all steel valves. Work began to include coverage for flanged-end valves in ANSI B16.34. The 1977 edition contained flanged-end valve requirements formerly in ANSI B16.5. The rating procedures of B16.5 were adopted and made applicable to Standard Class buttwelding-end valves. The method of deriving ratings was revised. Major changes were made in the method for determining ratings for austenitic stainless steel valves and ratings for Class 150 valves for all materials. The pressure–temperature tables and materials groups were rearranged and revised using data from the reference Sections of the ASME Boiler and Pressure Vessel Code through the Summer 1975 Addenda. A number of clarifying and editorial revisions were also made in order to improve the text. It was also resolved that frequent minor changes in pressure–temperature ratings because of revisions to the reference material

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strength property tables should be avoided and that, as a general guide, such changes should not be considered unless resulting ratings would be changed by an amount in excess of 10%.

Approval for the 1977 edition of the Standard was granted by ANSI on June 16, 1977.

In 1979, work began on the 1981 edition. Materials coverage was expanded. Nickel alloys and other alloys were added. Bolting rules were revised to accommodate special alloy bolting for the new materials. Revisions were included to clarify requirements for rotary motion valves, e.g., ball valves and butterfly valves. Wafer-type valves were specifically identified. Other clarifying and editorial revisions were made in order to improve the text.

Following approvals by the Standards Committee and Secretariat, approval for the 1981 edition was granted by ANSI on August 14, 1981.

During 1985, revisions were proposed that added requirements for socket welding-end and threaded-end valves. The inclusion of requirements for these valves increased the scope of the Standard. Also, the listings for nickel alloy and other alloy valves materials were expanded. Rules for threaded body joints were added, and wafer-type valve body rules improved.

Following approvals by the Standards Committee and ASME, approval for the 1988 edition was granted by ANSI on February 24, 1988.

During 1993 and carrying over into 1994, revisions offered included multiple material marking and an improved interpolation procedure. New materials were added and the pressure–temperature rating tables were recalculated in accordance with Nonmandatory Appendix B using the latest data available from the reference ASME Boiler and Pressure Vessel Code sources. An appendix was added covering nonmandatory requirements for a quality system program.

Following the approvals of the Standards Committee and ASME, approval for the new edition was granted by ANSI on October 3, 1996.

Work started in 1999 to revise the Standard to include metric units as the primary reference units while maintaining U.S. Customary units in either parenthetical or separate forms. The goal is to delete the U.S. Customary units in a future revision. All pressure–temperature ratings have been recalculated using data in the latest edition of the ASME Boiler and Pressure Vessel Code, Section II, Part D. As a result, some materials have been shifted to other material groups and some changes were made to some valve ratings within material groups. Because of diminished interest for flanged end valves conforming to ASME Class 400, they were not specifically listed in the 2004 revision. Flanges for Class 400 were still listed in B16 flange standards. Provisions were made to allow Class 400 valves to be furnished as intermediate rated valves. Numerous requirement clarifications and editorial revisions were also made.

Work started in 2007 to revise the Standard. Metric units remained the primary reference units with U.S. Customary units in either parenthetical or separate forms shown as in the earlier edition. Pressure–temperature ratings, in some cases, were revised, and new materials were added, all in keeping with the material properties provided in the latest edition of the ASME Boiler and Pressure Vessel Code, Section II, Part D. A number of requirement clarifications and editorial revisions were also made.

Following the approvals of the Standards Committee and ASME, approval for the 2009 edition was granted by ANSI on June 18, 2009.

Work started in 2009 to correct material listings with the material groups. Additionally, ASME B16.47 was added as a reference, and flanged-end valves coverage was expanded to NPS 50. A number of requirement clarifications and editorial revisions were also made.

Following the approvals of the Standards Committee and ASME, approval for the 2013 edition was granted by ANSI on February 19, 2013.

For 2017, valves up to NPS 60 were covered, a reference was added for materials manufactured to other editions, and changes were made to allowable materials. Pressure–temperature tables were also updated for consistency with the 2017 editions of ASME B16.5 and ASME B16.47. ASME B16.34-2017 was approved by the American National Standards Institute on March 9, 2017.

In ASME B16.34-2020, the U.S. Customary tables in former Mandatory Appendix VII were relocated to the main text and redesignated with a "C" suffix (e.g., Table VII-2-1.1 is now Table 2-1.1C). Former Mandatory Appendix VII was deleted and subsequent Mandatory Appendices were redesignated. Cross-references were updated accordingly. In addition, the 2020 edition included the following changes:

(a) A new paragraph was added to alert the users of the Standard to Cases issued by ASME, which can add to or alter the requirements of B16 standards.

(b) Additional operational conditions that can damage or render inoperable double-seated valves with trapped liquid in the center cavity were identified.

(c) Figures 18 and 19 were added to show typical casting sections requiring radiographic examination for special class top entry ball valves and swing check valves.

(d) Editorial corrections from inquiries were included.

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Following approval by the ASME B16 Standards Committee, ASME B16.34-2020 was approved by ANSI as an American National Standard on November 13, 2020.

In ASME B16.34-2025, various ASTM materials; new guidance for valves with nonstandard ends; a new appendix for determining minimum temperature limits; and definitions of *may*, *shall*, and *should* were added. After adopting revised ceiling values [see Nonmandatory Appendix B, Table B-3 (Table B-3C)], pressure–temperature ratings were revised in the 2025 edition, and a new table for duplex materials was added.

Following approval by the ASME B16 Standards Committee, ASME B16.34-2025 was approved by ANSI as an American National Standard on March 4, 2025.

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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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Revisions and Errata. The committee processes revisions to this Standard on a continuous basis 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 in the next edition of the Standard.

In addition, the committee may post errata on the committee web page. Errata become effective on the date posted. Users can register on the committee web page to receive email notifications of posted errata.

This Standard is always open for comment, and the committee welcomes proposals for revisions. Such proposals should be as specific as possible, citing the paragraph number, the proposed wording, and a detailed description of the reasons for the proposal, including any pertinent background information and supporting documentation.

Cases

(a) The most common applications for cases are

(1) to permit early implementation of a revision based on an urgent need

(2) to provide alternative requirements

(3) to allow users to gain experience with alternative or potential additional requirements prior to incorporation directly into the Standard

(4) to permit the use of a new material or process

(b) Users are cautioned that not all jurisdictions or owners automatically accept cases. Cases are not to be considered as approving, recommending, certifying, or endorsing any proprietary or specific design, or as limiting in any way the freedom of manufacturers, constructors, or owners to choose any method of design or any form of construction that conforms to the Standard.

(c) A proposed case shall be written as a question and reply in the same format as existing cases. The proposal shall also include the following information:

(1) a statement of need and background information

(2) the urgency of the case (e.g., the case concerns a project that is underway or imminent)

(3) the Standard and the paragraph, figure, or table number

(4) the editions of the Standard to which the proposed case applies

(d) A case is effective for use when the public review process has been completed and it is approved by the cognizant supervisory board. Approved cases are posted on the committee web page.

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INTRODUCTION

An American National Standard is intended as a basis for common practice by the manufacturer, the user, and the general public. The existence of an American National Standard does not in itself preclude the manufacture, sale, or use of products not conforming to the standard. Mandatory conformance is established, for example, by reference to the standard in a code, specification, sales contract, or public law.

It should be noted, specifically regarding this Standard, that certain requirements reflecting the general application of valves in a wide variety of services may not be considered to be appropriate for some valves whose application is known and which may incorporate certain features found by successful experience to be satisfactory. A specific case in point is that involving valves developed and used in gas and petroleum product pipelines. Conformance of such valves to the existing API 6D may by itself be sufficient to satisfy requirements of federal rules and regulations established by the Department of Transportation, Office of Pipeline Safety Operations. Another specific case is that involving valves used in instrument systems under an applicable piping code. Conformance of such valves to the requirements of an existing piping code may by itself be sufficient to satisfy jurisdictional rules and regulations.

This edition of ASME B16.34 states values in both Metric and U.S. Customary units of measurement. These systems of units are to be regarded separately. The values stated in each system are not exact equivalents; therefore each system shall be used independently of the other. Combining values from the two systems constitutes nonconformance with this Standard.

ASME B16.34-2025
SUMMARY OF CHANGES

Following approval by the ASME B16 Standards Committee and ASME, and after public review, ASME B16.34-2025 was approved by the American National Standards Institute on March 4, 2025.

ASME B16.34-2025 includes the following changes identified by a margin note, **(25)**. 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)*
1	1.1	Revised *(19-3077)*
2	1.9	Added *(23-2457)*
2	2.1.1	Subparagraphs (b) and (c) revised *(19-3077)*
3	2.3.2	Revised *(19-2733)*
5	4.3.4	Added *(19-3077)*
5	5.1.1	Revised *(23-2457)*
7	6.1.5	(1) Subparagraph (a) revised *(23-2457)* (2) Subparagraph (d) added *(19-3077)*
8	6.1.7	Revised *(23-2457)*
8	6.2.2	Revised *(23-2457)*
8	6.2.6	Revised *(19-3077)*
8	6.2.7	Added *(19-3077)*
9	6.4.1.1	Equation and nomenclature revised *(22-272)*
10	6.4.2	Revised *(22-2552)*
10	6.4.2.1	Equation and nomenclature revised *(22-272)*
10	6.4.2.3	Added *(22-2552)*
11	6.4.3	Revised *(23-2457)*
12	7.1.1	Revised *(19-605)*
12	7.2.3	Revised *(19-606)*
26	Table 1	(1) Revised *(11-1367, 19-1462, 22-651, 23-627)* (2) In Material group 3.12, for 58Ni–33Cr–8Mo, Bar grade corrected by errata *(23-2268)* (3) Note (6) revised *(22-651)*
34	Table 2-1.1	(1) Revised *(19-2733, 23-627)* (2) Notes (1) through (3) revised *(22-2275, 23-627)* (3) Note (4) deleted and subsequent Notes redesignated *(23-627)* (4) Note (6) added *(19-2733)*
35	Table 2-1.1C	(1) Revised *(19-2733, 23-627)* (2) Note (4) deleted and subsequent Notes redesignated *(23-627)* (3) Note (6) added *(19-2733)*
36	Table 2-1.2	(1) Revised *(19-2733, 23-627)* (2) Notes (1), (2), and (4) revised *(22-2275, 23-627)* (3) Notes (5) and (6) added *(19-2733, 23-627)*
37	Table 2-1.2C	(1) Revised *(19-2733, 23-627)* (2) Notes (5) and (6) added *(19-2733, 23-627)*

Page	*Location*	*Change (Record Number)*
38	Table 2-1.3	(1) Revised *(19-2733, 23-627)* (2) Notes revised and reordered *(19-2733, 22-2275, 23-627)*
40	Table 2-1.3C	(1) Revised *(19-2733, 23-627)* (2) Notes revised and reordered *(19-2733, 23-627)*
41	Table 2-1.4	(1) Revised *(11-1367, 19-2733, 23-627)* (2) Notes revised and reordered *(19-2733, 22-2275, 23-627)*
42	Table 2-1.4C	(1) Revised *(11-1367, 19-2733, 23-627)* (2) Notes reordered and Note (6) added *(19-2733)*
43	Table 2-1.5	(1) Revised *(19-2733, 23-627)* (2) Note (1) revised *(22-2275)* (3) Notes (2) and (3) added *(19-2733, 23-627)*
44	Table 2-1.5C	(1) Revised *(19-2733, 23-627)* (2) Notes (2) and (3) added *(19-2733, 23-627)*
45	Table 2-1.6	(1) Revised *(19-2733, 23-627)* (2) Notes (1) and (2) added *(19-2733, 23-627)*
46	Table 2-1.6C	(1) Revised *(19-2733, 23-627)* (2) Notes (1) and (2) added *(19-2733, 23-627)*
47	Table 2-1.7	(1) Revised *(19-2733, 23-627)* (2) Notes (4) and (5) added and subsequent Note revised and redesignated *(19-2733, 23-627)*
49	Table 2-1.7C	(1) Revised *(19-2733, 23-627)* (2) Notes (4) and (5) added and subsequent Note revised and redesignated *(19-2733, 23-627)*
50	Table 2-1.8	(1) Revised *(19-2733, 23-627)* (2) Note (1) revised *(22-2275)* (3) Notes (2) and (3) added and subsequent Note redesignated *(19-2733, 23-627)*
52	Table 2-1.8C	(1) Revised *(19-2733, 23-627)* (2) Notes (2) and (3) added and subsequent Note redesignated *(19-2733, 23-627)*
53	Table 2-1.9	(1) Revised *(19-2733, 23-627)* (2) Notes (1) and (3) revised *(22-2275, 23-627)* (3) Note (5) added and subsequent Note redesignated *(19-2733)*
55	Table 2-1.9C	(1) Revised *(19-2733, 23-627)* (2) Note (5) added and subsequent Note redesignated *(19-2733)*
57	Table 2-1.10	(1) Revised *(19-2733, 23-627)* (2) Note (1) revised *(22-2275)* (3) Note (3) deleted and subsequent Note redesignated *(23-627)* (4) Note (4) added *(19-2733)*
59	Table 2-1.10C	(1) Revised *(23-627)* (2) Note (3) deleted and subsequent Note redesignated *(23-627)* (3) Note (4) added *(19-2733)*
61	Table 2-1.11	(1) Revised *(19-2733, 23-627)* (2) Notes (1) through (4) revised *(22-2275, 23-627)* (3) Note (5) added and subsequent Note redesignated *(19-2733)*
63	Table 2-1.11C	(1) Revised *(19-2733, 23-627)* (2) Note (4) revised *(23-627)* (3) Note (5) added and subsequent Note redesignated *(19-2733)*
65	Table 2-1.12	(1) Revised *(19-2733, 23-627)* (2) Notes (1) and (2) added and subsequent Note redesignated *(19-2733, 23-627)*

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67	Table 2-1.12C	(1) Revised *(19-2733, 23-627)* (2) Notes (1) and (2) added and subsequent Note redesignated *(19-2733, 23-627)*
68	Table 2-1.13	(1) Revised *(19-2733, 23-627)* (2) Note (3) added and subsequent Note redesignated *(19-2733)*
70	Table 2-1.13C	(1) Revised *(19-2733, 23-627)* (2) Note (3) added and subsequent Note redesignated *(19-2733)*
71	Table 2-1.14	(1) Revised *(19-2733, 23-627)* (2) Note (3) added and subsequent Note redesignated *(19-2733)*
73	Table 2-1.14C	(1) Revised *(19-2733, 23-627)* (2) Note (3) added and subsequent Note redesignated *(19-2733)*
74	Table 2-1.15	(1) Revised *(19-2733, 23-627)* (2) Note (2) added and subsequent Note redesignated *(19-2733)*
76	Table 2-1.15C	(1) Revised *(19-2733, 23-627)* (2) Note (2) added and subsequent Note redesignated *(19-2733)*
77	Table 2-1.16	(1) Revised *(19-2733, 23-627)* (2) Notes (1) and (3) revised *(22-2275, 23-627)* (3) Notes (5) and (6) added and subsequent Note redesignated *(19-2733, 23-627)*
79	Table 2-1.16C	(1) Revised *(19-2733, 23-627)* (2) Note (1) revised *(23-627)* (3) Notes (5) and (6) added and subsequent Note redesignated *(19-2733, 23-627)*
81	Table 2-1.17	(1) Revised *(19-2733, 23-627)* (2) Note (2) revised *(22-2275)* (3) Note (3) added and subsequent Note redesignated *(19-2733)*
83	Table 2-1.17C	(1) Revised *(19-2733, 23-627)* (2) Note (3) added and subsequent Note redesignated *(19-2733)*
84	Table 2-1.18	(1) Revised *(19-2733, 23-627)* (2) Notes (1) and (2) revised *(19-2733)*
86	Table 2-1.18C	(1) Revised *(19-2733, 23-627)* (2) Notes (1) and (2) revised *(19-2733, 21-466)*
87	Table 2-2.1	(1) Revised *(19-2733, 23-627)* (2) Note (2) revised *(22-2275, 23-627)* (3) Note (3) added and subsequent Note redesignated *(19-2733)*
89	Table 2-2.1C	(1) Revised *(19-2733, 23-627)* (2) Note (3) added and subsequent Note redesignated *(19-2733)*
91	Table 2-2.2	(1) Revised *(19-2733, 23-627)* (2) Notes revised and reordered *(19-2733, 22-2275, 23-627)*
93	Table 2-2.2C	(1) Revised *(19-2733, 23-627)* (2) Notes revised and reordered *(19-2733, 23-627)*
95	Table 2-2.3	(1) Revised *(19-2733, 23-627)* (2) Note (1) revised *(23-627)* (3) Note (2) added *(19-2733)*
96	Table 2-2.3C	(1) Revised *(19-2733, 23-627)* (2) Note (1) revised *(23-627)* (3) Note (2) added *(19-2733)*

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97	Table 2-2.4	(1) Revised *(19-2733, 23-627)* (2) Note (2) revised *(22-2275)* (3) Notes (3) and (4) added and subsequent Note redesignated *(19-2733, 23-627)*
99	Table 2-2.4C	(1) Revised *(19-2733, 23-627)* (2) For Special Class 1500, working pressure at 400°F corrected by errata *(22-2096, 23-627)* (3) Notes (3) and (5) added and subsequent Note redesignated *(19-2733, 23-627)*
101	Table 2-2.5	(1) Revised *(19-2733, 23-627)* (2) Note (2) revised *(22-2275)* (3) Notes (3) and (4) added and subsequent Note redesignated *(19-2733, 23-627)*
103	Table 2-2.5C	(1) Revised *(19-2733, 23-627)* (2) Notes (3) and (4) added and subsequent Note redesignated *(19-2733, 23-627)*
105	Table 2-2.6	(1) Revised *(19-2733, 23-627)* (2) Note (1) added and subsequent Note redesignated *(19-2733)*
107	Table 2-2.6C	(1) Revised *(19-2733, 23-627)* (2) Note (1) added and subsequent Note redesignated *(19-2733)*
109	Table 2-2.7	(1) Revised *(19-2733, 23-627)* (2) Note (1) added and subsequent Note redesignated *(19-2733)*
111	Table 2-2.7C	(1) Revised *(19-2733, 23-627)* (2) Note (1) added and subsequent Note redesignated *(19-2733)*
113	Table 2-2.8	(1) Revised *(19-2733, 23-627)* (2) Note (1) revised *(19-2733, 23-627)*
114	Table 2-2.8C	(1) Revised *(19-2733, 23-627)* (2) Note (1) revised *(19-2733, 23-627)*
115	Table 2-2.9	(1) Revised *(19-2733, 23-627)* (2) Notes (2) and (3) revised *(22-2275)* (3) Notes (4) and (5) added and subsequent Note redesignated *(19-2733, 23-627)*
117	Table 2-2.9C	(1) Revised *(19-2733, 23-627)* (2) Note (3) revised *(23-627)* (3) Notes (4) and (5) added and subsequent Note redesignated *(19-2733, 23-627)*
119	Table 2-2.10	(1) Revised *(19-2733, 23-627)* (2) Note (2) added and subsequent Note redesignated *(19-2733)*
121	Table 2-2.10C	(1) Revised *(19-2733, 23-627)* (2) Note (2) added and subsequent Note redesignated *(19-2733)*
123	Table 2-2.11	(1) Revised *(19-2733, 23-627)* (2) Note (2) added and subsequent Note redesignated *(19-2733)*
125	Table 2-2.11C	(1) Revised *(19-2733, 23-627)* (2) Note (2) added and subsequent Note redesignated *(19-2733)*
127	Table 2-2.12	(1) Revised *(19-2733, 23-627)* (2) Note (2) added and subsequent Note redesignated *(19-2733)*
129	Table 2-2.12C	(1) Revised *(19-2733, 23-627)* (2) Note (2) added and subsequent Note redesignated *(19-2733)*
131	Table 2-2.13	Added *(19-2733, 23-627)*
132	Table 2-2.13C	Added *(19-2733, 23-627)*

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133	Table 2-3.1	(1) Revised *(19-1462, 19-2733, 23-627)* (2) Note (2) added *(19-2733)*
134	Table 2-3.1C	(1) Revised *(19-1462, 19-2733, 23-627)* (2) Note (2) added *(19-2733)*
135	Table 2-3.2	(1) Revised *(19-2733, 23-627)* (2) Note (2) added *(19-2733)*
136	Table 2-3.2C	(1) Revised *(19-2733)* (2) Note (2) added *(19-2733)*
137	Table 2-3.3	(1) Revised *(19-2733, 23-627)* (2) Note (2) added and subsequent Note redesignated *(19-2733)*
139	Table 2-3.3C	(1) Revised *(19-2733, 23-627)* (2) For Standard Class 900, working pressure at 400°F and 500°F corrected by errata *(22-2184, 23-627)* (3) For Special Class 1500, working pressure at 750°F corrected by errata *(22-2242, 23-627)* (4) Note (2) added and subsequent Note redesignated *(19-2733)*
140	Table 2-3.4	(1) Revised *(19-2733, 23-627)* (2) Note (2) added *(19-2733)*
141	Table 2-3.4C	(1) Revised *(19-2733)* (2) Note (2) added *(19-2733)*
142	Table 2-3.5	(1) Revised *(19-2733, 23-627)* (2) Note (2) added and subsequent Note redesignated *(19-2733)*
144	Table 2-3.5C	(1) Revised *(19-2733, 23-627)* (2) Note (2) added and subsequent Note redesignated *(19-2733)*
145	Table 2-3.6	(1) Revised *(19-1462, 19-2733, 23-627)* (2) Note (2) added and subsequent Note redesignated *(19-2733)*
147	Table 2-3.6C	(1) Revised *(19-1462, 19-2733, 23-627)* (2) Note (2) added and subsequent Note redesignated *(19-2733)*
149	Table 2-3.7	(1) Revised *(19-2733, 23-627)* (2) Note (1) revised *(23-627)* (3) Note (2) added *(19-2733)*
150	Table 2-3.7C	(1) Revised *(19-2733, 23-627)* (2) Note (2) added *(19-2733)*
151	Table 2-3.8	(1) Revised *(19-2733, 23-627)* (2) Notes revised and reordered *(19-2733, 22-2275, 23-627)*
153	Table 2-3.8C	(1) Revised *(19-2733, 23-627)* (2) Notes revised and reordered *(19-2733, 23-627)*
155	Table 2-3.9	(1) Revised *(19-2733, 23-627)* (2) Notes (1) and (3) added and subsequent Notes redesignated *(19-2733, 23-627)*
157	Table 2-3.9C	(1) Revised *(19-2733, 23-627)* (2) Notes (1) and (3) added and subsequent Notes redesignated *(19-2733, 23-627)*
159	Table 2-3.10	(1) Revised *(19-1462, 19-2733, 23-627)* (2) Note (1) revised *(23-627)* (3) Note (2) added *(19-2733)*
160	Table 2-3.10C	(1) Revised *(19-1462, 19-2733, 23-627)* (2) Note (2) added *(19-2733)*
161	Table 2-3.11	(1) Revised *(19-1462, 19-2733, 23-627)* (2) Note (2) added *(19-2733)*

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162	Table 2-3.11C	(1) Revised *(19-1462, 19-2733, 23-627)* (2) Note (2) added *(19-2733)*
163	Table 2-3.12	(1) Revised *(19-1462, 19-2733, 23-627)* (2) Note (2) revised *(23-627)* (3) Note (3) added *(19-2733)*
164	Table 2-3.12C	(1) Revised *(19-1462, 19-2733, 23-627)* (2) Note (2) revised *(23-627)* (3) Note (3) added *(19-2733)*
165	Table 2-3.13	(1) Revised *(19-2733, 23-627)* (2) Notes (1) and (2) revised *(19-2733, 23-627)*
166	Table 2-3.13C	(1) Revised *(19-2733, 23-627)* (2) Notes (1) and (2) revised *(19-2733, 23-627)*
167	Table 2-3.14	(1) Revised *(19-2733, 23-627)* (2) Notes (1) and (2) revised *(22-2275, 23-627)* (3) Note (3) added *(19-2733)*
168	Table 2-3.14C	(1) Revised *(19-2733, 23-627)* (2) Note (3) added *(19-2733)*
169	Table 2-3.15	(1) Revised *(19-1462, 19-2733, 23-627)* (2) Note (1) revised *(23-627)* (3) Note (3) added and subsequent Note redesignated *(19-2733)*
171	Table 2-3.15C	(1) Revised *(19-1462, 19-2733, 23-627)* (2) Note (1) revised *(23-627)* (3) Note (3) added and subsequent Note redesignated *(19-2733)*
173	Table 2-3.16	(1) Revised *(19-2733, 23-627)* (2) Notes (1) and (3) added and subsequent Notes redesignated *(19-2733, 23-627)* (3) Note (2) revised *(23-627)*
175	Table 2-3.16C	(1) Revised *(19-2733, 23-627)* (2) Notes (1) and (3) added and subsequent Notes redesignated *(19-2733, 23-627)* (3) Note (2) revised *(23-627)*
177	Table 2-3.17	(1) Revised *(19-2733, 23-627)* (2) Note (2) added *(19-2733)*
178	Table 2-3.17C	(1) Revised *(19-2733, 23-627)* (2) Note (2) added *(19-2733)*
179	Table 2-3.18	(1) Revised *(19-2733, 23-627)* (2) Note (2) added and subsequent Note redesignated *(19-2733)*
181	Table 2-3.18C	(1) Revised *(19-2733, 23-627)* (2) Note (2) added and subsequent Note redesignated *(19-2733)*
182	Table 2-3.19	(1) Revised *(19-2733, 23-627)* (2) Note (1) revised *(23-627)* (3) Note (2) added and subsequent Note revised and redesignated *(19-2733)*
184	Table 2-3.19C	(1) Revised *(19-2733, 23-627)* (2) Note (1) revised *(23-627)* (3) Note (2) added and subsequent Note revised and redesignated *(19-2733)*
197	II-2	(1) In II-2.1, the paragraph following (a)(3) revised *(23-2457)* (2) In II-2.2, the paragraph following (a)(3) revised *(23-2457)*
198	III-2	(1) In III-2.1, the paragraph following (a)(3) revised *(23-2457)* (2) In III-2.2, the paragraph following (a)(3) revised *(23-2457)*

Page	*Location*	*Change (Record Number)*
203	VI-2	Revised *(23-2457)*
204	Table VI-1C	Former Table VI-2 editorially redesignated
205	Mandatory Appendix VII	Updated *(11-1367, 19-2733, 23-2399)*
211	B-1.1	Revised *(23-2457)*
211	B-1.4	Revised *(23-2457)*
215	Table B-3	Revised *(19-2733, 22-2111)*
217	Table B-3C	Revised *(19-2733, 22-2111)*
220	Nonmandatory Appendix D	Added *(19-2733)*

LIST OF CHANGES IN RECORD NUMBER ORDER

Record Number	Change
11-1367	Added ASTM A333 Gr. 6 material and ASTM A333/A333M as a reference.
19-605	Revised para. 7.1.1 to clarify Metric and U.S. Customary valve increments.
19-606	Revised para. 7.2.3 to include ANSI/FCI 70-2 as an example for guidance for closure test acceptance. Added appropriate references.
19-1462	Added the following ASTM materials: – A182 Gr. N08020, A182 Gr. N08367, A182 Gr. N08810, A182 Gr. N08904 – A213 Gr. N08020, A213 Gr. N08367, A213 Gr. N08800, A213 Gr. N08810, A213 Gr. N08904 – A240 Gr. N08810, A240 Gr. N08367, A240 Gr. N08700, A240 Gr. N08800, A240 Gr. N08810, A240 Gr. N08904 – A312 Gr. N08810, A312 Gr. N08020, A312 Gr. N08367, A312 Gr. N08800, A312, Gr. N08904 – A479 Gr. N08810, A479 Gr. N08904 Removed the following ASTM materals: – B625 N08904 – B649 N08904 – B677 N08904
19-2733	Added guidance and new Nonmandatory Appendix D to provide a method to determine minimum temperature for ASME B16.34 materials.
19-3077	Revised the scope to include clamped valves and to exclude connectors intended for frequent disconnect or change. Added guidance for valves with nonstandard ends.
21-466	Revised notes for Tables 2-1.18 and 2-1.18C.
22-272	Added requirements to allow bolting with high allowable stress to have higher bolting limits.
22-651	Added the following new ASTM bolting materials: – A320 L7M – B511 N08830 – B572 N06230 – B637 N07740, B637 N07718 Revised notes for Table 1.
22-2096	Table 2-2.4C corrected by errata.
22-2111	Revised ceiling pressure for Classes 300, 600, 900, 1500, 2500, and 4500 Standard Class and Special Class valves.
22-2184	Table 2-3.3C corrected by errata.
22-2242	Table 2-3.3C corrected by errata
22-2268	Table 1 corrected by errata.
22-2275	Revised Metric temperatures in table notes to the nearest degree.
22-2552	Added requirements for stiffness and rigidity requirements for sectional flanged and threaded body joints subject to piping mechanical loads.
23-627	Revised pressure–temperature tables for group materials 1, 2, and 3. Added a new group material 2.13 for duplex materials.
23-2399	Revised references.
23-2457	Added definitions for *shall*, *should*, and *may*. Revised paragraphs to align with the added definitions.

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VALVES — FLANGED, THREADED, AND WELDING END

1 GENERAL

(25) **1.1 Scope**

This Standard applies to new construction and covers pressure–temperature ratings, dimensions, tolerances, materials, nondestructive examination requirements, testing, and marking for cast, forged, and fabricated flanged, threaded, clamped, and welding end and wafer or flangeless valves of steel, nickel-base alloys, and other alloys shown in Table 1. Wafer or flangeless valves, bolted or through-bolt types, that are installed between flanges or against a flange are treated as flanged-end valves. Alternative rules for NPS 2½ and smaller valves are given in Mandatory Appendix V. Connectors intended for frequent disconnection or change, for instance at hose connections, are outside the scope of this Standard.

1.2 Applicability

1.2.1 Standards and Specifications. Standards and specifications adopted by reference in this Standard and the names of the sponsoring organizations are shown in Mandatory Appendix VII. It is not considered practical to refer to a specific edition of each of the standards and specifications in the individual clause references. Instead, the specific edition references are included in Mandatory Appendix VII. A product made in conformance with a prior edition of reference standards and in all other respects conforming to this Standard shall be considered to be in conformance even though the edition reference may have been changed in a subsequent revision of this Standard.

1.2.2 Time of Purchase, Manufacture, or Installation. The pressure–temperature ratings included in this Standard are applicable, upon publication, to all valves covered within its scope that meet its requirements. For unused valves, valves that have been maintained in inventory, the manufacturer may certify conformance to this edition provided that it can be demonstrated that all requirements of this edition have been met. However, where such components were installed under the pressure–temperature ratings of an earlier edition of ASME B16.34, those ratings shall apply except as may be governed by an applicable Code or regulation.

1.2.3 User Accountability. This Standard cites duties and responsibilities that are to be assumed by the valve user in the areas of, for example, application, installation, system hydrostatic testing, operation, and material selection.

1.2.4 Quality Systems. Requirements relating to a valve manufacturer's Quality System Program are described in Nonmandatory Appendix C.

1.2.5 Relevant Units. This Standard states values in both SI (Metric) and U.S. Customary units. These systems of units are to be regarded separately as standard. Within the text, 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. Combining values from the two systems constitutes nonconformance with the Standard.

1.3 Selection of Valve Types and Material Service Conditions

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

1.4 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.

1.5 Denotation

1.5.1 Pressure Rating Designation. Class followed by a dimensionless number is the designation for pressure–temperature ratings. Standardized designations are as follows:

Class	150	300	600	900	1500	2500	4500

Class 400, an infrequently used flanged-end valve designation, is regarded as an intermediate class designation.