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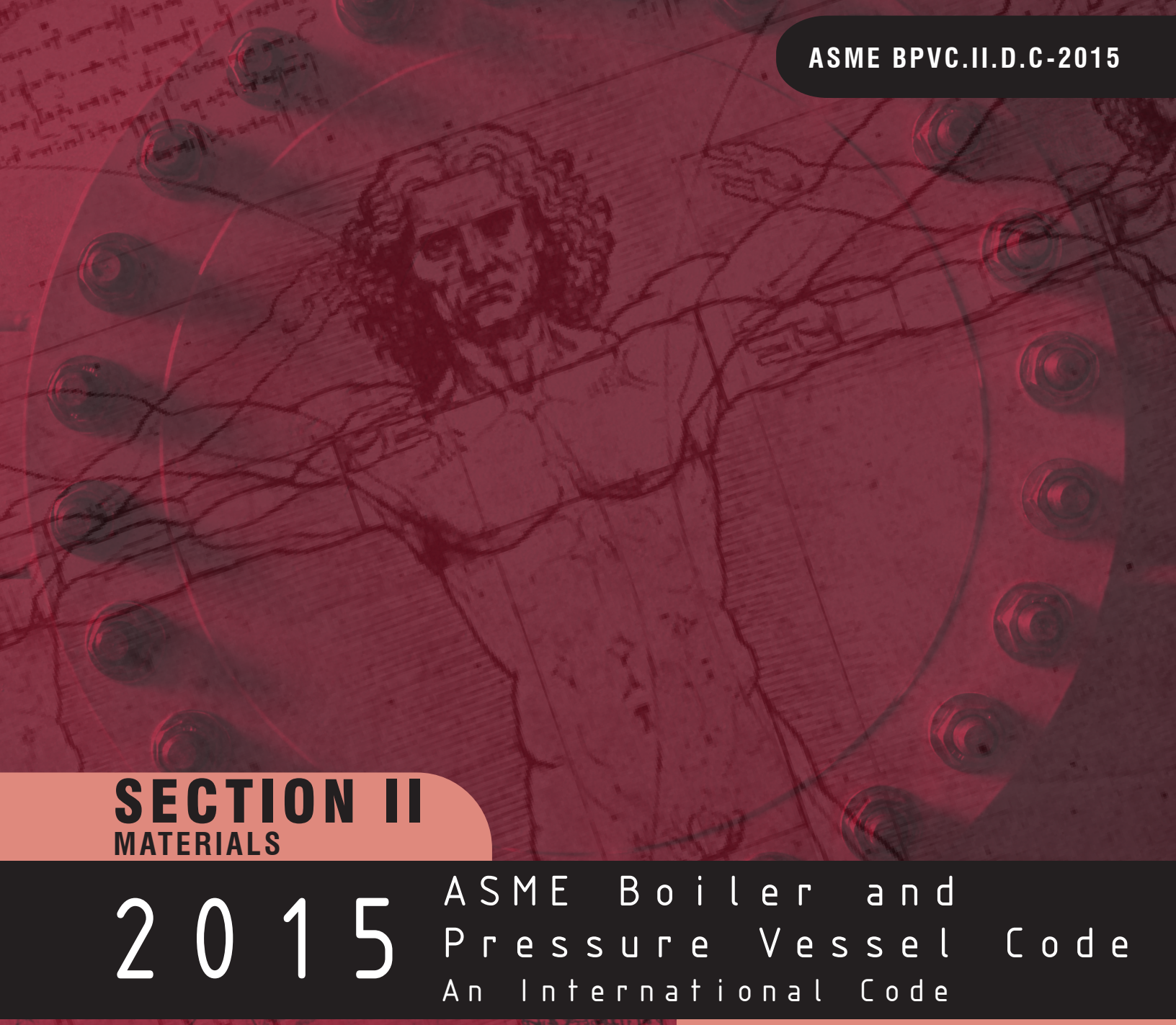
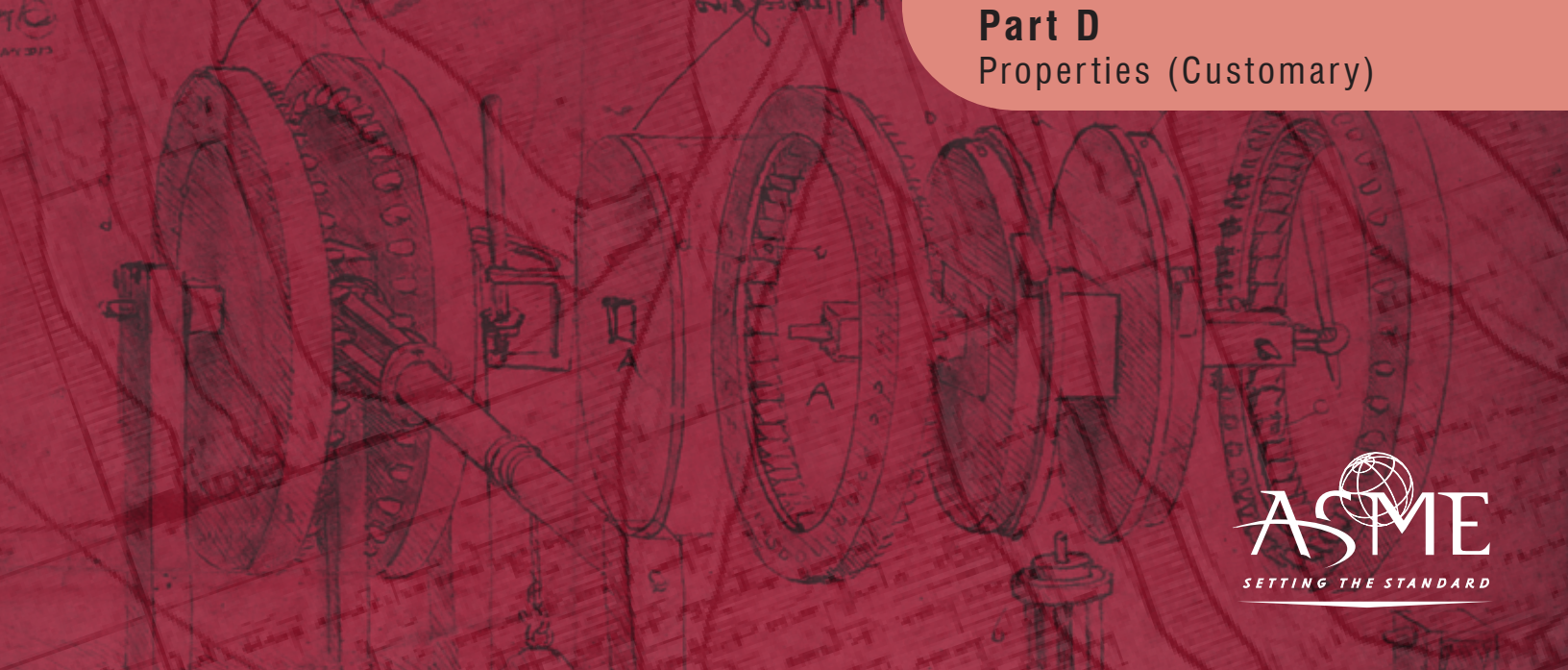


SECTION II
MATERIALS

2015 ASME Boiler and Pressure Vessel Code
An International Code

Part D
Properties (Customary)



ASME
SETTING THE STANDARD

AN INTERNATIONAL CODE

2015 ASME Boiler & Pressure Vessel Code

2015 Edition July 1, 2015

II

MATERIALS

Part D

Properties (Customary)

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, 2015

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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The endnotes and preamble in this document (if any) are part of this American National Standard.

ASME collective membership mark

Certification Mark

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

INTERPRETATIONS

Interpretations of the Code have historically been posted in January and July at http://cstools.asme.org/interpretations.cfm. Interpretations issued during the previous two calendar years are included with the publication of the applicable Section of the Code in the 2015 Edition. Interpretations of Section III, Divisions 1 and 2 and Section III Appendices are included with Subsection NCA.

Following the 2015 Edition, interpretations will not be included in editions; they will be 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 2015 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 2017 Code.

(15)

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 judgement* 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.

SUBMITTAL OF TECHNICAL INQUIRIES TO THE BOILER AND PRESSURE VESSEL STANDARDS COMMITTEES (15)

1 INTRODUCTION

(a) The following information provides guidance to Code users for submitting technical inquiries to the committees. See Guideline on the Approval of New Materials Under the ASME Boiler and Pressure Vessel Code in Section II, Parts C and D for additional requirements for requests involving adding new materials to the Code. Technical inquiries include requests for revisions or additions to the Code rules, requests for Code Cases, and requests for Code Interpretations, as described below.

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

(2) Code Cases. Code Cases represent alternatives or additions to existing Code rules. 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 jurisdictions or owners automatically accept Code Cases. The most common applications for Code Cases are:

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

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

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

(3) Code Interpretations. Code Interpretations provide clarification of the meaning of existing rules in the Code, and are also presented in question and reply format. Interpretations do not introduce new requirements. In cases where existing Code text does not fully convey the meaning that was intended, and revision of the rules is required to support an interpretation, an Intent Interpretation will be issued and the Code will be revised.

(b) The Code rules, Code Cases, and Code Interpretations established by the committees 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 rules.

(c) Inquiries that do not comply with these provisions or that do not provide sufficient information for a committee's full understanding may result in the request being returned to the inquirer with no action.

2 INQUIRY FORMAT

Submittals to a committee shall include:

(a) Purpose. Specify one of the following:

(1) revision of present Code rules

(2) new or additional Code rules

(3) Code Case

(4) Code Interpretation

(b) Background. 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, provide a copy of the specific referenced portions of the Code.

(c) Presentations. The inquirer may desire 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 committee meeting shall be at the expense of the inquirer. The inquirer's attendance or lack of attendance at a meeting shall not be a basis for acceptance or rejection of the inquiry by the committee.

3 CODE REVISIONS OR ADDITIONS

Requests for Code revisions or additions shall provide the following:

(a) Proposed Revisions or Additions. For revisions, identify the rules of the Code that require revision and submit a copy of the appropriate rules as they appear in the Code, marked up with the proposed revision. For additions, provide the recommended wording referenced to the existing Code rules.

(b) Statement of Need. Provide a brief explanation of the need for the revision or addition.

(c) Background Information. 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 proposed revision or addition. Sketches, tables, figures, and graphs should be submitted as appropriate. When applicable, identify any pertinent paragraph in the Code that would be affected by the revision or addition and identify paragraphs in the Code that reference the paragraphs that are to be revised or added.

4 CODE CASES

Requests for Code Cases shall provide a Statement of Need and Background Information similar to that defined 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, etc.) must be defined and it must be confirmed 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 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 proposed Code Case applies.

5 CODE INTERPRETATIONS

(a) Requests for Code Interpretations shall provide the following:

(1) Inquiry. Provide a condensed and precise question, omitting superfluous background information and, when possible, composed in such a way that a "yes" or a "no" *Reply,* with brief provisos if needed, is acceptable. The question should be technically and editorially correct.

(2) Reply. Provide a proposed *Reply* that will clearly and concisely answer the *Inquiry* question. Preferably, the *Reply* should be "yes" or "no," with brief provisos if needed.

(3) Background Information. Provide any background information that will assist the committee in understanding the proposed *Inquiry* and *Reply.*

(b) Requests for Code Interpretations must be limited to an interpretation of a particular requirement in the Code or a Code Case. The committee cannot 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

Submittals to and responses from the committees shall meet the following:

(a) Submittal. Inquiries from Code users shall be in English and preferably be submitted in typewritten form; however, legible handwritten inquiries will also be considered. They shall include the name, address, telephone number, fax number, and e-mail address, if available, of the inquirer and be mailed to the following address:

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

As an alternative, inquiries may be submitted via e-mail to: SecretaryBPV@asme.org or via our online tool at http://go.asme.org/InterpretationRequest.

(b) Response. The Secretary of the appropriate committee shall acknowledge receipt of each properly prepared inquiry and shall provide a written response to the inquirer upon completion of the requested action by the committee.

(15)

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January 1, 2015

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SUMMARY OF CHANGES

After publication of the 2015 Edition, 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, **(15)**, 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)*
x	List of Sections	Revised
xii	Foreword	*(1)* Revised *(2)* New footnote added by errata *(13-860)*
xv	Submittal of Technical Inquiries to the Boiler and Pressure Vessel Standards Committees	In last line of 6(a), URL revised
xvii	Personnel	Updated
3	3.1	Revised *(13–1919, 14–1425)*
3	3.3	Revised *(13–1919, 14–1425)*
18–21	Table 1A, Lines 13 & 16	For Sections I and VIII, Division 1, Carbon steel SA/EN 10222-2 P280GH added *(13-1839)*
22–25	Table 1A, Line 23	For VIII-1, for SA-841 A, Size/Thickness revised *(13-833)*
	Table 1A, Lines 24, 25 & 31	For I and VIII-1, SA/EN 10222-2 P305GH added *(13-1839)*
26–29	Table 1A, Line 14	For VIII-1, for SA-841 B, Size/Thickness revised *(13-833)*
34–37	Table 1A, Lines 20, 24, 26, 28 & 30	For I and VIII-1, 1Cr–$^{1}/_{2}$Mo SA/EN 10222-2 13CrMo4-5 added *(13-1839)*
38–41	Table 1A, Lines 32 & 45	For I and VIII-1, 2$^{1}/_{4}$Cr–1Mo SA/EN 10222-2 11CrMo9-10 added *(13-1839)*
98–101	Table 1A, Lines 2 & 3	For I, 18Cr–9Ni–3Cu–Cb–N SA-213 S30432 added *(13-118)*
122–125	Table 1A, Line 15	For Sections III, VIII-1, and XII, for 20Cr–18Ni–6Mo SA-249 S31254, Size/Thickness added and Min. Tensile Strength, Min. Yield Strength, and stress values revised *(07-667)*
	Table 1A, Line 16	For VIII-1 and XII, for SA-249 S31254, Size/Thickness added and Min. Tensile Strength, Min. Yield Strength, and stress values revised *(07-667)*
	Table 1A, Line 17	For III and VIII-1, for SA-312 S31254, Size/Thickness added and Min. Tensile Strength, Min. Yield Strength, and stress values revised *(07-667)*

Page	*Location*	*Change (Record Number)*
	Table 1A, Line 18	For VIII-1, for SA-312 S31254, Size/Thickness added and Min. Tensile Strength, Min. Yield Strength, and stress values revised *(07-667)*
	Table 1A, Line 19	For III and VIII-1, for SA-312 S31254, Size/Thickness added and Min. Tensile Strength, Min. Yield Strength, and stress values revised *(07-667)*
	Table 1A, Line 20	For VIII-1, for SA-312 S31254, Size/Thickness added and Min. Tensile Strength, Min. Yield Strength, and stress values revised *(07-667)*
	Table 1A, Line 21	For III, VIII-1, and XII, SA-249 S31254 added *(07-667)*
	Table 1A, Line 22	For VIII-1 and XII, SA-249 S31254 added *(07-667)*
	Table 1A, Line 23	For III and VIII-1, SA-312 S31254 added *(07-667)*
	Table 1A, Line 24	For VIII-1, SA-312 S31254 added *(07-667)*
	Table 1A, Line 25	For III and VIII-1, SA-312 S31254 added *(07-667)*
	Table 1A, Line 26	For VIII-1, SA-312 S31254 added *(07-667)*
	Table 1A, Lines 29–31	For VIII-1, 21Cr–5Mn–1.5Ni–Cu–N SA-240 and SA-479 S32101 added *(07-778)*
138–141	Table 1A, Line 12	For VIII-1, 25Cr–7.5Ni–3.5Mo–N–Cu–W SA-995 CD3MWCuN added *(14-48)*
150	Table 1A	*(1)* General Note (a) revised *(13-1839)* *(2)* General Note (f) revised *(13-118)*
151	Table 1A	*(1)* Note S10 revised editorially *(2)* Note T12 added *(13-118)*
154–157	Table 1B, Line 26	For III, VIII-1, and XII, for Alclad 6061 T4 SB-209, Size/Thickness and stress values revised *(13-1910)*
	Table 1B, Lines 27 & 28	For III, VIII-1, and XII, for T451 SB-209, stress values revised *(13-1910)*
	Table 1B, Line 29	For III, VIII-1, and XII, for T4 wld. SB-209, Size/Thickness and stress values revised *(13-1910)*
	Table 1B, Line 30	For III, VIII-1, and XII, for T451 wld. SB-209, stress values revised *(13-1910)*
	Table 1B, Line 31	For III, VIII-1, and XII, for T6 SB-209, Size/Thickness and stress value for 250°F revised *(13-1910)*
	Table 1B, Line 32	For III, VIII-1, and XII, for T651 SB-209, stress value for 250°F revised *(13-1910)*
	Table 1B, Lines 33 & 34	For III, VIII-1, and XII, for T651 SB-209, stress values revised *(13-1910)*
	Table 1B, Line 35	For III, VIII-1, and XII, for T6 wld. SB-209, Size/Thickness and stress values revised *(13-1910)*
	Table 1B, Line 36	For III, VIII-1, and XII, for T651 wld. SB-209, stress values revised *(13-1910)*
162–165	Table 1B, Line 20	For III, VIII-1, and XII, for A95052 O SB-209, Size/Thickness revised *(14-1425)*

Page	*Location*	*Change (Record Number)*
	Table 1B, Line 21	For III, VIII-1, and XII, for H112 SB-209, stress value at 250°F revised *(14-1425)*
	Table 1B, Lines 23 & 24	For III, VIII-1, and XII, for H32 and H34 SB-209, Size/Thickness and stress value at 250°F revised *(14-1425)*
	Table 1B, Lines 25–27	For III, VIII-1, and XII, for O, H32, and H34 SB-210, Size/Thickness and stress value at 250°F revised *(14-1425)*
	Table 1B, Lines 28–30	For III, VIII-1, and XII, for H32 and H34 SB-234, and O SB-241, stress value at 250°F revised *(14-1425)*
166–169	Table 1B, Line 10	For III, VIII-1, and XII, for A95086 O SB-209, Size/Thickness revised *(14-1425)*
	Table 1B, Lines 18–20	For III, VIII-1, and XII, for O, H111, and H112 SB-241, Size/Thickness deleted *(14-1425)*
170–173	Table 1B, Line 30	For III, VIII-1, and XII, for A96061 T4 SB-209, Size/Thickness and stress value at 250°F revised *(13-1910)*
	Table 1B, Line 31	For III, VIII-1, and XII, for T451 SB-209, stress value at 250°F revised *(13-1910)*
	Table 1B, Line 32	For III, VIII-1, and XII, for T6 SB-209, Size/Thickness and stress value at 250°F revised *(13-1910)*
	Table 1B, Lines 33 & 34	For III, VIII-1, and XII, for T651 SB-209, stress value at 250°F revised *(13-1910)*
	Table 1B, Line 35	For III, VIII-1, and XII, for T4 wld. SB-209, Size/Thickness and stress values revised *(13-1910)*
	Table 1B, Line 36	For VIII-1 and XII, for T451 wld. SB-209, stress values revised *(13-1910)*
	Table 1B, Line 37	For III, VIII-1, and XII, for T6 wld. SB-209, Size/Thickness and stress values revised *(13-1910)*
	Table 1B, Line 38	For VIII-1 and XII, for T651 wld. SB-209, stress values revised *(13-1910)*
	Table 1B, Lines 39 & 40	For III, VIII-1, and XII, for T4 and T6 SB-210, stress value at 250°F revised *(13-1910)*
	Table 1B, Lines 41 & 42	For III, VIII-1, and XII, for T4 wld. and T6 wld. SB-210, stress values revised *(13-1910)*
174–177	Table 1B, Lines 1 & 2	For III, VIII-1, and XII, for T6 and T651 SB-211, stress value at 250°F revised *(13-1910)*
	Table 1B, Lines 3 & 4	For III, VIII-1, and XII, for T6 wld. and T651 wld. SB-211, stress values revised *(13-1910)*
	Table 1B, Line 5	For III, VIII-1, and XII, for T4 SB-221, stress values revised *(13-1910)*
	Table 1B, Line 6	For III, VIII-1, and XII, for T6 SB-221, stress value at 250°F revised *(13-1910)*
	Table 1B, Lines 7 & 8	For III, VIII-1, and XII, for T4 wld. and T6 wld. SB-221, stress values revised *(13-1910)*
	Table 1B, Lines 9 & 10	For III, VIII-1, and XII, for T4 and T6 SB-234, stress value at 250°F revised *(13-1910)*

Page	Location	Change (Record Number)
	Table 1B, Lines 11 & 12	For III, VIII-1, and XII, for T4 wld. and T6 wld. SB-234, stress values revised *(13-1910)*
	Table 1B, Line 13	For III, VIII-1, and XII, for T4 SB-241, stress values revised *(13-1910)*
	Table 1B, Line 14	For III, VIII-1, and XII, for T6 SB-241, stress value at 250°F revised *(13-1910)*
	Table 1B, Lines 15 & 16	For III, VIII-1, and XII, for T4 wld. and T6 wld. SB-241, stress values revised *(13-1910)*
	Table 1B, Line 17	For III, VIII-1, and XII, for T6 drawn SB-241, Class/Condition/ Temper and stress value at 250°F revised *(13-1910)*
	Table 1B, Line 18	For III, VIII-1, and XII, for T6 SB-241, stress value at 250°F revised *(13-1910)*
	Table 1B, Line 19	For III, VIII-1, and XII, for T6 wld. SB-241, stress values revised *(13-1910)*
	Table 1B, Lines 20–22	For III, VIII-1, and XII, for T6 SB-247, stress value at 250°F revised *(13-1910)*
	Table 1B, Line 23	For III, VIII-1, and XII, for T6 wld. SB-247, stress values revised *(13-1910)*
	Table 1B, Line 24	For III, VIII-1, and XII, for T6 SB-308, stress value at 250°F revised *(13-1910)*
	Table 1B, Line 25	For III, VIII-1, and XII, for T6 wld. SB-308, stress values revised *(13-1910)*
178–181	Table 1B, Lines 4–8	For III, VIII-1, and XII, for C10200 H00 through H04 SB-152, Notes revised *(14-1007)*
	Table 1B, Lines 17–21	For III, VIII-1, and XII, for C10400 H00 through H04 SB-152, Notes revised *(14-1007)*
	Table 1B, Lines 23–27	For III, VIII-1, and XII, for C10500 H00 through H04 SB-152, Notes revised *(14-1007)*
	Table 1B, Line 29–33	For III, VIII-1, and XII, for C10700 H00 through H04 SB-152, Notes revised *(14-1007)*
	Table 1B, Line 35	For III, VIII-1, and XII, for C11000 H04 SB-187, Notes revised *(14-1007)*
	Table 1B, Lines 37–41	For VIII-1 and XII, for H00 through H04 SB-152, Notes revised *(14-1007)*
182–185	Table 1B, Lines 13–17	For III, VIII-1, and XII, for C12200 H00 through H04 SB-152, Notes revised *(14-1007)*
	Table 1B, Lines 28–32	For III, VIII-1, and XII, for C12300 H00 through H04 SB-152, Notes revised *(14-1007)*
	Table 1B, Line 40	For VIII-1 and XII, for C19400 WO61 SB-543, Notes revised *(13-986)*
	Table 1B, Line 41	For III, VIII-1, and XII, for WC55 SB-543, Notes revised *(13-986)*
	Table 1B, Line 42	For I, III, VIII-1, and XII, for C23000 H58 SB-43, Notes revised *(14-1007)*
186–189	Table 1B, Line 5	For III, VIII-1, and XII, for WC55 SB-543, Notes revised *(14-1007)*
	Table 1B, Lines 16 & 20	For VIII-1 and XII, C37700 TQ50 SB-283 deleted *(14-1188)*

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190–193	Table 1B, Lines 20–22	For VIII-1 and XII, for C64200 M10, M11, and O20 SB-283, Notes revised *(13-986)*
	Table 1B, Line 23	For VIII-1 and XII, TQ50 SB-283 deleted *(14-1188)*
	Table 1B, Lines 24–26	For VIII-1 and XII, for M10, M11, and O20 SB-283, Notes revised *(13-986)*
	Table 1B, Line 27	For VIII-1 and XII, TQ50 SB-283 deleted *(14-1188)*
	Table 1B, Line 28	For III, VIII-1, and XII, for C65100 O60 SB-98, Notes and stress values revised *(13-987)*
	Table 1B, Line 29	For III, VIII-1, and XII, for H02 SB-98, stress values revised *(13-987)*
	Table 1B, Line 30	For III, VIII-1, and XII, for C65500 O61 SB-315, Notes and stress values revised *(13-987)*
	Table 1B, Line 31	For III, VIII-1, and XII, for O61 SB-98, stress values revised *(13-987)*
	Table 1B, Line 32	For III, VIII-1, and XII, for O60 SB-98, Notes and stress values revised *(13-987)*
	Table 1B, Line 33	For III, VIII-1, and XII, for H02 SB-98, Notes and stress value at 350°F revised *(13-987)*
	Table 1B, Line 34	For III, VIII-1, and XII, for C66100 O60 SB-98, Notes revised *(13-987)*
	Table 1B, Line 35	For III, VIII-1, and XII, for H02 SB-98, stress value at 350°F revised *(13-987)*
	Table 1B, Lines 36 & 37	For III, VIII-1, and XII, for C68700 O61 SB-111 and SB-395, Notes added *(13-986)*
	Table 1B, Line 38	For VIII-1 and XII, for WO61 SB-543, Notes revised *(13-986)*
194–197	Table 1B, Lines 11 & 12	For III, VIII-1, and XII, for C70600 WO61 SB-467 and SB-543, Notes revised *(13-986)*
	Table 1B, Line 13	For VIII-1, for WO61 SB-956, Notes revised *(13-986)*
	Table 1B, Line 14	For VIII-1 and XII, for WM50 SB-467, Notes revised *(13-986)*
	Table 1B, Line 15	For III, VIII-1, and XII, for H55 SB-111, Notes revised *(14-1007)*
	Table 1B, Line 16	For VIII-1, for H55 SB-466, Notes revised *(14-1007)*
	Table 1B, Line 17	For III, VIII-1, and XII, for WC55 SB-543, Notes revised *(14-1007)*
	Table 1B, Line 18	For VIII-1, for WC55 SB-956, Notes revised *(14-1007)*
	Table 1B, Line 19	For VIII-1 and XII, for Wld. fr. cold rld. strip SB-467, Notes revised *(13-986)*
202–205	Table 1B, Lines 42–45	For I and VIII-1, N06025 Annealed SB-163 and SB-168 added *(11-772)*
206–209	Table 1B, Lines 1–10	For I and VIII-1, Annealed SB-366, SB-462, SB-516, SB-517, and SB-564 added *(11-772)*
	Table 1B, Lines 11–14	For I and VIII-1, HW or CW ann. SB-166 and SB-167 added *(11-772)*
242–245	Table 1B, Line 24	For III, VIII-1, and XII, N08904 Annealed SA-182 added *(13-1363)*
	Table 1B, Line 25	For III, VIII-1, and XII, Annealed SB-625 replaced by SA-240 *(13-1363)*
	Table 1B, Line 26	For III, VIII-1, and XII, Annealed SB-312 added *(13-1363)*

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	Table 1B, Line 27	For III, VIII-1, and XII, Annealed SB-673 replaced by SA-312 *(13-1363)*
	Table 1B, Line 28	For III, VIII-1, and XII, Annealed SB-366 replaced by SA-403 *(13-1363)*
	Table 1B, Line 31	For III, VIII-1, and XII, for Annealed SB-677, Product Form revised *(13-1363)*
274	Table 1B	General Note (a) revised *(11-772)*
275	Table 1B	*(1)* Notes G30, G31, and G32 added *(11-772)* *(2)* Note G33 added *(14-1007)*
340–342	Table 2B, Lines 13–15	N06690 Hot worked/ann. and Cold worked/ann. SB-167 added *(11-296)*
	Table 2B, Line 20	For Cold worked/ann. SB-167, Class/Condition/Temper revised *(11-296)*
364–367	Table 3, Line 1	For III; VIII-1; Section VIII, Division 2; and XII, for C65100 O60 SB-98, stress values revised *(13-987)*
	Table 3, Line 4	For III, VIII-1, VIII-2, and XII, for H06 SB-98, stress values revised *(13-987)*
	Table 3, Line 5	For III, VIII-1, VIII-2, and XII, for C65500 O60 SB-98, stress values revised *(14-442)*
	Table 3, Line 6	For III and VIII-2, for H01 SB-98, stress values revised *(13-987)*
	Table 3, Line 7	For III and VIII-2, for H02 SB-98, stress values revised *(14-442)*
	Table 3, Line 8	For III, VIII-1, VIII-2, and XII, for C66100 O60 SB-98, stress values revised *(13-987)*
	Table 3, Line 9	For III and VIII-2, for H01 SB-98, stress values revised *(13-987)*
	Table 3, Line 10	For III and VIII-2, for H02 SB-98, stress values revised *(14-442)*
378–380	Table 4, Lines 15 & 17	For III and VIII-2, for 16Cr–12Ni–2Mo SA-193 B8M and 16Cr–12Ni–2Mo–N SA-193 B8MNA, stress values revised *(11-2203)*
	Table 4, Lines 18 & 20	For III and VIII-2, for 18Cr–8Ni SA-193 B8 and 18Cr–8Ni–N SA-193 B8NA, stress values revised *(11-2203)*
	Table 4, Lines 21–24	For III and VIII-2, for 18Cr–8Ni–4Si–N SA-193 B8S and B8SA, 18Cr–10Ni–Cb SA-193 B8C, and 18Cr–10Ni–Ti SA-193 B8T, stress values revised *(11-2203)*
382–384	Table 4, Lines 1–3	For III and VIII-2, for N04400 Annealed and Hot worked SB-164, stress values revised *(11-2203)*
	Table 4, Lines 9 & 10	For III and VIII-2, for N04405 Annealed and Hot worked SB-164, stress values revised *(11-2203)*
	Table 4, Line 12	For III and VIII-2, for N07718 Sol. & precip. harden SB-637, Class/Condition/Temper revised *(11-2203)*
385	Table 4	General Note (c) revised *(11-2203)*
386–445	Table 5A	Title corrected by errata to read *S (13-1287)*
386–389	Table 5A, Lines 39 & 40	Carbon steel SA/EN 10222-2 P280GH added *(13-1839)*
390–393	Table 5A, Line 20	For SA-841 A, Size/Thickness revised *(13-833)*

Page	Location	Change (Record Number)
	Table 5A, Lines 21, 22 & 24	SA/EN 10222-2 P305GH added *(13-1839)*
	Table 5A, Line 43	For SA-841 B, Size/Thickness revised *(13-833)*
398–401	Table 5A, Lines 1 & 4	1Cr–$^{1}/_{2}$Mo SA/EN 10222-2 13CrMo4-5 added *(13-1839)*
	Table 5A, Lines 6–8	SA/EN 10222-2 13CrMo4-5 added *(13-1839)*
	Table 5A, Line 41	2$^{1}/_{4}$Cr–1Mo SA/EN 10222-2 11CrMo9-10 added *(13-1839)*
402–405	Table 5A, Line 6	SA/EN 10222-2 11CrMo9-10 added *(13-1839)*
406–409	Table 5A, Line 11	9Cr–1Mo–V SA-336 F91 added *(14-846)*
442–445	Table 5A, Lines 24–30	29Cr–6.5Ni–2Mo–N SA-240, SA-479, SA-789, and SA-790 S32906 added *(09-94)*
446	Table 5A	*(1)* General Note (a) revised *(13-1839)* *(2)* Notes G11, G12, and H6 revised *(13-2174)*
452–471	Table 5B	Title corrected by errata to read *S (13-1287)*
452–455	Table 5B, Line 29	For C65500 O61 SB-96, stress values revised *(13-987)*
478, 479	Table U, Line 28	Carbon steel SA/EN 10222-2 P280GH added *(13-1839)*
480, 481	Table U, Line 33	For SA-841 A, Size/Thickness revised *(13-833)*
	Table U, Lines 34 & 39	SA/EN 10222-2 P305GH added *(13-1839)*
482, 483	Table U, Line 23	For SA-841 B, Size/Thickness revised *(13-833)*
486, 487	Table U, Lines 40 & 46	1Cr–$^{1}/_{2}$Mo SA/EN 10222-2 13CrMo4-5 added *(13-1839)*
490, 491	Table U, Lines 7 & 19	2$^{1}/_{4}$Cr–1Mo SA/EN 10222-2 11CrMo9-10 added *(13-1839)*
512, 513	Table U, Line 37	18Cr–9Ni–3Cu–Cb–N SA-213 S30432 added *(13-118)*
520, 521	Table U, Lines 13 & 14	For 20Cr–18Ni–6Mo SA-249 and SA-312 S31254, Size/Thickness added, and Min. Tensile Strength and tensile strength values revised *(07-667)*
	Table U, Lines 15 & 16	SA-249 and SA-312 S31254 added *(07-667)*
	Table U, Lines 18–20	21Cr–5Mn–1.5Ni–Cu–N SA-240 and SA-479 S32101 added *(07-778)*
524, 525	Table U, Line 27	25Cr–7.5Ni–3.5Mo–N–Cu–W SA-995 CD3MWCuN added *(14-48)*
528, 529	Table U, Lines 1–11	Alclad 6061 SB-209 added *(13-1910)*
	Table U, Lines 12–22	A95052 SB-209, SB-210, SB-234, and SB-241 added *(14-1425)*
	Table U, Lines 23–43	A95083 SB-209, SB-221, SB-241, SB-247, and SB-928 added *(14-1425)*
530, 531	Table U, Lines 1–11	A95086 SB-209, SB-221, SB-241, and SB-928 added *(14-1425)*
	Table U, Lines 12–43	A96061 SB-209, SB-210, SB-211, SB-221, SB-234, and SB-241 added *(13-1910)*
532, 533	Table U, Lines 1–6	A96061 SB-247 and SB-308 added *(13-1910)*
536, 537	Table U, Lines 11–14	C65100 O60, H02, and H06 SB-98 added *(13-987)*
	Table U, Line 15	For C65500 O61 SB-96, tensile strength values revised *(13-987)*
	Table U, Lines 16–19	O61 SB-315 and O60, H01, and H02 SB-98 added *(13-987)*
	Table U, Lines 20–22	C66100 O60, H01, and H02 SB-98 added *(13-987)*

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540, 541	Table U, Lines 17–23	N06025 Annealed SB-163, SB-168, SB-366, SB-462, SB-516, SB-517, and SB-564 added *(11-772)*
	Table U, Lines 24 & 25	HW or CW ann. SB-166 and SB-167 added *(11-772)*
544, 545	Table U, Line 40	N06690 Hot worked/ann. SB-167 added *(11-296)*
	Table U, Line 45	For Cold worked/ann. SB-167, Class/Condition/Temper and tensile strength values revised *(11-296)*
	Table U, Line 46	Hot worked/ann. SB-167 added *(11-296)*
550, 551	Table U, Line 12	N08904 Annealed SA-182 added *(13-1363)*
	Table U, Line 13	Annealed SB-625 replaced by SA-240 *(13-1363)*
	Table U, Line 14	Annealed SB-673 replaced by SA-312 and Product Form revised *(13-1363)*
	Table U, Line 15	Annealed SB-366 replaced by SA-403 *(13-1363)*
	Table U, Line 18	For Annealed SB-677, Product Form revised *(13-1363)*
558	Table U	General Note (a) revised *(11-772, 13-1839)*
574–577	Table Y-1, Lines 1 & 5	Carbon steel SA/EN 10222-2 P280GH added *(13-1839)*
578–581	Table Y-1, Line 14	For SA-841 A, Size/Thickness revised *(13-833)*
	Table Y-1, Lines 15, 16 & 22	SA/EN 10222-2 P305GH added *(13-1839)*
582–585	Table Y-1, Line 6	For SA-841 B, Size/Thickness revised *(13-833)*
590–593	Table Y-1, Lines 42 & 46	1Cr–$\frac{1}{2}$Mo SA/EN 10222-2 13CrMo4-5 added *(13-1839)*
594–597	Table Y-1, Lines 1, 3 & 5	SA/EN 10222-2 13CrMo4-5 added *(13-1839)*
	Table Y-1, Lines 23–28	1Cr–1Mn–$\frac{1}{4}$Mo SA-540 B22 added *(13-528)*
598–601	Table Y-1, Lines 17 & 32	2$\frac{1}{4}$Cr–1Mo SA/EN 10222-2 11CrMo9-10 added *(13-1839)*
606–609	Table Y-1, Lines 20 & 21	12Cr–1Mo–V–W SA-437 B4C and B4B added *(13-528)*
638–641	Table Y-1, Line 29	For 16Cr–12Ni–2Mo–N SA-193 B8MNA, yield strength values revised *(13-528)*
654–657	Table Y-1, Line 20	18Cr–9Ni–3Cu–Cb–N SA-213 S30432 added *(13-118)*
670–673	Table Y-1, Lines 13 & 14	For 20Cr–18Ni–6Mo SA-249 and SA-312 S31254, Size/Thickness added and Min. Tensile Strength, Min. Yield Strength, and yield strengths revised *(07-667)*
	Table Y-1, Lines 15 & 16	SA-249 and SA-312 S31254 added *(07-667)*
	Table Y-1, Lines 18–20	21Cr–5Mn–1.5Ni–Cu–N SA-240 and SA-479 S32101 added *(07-778)*
678–681	Table Y-1, Line 27	25Cr–7.5Ni–3.5Mo–N–Cu–W SA-995 CD3MWCuN added *(14-48)*
686–689	Table Y-1, Lines 3–9	Alclad 6061 SB-209 added *(13-1910)*
	Table Y-1, Line 23	For A95052 O SB-209, Size/Thickness revised, Min. Tensile Strength added, and yield strength values revised *(14-1425)*
	Table Y-1, Lines 24 & 25	For H112 SB-209, Min. Tensile Strength added and yield strength values revised *(14-1425)*
	Table Y-1, Lines 26–33	H32 and H34 SB-209; O, H32, and H34 SB-210; H32 and H34 SB-234; and O SB-241 added *(14-1425)*

Page	*Location*	*Change (Record Number)*
	Table Y-1, Line 39	For A95083 H112 SB-209, Min. Tensile Strength added *(14-1425)*
	Table Y-1, Lines 41–43	H32 SB-209 and O SB-221 added *(14-1425)*
	Table Y-1, Line 44	For H111 SB-221, Min. Tensile Strength added *(14-1425)*
	Table Y-1, Lines 45 & 46	H112 SB-221 and O SB-241 added *(14-1425)*
	Table Y-1, Line 47	For H111 SB-241, Size/Thickness deleted *(14-1425)*
	Table Y-1, Line 48	H112 SB-241 added *(14-1425)*
690–693	Table Y-1, Lines 1–4	H111 SB-247, H112 SB-247, and H321 SB-928 added *(14-1425)*
	Table Y-1, Lines 5 & 6	For A95086 O and H112 SB-209, Size/Thickness revised, Min. Tensile Strength added, and yield strength for 150°F revised *(14-1425)*
	Table Y-1, Line 7	For H112 SB-209, Min. Tensile Strength added and yield strength for 150°F revised *(14-1425)*
	Table Y-1, Line 8	For H112 SB-209, Size/Thickness revised, Min. Tensile Strength added, and yield strength for 150°F revised *(14-1425)*
	Table Y-1, Lines 9–16	H112, H32, and H34 SB-209; H112 SB-221; O, H111, and H112 SB-241; and H116 SB-928 added *(14-1425)*
	Table Y-1, Line 24	For A96061 T4 SB-209, Size/Thickness revised, Min. Tensile Strength added, and yield strength values revised *(13-1910)*
	Table Y-1, Line 25	For T451 SB-209, Min. Tensile Strength added and yield strength values revised *(13-1910)*
	Table Y-1, Lines 26 & 27	For T6 and T651 SB-209, Size/Thickness revised, Min. Tensile Strength added, and yield strength values revised *(13-1910)*
	Table Y-1, Line 28	T651 SB-209 added *(13-1910)*
	Table Y-1, Lines 29 & 30	For T4 and T6 SB-210, Min. Tensile Strength added and yield strength values revised *(13-1910)*
	Table Y-1, Lines 31 & 32	For T6 and T651 SB-211, Product Form revised *(13-1910)*
	Table Y-1, Lines 33 & 34	For T4 and T6 SB-221, Min. Tensile Strength added and yield strength values revised *(13-1910)*
	Table Y-1, Lines 35 & 36	T4 and T6 SB-234 added *(13-1910)*
	Table Y-1, Line 37	For T4 SB-241, yield strength values revised *(13-1910)*
	Table Y-1, Line 38	For T6 SB-241, Product Form and yield strength values revised *(13-1910)*
	Table Y-1, Lines 39–43	T6 drawn SB-241, T6 SB-241, and T6 SB-247 added *(13-1910)*
	Table Y-1, Line 44	For T6 SB-308, Product Form revised, Min. Tensile Strength added, and yield strength values revised *(13-1910)*
702–705	Table Y-1, Lines 21–25	C65100 O60, H02, and H06 SB-98 added *(13-987)*
	Table Y-1, Line 26	C65500 O61 SB-315 added *(13-987)*
	Table Y-1, Line 27	For O61 SB-96, yield strength values revised *(13-987)*
	Table Y-1, Line 28	For O60 SB-98, Product Form and yield strength values revised *(13-987)*
	Table Y-1, Line 29	For H01 SB-98, yield strength values revised *(13-987)*

Page	*Location*	*Change (Record Number)*
	Table Y-1, Line 30	For H02 SB-98, Product Form and yield strength values revised *(13-987)*
	Table Y-1, Lines 31–33	C66100 O60, H01, and H02 SB-98 added *(13-987)*
710–713	Table Y-1, Lines 25–31	N06025 Annealed SB-163, SB-168, SB-366, SB-462, SB-516, SB-517, and SB-564 added *(11-772)*
	Table Y-1, Lines 32 & 33	HW or CW ann. SB-166 and SB-167 added *(11-772)*
722–725	Table Y-1, Lines 7–9	N06690 Hot worked/ann. and Cold worked/ann. SB-167 added *(11-296)*
	Table Y-1, Line 15	For Cold worked/ann. SB-167, Class/Condition/Temper revised, Size/Thickness added, and yield strength values revised *(11-296)*
730–733	Table Y-1, Line 23	N08904 Annealed SA-182 added *(13-1363)*
	Table Y-1, Line 24	Annealed SB-625 replaced by SA-240 *(13-1363)*
	Table Y-1, Line 25	Annealed SB-673 replaced by SA-312 and Product Form revised *(13-1363)*
	Table Y-1, Line 26	Annealed SB-366 replaced by SA-403 *(13-1363)*
	Table Y-1, Line 29	For Annealed SB-677, Product Form revised *(13-1363)*
771	Table TCD	General Note (b) revised *(14-1204)*
922	1-100	In subparagraph (a), last paragraph revised *(13-2008)*
923	Table 1-100	Note (1) revised *(13-2008)*
924	2-100	First paragraph revised *(13-2008)*
924	2-110	*(1)* Subparagraph (d) revised *(13-2008)* *(2)* Last two paragraphs editorially revised
925	2-130	Revised in its entirety *(11-2203)*
925	Table 2-100(a)	Note (1) revised *(13-2008)*
926	Table 2-100(c)	Revised in its entirety *(11-2203)*
935	5-800	Revised *(13-430, 14-145)*
937	Table 5–800	Added *(13-430)*
936	5-900	Revised *(13-430)*
938	5-1400	Revised *(13-430)*
938	5-1500	Revised *(12-1363)*
940	Table 5–1500	Added *(12–1363)*
945	Table 10-100	First column and Note (1) revised *(13-2008)*
946	10-110	Subparagraphs (a)(3) and (a)(4) revised *(13-2008)*

NOTE: Volume 63 of the Interpretations to Section II, Part D (Customary) of the ASME Boiler and Pressure Vessel Code follows the last page of Section II, Part D (Customary).

LIST OF CHANGES IN RECORD NUMBER ORDER

Record Number	Change
07-667	Revised stress lines for SA-249 and SA-312 (UNS S31254) in Tables 1A, U, and Y-1.
07-778	Added lines for SA-240 and SA-479 (UNS S32101) to Tables 1A, U, and Y-1.
09-94	Added allowable stresses for UNS S32906 (29Cr-6.5Ni-2Mo-N) covered by Code Case 2295-3, but using the new criteria of the current Section VIII, Division 2, to Table 5A.
11-296	Added lines for SB-167 UNS N06690 to Tables 2B, U, and Y-1.
11-772	Added stress lines for SB-163, SB-166, SB-167, SB-168, SB-366, SB-462, SB-516, SB-517, and SB-564 UNS N06025 to Tables 1B, U, and Y-1 for Section I and VIII applications.
11-2203	Revised criteria for Appendix 2 for Table 4 and revised Table 4 values accordingly.
12-1363	Replaced the Weldability paragraph of Appendix 5 with new requirements.
13-118	Added lines for SA-213 UNS S30432 to Tables 1A, U, and Y-1. The time-dependent properties note, T12, was created for the stresses at the temperature of 1200°F and above.
13-430	Revised Appendix 5 to specify test methods and precision requirements for data required by Appendix 5.
13-528	Added yield strength at temperature values to Table Y-1 for SA-437 B4B; SA-437 B4C; SA-540 B22 Classes 1, 2, 3, 4, and 5; and SA-193 Grade B8MNA Class 1A (S31651).
13-833	Increased the maximum thickness of SA-841, Grade A, Class 1 and Grade B, Class 2 plates from 2 in. to 4 in. in Tables 1A, 5A, U, and Y-1.
13-860	In the Foreword, the subtitle has been deleted and replaced with an ANSI disclaimer as a footnote.
13-986	The T notes for all entries for copper alloys in Table 1B were reviewed. Errors that were found were corrected.
13-987	Revisions were made to the stress lines for C65100, C65500, and C66100 in Tables 1B, 3, 5B, U, and Y-1. Entries for alloys and tempers that were missing from Tables U and Y-1 have been added. Note W9 was added to Table 1B for SB-98 C65500 H02. Changes of ±0.2 ksi were made to the allowable stresses below 300°F for Tables 1B, 3, and 5B. Some changes at and above 300°F provide higher allowable stresses.
13-1287	Errata correction to titles of Tables 5A and 5B.
13-1363	N08904 SB specifications were replaced with SA specifications in Table 1B.
13-1839	Added lines for SA/EN 10222-2 Grades P280GH, P305GH, 13CrMo4-5, and 11CrMo9-10 to Tables 1A, 5A, U, and Y-1. Conditions for SA/EN 10222-2 materials were abbreviated.
13-1910	In Tables 1B, U, and Y-1, provided yield and tensile stress values, and revised allowable stress values, for Grade 6061 aluminum and Alclad.
13-2008	Revised Appendices 1, 2, and 10 to provide a quantitative criterion for applying the 90% yield strength factor.
13-2174	Corrected the Section VIII-2 paragraph references in Notes G11, G12, and H6 of Table 5A.
14-48	Incorporated Code Case 2244-2 for UNS J93380 for Section VIII, Division 1 applications. Changes included addition of the alloy to Tables 1A, U, and Y-1.
14-145	Revised Appendix 5, paragraph 5-800 to provide different starting points for data to be provided for different classes of alloys.
14-442	Changed the originally proposed Table 3 allowable stress values in 13-987 for C65500 H02 and C66100 H02 to be identical to the values for the annealed temper.
14-846	Added the same maximum allowable stresses for SA-336/SA-336M F91 for Section VIII-2 use as those for SA-182/SA-182M F91 in Table 5A.
14-1007	Added Note G33 for certain copper alloy entries in Table 1B.
14-1188	Deleted SB-283 TQ50 stress lines from Table 1B.
14-1204	Corrected General Note (b) for Table TCD.
14-1425	Provided yield and tensile stress values for alloys A95052, A95083, and A95086.
14-1592	Grade PG305GH of SA/EN 10222-2 corrected as P305GH.

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).