



SUMMARY OF CHANGES IN 2025 EDITION

ASME SECTION VIII, Division 1

NEW MATERIALS

Part UHA	Added SA-693
Part UNF	Added Grade N08354 to SB-625 and SB-649
	Added Alloy N08367
Part UCI	Added SA-439 (Type D-2 Austenitic ductile iron)
Part UF	Added SA-372 Grades N & P, Classes 100 and 120

GENERAL

- Update code to have metric NPS equivalents
- Update code to remove gender specific language
- Consistently covert -20°F to -29°C throughout the code

INTRODUCTION

U-1	Scope	Revision to U-1(a) and U-1(c)
U-2	General	Revision to U-2(a)(2)
U-3	Standards	Updated table for referenced standards
U-6	New Paragraph	Added new paragraph: “Cross-references to Division 2”

PART UG

Materials	UG-6	Forgings	Revision to UG-6(a)
	UG-9	Welding Materials	Revision to UG-9
	UG-10	Materials Not Identified	Revision to UG-10
	UG-11	Prefabricated Parts	Revision to UG-11(e): Applicable to brazing as well
	UG-14	Rods and Bars	Revised in its entirety
	UG-15	Product Specification	Revised for clarity
Design	UG-16	General	Revised to include printed circuit heat exchangers. Revised and reorganized entire



			paragraph. Allow use of ASME VIII-2 design rules as an alternative only for those cases where in Division 1 does not have common rules approved.
	UG-23	Maximum Allowable Stress Values	Correction of error
	UG-24	Castings	Major rewrite with several technical changes
	UG-33	Formed Heads (External Pressure)	Editorial changes
	UG-34	Flat Heads and Covers	Revision to design for screwed-in plates
	UG-35	Other Closure Types	Revision to UG-35.2 and 35.3 (Quick-actuating closures and quick-opening closures)
Openings	UG-39	Reinforcements for Openings in Flat Heads and Covers	Modify UG-39(b)(3) and Figure UG-39 Sketch (a)
Fabrication	UG-75	General	Rewritten; no technical change
	UG-76	Cutting Plates and Other Stock	Rewritten; no technical change
	UG-77	Material Identification	This paragraph has been updated to provide improved clarity, including an update to numbering, the addition of paragraph titles, and reorganization of information. Language regarding markings (original, codes, required) was updated.
	UG-78	Repair of Defects in Materials	Rewritten; no technical change
	UG-79	Forming Pressure Parts	Rewritten; no technical change
	UG-84	Charpy Impact Tests	Complete editorial rewrite
			UG-84(i)(1) was modified to direct the reader to UG-84(h)(3) for where to remove impact test specimens
			Revisions in VIII-1 UG-84(c)(6) and General note (b) in Figure UG-84.1 to clarify impact test retest requirements
	UG-85	Heat Treatment	Complete rewrite of UG-85 and UCS-85 for improved clarity. Incorporated Code Case 2941 in the revised version of subparagraph UCS-85(f).
Inspection and Tests	UG-90	General	Editorial revisions of paragraphs UG-90 through UG-97



	UG-91	The Inspector	Editorial revisions of paragraphs UG-90 through UG-97. Removal of requirements for marking and user's inspection of User-Manufacturer Vessels.
	UG-92	Access for Inspector	Editorial revisions of paragraphs UG-90 through UG-97
	UG-93	Inspection of Materials	Editorial revisions of paragraphs UG-90 through UG-97
	UG-94	Marking on Materials	Editorial revisions of paragraphs UG-90 through UG-97
	UG-95	Examination of Surfaces during Fabrication	Editorial revisions of paragraphs UG-90 through UG-97
	UG-96	Dimensional Check of Component Parts	Editorial revisions of paragraphs UG-90 through UG-97
	UG-97	Inspection During Fabrication	Editorial revisions of paragraphs UG-90 through UG-97
	UG-99	Standard Hydrostatic Test	Added requirement for inspection to be done at MAWP, for vessel to be depressurized before commencement of any additional work, and other requirements for test closures and equipment.
	UG-100	Pneumatic Test	Added requirement for inspection to be done at MAWP, recommendations for testing medium, requirement for thread engagement for bolted connections
	UG-102	Test Gages	Rewritten to present information in a more structured manner.
	UG-103	Nondestructive Testing	Rewritten to present information in a more structured manner.
Markings and Reports	UG-115	General	Rewritten to present information in a more structured manner.
Overpressure Protection	UG-154	Permitted PRD and Methods	Clarified User's responsibilities when providing overpressure protection by system design. Renamed "Spring loaded nonreclosing PRD" as "Spring actuated nonreclosing PRD" and simplified its requirements.



PART UW

General	UW-3	Welded Joint Category	Revised to clarify the requirements for design, construction and examination of microchannel heat exchangers fabricated using diffusion welded plate packs. Added Category F for tub-to-tubesheet welds.
Design	UW-13	Attachment Welds	Revisions related to attachment welds for box headers.
	UW-14	Openings in or Adjacent to Welds	Rewrite for greater clarity
	UW-15	Welded Connections	Rewrite for greater clarity
	UW-20	Tube-to-Tubesheet Joint Strength	Change the yield strengths used in calculation of interface pressures P_o and P_t to be at ambient instead of design. Remove statement in P_o definition requiring change in material strength to be considered.
Inspection and Tests	UW-55	Diffusion Welding Examination	Revised to clarify the requirements for design, construction and examination of microchannel heat exchangers fabricated using diffusion welded plate packs.
Fabrication	UW-26	General	Added a new paragraph to require certificate holder to provide complete supervision and administrative control over production welding performed by all welders and welding operators, whether these personnel are direct employees or they are retained by contract for their services.
	UW-28	Qualification of Welding Procedures	Correction of a previous error
	UW-33	Alignment Tolerances	Provide Table name for table in UW-33
	UW-34	Spin Holes	NDE requirements for spin holes revised.
	UW-35	Completed Welds	Rewritten for better readability. Provide Table number and name to table in UW-35.
	UW-36	Fillet Welds	Deleted
	UW-40	Procedure for PWHT	Rewritten to improve readability and clarity. Definition of term "harmful thermal gradient" includes a reference to WRC 452.
Inspection and Tests	UW-50	NDE of Welds on Pneumatically Tested Vessels	Revised to add requirement for NDE of areas where temporary welds have been removed.



	UW-51	Radiographic Examination of Welded Joints	Reorganized for better readability. Recognize the expected deterioration of radiographic film, and that it does not violate the requirements of record maintenance OR radiographic image to be retained until acceptance by the AI. Radiographic Review Form to be document of record and to be maintained in accordance with Appendix 10.
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PART UCS

Design	UCS-56	Requirements for PWHT	Reorganized for clarity and ease of use.
Low Temperature Operation	UCS-66	Materials	Revised UCS-66(a)(1)(-a)(-1) to add "other flat components subjected to primary bending stress". Revised bolting table for SA-193-B16.
	UCS-67	Impact Tests of Welding Procedures	Rewrite for impact test of welding procedures.
	UCS-68	Design	Rewritten for greater clarity. This affects the design of welded joints when MDMT is colder than -55°F and coincident ratio > 0.35.
Fabrication	UCS-85	Heat Treatment of Test Specimen	Complete rewrite of UG-85 and UCS-85 for improved clarity. Incorporated Code Case 2941 in the revised version of subparagraph UCS-85(f).

PART UNF

Design	UNF-56	Post Weld Heat Treatment	Revised UNF-56(c) by deleting reference to end note 54 that appears after the term "cooling rate". Deleted end note 54.
	UNF-65	Low Temperature Operation	Rewritten to improve clarity

PART UHA

Design	UHA-23	Permitted High Alloy Steel Materials	Added SA-693 S17400 Gr 630.
	UHA-32	Requirements for PWHT	Replaced current designation of materials in Table UHA-32-2 with their equivalent UNS designations.
Fabrication	UHA-40	General	Added a new paragraph for UNS S17400.



	UHA-42	Weld Metal Composition	Removed exception to the requirement of Co content of weld metal.
Inspection and Tests	UHA-51	Impact Tests	Rewrite for greater clarity. Added diffusion welding to UHA-51(a)(3).

PART UHX

UHX-1	General	Delete cross-reference table UHX-1.1. Revised Table UHX-1.2 to remove reference to year.
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PART UIG

General	Entirety	***	All instances of “impregnated” replaced by “impervious”.
Design	UIG-34	Calculating Flat Heads, Covers, and Tubesheets	Updated Table UIG-34-1.
	UIG-35	Block Heat Exchangers	New paragraph added.
	UIG-36	Openings and Reinforcements	Completely rewritten.
Fabrication	UIG-81	Repair of Materials	Revised to include consideration of UIG-97.
Inspection and Tests	UIG-97	Acceptance Standards and Documentation	Deleted.
Inspection and Tests	UIG-116	Required Markings	Added new paragraph to allow a manufacturer with multiple locations, each holding its own Certificates, to transfer graphite pressure vessels or vessel parts from one location to another.
	UIG-120	Data Reports	Insert new paragraph to include instructions for completing Form U-5B located in Appendix W.

SUBSECTION D

Added new Subsection D, “Requirements for Specific Types of Pressure Vessels and Components”. The following Parts and Appendices have been moved to this new Subsection and have been renamed as follows:

New Part in Subsection D	Old Appendix	Title for New Part
Part UAS	Appendix 48	Vessels with Acrylic Cylindrical Shells
Part UCC	Appendix 24	Design Rules for Clamp Connections
Part UDA	Appendix 17	Dimpled or Embossed Assemblies



Part UEB	Appendix 26	Bellows Expansion Joint
Part UEJ	Appendix 5	Flexible Shell Elements Expansion Joints
Part UGL	Appendix 27	Alternative Requirement for Glass-Lined Vessels
Part UHX	-----	Rules for Shell-and-Tube Heat Exchangers
Part UIF	Appendix 22	Integrally Forged Vessels
Part UIG	----	Requirements for Pressure Vessels Constructed of Impervious Graphite
Part UJK	Appendix 19	Electrically Heated or Gas Fired Jacketed Steam Kettles
Part UJV	Appendix 9	Jacketed Vessels
Part UNC	Appendix 13	Vessels of Non-Circular Cross-Section
Part UPX	Appendix 45	Plate Heat Exchangers

MANDATORY APPENDICES

Appendix 1	Editorial changes in 1-4(f) for formed heads when $t_s/L < 0.002$. Previous error corrected. Note in 1-5(c)(1) deleted for conical reducer sections and conical heads.
Appendix 2	Removed design rules for bolted flanged joints and provided cross-reference to design rules in Division 2, Part 4.16.
Appendix 5	Removed design rules for flexible shell element expansion joints and provided cross-reference to design rules in Division 2, Part 4.20.
Appendix 9	Removed design rules for jacketed vessels and provided cross-reference to design rules in Division 2, Part 4.11.
Appendix 10	Radiographs redesignated as "Radiographic Review Form". Revised computer program verification requirement. Revised to replace welding with welding/ brazing.
Appendix 13	Removed design rules for vessels of non-circular cross-section and provided cross-reference to design rules in Division 2, Part 4.12.1.1.
Appendix 14	Removed design rules for integral flat heads with large, single, circular, centrally locate opening and provided cross-reference to design rules in Division 2, Part 4.6.4.
Appendix 23	Revised 23-4(a)(3) and 23-4(b)(3) for criteria for design of copper and copper alloy finned tubes.
Appendix 24	Removed design rules for clamped connections and provided cross-reference to design rules in Division 2, Part 4.17.
Appendix 26	Delete cross-reference table 26-1.1
Appendix 31	Deleted from Table 31-1 specification/ grades with SMTS < 85 ksi; added one material with SMTS = 85 ksi; and added a note on the 85 ksi basis.
Appendix 43	Changes to 43-2: Design responsibilities for replacement parts



Appendix 44	44-5(i) revised to clarify what is meant by terms “shell”, “ring”, and “gross structural discontinuity”. Wording is added which limits use of elements that increase the stiffness of the vessel in the radial direction. Revised 44-6.1(g) to specify that weld qualification plate material type shall be same as the vessel construction material type.
Appendix 45	Minor revision to 45-6(b)(1).
Appendix 46	Added new paragraphs in 46-2 to clarify that material does not have to be permitted for use in Division 2 to be valid in this Appendix. However, cast iron and impregnated graphite are not permitted for this Appendix. Error corrected in 46-4 for design by analysis. Authoritative sources clause of UG-4(h) shall not be used if material properties are not available for those sources in Division 2, 5.1.4.2 for design by analysis.
Appendix 47	Existing paragraphs 47-3 (alternative qualifications for responsible charge), 47-5 (additional qualification requirements) and 47-6 (manufacturer responsibilities). Now this Appendix only has three paragraphs: 47-1 (Introduction), 47-2 (manufacturer’s responsibilities) and 47-3 (design responsibilities). “Certifying Engineers” and “Engineers” have been deleted in favor of “Designers”. How engineering/ design oversight is accomplished has been simplified. Prescriptive education and experience requirements have been removed.
Appendix XX	Added new Appendix: Guidance for Mandatory Application of Code Rules for Pressure Vessels

NONMANDATORY APPENDICES

Appendix W	New Form U-5B added for graphite shell-and-tube heat exchangers with springs
Appendix EE	Removed design rules for half pipe jackets and provided cross-reference to design rules in Division 2, Part 4.11.
Appendix FF	DELETED
Appendix LL	DELETED. The values presented in the tables and figures are determined using equations. The graphical and tabular data are available in PTB-7 for reference, if needed.

Prepared by: Ramesh Tiwari, P.E.

President, CoDesign Engineering