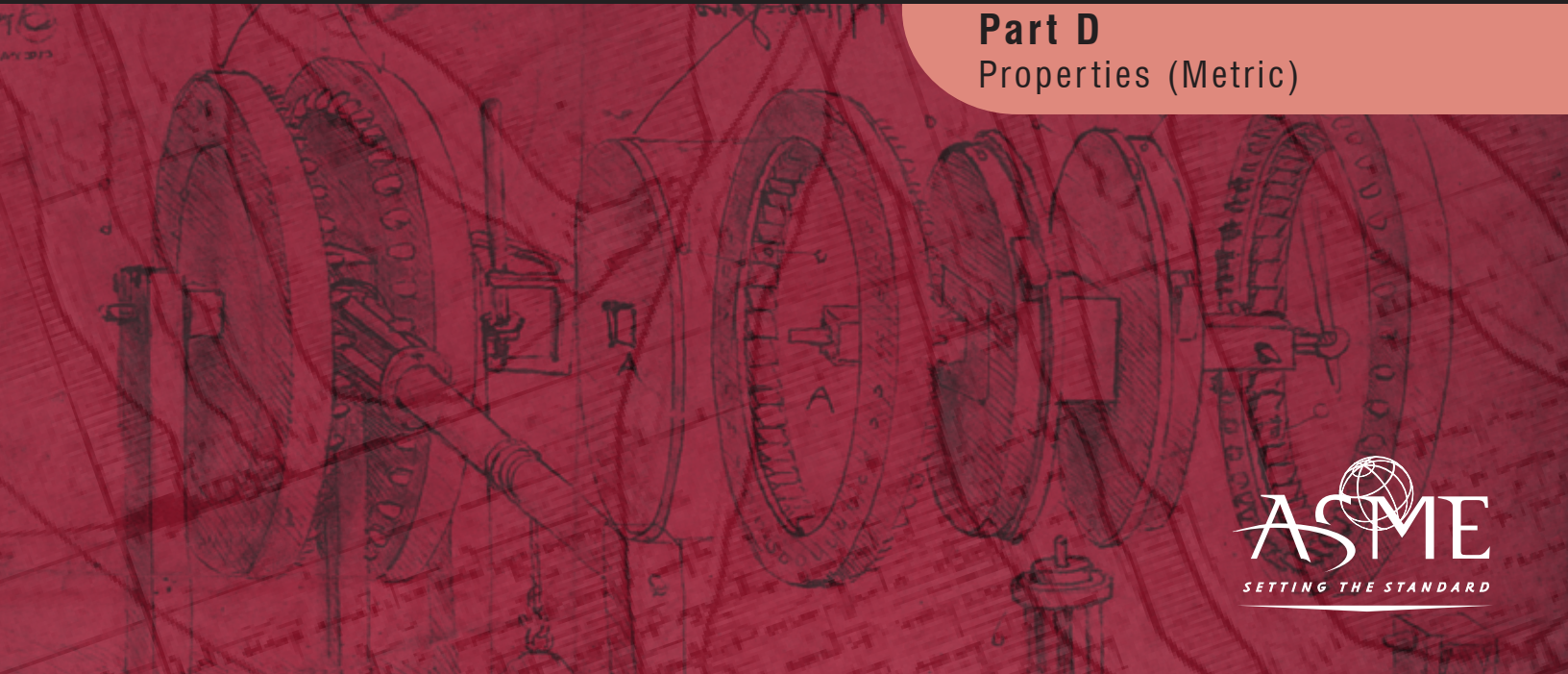
ASME BPVC.II.D.M-2017

SECTION II
MATERIALS

2017 ASME Boiler and Pressure Vessel Code
An International Code

Part D
Properties (Metric)



ASME
SETTING THE STANDARD

AN INTERNATIONAL CODE

2017 ASME Boiler & Pressure Vessel Code

2017 Edition July 1, 2017

II

MATERIALS

Part D

Properties (Metric)

ASME Boiler and Pressure Vessel Committee
on Materials

The American Society of Mechanical Engineers

Two Park Avenue • New York, NY • 10016 USA

Date of Issuance: July 1, 2017

This international code or standard was developed under procedures accredited as meeting the criteria for American National Standards and it is an American National Standard. The Standards Committee that approved the code or standard was balanced to assure that individuals from competent and concerned interests have had an opportunity to participate. The proposed code or standard was made available for public review and comment that provides an opportunity for additional public input from industry, academia, regulatory agencies, and the public-at-large.

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Certification Mark

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[*] The 2015 Edition of Section III was the last edition in which Section III, Division 1, Subsection NH, *Class 1 Components in Elevated Temperature Service*, was published. The requirements located within Subsection NH were moved to Section III, Division 5, Subsection HB, Subpart B for the elevated temperature construction of Class A components.

INTERPRETATIONS

Interpretations are issued in real time in ASME's Interpretations Database at http://go.asme.org/Interpretations. Historical BPVC interpretations may also be found in the Database.

CODE CASES

The Boiler and Pressure Vessel Code committees meet regularly to consider proposed additions and revisions to the Code and to formulate Cases to clarify the intent of existing requirements or provide, when the need is urgent, rules for materials or constructions not covered by existing Code rules. Those Cases that have been adopted will appear in the appropriate 2017 Code Cases book: "Boilers and Pressure Vessels" or "Nuclear Components." Supplements will be sent or made available automatically to the purchasers of the Code Cases books up to the publication of the 2019 Code.

FOREWORD[*]

In 1911, The American Society of Mechanical Engineers established the Boiler and Pressure Vessel Committee to formulate standard rules for the construction of steam boilers and other pressure vessels. In 2009, the Boiler and Pressure Vessel Committee was superseded by the following committees:

(a) Committee on Power Boilers (I)

(b) Committee on Materials (II)

(c) Committee on Construction of Nuclear Facility Components (III)

(d) Committee on Heating Boilers (IV)

(e) Committee on Nondestructive Examination (V)

(f) Committee on Pressure Vessels (VIII)

(g) Committee on Welding, Brazing, and Fusing (IX)

(h) Committee on Fiber-Reinforced Plastic Pressure Vessels (X)

(i) Committee on Nuclear Inservice Inspection (XI)

(j) Committee on Transport Tanks (XII)

(k) Technical Oversight Management Committee (TOMC)

Where reference is made to "the Committee" in this Foreword, each of these committees is included individually and collectively.

The Committee's function is to establish rules of safety relating only to pressure integrity, which govern the construction[**] of boilers, pressure vessels, transport tanks, and nuclear components, and the inservice inspection of nuclear components and transport tanks. The Committee also interprets these rules when questions arise regarding their intent. The technical consistency of the Sections of the Code and coordination of standards development activities of the Committees is supported and guided by the Technical Oversight Management Committee. This Code does not address other safety issues relating to the construction of boilers, pressure vessels, transport tanks, or nuclear components, or the inservice inspection of nuclear components or transport tanks. Users of the Code should refer to the pertinent codes, standards, laws, regulations, or other relevant documents for safety issues other than those relating to pressure integrity. Except for Sections XI and XII, and with a few other exceptions, the rules do not, of practical necessity, reflect the likelihood and consequences of deterioration in service related to specific service fluids or external operating environments. In formulating the rules, the Committee considers the needs of users, manufacturers, and inspectors of pressure vessels. The objective of the rules is to afford reasonably certain protection of life and property, and to provide a margin for deterioration in service to give a reasonably long, safe period of usefulness. Advancements in design and materials and evidence of experience have been recognized.

This Code contains mandatory requirements, specific prohibitions, and nonmandatory guidance for construction activities and inservice inspection and testing activities. The Code does not address all aspects of these activities and those aspects that are not specifically addressed should not be considered prohibited. The Code is not a handbook and cannot replace education, experience, and the use of engineering judgment. The phrase *engineering judgment* refers to technical judgments made by knowledgeable engineers experienced in the application of the Code. Engineering judgments must be consistent with Code philosophy, and such judgments must never be used to overrule mandatory requirements or specific prohibitions of the Code.

The Committee recognizes that tools and techniques used for design and analysis change as technology progresses and expects engineers to use good judgment in the application of these tools. The designer is responsible for complying with Code rules and demonstrating compliance with Code equations when such equations are mandatory. The Code neither requires nor prohibits the use of computers for the design or analysis of components constructed to the

[*] The information contained in this Foreword is not part of this American National Standard (ANS) and has not been processed in accordance with ANSI's requirements for an ANS. Therefore, this Foreword may contain material that has not been subjected to public review or a consensus process. In addition, it does not contain requirements necessary for conformance to the Code.

[**] *Construction*, as used in this Foreword, is an all-inclusive term comprising materials, design, fabrication, examination, inspection, testing, certification, and pressure relief.

requirements of the Code. However, designers and engineers using computer programs for design or analysis are cautioned that they are responsible for all technical assumptions inherent in the programs they use and the application of these programs to their design.

The rules established by the Committee are not to be interpreted as approving, recommending, or endorsing any proprietary or specific design, or as limiting in any way the manufacturer's freedom to choose any method of design or any form of construction that conforms to the Code rules.

The Committee meets regularly to consider revisions of the rules, new rules as dictated by technological development, Code Cases, and requests for interpretations. Only the Committee has the authority to provide official interpretations of this Code. Requests for revisions, new rules, Code Cases, or interpretations shall be addressed to the Secretary in writing and shall give full particulars in order to receive consideration and action (see Submittal of Technical Inquiries to the Boiler and Pressure Vessel Standards Committees). Proposed revisions to the Code resulting from inquiries will be presented to the Committee for appropriate action. The action of the Committee becomes effective only after confirmation by ballot of the Committee and approval by ASME. Proposed revisions to the Code approved by the Committee are submitted to the American National Standards Institute (ANSI) and published at http://go.asme.org/BPVCPublicReview to invite comments from all interested persons. After public review and final approval by ASME, revisions are published at regular intervals in Editions of the Code.

The Committee does not rule on whether a component shall or shall not be constructed to the provisions of the Code. The scope of each Section has been established to identify the components and parameters considered by the Committee in formulating the Code rules.

Questions or issues regarding compliance of a specific component with the Code rules are to be directed to the ASME Certificate Holder (Manufacturer). Inquiries concerning the interpretation of the Code are to be directed to the Committee. ASME is to be notified should questions arise concerning improper use of an ASME Certification Mark.

When required by context in this Section, the singular shall be interpreted as the plural, and vice versa, and the feminine, masculine, or neuter gender shall be treated as such other gender as appropriate.

STATEMENT OF POLICY ON THE USE OF THE CERTIFICATION MARK AND CODE AUTHORIZATION IN ADVERTISING

ASME has established procedures to authorize qualified organizations to perform various activities in accordance with the requirements of the ASME Boiler and Pressure Vessel Code. It is the aim of the Society to provide recognition of organizations so authorized. An organization holding authorization to perform various activities in accordance with the requirements of the Code may state this capability in its advertising literature.

Organizations that are authorized to use the Certification Mark for marking items or constructions that have been constructed and inspected in compliance with the ASME Boiler and Pressure Vessel Code are issued Certificates of Authorization. It is the aim of the Society to maintain the standing of the Certification Mark for the benefit of the users, the enforcement jurisdictions, and the holders of the Certification Mark who comply with all requirements.

Based on these objectives, the following policy has been established on the usage in advertising of facsimiles of the Certification Mark, Certificates of Authorization, and reference to Code construction. The American Society of Mechanical Engineers does not "approve," "certify," "rate," or "endorse" any item, construction, or activity and there shall be no statements or implications that might so indicate. An organization holding the Certification Mark and/or a Certificate of Authorization may state in advertising literature that items, constructions, or activities "are built (produced or performed) or activities conducted in accordance with the requirements of the ASME Boiler and Pressure Vessel Code," or "meet the requirements of the ASME Boiler and Pressure Vessel Code." An ASME corporate logo shall not be used by any organization other than ASME.

The Certification Mark shall be used only for stamping and nameplates as specifically provided in the Code. However, facsimiles may be used for the purpose of fostering the use of such construction. Such usage may be by an association or a society, or by a holder of the Certification Mark who may also use the facsimile in advertising to show that clearly specified items will carry the Certification Mark. General usage is permitted only when all of a manufacturer's items are constructed under the rules.

STATEMENT OF POLICY ON THE USE OF ASME MARKING TO IDENTIFY MANUFACTURED ITEMS

The ASME Boiler and Pressure Vessel Code provides rules for the construction of boilers, pressure vessels, and nuclear components. This includes requirements for materials, design, fabrication, examination, inspection, and stamping. Items constructed in accordance with all of the applicable rules of the Code are identified with the official Certification Mark described in the governing Section of the Code.

Markings such as "ASME," "ASME Standard," or any other marking including "ASME" or the Certification Mark shall not be used on any item that is not constructed in accordance with all of the applicable requirements of the Code.

Items shall not be described on ASME Data Report Forms nor on similar forms referring to ASME that tend to imply that all Code requirements have been met when, in fact, they have not been. Data Report Forms covering items not fully complying with ASME requirements should not refer to ASME or they should clearly identify all exceptions to the ASME requirements.

(17) # SUBMITTAL OF TECHNICAL INQUIRIES TO THE BOILER AND PRESSURE VESSEL STANDARDS COMMITTEES

1 INTRODUCTION

(a) The following information provides guidance to Code users for submitting technical inquiries to the applicable Boiler and Pressure Vessel (BPV) Standards Committee (hereinafter referred to as the Committee). See the guidelines on approval of new materials under the ASME Boiler and Pressure Vessel Code in Section II, Part D for requirements for requests that involve adding new materials to the Code. See the guidelines on approval of new welding and brazing materials in Section II, Part C for requirements for requests that involve adding new welding and brazing materials ("consumables") to the Code.

Technical inquiries can include requests for revisions or additions to the Code requirements, requests for Code Cases, or requests for Code Interpretations, as described below:

(1) Code Revisions. Code revisions are considered to accommodate technological developments, to address administrative requirements, to incorporate Code Cases, or to clarify Code intent.

(2) Code Cases. Code Cases represent alternatives or additions to existing Code requirements. Code Cases are written as a Question and Reply, and are usually intended to be incorporated into the Code at a later date. When used, Code Cases prescribe mandatory requirements in the same sense as the text of the Code. However, users are cautioned that not all regulators, jurisdictions, or Owners automatically accept Code Cases. The most common applications for Code Cases are as follows:

(-a) to permit early implementation of an approved Code revision based on an urgent need

(-b) to permit use of a new material for Code construction

(-c) to gain experience with new materials or alternative requirements prior to incorporation directly into the Code

(3) Code Interpretations

(-a) Code Interpretations provide clarification of the meaning of existing requirements in the Code and are presented in Inquiry and Reply format. Interpretations do not introduce new requirements.

(-b) If existing Code text does not fully convey the meaning that was intended, or conveys conflicting requirements, and revision of the requirements is required to support the Interpretation, an Intent Interpretation will be issued in parallel with a revision to the Code.

(b) Code requirements, Code Cases, and Code Interpretations established by the Committee 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 Code requirements.

(c) Inquiries that do not comply with the following guidance or that do not provide sufficient information for the Committee's full understanding may result in the request being returned to the Inquirer with no action.

2 INQUIRY FORMAT

Submittals to the Committee should include the following information:

(a) Purpose. Specify one of the following:

(1) request for revision of present Code requirements

(2) request for new or additional Code requirements

(3) request for Code Case

(4) request for Code Interpretation

(b) Background. The Inquirer should provide the information needed for the Committee's understanding of the Inquiry, being sure to include reference to the applicable Code Section, Division, Edition, Addenda (if applicable), paragraphs, figures, and tables. Preferably, the Inquirer should provide a copy of, or relevant extracts from, the specific referenced portions of the Code.

(c) Presentations. The Inquirer may desire to attend or be asked to attend a meeting of the Committee to make a formal presentation or to answer questions from the Committee members with regard to the Inquiry. Attendance at a BPV Standards Committee meeting shall be at the expense of the Inquirer. The Inquirer's attendance or lack of attendance at a meeting will not be used by the Committee as a basis for acceptance or rejection of the Inquiry by the Committee. However, if the Inquirer's request is unclear, attendance by the Inquirer or a representative may be necessary for the Committee to understand the request sufficiently to be able to provide an Interpretation. If the Inquirer desires to make a presentation at a Committee meeting, the Inquirer should provide advance notice to the Committee Secretary, to ensure time will be allotted for the presentation in the meeting agenda. The Inquirer should consider the need for additional audiovisual equipment that might not otherwise be provided by the Committee. With sufficient advance notice to the Committee Secretary, such equipment may be made available.

3 CODE REVISIONS OR ADDITIONS

Requests for Code revisions or additions should include the following information:

(a) Requested Revisions or Additions. For requested revisions, the Inquirer should identify those requirements of the Code that they believe should be revised, and should submit a copy of, or relevant extracts from, the appropriate requirements as they appear in the Code, marked up with the requested revision. For requested additions to the Code, the Inquirer should provide the recommended wording and should clearly indicate where they believe the additions should be located in the Code requirements.

(b) Statement of Need. The Inquirer should provide a brief explanation of the need for the revision or addition.

(c) Background Information. The Inquirer should provide background information to support the revision or addition, including any data or changes in technology that form the basis for the request, that will allow the Committee to adequately evaluate the requested revision or addition. Sketches, tables, figures, and graphs should be submitted, as appropriate. The Inquirer should identify any pertinent portions of the Code that would be affected by the revision or addition and any portions of the Code that reference the requested revised or added paragraphs.

4 CODE CASES

Requests for Code Cases should be accompanied by a statement of need and background information similar to that described in 3(b) and 3(c), respectively, for Code revisions or additions. The urgency of the Code Case (e.g., project underway or imminent, new procedure) should be described. In addition, it is important that the request is in connection with equipment that will bear the Certification Mark, with the exception of Section XI applications. The proposed Code Case should identify the Code Section and Division, and should be written as a Question and a Reply, in the same format as existing Code Cases. Requests for Code Cases should also indicate the applicable Code Editions and Addenda (if applicable) to which the requested Code Case applies.

5 CODE INTERPRETATIONS

(a) Requests for Code Interpretations should be accompanied by the following information:

(1) Inquiry. The Inquirer should propose a condensed and precise Inquiry, omitting superfluous background information and, when possible, composing the Inquiry in such a way that a "yes" or a "no" Reply, with brief limitations or conditions, if needed, can be provided by the Committee. The proposed question should be technically and editorially correct.

(2) Reply. The Inquirer should propose a Reply that clearly and concisely answers the proposed Inquiry question. Preferably, the Reply should be "yes" or "no," with brief limitations or conditions, if needed.

(3) Background Information. The Inquirer should provide any need or background information, such as described in 3(b) and 3(c), respectively, for Code revisions or additions, that will assist the Committee in understanding the proposed Inquiry and Reply.

If the Inquirer believes a revision of the Code requirements would be helpful to support the Interpretation, the Inquirer may propose such a revision for consideration by the Committee. In most cases, such a proposal is not necessary.

(b) Requests for Code Interpretations should be limited to an Interpretation of a particular requirement in the Code or in a Code Case. Except with regard to interpreting a specific Code requirement, the Committee is not permitted to consider consulting-type requests such as the following:

(1) a review of calculations, design drawings, welding qualifications, or descriptions of equipment or parts to determine compliance with Code requirements

(2) a request for assistance in performing any Code-prescribed functions relating to, but not limited to, material selection, designs, calculations, fabrication, inspection, pressure testing, or installation

(3) a request seeking the rationale for Code requirements

6 SUBMITTALS

(a) Submittal. Requests for Code 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, the Inquirer may mail the request to the following address:

Secretary
ASME Boiler and Pressure Vessel Committee
Two Park Avenue
New York, NY 10016-5990

All other Inquiries should be mailed to the Secretary of the BPV Committee at the address above. Inquiries are unlikely to receive a response if they are not written in clear, legible English. They must also include the name of the Inquirer and the company they represent or are employed by, if applicable, and the Inquirer's address, telephone number, fax number, and e-mail address, if available.

(b) Response. The Secretary of the appropriate Committee will provide a written response, via letter or e-mail, as appropriate, to the Inquirer, upon completion of the requested action by the Committee. Inquirers may track the status of their Interpretation Request at http://go.asme.org/Interpretations.

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(17)

January 1, 2017

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SUMMARY OF CHANGES

Errata to the BPV Code may be posted on the ASME Web site to provide corrections to incorrectly published items, or to correct typographical or grammatical errors in the BPV Code. Such Errata shall be used on the date posted.

Information regarding Special Notices and Errata is published by ASME at http://go.asme.org/BPVCerrata.

Changes given below are identified on the pages by a margin note, **(17)**, placed next to the affected area.

The Record Numbers listed below are explained in more detail in "List of Changes in Record Number Order" following this Summary of Changes.

Page	*Location*	*Change (Record Number)*
xiii	List of Sections	Updated
xviii	Submittal of Technical Inquiries to the Boiler and Pressure Vessel Standards Committees	Revised in its entirety *(13-2222)*
xxi	Personnel	Updated
3	2.3	Revised *(16-1411)*
3	2.4	Revised *(16-1411)*
6–149	Table 1A	Column heading for lowest-temperature stress values revised *(11-1811)*
30–33	Table 1A, Lines 18–21	For Sections VIII, Division 1 and XII, $\frac{1}{2}$Cr–$\frac{1}{5}$Mo SA-372 G and H Cl. 55 and 65 added *(13-1360)*
	Table 1A, Lines 39 & 40	For Sections I and VIII-1, $\frac{1}{2}$Cr–1$\frac{1}{4}$Mn–Si SA-202 A and B deleted *(06-50)*
	Table 1A, Lines 44–46	For VIII-1 and XII, 1Cr–$\frac{1}{5}$Mo SA-372 E, F, and J Cl. 55 added *(13-1360)*
34–37	Table 1A, Line 2	For VIII-1 and XII, SA-372 F Cl. 65 added *(13-1360)*
	Table 1A, Lines 21, 31 & 33	For I, for 1Cr–$\frac{1}{2}$Mo SA/GB-713 15CrMoR, Class/Condition/Temper added and Notes revised *(15-1717)*
50–53	Table 1A, Line 4	For Section III, 13Cr SA/EN 10088-3 X12Cr13 added *(12-131)*
74–77	Table 1A, Lines 40 & 41	For VIII-1 and XII, 16Cr–12Ni–2Mo SA/EN 10028-7 X2CrNiMo17-12-2 added *(09-759)*
	Table 1A, Lines 42 & 43	*(1)* For VIII-1, for SA/EN 10028-7 X5CrNiMo17-12-2, Notes and stress values revised *(09-759)* *(2)* For XII, SA/EN 10028-7 X5CrNiMo17-12-2 added *(09-759)*
78–81	Table 1A, Lines 37 & 38	For VIII-1 and XII, 16Cr–12Ni–2Mo–N SA/EN 10028-7 X2CrNiMoN17-11-2 and X2CrNiMoN17-13-3 added *(09-759)*
86–89	Table 1A, Lines 18 & 19	For VIII-1 and XII, 18Cr–8Ni SA/EN 10028-7 X2CrNi18-9 added *(09-759)*
90–93	Table 1A, Line 30	*(1)* For VIII-1, for SA/EN 10028-7 X5CrNi18-10, Notes and stress values for 300°F and 400°F revised *(09-759)* *(2)* For XII, SA/EN 10028-7 X5CrNi18-10 added *(09-759)*

Page	*Location*	*Change (Record Number)*
	Table 1A, Line 31	*(1)* For VIII-1, for SA/EN 10028-7 X5CrNi18-10, Notes revised *(09-759)* *(2)* For XII, SA/EN 10028-7 X5CrNi18-10 added *(09-759)*
94–97	Table 1A, Lines 33–35	For VIII-1 and XII, 18Cr–8Ni–N SA/EN 10028-7 X2CrNiN18-10 and X5CrNiN19-9 added *(09-759)*
106–109	Table 1A, Lines 28 & 29	For VIII-1 and XII, 18Cr–10Ni–Ti SA/EN 10028-7 X6CrNiTi18-10 added *(09-759)*
118–121	Table 1A, Line 39	For III, VIII-1, and XII, for 20Cr–18Ni–6Mo SA-358, Size/Thickness added and Min. Tensile Strength, Min. Yield Strength, and stress values revised *(15-962)*
	Table 1A, Line 40	For VIII-1 and XII, for SA-358, Size/Thickness added and Min. Tensile Strength, Min. Yield Strength, and stress values revised *(15-962)*
122–125	Table 1A, Line 9	For III, VIII-1, and XII, SA-358 added *(15-962)*
	Table 1A, Line 10	For VIII-1 and XII, SA-358 added *(15-962)*
	Table 1A, Lines 13–17	For VIII-1, 21Cr–5Mn–1.5Ni–Cu–N SA-789, SA-790, and SA-815 added *(13-2019)*
	Table 1A, Lines 19–22	For VIII-1, SA-789 and SA-790 added *(13-2019)*
126–129	Table 1A, Line 10	For VIII-1, 22Cr–5Ni–3Mo–N SA-995 4A added *(14-49)*
134–137	Table 1A, Lines 12–14	For VIII-1, 24Cr–22Ni–6Mo–2W–Cu–N SA-182 F58, SA-240, and SA-358 added *(14-446)*
150, 151	Table 1A	*(1)* General Note (e) revised *(11-1811)* *(2)* Note G30 added *(09-759)* *(3)* Note H3 deleted *(15-1717)* *(4)* Note H6 added *(12-131)*
154–269	Table 1B	Column heading for lowest-temperature stress values revised *(11-1811)*
154–157	Table 1B, Line 1	For III, VIII-1, and XII, for Alclad 3003 O SB-209, Size/Thickness, Min. Yield Strength, and stress values revised *(14-2058)*
	Table 1B, Line 2	For III, VIII-1, and XII, for O SB-209, Min. Tensile Strength, Min. Yield Strength, and stress values revised *(14-2058)*
	Table 1B, Line 3	*(1)* For III, for H112 SB-209, Size/Thickness, Min. Yield Strength, Max. Temperature Limit, and stress values revised *(14-2058)* *(2)* For VIII-1 and XII, Size/Thickness, Min. Yield Strength, and stress values revised *(14-2058)*
	Table 1B, Line 4	For III, VIII-1, and XII, for H112 SB-209, Min. Tensile Strength, Min. Yield Strength, and stress values revised *(14-2058)*
	Table 1B, Line 5	For III, VIII-1, and XII, for H112 SB-209, Size/Thickness, Min. Yield Strength, and stress values revised *(14-2058)*
	Table 1B, Line 6	*(1)* For III, for H12 SB-209, Size/Thickness, Min. Yield Strength, Max. Temperature Limit, and stress values revised *(14-2058)* *(2)* For VIII-1 and XII, Size/Thickness, Min. Yield Strength, and stress values revised *(14-2058)*

Page	*Location*	*Change (Record Number)*
	Table 1B, Line 7	*(1)* For III, for H12 SB-209, Min. Tensile Strength, Min. Yield Strength, Max. Temperature Limit, and stress values revised *(14-2058)* *(2)* For VIII-1 and XII, Min. Tensile Strength, Min. Yield Strength, and stress values revised *(14-2058)*
	Table 1B, Line 8	For III, VIII-1, and XII, for H14 SB-209, Size/Thickness and stress values revised *(14-2058)*
	Table 1B, Line 9	For III, VIII-1, and XII, for H14 SB-209, Min. Yield Strength and stress values revised *(14-2058)*
	Table 1B, Lines 10 & 11	For III, VIII-1, and XII, for O and H113 SB-210, Size/Thickness, Min. Yield Strength, and stress values revised *(14-2058)*
	Table 1B, Lines 12 & 13	For III, VIII-1, and XII, for H14 and H18 SB-210, Size/Thickness and stress values revised *(14-2058)*
	Table 1B, Lines 14 & 15	For III, VIII-1, and XII, for H14 and H25 SB-234, stress values revised *(14-2058)*
	Table 1B, Lines 16 & 17	For III, VIII-1, and XII, for O and H112 SB-241, Min. Yield Strength and stress values revised *(14-2058)*
	Table 1B, Line 18	*(1)* For III, for Alclad 3004 O SB-209, Size/Thickness, Max. Temperature Limit, and stress values revised *(14-2058)* *(2)* For VIII-1 and XII, Size/Thickness and stress values revised *(14-2058)*
	Table 1B, Line 19	*(1)* For III, for O SB-209, Min. Yield Strength, Max. Applicability Temperature, and stress values revised *(14-2058)* *(2)* For VIII-1 and XII, Min. Yield Strength and stress values revised *(14-2058)*
	Table 1B, Line 20	*(1)* For III, for H112 SB-209, Size/Thickness, Min. Yield Strength, Max. Applicability Temperature, and stress values revised *(14-2058)* *(2)* For VIII-1 and XII, Size/Thickness, Min. Yield Strength, and stress values revised *(14-2058)*
	Table 1B, Line 21	*(1)* For III, for H112 SB-209, Min. Yield Strength, Max. Applicability Temperature, and stress values revised *(14-2058)* *(2)* For VIII-1 and XII, Min. Yield Strength and stress values revised *(14-2058)*
	Table 1B, Line 22	For III, VIII-1, and XII, for H32 SB-209, Size/Thickness and stress values revised *(14-2058)*
	Table 1B, Line 23	For III, VIII-1, and XII, for H32 SB-209, stress values revised *(14-2058)*
	Table 1B, Line 24	For III, VIII-1, and XII, for H34 SB-209, Size/Thickness, Min. Tensile Strength, and stress values revised *(14-2058)*
	Table 1B, Line 25	For III, VIII-1, and XII, for H34 SB-209, stress values revised *(14-2058)*
158–161	Table 1B, Line 30	For III, VIII-1, and XII, for A93003 O SB-209, Size/Thickness, Min. Tensile Strength, Min. Yield Strength, and stress values revised *(14-2058)*

Page	Location	Change (Record Number)
	Table 1B, Line 31	*(1)* For III, for H112 SB-209, Size/Thickness, Min. Tensile Strength, Min. Yield Strength, Max. Applicability Limit, and stress values revised *(14-2058)* *(2)* For VIII-1 and XII, Size/Thickness, Min. Tensile Strength, Min. Yield Strength, and stress values revised *(14-2058)*
	Table 1B, Line 32	For III, VIII-1, and XII, for H112 SB-209, Min. Tensile Strength, Min. Yield Strength, and stress values revised *(14-2058)*
	Table 1B, Line 33	For III, VIII-1, and XII, for H112 SB-209, Size/Thickness, Min. Yield Strength, and stress values revised *(14-2058)*
	Table 1B, Line 34	*(1)* For III, for H12 SB-209, Size/Thickness, Min. Tensile Strength, Min. Yield Strength, Max. Applicability Limit, and stress values revised *(14-2058)* *(2)* For VIII-1 and XII, Size/Thickness, Min. Tensile Strength, Min. Yield Strength, and stress values revised *(14-2058)*
	Table 1B, Line 35	For III, VIII-1, and XII, for H14 SB-209, Size/Thickness, Min. Yield Strength, and stress values revised *(14-2058)*
	Table 1B, Lines 36 & 37	For III, VIII-1, and XII, for O and H113 SB-210, Size/Thickness, Min. Tensile Strength, Min. Yield Strength, and stress values revised *(14-2058)*
	Table 1B, Line 38	*(1)* For III, for H12 SB-210, Size/Thickness, Min. Tensile Strength, Min. Yield Strength, Max. Temperature Limit, and stress values revised *(14-2058)* *(2)* For VIII-1 and XII, Size/Thickness, Min. Tensile Strength, Min. Yield Strength, and stress values revised *(14-2058)*
	Table 1B, Line 39	For III, VIII-1, and XII, for H14 SB-210, Size/Thickness, Min. Yield Strength, and stress values revised *(14-2058)*
	Table 1B, Line 40	For III, VIII-1, and XII, for H18 SB-210, Size/Thickness and stress values revised *(14-2058)*
	Table 1B, Lines 41 & 42	For III, VIII-1, and XII, for O and H112 SB-221, Min. Tensile Strength, Min. Yield Strength, and stress values revised *(14-2058)*
	Table 1B, Line 43	For III, VIII-1, and XII, for H14 SB-234, Min. Yield Strength and stress values revised *(14-2058)*
	Table 1B, Line 44	For III, VIII-1, and XII, for H25 SB-234, stress values revised *(14-2058)*
162–165	Table 1B, Lines 1 & 2	For III, VIII-1, and XII, for O and H112 SB-241, Min. Tensile Strength, Min. Yield Strength, and stress values revised *(14-2058)*
	Table 1B, Line 3	For III, VIII-1, and XII, for H112 SB-241, Size/Thickness, Min. Tensile Strength, Min. Yield Strength, and stress values revised *(14-2058)*
	Table 1B, Line 4	For III, VIII-1, and XII, for H18 SB-241, Size/Thickness and stress values revised *(14-2058)*
	Table 1B, Line 5	For III, VIII-1, and XII, for H112 SB-247, Size/Thickness, Min. Tensile Strength, Min. Yield Strength, and stress values revised *(14-2058)*
	Table 1B, Line 6	For III, VIII-1, and XII, for H112 wld. SB-247, Size/Thickness, Min. Tensile Strength, and stress values revised, and Min. Yield Strength added *(14-2058)*

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	Table 1B, Lines 7 & 8	*(1)* For III, for A93004 O and H112 SB-209, Size/Thickness, Min. Yield Strength, Max. Temperature Limit, and stress values revised *(14-2058)* *(2)* For VIII-1 and XII, Size/Thickness, Min. Yield Strength, and stress values revised *(14-2058)*
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620–623	Table Y-1, Lines 44 & 45	For SA/EN 10222-2 P305GH, yield strength values for 100°C through 525°C added *(01-633)*

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624–627	Table Y-1, Line 3	For SA/EN 10222-2 P305GH, yield strength values for 100°C through 525°C added *(01-633)*
	Table Y-1, Line 7	SA/EN 10025-2 S355J2+N added *(12-698)*
628–631	Table Y-1, Lines 6–15	For SA-905, Notes revised *(16-441)*
632–635	Table Y-1, Lines 24–27	$\frac{1}{2}$Cr–$\frac{1}{5}$Mo SA-372 G and H Cl. 55 and 65 added *(13-1360)*
	Table Y-1, Lines 42 & 43	$\frac{1}{2}$Cr–1$\frac{1}{4}$Mn–Si SA-202 A and B deleted *(06-50)*
636–639	Table Y-1, Lines 1–3	1Cr–$\frac{1}{5}$Mo SA-372 E, F, and J Cl. 55 added *(13-1360)*
	Table Y-1, Line 7	SA-372 F Cl. 65 added *(13-1360)*
	Table Y-1, Line 25	For 1Cr–$\frac{1}{2}$Mo SA/EN 10222-2 13CrMo4-5, yield strength values for 100°C through 525°C added *(01-633)*
	Table Y-1, Line 28	For SA/GB 713 15CrMoR, Class/Condition/Temper revised *(15-1717)*
	Table Y-1, Line 29	For SA/EN 10222-2 13CrMo4-5, yield strength values for 100°C through 525°C added *(01-633)*
	Table Y-1, Lines 31, 33 & 35	For SA/EN 10222-2 13CrMo4-5, yield strength values for 100°C through 525°C added *(01-633)*
	Table Y-1, Lines 38 & 40	For SA/GB 713 15CrMoR, Class/Condition/Temper revised *(15-1717)*
644–647	Table Y-1, Lines 2 & 17	For 2$\frac{1}{4}$Cr–1Mo SA/EN 10222-2 11CrMo9-10, yield strength values for 100°C through 525°C added *(01-633)*
652–655	Table Y-1, Lines 5 & 6	For 12Cr–1Mo–V–W SA-437 B4C and B4B, Notes deleted *(15-525)*
	Table Y-1, Lines 7–12	For 12Cr–9Ni–2Cu–1Ti SA-564 and SA-705 XM-16, Notes deleted *(15-525)*
	Table Y-1, Line 24	13Cr SA/EN 10088-3 X12Cr13 added *(12-131)*
	Table Y-1, Lines 35–42	For 13Cr–8Ni–2Mo SA-564 and SA-705 XM-13, Notes deleted *(15-525)*
656–659	Table Y-1, Lines 3 & 4	For 15Cr–5Ni–3Cu SA-564 and SA-705 XM-12, Notes deleted *(15-525)*
	Table Y-1, Lines 7–12	For SA-564 and SA-705 XM-12, Notes deleted *(15-525)*
	Table Y-1, Lines 19–26	For 15Cr–6Ni–Cu–Mo SA-564 and SA-705 XM-25, Notes deleted *(15-525)*
	Table Y-1, Lines 30 & 31	For 17Cr–4Ni–4Cu SA-564 and SA-705 630, Notes deleted *(15-525)*
	Table Y-1, Lines 41–44	For SA-564 and SA-705 630, Notes deleted *(15-525)*
660–663	Table Y-1, Lines 1 & 2	For 17Cr–7Ni–1Al SA-705 631, Notes deleted *(15-525)*
672–675	Table Y-1, Line 39	For 25Ni–15Cr–2Ti SA-638 660, Class/Condition/Temper and yield strength values for 400°C through 525°C added *(13-215)*
	Table Y-1, Line 40	SA-638 660 added *(13-215)*
680–683	Table Y-1, Line 14	16Cr–12Ni–2Mo SA/EN 10028-7 X2CrNiMo17-12-2 added *(09-759)*
	Table Y-1, Lines 16 & 17	For SA-193 B8M2 and SA-276 316, Notes deleted *(15-525)*
	Table Y-1, Line 21	For SA-276 316, Notes deleted *(15-525)*

Page	*Location*	*Change (Record Number)*
	Table Y-1, Lines 22 & 26	For SA-276 316, Notes deleted *(15-525)*
	Table Y-1, Lines 27 & 30	For SA-276 316, Notes deleted *(15-525)*
	Table Y-1, Lines 33 & 34	For SA-276 316, Notes deleted *(15-525)*
684–687	Table Y-1, Lines 19 & 20	16Cr–12Ni–2Mo–N SA/EN 10028-7 X2CrNiMoN17-11-2 and X2CrNiMoN17-13-3 added *(09-759)*
688–691	Table Y-1, Line 15	18Cr–8Ni SA/EN 10028-7 X2CrNi18-9 added *(09-759)*
692–695	Table Y-1, Line 12	For SA/EN 10028-7 X5CrNi18-10, yield strength values for 100°C and 400°C revised *(09-759)*
	Table Y-1, Lines 17–24	For SA-193 and SA-320 B8, Notes deleted *(15-525)*
696–699	Table Y-1, Lines 7 & 8	18Cr–8Ni–N SA/EN 10028-7 X2CrNiN18-10 and X5CrNiN19-9 added *(09-759)*
700–703	Table Y-1, Lines 38–45	For 18Cr–10Ni–Cb SA-193 and SA-320 B8C, Notes deleted *(15-525)*
704–707	Table Y-1, Line 9	18Cr–10Ni–Ti SA/EN 10028-7 X6CrNiTi18-10 added *(09-759)*
	Table Y-1, Lines 38–45	For SA-193 and SA-320 B8T, Notes deleted *(15-525)*
708–711	Table Y-1, Lines 3–6	For 18Cr–11Ni SA-193 B8P, Notes deleted *(15-525)*
712–715	Table Y-1, Line 3	For 20Cr–18Ni–6Mo SA-358, Size/Thickness added, and Min. Tensile Strength, Min. Yield Strength, and yield strength values revised *(15-962)*
	Table Y-1, Line 7	SA-358 added *(15-962)*
	Table Y-1, Lines 10–12	21Cr–5Mn–1.5Ni–Cu–N SA-789, SA-790, and SA-815 added *(13-2019)*
	Table Y-1, Lines 14 & 15	SA-789 and SA-790 added *(13-2019)*
	Table Y-1, Line 32	22Cr–5Ni–3Mo–N SA-995 4A added *(14-49)*
720–723	Table Y-1, Lines 5–7	24Cr–22Ni–6Mo–2W–Cu–N SA-182 F58, SA-240, and SA-358 added *(14-446)*
728–731	Table Y-1, Lines 1–9	Alclad 3003 SB-209 added *(14-2058)*
	Table Y-1, Line 10	For O SB-210, Size/Thickness revised, Min. Tensile Strength added, and Min. Yield Strength and yield strength values revised *(14-2058)*
	Table Y-1, Lines 11–13	H113, H14, and H18 SB-210 added *(14-2058)*
	Table Y-1, Lines 14 & 15	H14 and H25 SB-234 added *(14-2058)*
	Table Y-1, Line 16	For O SB-241, Min. Yield Strength and yield strength values revised *(14-2058)*
	Table Y-1, Line 17	H112 SB-241 added *(14-2058)*
	Table Y-1, Lines 18–25	Alclad 3004 SB-209 added *(14-2058)*
	Table Y-1, Line 33	For A93003 O SB-209, Size/Thickness revised, Min. Tensile Strength added, and Min. Yield Strength and yield strength values revised *(14-2058)*
	Table Y-1, Lines 34 & 35	For H112 SB-209, Size/Thickness revised, Min. Tensile Strength added, and Min. Yield Strength and yield strength values revised *(14-2058)*

Page	*Location*	*Change (Record Number)*
	Table Y-1, Lines 36–38	H112, H12, and H14 SB-209 added *(14-2058)*
	Table Y-1, Line 39	For O SB-210, Size/Thickness revised, Min. Tensile Strength added, and Min. Yield Strength and yield strength values revised *(14-2058)*
	Table Y-1, Line 40	For H113 SB-210, Size/Thickness, Min. Tensile Strength, Min. Yield Strength, and yield strength values revised *(14-2058)*
	Table Y-1, Lines 41–43	H12, H14, and H18 SB-210 added *(14-2058)*
	Table Y-1, Lines 44 & 45	For O and H112 SB-221, Min Tensile Strength added and Min. Yield Strength and yield strength values revised *(14-2058)*
	Table Y-1, Lines 46 & 47	H14 and H25 SB-234 added *(14-2058)*
732–735	Table Y-1, Line 1	For O SB-241, Min. Tensile Strength, Min. Yield Strength, and yield strength values revised *(14-2058)*
	Table Y-1, Line 2	H112 SB-241 deleted *(14-2058)*
	Table Y-1, Line 3	For H112 SB-241, Min. Tensile Strength, Min. Yield Strength, and yield strength values revised *(14-2058)*
	Table Y-1, Line 4	For H112 SB-241, Size/Thickness added and Min. Tensile Strength, Min. Yield Strength, and yield strength values revised *(14-2058)*
	Table Y-1, Lines 5 & 6	H18 SB-241 and H112 SB-247 added *(14-2058)*
	Table Y-1, Line 7	For A93004 O SB-209, Size/Thickness revised, Min. Tensile Strength added, and Min. Yield Strength and yield strength values at 175°C through 225°C revised *(14-2058)*
	Table Y-1, Line 8	For H112 SB-209, Size/Thickness revised, Min. Tensile Strength added, and Min. Yield Strength and yield strength values revised *(14-2058)*
	Table Y-1, Lines 9 & 10	H32 and H34 SB-209 added *(14-2058)*
740–743	Table Y-1, Line 48	C12200 WO61 SB-543 added *(11-451)*
744–747	Table Y-1, Line 7	For WC55 SB-543, Class/Condition/Temper revised *(11-451)*
	Table Y-1, Lines 28 & 29	For C19400 WO61 and WC55 SB-543, Class/Condition/Temper revised *(11-451)*
	Table Y-1, Lines 30–47	C44300, C44400, and C44500 SB-171, SB-111, SB-359, SB-395, and SB-543 added *(15-539)*
752–755	Table Y-1, Line 27	C95800 M01 SB-148 added *(15-1636)*
	Table Y-1, Line 28	C95820 M01 SB-148 added *(16-946)*
772–775	Table Y-1, Lines 33–45	For N08367 Solution ann. SB-462, SB-564, SB-675, SB-676, SB-688, SB-690, SB-691, and SB-804, Nominal Composition revised *(14-1876)*
	Table Y-1, Line 46	For SA-351 CN3MN, Nominal Composition revised *(14-1876)*
776–779	Table Y-1, Line 33	N08904 Annealed SB-674 replaced by SA-249 *(07-1317)*
780–783	Table Y-1, Lines 24–31	N10362 Solution ann. SB-366, SB-462, SB-564, SB-574, SB-575, SB-619, SB-622, and SB-626 added *(14-47)*
792–795	Table Y-1, Lines 18–26	R54250 Annealed SB-265, SB-338, SB-348, SB-363, SB-381, SB-861, and SB-862 added *(14-1730)*

Page	*Location*	*Change (Record Number)*
800	Table Y-1	*(1)* General Note (a) revised *(15-1717)* *(2)* Notes (1) and (3) through (6) deleted *(16-441)* *(3)* Note (2) redesignated as Note (1) *(16-441)*
803	Table TE-1	*(1)* On first page, third column heading revised *(16-911)* *(2)* Six Mn entries from Note (2) transferred to Note (1) *(16-911)* *(3)* In Note (3), 18Cr–15Ni–4Si added *(16-1794)* *(4)* In Note (4), 14Cr–16Ni–6Si–Cu–Mo, 18Cr–20Ni–5.5Si, and 24Cr–22Ni–6Mo–2W–Cu–N added *(14-446, 16-1794)*
810	Table TE-4	N08367 added to column heading for N08031 *(14-1876)*
821	Table TCD	*(1)* For N08020, TD values revised *(15-1704)* *(2)* N08367 added to column heading for N08031 *(14-1876)* *(3)* In Note (11), 18Cr–15Ni–4Si added *(16-1794)* *(4)* In Note (12), 14Cr–16Ni–6Si–Cu–Mo, 18Cr–20Ni–5.5Si, and 24Cr–22Ni–6Mo–2W–Cu–N added *(14-446, 16-1794)*
835	Table TM-1	In Note (10), 24Cr–22Ni–6Mo–2W–Cu–N added and fifth nominal composition revised *(14-446, 14-1876)*
839	Table TM-3	C95800 and C95820 added *(15-1636, 16-946)*
841	Table PRD	C95800 and C95820 added *(15-1636, 16-946)*
863	Figure HA-10	Added *(14-446)*
881	Figure NFC-2	Revised in its entirety *(09-2207)*
920	Figure NFT-6	Added *(14-1730)*
923	Table G	First column heading revised *(15-380)*
936	Table HA-10	Added *(14-446)*
947	Table NFC-2	Revised in its entirety *(09-2207)*
974	Table NFT-6	Added *(14-1730)*
976	1-100	In subparagraph (a), last paragraph revised *(14-2272)*
977	Table 1-100	Note (1) revised *(14-2272)*
978	2-110	Subparagraph (d) revised *(14-2272)*
979	Table 2-100(a)	Note (1) revised *(14-2272)*
981	3-500	Subparagraphs (d)(2) and (3) revised *(15-1642)*
999	10-110	Subparagraphs (a)(3) and (4) revised *(14-2272)*
1000	Table 10-100	First column revised *(14-2272)*
1028	D-300	Revised in its entirety *(15-31)*
1029	Nonmandatory Appendix E	Added *(15-2505)*

LIST OF CHANGES IN RECORD NUMBER ORDER

Record Number	Change
01-633	In Tables U and Y-1, added values for SA/EN 10222-2 Grades P280GH, P305GH, 13CrMo4-5, and 11CrMo9-10.
06–50	Deleted SA-202 specification from Section II, Part D.
07-1317	Spec No. changed from SB-674 to SA-249.
09-759	Added SA/EN 10028-7 grades to Tables 1A, 5A, U, and Y-1.
09-1250	Corrected the references to Part AF in Notes W2 and W6 of Table 5A.
09–2207	Revised Figure NFC-2 and Table NFC-2.
11-124	Added high alloy steels from Section VIII, Division 3 to Table U.
11-451	Added SB-543 UNS C12200 WO61 to Tables U and Y-1. In Tables U and Y-1, for SB-543 C12200, changed temper designation from light cold worked to WC55; for SB-543 C19400, changed temper designation from light cold worked to WC55; and for SB-543 C19400, changed temper designation from annealed to WO61.
11-1811	Changed the first temperature column in the stress tables from “–30 to 40" to “40.”
12-131	For SA/EN 10088-3, added stress values for Grade X12Cr13 to Tables 1A, 2A, U, and Y-1.
12-698	In Tables U and Y-1, added tensile and yield strength values for SA/EN 10025-2 Grade S355J2+N.
13-215	Added yield strength values for SA-638 Grade 660 (UNS S66286) from 375°C to 525°C in Table Y-1. Added Class 1 and 2 for SA-638 Grade 660 material to Tables U and Y-1.
13-828	SB-673 UNS N07718 and N07750 condition revised from “Solution ann.” to “Ann./aged.”
13-1360	Added lines for SA-372 Grades E, F, G, H, and J to Tables 1A, U, and Y-1.
13-2019	Added SA-789, SA-790, and SA-815 UNS S32101 to Tables 1A, U, and Y-1.
13-2222	Revised the front guidance on interpretations in its entirety.
14-47	Incorporated Code Case 2648 with the addition of allowable stress values for UNS N10362 in Table 1B to 427°C, tensile values in Table U, and yield strengths in Table Y-1. External Pressure Chart NFN-10 was assigned.
14-49	Incorporated Code Case 2402-1 for use of SA-995 UNS J92205 for Section VIII, Division 1 applications up to 260°C. Added new lines to Tables 1A, U, and Y-1.
14-446	Added S31266 to Tables 1A, 5A, U, and Y-1. Added S31266 to physical properties tables. Added Figure HA-10 and assigned S31266.
14-1730	In Tables 1B, U, and Y-1, added allowable, yield, and tensile stress values for Titanium Aluminum Vanadium Iron Alloy, Grade 38 (Ti–4Al–2.5V–1.5Fe), UNS R54250 for Section VIII, Division 1 applications.
14-1876	Added physical properties for N08367 alloys. Corrected nominal composition for N08367 alloys by removing “Cu.”
14-2058	In Tables U, Y-1, and 1B, added yield and tensile stress values for alloys A93003, A93004, Alclad 3003, and Alclad 3004.
14-2271	Changed welding note references for many copper alloys in Table 1B; deleted and added welding notes.
14-2272	Added copper alloys to the list of alloys to which the high-stress rules apply in Appendices 1, 2, and 10.
14-2384	Added allowable stress values in Table 3, tensile strength values in Table U, and yield strength values in Table Y-1 for SA-307 Grade A bolting material up to 232°C for Section VIII, Division 1 applications. Added thickness limitation and new G12 note to explain lower values and lower temperature.
15-31	Revised Appendix D to address significant figures for allowable stresses, tensile strength, and yield strength values in the Section II, Part D tables and in Code Cases.
15-380	Editorial revision changed D_o/T to D_o/t in the column heading of Table G.
15-525	Deleted Section VIII, Division 3 notes from Table Y-1 stress lines.

Record Number	Change
15-539	Added lines for C44300, C44400, and C44500 to Tables U and Y-1. In Tables 1B and 5B, corrected size break for SB-111 entry from 75 mm to 80 mm. In Table 1B, revised values at 175°C, 200°C, 225°C, and 250°C. In Table 5B, revised values at 200°C and 225°C. Corrected references to T-notes.
15-962	Revised allowable stress, tensile, and yield lines for UNS S31254 in Tables 1A, U, and Y-1 for SA-358 for both high and low stresses. Added size/thickness, including SA-240 for explanation of strength origin for welded pipe.
15-1617	Nominal Composition for UNS N08825 revised.
15-1636	Added SB-148 C95800 allowable, tensile, and yield stress values to Tables 1B, U, and Y-1 and to the physical properties tables.
15-1641	In Table 1B, revised the nominal composition for UNS R60705.
15-1642	Replaced references to Section III, Subsection NH.
15-1704	Revised N08020 (Alloy 20) thermal diffusivity.
15-1717	Notes H3 in Table 1A; H2 in Table 2A; and H2, H3, and H7 in Table 5A replaced by symbols in Class/Condition/Temper column.
15-2505	Added Nonmandatory Appendix E, Material Data for Stress Analysis in the Time-Dependent Regime."
16-441	Revised a previous action that removed all Section VIII, Division 3 notes such that Note (2) is now Note (1) and remained in the table.
16-911	A number of materials were improperly grouped in Table TE-1 such that the values were not consistent. The alloys with nominal compositions of Mn–¼Mo, Mn–½Mo–¼Ni, Mn–½Mo–¾Ni, Mn–½Mo, Mn–½Mo–½Ni, and Mn–V were moved from Group 2 to Group 1. The word “Low” was deleted from Group 2.
16-946	Added C95820 line to Tables 1B, U, Y-1, TM-3, and PRD.
16-1348	Added high-stress lines for SB-111 and SB-396 C60800 O61 to Tables 1B and 5B. Corrected values for stress lines in Table 1B to be the same as those in Table 5B except the value at 175°C in Table 5B is 70.4 MPa (in italics). In Table 1B, added italics at 175°C and changed T-note to T3.
16-1411	In response to Section VIII's creation of a new Class 1 materials group for Division 2, added back into Tables 2A and 2B all Section VIII, Division 2 materials that were removed from those tables following the creation of the new Division 2 for the 2007 Code edition.
16-1794	Added TE and TCD values for S30600, S32615, and S38815.
16-2332	Changed density value for C95800 in Table PRD to 7 640 kg/m^3.
16-3040	In Tables 2A and 2B, added applicability/maximum temperature limits and stress values for Section VIII, Division 2 use.

CROSS-REFERENCING AND STYLISTIC CHANGES IN THE BOILER AND PRESSURE VESSEL CODE

There have been structural and stylistic changes to BPVC, starting with the 2011 Addenda, that should be noted to aid navigating the contents. The following is an overview of the changes:

Subparagraph Breakdowns/Nested Lists Hierarchy

- First-level breakdowns are designated as (a), (b), (c), etc., as in the past.
- Second-level breakdowns are designated as (1), (2), (3), etc., as in the past.
- Third-level breakdowns are now designated as (-a), (-b), (-c), etc.
- Fourth-level breakdowns are now designated as (-1), (-2), (-3), etc.
- Fifth-level breakdowns are now designated as (+a), (+b), (+c), etc.
- Sixth-level breakdowns are now designated as (+1), (+2), etc.

Footnotes

With the exception of those included in the front matter (roman-numbered pages), all footnotes are treated as endnotes. The endnotes are referenced in numeric order and appear at the end of each BPVC section/subsection.

Submittal of Technical Inquiries to the Boiler and Pressure Vessel Standards Committees

Submittal of Technical Inquiries to the Boiler and Pressure Vessel Standards Committees has been moved to the front matter. This information now appears in all Boiler Code Sections (except for Code Case books).

Cross-References

It is our intention to establish cross-reference link functionality in the current edition and moving forward. To facilitate this, cross-reference style has changed. Cross-references within a subsection or subarticle will not include the designator/identifier of that subsection/subarticle. Examples follow:

- *(Sub-)Paragraph Cross-References.* The cross-references to subparagraph breakdowns will follow the hierarchy of the designators under which the breakdown appears.
  - If subparagraph (-a) appears in X.1(c)(1) and is referenced in X.1(c)(1), it will be referenced as (-a).
  - If subparagraph (-a) appears in X.1(c)(1) but is referenced in X.1(c)(2), it will be referenced as (1)(-a).
  - If subparagraph (-a) appears in X.1(c)(1) but is referenced in X.1(e)(1), it will be referenced as (c)(1)(-a).
  - If subparagraph (-a) appears in X.1(c)(1) but is referenced in X.2(c)(2), it will be referenced as X.1(c)(1)(-a).
- *Equation Cross-References.* The cross-references to equations will follow the same logic. For example, if eq. (1) appears in X.1(a)(1) but is referenced in X.1(b), it will be referenced as eq. (a)(1)(1). If eq. (1) appears in X.1(a)(1) but is referenced in a different subsection/subarticle/paragraph, it will be referenced as eq. X.1(a)(1)(1).