ASME BPVC.SSC.VIII.XII.II.V.IX.XIII-2023



Summary of Significant Changes in the

2023 ASME Boiler and Pressure Vessel Code

Section VIII
Section XII
Section II
Section V
Section IX
Section XIII

ASME
SETTING THE STANDARD

ASME BPVC.SSC.VIII.XII.II.V.IX.XIII-2023

Summary of Significant Changes in the 2023 ASME Boiler and Pressure Vessel Code

Sections VIII, XII, II, V, IX, and XIII

The American Society of Mechanical Engineers

Two Park Avenue • New York, NY • 10016 USA

Date of Issuance: April 28, 2023

ASME does not issue written replies to inquiries concerning this publication.

No part of this document may be reproduced in any form,
in an electronic retrieval system or otherwise,
without the prior written permission of the publisher.

The American Society of Mechanical Engineers
Two Park Avenue, New York, NY 10016-5990

Copyright © 2023 by
THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS
All rights reserved

CONTENTS

List of Sections in the ASME Boiler and Pressure Vessel Code iv

Foreword v

Acknowledgments vi

SECTION VIII 1

Introduction 1

Division 1 5

Division 2 10

Division 3 13

SECTION XII 15

Introduction 15

Significant Changes 17

SECTION II 18

Introduction 18

Part A 19

Part B 27

Part C 29

Part D Customary and Metric 32

SECTION V 36

Introduction 36

Significant Changes 37

SECTION IX 41

Introduction 41

Significant Changes 44

SECTION XIII 45

Introduction 45

Significant Changes 46

LIST OF SECTIONS
IN THE ASME BOILER AND PRESSURE VESSEL CODE

I Rules for Construction of Power Boilers

II Materials
- Part A — Ferrous Material Specifications
- Part B — Nonferrous Material Specifications
- Part C — Specifications for Welding Rods, Electrodes, and Filler Metals
- Part D — Properties (Customary)
- Part D — Properties (Metric)

III Rules for Construction of Nuclear Facility Components
- Subsection NCA — General Requirements for Division 1 and Division 2
- Appendices
- Division 1
  - Subsection NB — Class 1 Components
  - Subsection NCD — Class 2 and Class 3 Components
  - Subsection NE — Class MC Components
  - Subsection NF — Supports
  - Subsection NG — Core Support Structures
- Division 2 — Code for Concrete Containments
- Division 3 — Containment Systems for Transportation and Storage of Spent Nuclear Fuel and High-Level Radioactive Material
- Division 4 — Fusion Energy Devices
- Division 5 — High Temperature Reactors

IV Rules for Construction of Heating Boilers

V Nondestructive Examination

VI Recommended Rules for the Care and Operation of Heating Boilers

VII Recommended Guidelines for the Care of Power Boilers

VIII Rules for Construction of Pressure Vessels
- Division 1
- Division 2 — Alternative Rules
- Division 3 — Alternative Rules for Construction of High Pressure Vessels

IX Welding, Brazing, and Fusing Qualifications

X Fiber-Reinforced Plastic Pressure Vessels

XI Rules for Inservice Inspection of Nuclear Reactor Facility Components
- Division 1 — Rules for Inspection and Testing of Components of Light-Water-Cooled Plants
- Division 2 — Requirements for Reliability and Integrity Management (RIM) Programs for Nuclear Reactor Facilities

XII Rules for Construction and Continued Service of Transport Tanks

XIII Rules for Overpressure Protection

FOREWORD

This book is a companion to the 2023 ASME Boiler and Pressure Vessel Code (BPVC). It explains only significant changes to Code requirements that will be published in the 2023 Edition. It covers the following ASME BPVC Sections:

- Section VIII, Divisions 1, 2, and 3
- Section XII
- Section II, Parts A, B, C, and D
- Section V
- Section IX
- Section XIII

For each of the above Sections, an Introduction describes the historical background, scope of coverage, and commercial application of that Section. The list of changes follows the Introduction. The "Explanation" for each change provides the reason for the action and the value to the Code user. The sequence of the changes follows the order of the Code requirements.

ACKNOWLEDGMENTS

This book is the work of the following ASME Standards and Certification (S&C) staff:
- Steven J. Rossi, *S&C Project Engineering Manager*, Section VIII, Divisions 1 and 2
- Abena Dinizulu, *S&C Engineer*, Section VIII, Division 3
- Jihoon Oh, *S&C Project Engineering Advisor*, Section XII
- Colleen E. Rodrigues, *S&C Project Engineering Manager*, Section II, Parts A, B, and D; and Section XIII
- Ray Rahaman, *S&C Project Engineer*, Section II, Part C; and Section IX
- Carlton R. Ramcharran, *S&C Project Engineering Manager*, Section V

ASME Press's *Online Companion Guide to the ASME Boiler and Pressure Vessel Codes: Criteria and Commentary on Select Aspects of the Boiler & Pressure Vessel and Piping Codes* (January 2020) provided source material for the Introduction preceding each list of changes. The complete Guide is available in the ASME Digital Collection at https://asmedigitalcollection.asme.org/ebooks/pages/onlinecompanionguide.

ASME gratefully acknowledges the members of the following volunteer committees, who are responsible for development of the ASME Boiler and Pressure Vessel Code Sections noted in this book:
- BPV Committee on Pressure Vessels (VIII)
- BPV Committee on Transport Tanks (XII)
- BPV Committee on Materials (II)
- BPV Committee on Nondestructive Examination (V)
- BPV Committee on Welding, Brazing, and Fusing (IX)
- BPV Committee on Overpressure Protection (XIII)

SECTION VIII

Introduction

1 DIVISION 1

Section VIII, Division 1 of the ASME Boiler and Pressure Vessel Code (BPVC) provides requirements for the construction of new pressure vessels. The ASME BPVC is a safety code written to cover a wide range of industrial and commercial pressure vessel applications. For example, Section VIII, Division 1 applies to small compressed-air receivers that are sold commercially to the public as well as to very large pressure vessels needed by the petrochemical and refining industry. Thus, it is necessary that the user of the ASME BPVC be knowledgeable and experienced in the principles of pressure vessel engineering to ensure that the selected requirements and details are appropriate for the specific service conditions that a pressure vessel is expected to experience. The ASME BPVC is implemented either by contract or by compliance with laws and regulations in those jurisdictions that require its use. Numerous U.S. states, cities, and municipalities and several Canadian provinces require the ASME BPVC for the construction of pressure vessels installed within their jurisdictions.

Within Section VIII, Division 1, pressure vessels are containers of pressure, either internal or external. This pressure may be obtained from an external source or by the application of heat from a direct or indirect source, or from any combination of those sources. Section VIII, Division 1 contains mandatory requirements, specific restrictions, and nonmandatory guidance for pressure vessel materials, design, fabrication, examination, inspection, testing, overpressure protection, and product certification. The requirements of Section VIII, Division 1 were formulated based on design principles and construction practices applicable to vessels designed for pressures up to 3,000 psi (20 MPa).

Section VIII, Division 1 is divided into Subsections, Mandatory Appendices, and Nonmandatory Appendices. Subsection A consists of Part UG, covering the general requirements applicable to all pressure vessels. Subsection B covers requirements for the various methods used in the fabrication of pressure vessels. It consists of Parts UW, UF, and UB dealing with welded, forged, and brazed methods, respectively. Subsection C covers requirements for the several classes of materials used in pressure vessel construction. The Mandatory Appendices address specific subjects not covered elsewhere in this Division, and their requirements are mandatory when the subject covered applies to the construction. The Nonmandatory Appendices provide information and suggested good practices.

1.1 Pressure Vessels Included in the Scope of Section VIII, Division 1

(a) Regarding the geometry of pressure-containing parts, the scope includes the following:

(1) for connections to the vessel, such as external piping, other pressure vessels, and mechanical devices such as pumps, mixers, or compressors

(-a) the welding end connection for the first circumferential joint for welded connections

(-b) the first threaded joint for screwed connections

(-c) the face of the first flange for bolted, flanged connections

(-d) the first sealing surface for proprietary connections or fittings

(2) the design, fabrication, testing, and material requirements for nonpressure parts that are welded directly to either the internal or external pressure-retaining surface of a pressure vessel

(3) pressure-retaining covers for vessel openings, such as manhole or handhole covers

(4) the first sealing surface for proprietary fittings or components for which specific rules are not provided by this Division, such as gages

(b) Regarding steam-generating vessels, the scope includes the following:

(1) unfired steam boilers, which may be constructed in accordance with the rules of either Section I or Section VIII, Division 1