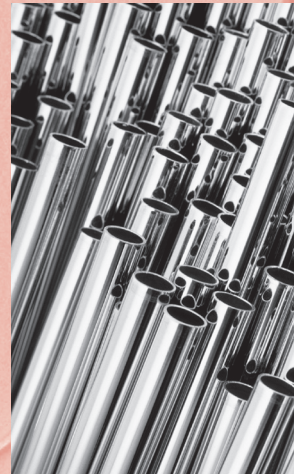
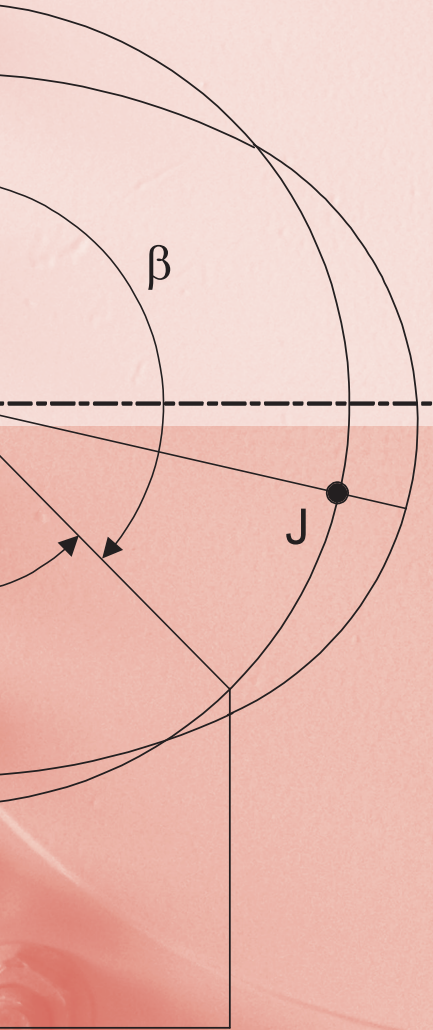


# 2013

ASME Boiler and  
Pressure Vessel Code  
AN INTERNATIONAL CODE

## Code Cases

### Boilers and Pressure Vessels



INTENTIONALLY LEFT BLANK

AN INTERNATIONAL CODE

# 2013 ASME Boiler & Pressure Vessel Code

2013 Edition

July 1, 2013

## CODE CASES

## Boilers and Pressure Vessels



The American Society of  
Mechanical Engineers

Two Park Avenue • New York, NY • 10016 USA

Date of Issuance: July 1, 2013

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.

ASME does not “approve,” “rate,” or “endorse” any item, construction, proprietary device, or activity.

ASME does not take any position with respect to the validity of any patent rights asserted in connection with any items mentioned in this document, and does not undertake to insure anyone utilizing a standard against liability for infringement of any applicable letters patent, nor assume any such liability. Users of a code or standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, is entirely their own responsibility.

Participation by federal agency representative(s) or person(s) affiliated with industry is not to be interpreted as government or industry endorsement of this code or standard.

ASME accepts responsibility for only those interpretations of this document issued in accordance with the established ASME procedures and policies, which precludes the issuance of interpretations by individuals.

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



ASME collective membership mark



Certification Mark

The above ASME symbol is registered in the U.S. Patent Office.

“ASME” is the trademark of The American Society of Mechanical Engineers.

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.

Library of Congress Catalog Card Number: 56-3934  
Printed in the United States of America

Adopted by the Council of The American Society of Mechanical Engineers, 1914; latest edition 2013.

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

Copyright © 2013 by  
THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS  
All rights reserved

# TABLE OF CONTENTS

List of Sections .....	iv
Summary of Changes .....	vi
Cross-Referencing and Stylistic Changes in the Boiler and Pressure Vessel Code .....	viii
Notes to Numeric Index .....	ix
Numeric Index .....	xi
Subject Index .....	xv
Index of Material Specifications Referred to in Cases .....	xxi

(13)

## LIST OF SECTIONS

### SECTIONS

- 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 NC — Class 2 Components
    - Subsection ND — Class 3 Components
    - Subsection NE — Class MC Components
    - Subsection NF — Supports
    - Subsection NG — Core Support Structures
    - Subsection NH — Class 1 Components in Elevated Temperature Service
  - Division 2 — Code for Concrete Containments
  - Division 3 — Containments for Transportation and Storage of Spent Nuclear Fuel and High Level Radioactive Material and Waste
  - 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 Power Plant Components
  
- XII Rules for Construction and Continued Service of Transport Tanks

## **INTERPRETATIONS**

ASME issues written replies to inquiries concerning interpretation of technical aspects of the Code.

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

## **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 2013 Code Cases book: "Boilers and Pressure Vessels" or "Nuclear Components." Supplements will be sent automatically to the purchasers of the Code Cases books up to the publication of the 2015 Code.

## SUMMARY OF CHANGES

The 2013 Edition of the Code Cases includes all Code Case actions published through Supplement 11 to the 2010 Edition. The 2015 Edition of the Codes Cases will include Code Case actions published through Supplement 7 to the 2013 Edition.

Changes given below are identified on the pages by a margin note, **(13)**, placed next to the affected area. Errata are identified by a margin note, **(E)**, placed next to the affected area.

<i>Page</i>	<i>Location</i>	<i>Change</i>
iv	List of Sections	Revised
viii	Cross-Referencing and Stylistic Changes in the Boiler and Pressure Vessel Code	Added
xi	Numeric Index	Updated
xv	Subject Index	Updated
xxi	Index of Material Specifications Referred to in Cases	Updated
1 (2153-2)	2153-2	Revised
1 (2192-8)	2192-8	Revised
1 (2245-2)	2245-2	Incorporated, will be annulled 6 months after publication of the Edition
1 (2344-4)	2344-4	Revised
1 (2382-6)	2382-6	Revised
1 (2410)	2410	Annulled
1 (2594-1)	2594-1	Revised
1 (2626)	2626	Annulled
1 (2642)	2642	Incorporated, will be annulled 6 months after publication of the Edition
1 (2651-1)	2651-1	Annulled
1 (2661-1)	2661-1	Revised
1 (2662)	2662	Annulled
1 (2701-1)	2701-1	Revised
1 (2710-1)	2710-1	Revised
1 (2714-1)	2714-1	Revised
1 (2736-1)	2736-1	Revised
1 (2737-1)	2737-1	Revised
1 (2748)	2748	Added
1 (2749)	2749	Added
1 (2750)	2750	Added
1 (2751)	2751	Added
1 (2752)	2752	Added
1 (2753)	2753	Added
1 (2754)	2754	Added



<i>Page</i>	<i>Location</i>	<i>Change</i>
1 (2755)	2755	Added
1 (2756)	2756	Added
1 (2757)	2757	Added
1 (2758)	2758	Added
1 (2759)	2759	Added

## (13) **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).

## NOTES TO NUMERIC INDEX

- All Code Cases remain available for use until annulled by the ASME Boiler and Pressure Vessel Standards Committees. Code Cases will be reviewed routinely for possible incorporation into the body of the ASME Boiler and Pressure Vessel Code.
- Supplement 11 is the last supplement published for the 2010 edition. Supplement 12 is incorporated into the 2013 edition.
- Cases may be used beginning with the date of approval shown on the Case.
- Annulled Cases will remain in the Numeric Index until the next Edition, at which time they will be deleted.
- Newly revised cases supersede previous versions. An "S" is placed in the Numeric Index next to the superseded code case.
- The digit following a Case Number is used to indicate the number of times a Case has been revised.
- The Cases are arranged in numerical order, and each page of a Case is identified at the top with the appropriate Case Number.

### *Legend of Abbreviations*

Supp. = Supplement  
R = Reinstated  
S = Superseded

INTENTIONALLY LEFT BLANK

# NUMERIC INDEX

Case	Approval Date	Errata	Annulled Date/ Superseded (S)	Case	Approval Date	Errata	Annulled Date/ Superseded (S)
1325-18	6-23-05	...	...	2245-2	12-15-11	...	...
1518-5	3-1-99	...	...	2247	7-9-98	...	...
1750-23	9-8-10	...	...	2249	8-11-97	...	...
1827-3	12-30-06	...	...	2254	3-5-98	...	...
1849-1	8-4-04	...	...	2256	8-11-97	...	...
1855-1	12-30-06	...	...	2270	3-1-99	...	...
1876-4	9-26-11	...	...	2276-1	2-17-00	...	...
1924-2	12-30-06	...	...	2277	3-5-98	...	...
1932-5	8-4-06	...	...	2286-4	1-13-10	...	...
1934	5-25-83	...	...	2295-3	R 5-9-09	...	...
1935-4	9-23-07	...	...	2296	11-30-99	...	...
1936-3	2-20-02	...	...	2297	11-30-99	...	...
1949-4	2-20-04	...	...	2300	9-23-99	...	...
1968-1	12-2-90	...	...	2304-2	5-12-04	...	...
1993-6	10-29-99	...	...	2305-1	12-14-09	...	...
1998	2-8-87	...	...	2309	5-4-99	...	...
2016-1	R 8-12-96	...	...	2313	5-4-99	...	...
2038-5	2-7-00	...	...	2318	9-23-99	...	...
2055-2	5-4-99	...	...	2321-1	2-20-02	...	...
2063-6	10-2-08	...	...	2324-1	3-21-12	...	...
2073-1	10-29-99	...	...	2327-2	1-29-09	...	...
2093	6-19-90	...	...	2328-2	9-18-10	...	...
2096-2	2-14-03	...	...	2329-1	10-27-05	...	...
2120-1	10-29-99	...	...	2334	7-10-00	...	...
2127-3	9-18-06	...	...	2344-3	5-19-11	...	S
2130-4	8-4-06	...	...	2344-4	12-31-12	...	...
2142-4	9-27-12	...	...	2346-1	2-14-03	...	...
2143-1	6-5-95	...	...	2349-1	6-20-02	...	...
2146	11-25-92	...	...	2350	2-26-01	...	...
2150	8-12-93	...	...	2351	2-26-01	...	...
2151-1	3-10-97	...	...	2353-1	10-18-04	...	...
2153-1	R 8-4-04	...	S	2357-2	12-30-06	...	...
2153-2	12-31-12	...	...	2359-2	6-23-05	...	...
2155	12-6-93	...	...	2361	11-30-01	...	...
2156-1	9-18-06	...	...	2367-1	5-9-09	...	...
2172	8-8-94	...	...	2369	5-10-02	...	...
2179-8	6-28-12	...	...	2377	1-27-03	...	...
2180-6	8-11-10	...	...	2378	2-19-03	...	...
2192-7	7-13-11	...	S	2382-5	8-19-11	...	S
2192-8	12-18-12	...	...	2382-6	12-31-12	...	...
2195-1	2-7-00	...	...	2385-1	5-4-04	...	...
2196-2	12-10-10	...	...	2396	5-9-03	...	...
2197-1	2-17-00	...	...	2397	2-14-03	...	...
2199-6	4-4-11	...	...	2400	2-14-03	...	...
2203-1	5-9-09	...	...	2401	2-14-03	...	...
2205	6-5-95	...	...	2402-1	9-25-12	...	...
2217-5	6-17-03	...	...	2403	2-13-03	...	...
2222-2	10-29-99	...	...	2404-1	11-29-04	...	...
2223-3	6-20-02	...	...	2407	2-13-03	...	...
2224-2	9-18-06	...	...	2408-1	6-4-09	...	...
2226-2	5-21-03	...	...	2410	2-13-03	...	1-10-13
2230-2	10-29-99	...	...	2411	6-23-05	...	...
2235-10	3-21-12	...	...	2416	2-13-03	...	...
2239-1	10-29-99	...	...	2418-1	1-26-09	...	...
2244-2	1-20-00	...	...	2419	5-21-03	...	...

Case	Approval Date	Errata	Annulled Date/ Superseded (S)	Case	Approval Date	Errata	Annulled Date/ Superseded (S)
2421	5-21-03	...	...	2554	1-3-06	...	...
2424-1	12-15-11	...	...	2556-2	9-15-09	...	...
2426	1-27-03	...	...	2557	9-18-06	...	...
2427	5-21-03	...	...	2558	12-30-06	...	...
2428-3	10-8-12	...	...	2559-1	9-26-11	...	...
2430	1-12-05	...	...	2560	12-30-06	...	...
2432-1	6-20-08	...	...	2561-1	5-23-12	...	...
2437-1	6-23-05	...	...	2562	12-30-06	...	...
2439	2-14-03	...	...	2563	12-30-06	...	...
2440	2-20-04	...	...	2564-3	9-26-11	...	...
2445-2	6-25-10	...	...	2565	12-30-06	...	...
2446	11-29-04	...	...	2567	12-30-06	...	...
2450	5-4-04	...	...	2568	1-4-08	...	...
2451-1	8-4-06	...	...	2570	4-2-07	...	...
2458-3	1-22-07	...	...	2571-1	1-26-09	...	...
2461-1	6-25-10	...	...	2573	9-23-07	...	...
2463-1	9-8-10	...	...	2576	12-30-06	...	...
2468-1	9-8-10	...	...	2577	10-2-08	...	...
2469-1	10-21-09	...	...	2579-3	11-28-10	...	...
2473	8-11-04	...	...	2581	4-26-07	...	...
2475	11-29-04	...	...	2582-1	7-28-10	...	...
2476	10-8-04	...	...	2583	1-4-08	...	...
2477	6-23-05	...	...	2585-1	9-15-09	...	...
2478	1-12-05	...	...	2586-1	10-2-08	...	...
2481	2-22-05	...	...	2587	8-6-07	...	...
2483	9-18-06	...	...	2588	10-19-07	...	...
2485	7-7-06	...	...	2590-3	9-26-11	...	...
2488-2	4-25-06	...	...	2591	10-2-08	...	...
2489	2-22-05	...	...	2592-1	1-29-08	...	...
2493	6-23-05	...	...	2593-1	1-26-09	...	...
2494-1	9-18-10	...	...	2594	11-20-07	...	S
2496-1	12-10-10	...	...	2594-1	1-10-13	...	...
2497-3	10-2-08	...	...	2595	1-4-08	...	...
2498	6-20-08	...	...	2596-1	4-6-11	...	...
2500	11-2-04	...	...	2597	5-21-08	...	...
2501-1	9-30-09	...	...	2598	1-29-08	...	...
2502	9-18-06	...	...	2599	1-29-08	...	...
2503-1	11-20-07	...	...	2600	1-29-08	...	...
2507	6-23-05	...	...	2601	5-21-08	...	...
2511	8-3-05	...	...	2602-1	1-26-09	...	...
2512	10-27-05	...	...	2603-1	7-28-10	...	...
2514-1	7-7-06	...	...	2604	10-2-08	...	...
2515	8-3-05	...	...	2605-1	1-13-10	...	...
2516	8-3-05	...	...	2606	1-26-09	...	...
2518-1	1-29-08	...	...	2607	1-26-09	...	...
2520	8-4-06	...	...	2608	1-26-09	...	...
2523	10-11-05	...	...	2609	1-26-09	...	...
2524-1	1-4-08	...	...	2610	1-26-09	...	...
2526	1-3-06	...	...	2611	1-26-09	...	...
2527	4-26-07	...	...	2613	1-30-09	...	...
2529	10-27-05	...	...	2614	1-30-09	...	...
2530	1-3-06	...	...	2615	1-30-09	...	...
2532-4	12-15-11	...	...	2616	5-9-09	...	...
2534	1-3-06	...	...	2617	5-9-09	...	...
2537	10-27-05	...	...	2618	7-5-09	...	...
2538	1-19-06	...	...	2619	6-24-09	...	...
2540	7-2-10	...	...	2620-1	7-28-10	...	...
2541	1-19-06	...	...	2621-1	12-14-09	...	...
2543	1-22-07	...	...	2623	8-25-09	...	...
2544-2	1-26-09	...	...	2624	7-8-09	...	...
2545-1	6-20-08	...	...	2626	9-15-09	...	1-10-13
2546	1-19-06	...	...	2627	9-30-09	...	...
2547	4-25-06	...	...	2628	9-30-09	...	...

Case	Approval Date	Errata	Annulled Date/ Superseded (S)	Case	Approval Date	Errata	Annulled Date/ Superseded (S)
2629	1-13-10	...	...	2694	9-26-11	...	...
2630	1-13-10	...	...	2695	9-26-11	...	...
2631	12-14-09	...	...	2696	7-13-11	...	...
2632	10-21-09	...	...	2697	9-26-11	...	...
2633	12-14-09	...	...	2698	9-26-11	...	...
2634	12-14-09	...	...	2699	9-26-11	...	...
2635	12-21-09	...	...	2700	9-26-11	...	...
2636	1-13-10	...	...	2701	9-26-11	...	S
2637	12-14-09	...	...	2701-1	1-10-13	...	...
2638	1-20-10	...	...	2702	9-26-11	...	...
2639	1-20-10	...	...	2703	9-26-11	...	...
2640-1	1-20-11	...	...	2704	9-26-11	...	...
2641	12-14-09	...	...	2705	8-9-11	...	...
2642	3-10-10	...	...	2706	11-7-11	...	...
2643	4-6-10	...	...	2707	11-7-11	...	...
2644	4-6-10	...	...	2708	11-7-11	...	...
2645	3-10-10	...	...	2709	11-7-11	...	...
2648	6-25-10	...	...	2710	2-1-12	...	S
2649	7-2-10	...	...	2710-1	1-7-13	...	...
2650	6-25-10	...	...	2711	12-15-11	...	...
2651-1	9-8-10	...	12-12-12	2712	12-15-11	...	...
2652	6-25-10	...	...	2713	2-1-12	...	...
2653	7-2-10	...	...	2714	1-22-12	...	S
2654-1	4-4-12	...	...	2714-1	1-10-13	...	...
2655	9-8-10	...	...	2715	2-13-12	...	...
2656	8-24-10	...	...	2716	2-24-12	...	...
2657	7-28-10	...	...	2717	3-21-12	...	...
2658	9-8-10	...	...	2718	3-21-12	...	...
2659	9-8-10	...	...	2719	4-4-12	...	...
2660	9-8-10	...	...	2720	4-4-12	...	...
2661	9-8-10	...	S	2721	4-4-12	...	...
2661-1	1-10-13	...	...	2722-1	10-25-12	...	...
2662	12-10-10	...	1-1-12	2723	4-4-12	...	...
2663	12-7-10	...	...	2724	4-4-12	...	...
2664	12-27-10	...	...	2726	5-24-12	...	...
2665-1	7-13-11	...	...	2727	5-23-12	...	...
2666	1-12-11	...	...	2728	5-23-12	...	...
2667	1-31-11	...	...	2729	5-8-12	...	...
2668	1-31-11	...	...	2730	6-28-12	...	...
2669	4-6-11	...	...	2731	5-16-12	...	...
2671	6-3-11	...	...	2732	5-23-12	...	...
2672	6-16-11	...	...	2733	6-28-12	...	...
2673	6-16-11	...	...	2734	6-28-12	...	...
2674	4-6-11	...	...	2735	9-25-12	...	...
2675	4-6-11	...	...	2736	9-25-12	...	S
2676	6-16-11	...	...	2736-1	1-10-13	...	...
2677	4-6-11	...	...	2737	9-25-12	...	S
2678-1	9-26-11	...	...	2737-1	1-10-13	...	...
2679	6-16-11	...	...	2738	9-25-12	...	...
2680	6-16-11	...	...	2739	9-25-12	...	...
2681	6-16-11	...	...	2740	9-25-12	...	...
2682	7-13-11	...	...	2741	8-15-12	...	...
2683	7-13-11	...	...	2742	8-29-12	...	...
2684-1	5-8-12	...	...	2743	8-29-12	...	...
2685	8-3-11	...	...	2744	8-29-12	...	...
2686	8-5-11	...	...	2745	8-29-12	...	...
2687	8-19-11	...	...	2746	8-29-12	...	...
2688	8-19-11	...	...	2747	8-29-12	...	...
2689	8-5-11	...	...	2748	12-12-12	...	...
2690	8-19-11	...	...	2749	12-12-12	...	...
2691	8-23-11	...	...	2750	12-12-12	...	...
2692	8-19-11	...	...	2751	12-12-12	...	...
2693-1	4-4-12	...	...	2752	12-12-12	...	...

<b>Case</b>	<b>Approval Date</b>	<b>Errata</b>	<b>Annulled Date/ Superseded (S)</b>	<b>Case</b>	<b>Approval Date</b>	<b>Errata</b>	<b>Annulled Date/ Superseded (S)</b>
2753	12-18-12	...	...	2757	1-7-13	...	...
2754	12-12-12	...	...	2758	1-10-13	...	...
2755	12-18-12	...	...	2759	1-10-13	...	...
2756	1-7-13	...	...				



# SUBJECT INDEX

Subject	Case	Subject	Case
<b>SECTION I</b>		<b>SECTION I</b>	
<b>POWER BOILERS</b>		<b>POWER BOILERS (Cont'd)</b>	
Alternative Rules for Heat Treatment of Boiler External Piping . . .	1934	9Cr-1Mo-1W-Cb Material. . . . .	2327
Application of the ASME Certification Mark . . . . .	2710	9Cr-2W, UNS K92460 Material . . . . .	2179
ASTM B 167-08 UNS N06696 Nickel-Chromium-Iron-Copper Alloy		Pilot Operated Pressure Relief Valves for PG-67.2.6 Applications . .	2446
Seamless Pipe and Tube . . . . .	2652	Postponement of Mandatory Date for Compliance . . . . .	2640
ASTM B 407-04 UNS N06811, 42Ni-29Cr-28Fe-Mo-N, Seamless		Precipitation-Hardening Nickel Alloy (UNS N07718) Used as Bolting	
Pipes and Tubes . . . . .	2518	Material . . . . .	1993
ASTM B 444-04 UNS N06852, 50Ni-21.5Cr-17.5Fe-9Mo-Nb,		Pressure Relief Valves That Exceed the Capability of Testing	
Solution Annealed Seamless Pipes and Tubes . . . . .	2520	Laboratories . . . . .	2397
Austenitic Fe-35Ni-27Cr Alloy (UNS S35045) . . . . .	2304	PW-39.2.1, PWHT Requirements for P-No. 4 Material Welded to	
Austenitic Fe-27Ni-22Cr-7Mo-Mn-Cu-N Alloy (UNS S31277) . . . . .	2458	Lower P-Number Material . . . . .	2741
Austenitic Stainless Steel Seamless Tubes, SA-213/SA-213M, UNS		Requirements for Use of an Alternative Test Method Under	
S30432, 18Cr-9Ni-3Cu-Cb-N . . . . .	2328	PG-73.4.2.2 . . . . .	2511
Changeover Valves Installed Between Safety Valves or Safety Relief		SA-487 Grade CA6NM Class A . . . . .	2073
Valves and Boilers . . . . .	2254	Seamless 1.15Ni-0.65Cu-Mo-Cb Material . . . . .	2353
Corrosion-Resistant Cu-Sb Carbon Steel Tube . . . . .	2494	Seamless 12Cr-2W Material . . . . .	2180
Design of Safety Valve Connections . . . . .	1876	Seamless Ni-25Cr-20Co Material . . . . .	2702
Drilled Holes Not Penetrating Through Vessel Wall . . . . .	1998	Section VIII, Division 2 Components in Boilers . . . . .	2559
18Cr-9Ni-2.5W-V-Cb Austenitic Seamless Tube Steel . . . . .	2475	Section VIII, Division 1, Unfired Steam Boiler in Section I System . .	1855
18Cr-10Ni-3Cu-Ti-Cb Seamless Austenitic Stainless Steel Tube . . . . .	2512	Single Feedwater Source for Solar Fired Boiler . . . . .	2635
Exemption From Mandatory Requirement for Fusible Plug in		Steam Drum in Heat Recovery Steam Generator System . . . . .	2485
Hand-Fired Boilers . . . . .	2731	2.25Cr-1.6W-V-Cb Material . . . . .	2199
Exemption From Postweld Heat Treatment for SA-268 TP439 P-No.		2.5Cr-1Mo-V-B-Ti Material . . . . .	2540
7 Tube to SA-790 Alloy UNS S31803 P-No. 10H Header Welds . .	2666	20Cr-25Ni-1.5Mo-Cb-N Seamless Austenitic Stainless Steel Tube . .	2581
Exemption from Preheat and PWHT for Autogenous Buttwelding of		22Cr-15Ni-Cb-N Austenitic Stainless Steel Seamless Tubing . . . . .	2598
SA-213/SA-213M T22 Seamless Tubing . . . . .	2755	22Cr-25Ni-3.5W-3Cu Austenitic Stainless Steel UNS S31035 . . . . .	2753
F-Number Grouping for Ni-Cr-Fe, Classification UNS W86152		25Cr-14Ni-Mo-Low C (UNS S30925) Seamless Austenitic Steel Tube	2639
Welding Electrode . . . . .	2143	UNS S31803 Plates and Seamless and Welded Pipe and Tube and	
57Ni-22Cr-14W-2Mo-La Alloy (UNS N06230) . . . . .	2665	Forgings and Fittings and Bar . . . . .	2488
57Ni-22Cr-14W-2Mo-La Alloy (UNS N06230) Autogenously Welded		Unstayed Flat Head Constructed From Forged Material . . . . .	2697
Tube and Seamless Pipe and Tube . . . . .	2756	Use of	
59Ni-23Cr-16Mo Low Carbon Alloy (UNS N06059) . . . . .	2355	A 213/A 213M-04 UNS S31060 Austenitic Stainless Steel	
Forgings of Nickel-Iron-Chromium Alloys N08800 and N08810 . . .	1949	Seamless Tubing and A 240/A 240M-04a <sup>e1</sup> UNS S31060	
Gray Cast Iron Castings . . . . .	1849	Austenitic Stainless Steel Plate . . . . .	2430
Heat Recovery Steam Generators With Multiple Design Conditions		ASTM A106/A 106M-08 as SA-106/SA-106M . . . . .	2663
for Reheaters and Superheaters . . . . .	2664	ASTM A672-06 and A 691-98(R2002) Electric-Fusion- Welded	
Materials for Bodies, Bonnets, Yokes, Housings, and Holders of		Pipe . . . . .	2576
Pressure Relief Devices . . . . .	1750	B 43 Seamless Red Brass Pipe (UNS C23000) With Drawn General	
Method for Basing Design Values on Material Properties Affirmed by		Purpose Temper (H58) for Threaded Piping for Construction of	
Material Manufacturers . . . . .	2556	PMB and PEB Miniature Electric Boilers . . . . .	2172
Modified 9Cr-1Mo-V Cast Material . . . . .	2192	Capacitive Discharge Welding for Joining Non-Load- Bearing	
Nickel-Chromium-Iron (Alloy UNS N06600) . . . . .	1827	Attachments to P-No. 15E Group No. 1 Materials . . . . .	2649
Nickel-Chromium-Molybdenum-Columbium Alloy (UNS N06625) . .	1935	Carbon and Low Alloy Steel Plate, AS 1548-2008 Grades	
Nickel-Iron-Chromium Alloys 800 and 800H (UNS N08800 and		PT430N/PT430NR, PT460N/PT460NR, and PT490N/	
N08810) and Nickel-Iron-Chromium-Molybdenum- Copper		PT490NR . . . . .	2645
Low-Carbon Alloy (UNS N08028) . . . . .	1325	Glass Bull's-Eye Water Level Indicators on Electric Boilers . . . . .	2715
Nickel-Iron-Chromium-Molybdenum-Copper Alloy (UNS N08825)		Magnetically Impelled Arc Butt Welding (MIABW) . . . . .	2694
for Water Wetted Service . . . . .	1936	Materials in a Current Code Edition for a Boiler Constructed to an	
Nickel-Molybdenum-Chromium Alloy (UNS N10276) . . . . .	1924	Earlier Code Edition . . . . .	2595
Ni-Cr-Mo Alloy (UNS N06022) for Code Construction for		Metric Units . . . . .	2523
Temperatures up to 1250°F . . . . .	2226	Mn- <sup>1</sup> / <sub>2</sub> Mo- <sup>1</sup> / <sub>2</sub> Ni (UNS K12039) Pipe . . . . .	2440
Ni-22Cr-14W-2Mo-La Alloy (UNS N06230) . . . . .	2063	SA-240/SA-240M UNS S41003 Plates in the Construction of	
Ni-23Cr-7W, UNS N06674, Alloy Seamless Pipe and Tube . . . . .	2684	Boilers . . . . .	2696
Ni-Fe-Cr Alloy N08801 for Water-Wetted Service . . . . .	2357	SA-350, Grade LF2, Class 1 Steel Forgings . . . . .	2606
Ni-25Cr-9.5Fe-2.1Al Alloy (UNS N06025) . . . . .	2359	SA-420, Grade WPL6 and Welded Steel Fittings . . . . .	2607

Subject	SECTION I	Case Subject	SECTION IV	Case
	<b>POWER BOILERS (Cont'd)</b>		<b>HEATING BOILERS (Cont'd)</b>	
SA-508 Class 1, Grades 2 and 3 Forgings . . . . .		2489	Austenitic Stainless Steel Material With Minimum Thickness of 0.020 in. (0.5 mm) for Hot Water Heating Boilers . . . . .	2688
Ultrasonic Examination in Lieu of Radiography . . . . .		2235	Austenitic Stainless Steel on HLW Water Heaters for Potable Water Applications. . . . .	2656
UNS N06625 Nickel Alloy (60Ni-22Cr-9Mo-3.5Cb) Annealed Grade 1 in Welded Tube, Plate, Sheet, and Strip . . . . .		2632	Cast Aluminum EN AC-ALSi12 (Fe) in the F Temper Condition Meeting All Requirements of SB/EN 1706:1998 in the Manufacture of Hot Water Heating Boilers . . . . .	2667
	<b>SECTION II</b>		EN 10025-2 Gr. S235JR Plate in the Construction of Boilers . . . . .	2720
	<b>MATERIALS PART A — FERROUS</b>		EN 10088-2 Gr. X6CrNiMoTi 17-12-2 Sheet, Plate, and Strip in the Construction of Boilers . . . . .	2719
Nondestructive Examination as an Alternative to Hydrostatic Testing for SA-376 . . . . .		2096	EN 10217-1 Gr. P235TR2 Tubes in the Construction of Boilers . . . . .	2721
	<b>SECTION II</b>		ER310 Filler Metals to Weld UNS S43035, Grades 439 and TP439 Materials to Austenitic Grades 304, 304L, 316, 316L, and 316Ti for the Construction of Heating Boiler . . . . .	2724
	<b>MATERIALS PART B — NONFERROUS</b>		5052-H32, 6061-T6, and 6061-T651 Temper Aluminum Alloys in Part HF of Section IV, for Construction of Heating Boilers . . . . .	2432
Use of 5052-H32, 6061-T6, and 6061-T651 Temper Aluminum Alloys in Part HF of Section IV, for Construction of Heating Boilers . . . . .		2432	Metric Units . . . . .	2523
	<b>SECTION II</b>		Nickel Alloy UNS N08367 in Construction of Boilers . . . . .	2693
	<b>WELDING SPECIFICATIONS — PART C</b>		Pneumatic Testing on Individual Cast Aluminum Sections . . . . .	2604
No Cases . . . . .			Polymer Material for Bolted Box Headers. . . . .	2411
	<b>SECTION II</b>		Sand Cast Aluminum Alloy EN AC-ALSi10Mg(a), F Temper, for the Manufacture of Hot Water Heating Boilers Under Part HA . . . . .	2382
	<b>MATERIAL PROPERTIES — PART D</b>		Sand Cast Aluminum Alloy A356.0, T6 Temper, for the Manufacture of Hot Water Heating Boilers Under Part HA . . . . .	2344
57Ni-22Cr-14W-2Mo-La Alloy (UNS N06230), Subpart 3, Fig. NFN-24 Up to 1,800°F (982°C) . . . . .		2671	SA-240/SA-240M, Alloys 439 and UNS S43932 and SA-268, Alloy TP439 Up to 210°F (99°C) in Heating Boiler Construction . . . . .	2722
	<b>SECTION IV</b>		SA-240/SA-240M UNS S41003 Plate in the Construction of Boilers . . . . .	2707
	<b>HEATING BOILERS</b>		SA-240/SA-240M UNS S43035 (Grade 439) and UNS S43932 Less Than 1/4 in. (6 mm) in Thickness for the Construction of Water Boilers Intended for Working Pressures Up to 160 psi (1 100 kPa) Under Part HF . . . . .	2708
Allowance to Use Provisions of HG-402.5 as Alternative to Using Steam to Determine Set Pressure for "Pressure Only" Safety Relief Valves During Capacity Certification Testing . . . . .		2692	SA-240, Grades 304L and 316L in Thickness Less Than 1/4 in. (6 mm) . . . . .	2571
Alternate Weld Size for Attachment of Flat Heads Forming a Corner Joint . . . . .		2623	SA-240 Grade 904L (UNS N08904) . . . . .	2546
Alternative Relief-Valve Sizing . . . . .		2583	SA-240 (UNS S43932) in Thickness Less Than 1/4 in. . . . .	2534
Alternative Lining Material in HLW-200 Application . . . . .		2614	SA-268 Grades UNS S43932 and UNS S43940 Conforming to SA-268 in the Manufacture of Coil Type Heating Boilers . . . . .	2668
Application of the ASME Certification Mark . . . . .		2710	SA-278 Material for Part HLW Construction of Lined Headers . . . . .	2329
Attaching Nozzles and Fittings to Headers . . . . .		2690	SB-148 C95500, As-Cast Temper, in the Manufacture of Heating Boilers, Part HF and Potable-Water Heaters, Part HLW . . . . .	2618
Copper Alloys . . . . .		2570	SB-210 Alloys 3003-O and 6061-T6 and SB-241 Alloy 1100-O Tubes for Construction of Heating Boilers. . . . .	2545
Drain Valve on Horizontal Helical Coil Watertube Boilers . . . . .		2529	SB-241/SB-241M Grade 6063 T1 (UNS A96063) Aluminum Alloy Extruded (Integrally) Finned and Coiled Tube in the Manufacture of Hot Water Heating Boilers. . . . .	2628
HG-701.1 Permissible Mounting Safety Relief Valves for Coil-Type Boilers . . . . .		2568	SB-584 (UNS C87500) Copper Alloy Sand Castings in the Manufacture of Nonstandard Pressure Parts for Hot Water Heating Boilers and Potable Water Heaters . . . . .	2706
Laser Welding of Heat Transfer Fins . . . . .		2654	Semi-Permanent Mold Cast Aluminum Alloy A356.0 for the Manufacture of Heating Boilers Under Part HC . . . . .	2153
Mounting Safety and Safety Relief Valves for Coil Type Heating Boilers . . . . .		2565	Sheet or Plate With Revised Minimum Thickness for HLW Water Heater and Storage Tank Construction . . . . .	2615
Phenolic Lining Material in HLW-200 Application . . . . .		2613	Stainless Steel Tubes With Revised Minimum Thickness for Hot Water Supply Boilers . . . . .	2713
Pneumatic Testing . . . . .		2469	UNS S32003 Ferritic/Austenitic Stainless Steel Plate, Pipe, and Tube . . . . .	2643
Punching and Shaving of Tube Holes . . . . .		2644	UNS S32101 Ferritic/Austenitic Stainless Steel Plate, Sheet, Strip, Pipe, and Tube. . . . .	2603
Revised Manufacturer's Data Reports . . . . .		2691	UNS S32101 Ferritic/Austenitic Stainless Steel Plate, Sheet, Strip, Pipe, and Tube in the Manufacture of Part HLW Water Heaters and Storage Tanks . . . . .	2620
Thermometer Range Other Than That Specified in HG-612 . . . . .		2716		
Tubes Attached by Welding . . . . .		2657		
UNS S31635 Tubing . . . . .		2687		
UNS S31635 Tubing for Construction of Water Heaters . . . . .		2723		
UNS S31803 Plate and Seamless and Welded Pipe and Tube . . . . .		2582		
UNS S43035 SA-268 Grade TP439 Welded Tubing . . . . .		2709		
Use of				
Aluminum Alloy EN AC-ALSi7Mg Sand Castings in F Temper Condition Meeting All Requirements of BS EN1706 1998 . . . . .		2483		
Aluminum Alloy EN AW-6060 T1 Extruded (Integrally) Finned Tube in the Manufacture of Hot Water Heating Boilers . . . . .		2627		
Aluminum Alloy 6063-0 Conforming to SB-241/SB-241M in the Manufacture of Hot Water Boilers Under Part HF. . . . .		2501		
Aluminum Alloy 6063-T5 in the Manufacture of Hot Water Heating Boilers Under Part HF . . . . .		2502		
Aluminum Alloy 6063-T6 Conforming to SB-221 in the Manufacture of Heating Boilers Under Part HF . . . . .		2573		
ASTM A106/A 106M-08 as SA-106/SA-106M . . . . .		2663		
ASTM A576 Hot-Wrought Carbon Steel Bars for Forming Fittings for HLW Construction . . . . .		2500		

Subject	Case	Subject	Case
<b>SECTION IV</b>		<b>SECTION VIII, DIVISION 1</b>	
<b>HEATING BOILERS (Cont'd)</b>		<b>PRESSURE VESSELS (Cont'd)</b>	
Valve Markings .....	2256	Stresses That May Be Used in the Equation in UG-101(k) for Calculating the Maximum Allowable Working Pressure at Design Temperature .....	2361
<b>SECTION V</b>		Alternatives to Flange Rigidity Requirements, Appendix 2-14 .....	2547
<b>NONDESTRUCTIVE EXAMINATION</b>		Aluminum Alloy (Aluminum-6.3 Magnesium) for Code Construction .....	2403
Alternative Piping Calibration Blocks .....	2638	Application of the ASME Certification Mark .....	2714
Alternative Rules for Ultrasonic Examination of Cladding and Base Metal Clad Interfaces .....	2309	ASME SA-240 Type 316 Plate .....	2401
Dry Film Storage of Digital Radiographic Images .....	2602	ASTM A240/A 240M-09a UNS S30530 Solution Annealed Austenitic Stainless Steel Plate and Sheet .....	2636
Radiography Using Phosphor Imaging Plate .....	2476	ASTM A841 / A 841M-98 Plate .....	2130
Use of .....		ASTM B167-08 UNS N06696 Nickel-Chromium-Iron-Copper Alloy Seamless Pipe and Tube .....	2652
Linear Phased Array E-Scan Ultrasonic Examination Per Article 4 .....	2599	Attachment of Tubes to Flat Tubesheets Using Complete Penetration Welds .....	2428
Linear Phased Array S-Scan Ultrasonic Examination Per Article 4 .....	2600	Austenitic Fe-35Ni-27Cr Alloy (UNS S35045) .....	2304
Manual Phased Array E-Scan Ultrasonic Examination Per Article 4 .....	2558	Austenitic Fe-27Ni-22Cr-7Mo-Mn-Cu-N Alloy (UNS S31277) .....	2458
Manual Phased Array S-Scan Ultrasonic Examination Per Article 4 .....	2557	Austenitic Ni-Cr-Mo-Nb Alloy (UNS N06626) .....	2276
Manual Phased Array Ultrasonic Examination .....	2541	Austenitic Stainless Steel Seamless Tubes and Pipe, Seamless Wrought Fittings, Plate, and Sheet, 18Cr-11Ni-Cb-N, UNS S34751, 347LN .....	2196
Metric Units .....	2523	Cast ASTM B752-06 Zirconium Alloy Grades 702C and 705C .....	2633
Metric Units Boiler and Pressure Vessel Code (For Case N-744, see Nuclear Components Code Cases) .....	N-744	Cast Titanium Aluminum Vanadium Iron Alloy, SB-367, Grade C-38 (Ti 4Al-2.5V-1.5Fe) UNS R54250 .....	2717
<b>SECTION VIII, DIVISION 1</b>		Chinese Steel Material Q345R .....	2642
<b>PRESSURE VESSELS</b>		Chromium-Nickel-Molybdenum-Nitrogen-Tungsten Duplex Stainless Steel UNS S39274 Plate .....	2427
A 439 Type D-2 Austenitic Ductile Iron .....	2093	Cold-Stretching of Austenitic Stainless Steel Pressure Vessels .....	2596
Allowing Section VIII, Division 2 Design Rules to Be Used for Section VIII, Division 1 Pressure Vessel .....	2695	Copper Beryllium Alloy (UNS C17510) for Code Construction .....	2404
Alloy UNS N06690 Up To 1200°F (649°C) .....	2629	Diffusion Bonding .....	2621
Alternate Rules for Heat Treatment of Repair Welds to Castings ..	2205	18.5Cr-15.5Ni-4.5Mo-N Alloy (UNS S31726) .....	2197
Attachment .....		18Cr-15Ni-4Mo-3Cu-N, UNS S31727, Austenitic Stainless Steel ...	2617
Attachment Details for Welded Stayed Construction Using Dimpled or Embossed Plate .....	2424	Electric Resistance and Autogenous Welded Tubing With 100% Longitudinal Weld Joint Factor for Use in Feedwater Heaters ...	2313
Flanged Joint Design for Nuclear Material Fluidized Bed Reactors ..	2318	Exemption From Postweld Heat Treatment for P-No. 4 or P-No. 5A Tube-to-Tubesheet Seal Welds .....	2321
Method of Vessel Markings .....	2396	Exemption From Postweld NDE Requirements of UG-93(d)(4)(-b) on Fig. UW-13.2(d) Construction .....	2305
Method of Pressure Relief Device Marking .....	2408	F-Number Grouping for Ni-Cr-Fe, Classification UNS W86152 .....	2143
Pressure Test Procedure to UG-99 and UG-100 for the Construction of Multistream Aluminum Vacuum Brazed Plate-Fin Heat Exchangers .....	2247	Hydrostatic and Pneumatic Testing of Mass-Produced Pressure Vessels With an Intermediate Isolation Valve Between Indicating Gage and Pressure Vessel .....	2726
Procedure for Calculating Allowable Axial Compressive Stress and External Pressure in Cylindrical Shells Constructed of Stainless Steel Alloy 253MA (UNS S30815) at Temperatures Greater Than 1200°F (650°C) and Less Than or Equal to 1650°F (900°C) .....	2682	Inspection Openings in Small Pressure Vessels .....	2634
Procedure for Calculating Allowable Axial Compressive Stress in Cylindrical Shells Constructed of 2 <sup>1</sup> / <sub>4</sub> Cr-1Mo Steel at Temperatures Greater Than 700°F and Less Than or Equal to 1000°F .....	2676	Large-End Cone-to-Cylinder Junction for 30 <math>\alpha \le 60</math> Degrees .....	2150
Requirements for Seal Welding of Threaded Connections, UF-32(b) .....	2016	Manufacturer's Data Reports .....	2738
Rules for Appendix 24 When Controlled Bolting Is Used .....	2658	Marking of Rupture Disk Devices Fully Enclosed in a Rupture Disk .....	2367
Rules for Brazing Qualifications .....	2351	Materials for Bodies, Bonnets, Yokes, Housings, and Holders of Pressure Relief Devices .....	1750
Rules for Corner Joint Fabrication .....	2349	Method for Basing Design Values on Material Properties Affirmed by Material Manufacturers .....	2556
Rules for Designing U-Shaped Bellows .....	2587	Minimum Thickness of Dimpled or Embossed Assemblies Per Appendix 17 .....	2507
Rules for Determining Allowable External Pressure and Compressive Stresses for Cylinders, Cones, Spheres, and Formed Heads .....	2286	Minimum Thickness of Furnace Brazed Plate Heat Exchanger Heads .....	2538
Rules for Ellipsoidal or Torispherical Heads Having Integral Backing Strip Attached to Shells .....	2346	Nickel-Iron-Chromium-Molybdenum-Copper Low Carbon Alloy (UNS N08926) for Code Construction .....	2120
Rules for Ellipsoidal or Torispherical Heads Having Integral Backing Strip Attached to Shells .....	2537	Ni-Cr-Mo Bolting Material UNS N06059, ASTM F468-06 .....	2588
Rules for Hemispherical Head Attached to Cylindrical Shell Having Integral Backing Ring That Is Part of the Shell .....	2751	Ni-25Cr-9.5Fe-2.1Al Alloy (UNS N06025) .....	2359
Rules for Pressure Testing Vessels Utilizing a Bolted Flat Blind Flange as Removable or Remote End Closures .....	2369	Ni-29Cr-3.5Fe-3.3Al-1.5Nb Alloy (UNS N06693) .....	2481
Rules for the Postweld Heat Treatment of Finned Tubes .....	2400	9Cr-2W, UNS K92460 Material .....	2179
		Omission of Lifting Device Requirements for Pressure Relief Valves on Air, Water Over 140°F, or Steam Service .....	2203
		Pneumatic Test .....	2407

Subject	Case
<b>SECTION VIII, DIVISION 1</b>	
<b>PRESSURE VESSELS (Cont'd)</b>	
Pneumatic Testing of Pressure Vessels, UG-20 . . . . .	2055
Pneumatic Testing of Pressure Vessels, U-1(j), UM Vessels . . . . .	2527
Precipitation-Hardening Nickel Alloy (UNS N07718) Used as Pressure Retaining Component Material . . . . .	2222
Precipitation-Hardening Ni-Cr-Mo Alloy (UNS N07725) . . . . .	2217
Pressure Relief Valves That Exceed the Capability of Testing Laboratories . . . . .	2397
Pressure Vessels With Overpressure Protection by System Design for Application to Gas Turbine Systems . . . . .	2560
Radiographic Requirements for SA-612 Steel Plate . . . . .	2377
Rules for Diffusion Bonded, Flat Plate, Microchannel Heat Exchanger . . . . .	2437
SA-182, SA-240, and SA-479 21Cr-5Mn-1.5Ni-Cu-N (UNS S32101) Austenitic-Ferritic Duplex Stainless Steel . . . . .	2418
SA-240/SA-240M, UNS S43035 Plate . . . . .	2758
SA-453, Grade 660, Class C, High Temperature Bolting Materials With Expansion Coefficients Comparable to Austenitic Steels . . . . .	2610
SA-736/SA-736M Plates and ASTM A859/A 859M-95 Forgings . . . . .	1932
SA-995, UNS J92205 (CD3MN), Austenitic/Ferritic Duplex Stainless Steel . . . . .	2402
Seamless 12Cr-2W Material . . . . .	2180
7% Ni Thermo-Mechanical Control Processed Steel Plate for Cryogenic Applications . . . . .	2736
Single Fillet Lap Joint for Heat Exchanger Tube Welds . . . . .	2421
Single Fillet Lap Joints in the Shell of a Shell-and-Tube Heat Exchanger . . . . .	2334
62Ni-22Mo-15Cr Alloy (UNS N10362) . . . . .	2648
Spherical Intermediate Head Without Straight Flange . . . . .	2712
Strength of Aluminum Brazed Joints Up to 400°F . . . . .	2350
Testing of Vessels Containing an Internal Piston . . . . .	2608
Thermo-Mechanical Control Processed 7% Ni Steel Plate . . . . .	2750
37Ni-30Co-28Cr-2.75Si Alloy (UNS N12160) . . . . .	2385
37Ni-33Fe-25Cr Alloy (UNS N08120) Welded Construction Above 1650°F to 1800°F . . . . .	2672
3 Chromium-1 Molybdenum- $\frac{1}{4}$ Vanadium-Columbium- Calcium Alloy Steel Plates and Forgings . . . . .	2151
Titanium Aluminum Alloy, ASTM B367-08b, Ti 3Al-2.5V or Ti 3Al-2.5V-0.05Pd Castings . . . . .	2631
Titanium Aluminum Vanadium Iron Alloy, Grade 38 (Ti 4Al-2.5V-1.5Fe) UNS R54250 . . . . .	2532
Titanium Nickel Molybdenum Alloy (Ti 0.8Ni-0.3Mo), Grade C-12 Castings . . . . .	2641
Titanium Nickel-Molybdenum Ruthenium Alloy, Ti-0.8Ni- 0.3Mo-0.1Ru . . . . .	2426
Tolerance for Formed Heads for External Pressure Design Conditions . . . . .	2544
22Cr-25Ni-3.5W-3Cu Austenitic-Stainless Steel UNS S31035 . . . . .	2752
25Cr-7.5Ni-3.5Mo-N-Cu-W Alloy, UNS S32760, Forgings, Plate, Sheet, Strip, Bar, Seamless and Welded Pipe and Tube, and Fittings . . . . .	2245
25Cr-6Ni-Mo-N, UNS S32506, Austenitic-Ferritic Duplex Stainless Steel . . . . .	2543
25Cr-22Ni-2Mo-N, UNS S31050, Austenitic Stainless Steel Forgings	2038
24Cr-17Ni-6Mn-4.5Mo-N, UNS S34565, Austenitic Stainless Steel Forgings, Bar, Fittings Welded and Seamless Pipe and Tube, Plate, Sheet, and Strip . . . . .	2146
24.5Cr-22Ni-7.5Mo-3Mn-N Austenitic Stainless Steel (UNS S32654)	2195
25Cr-7.5Ni-4.5Mo-Co-N Austenitic-Ferritic Stainless Steel UNS S32707 . . . . .	2586
25Cr-20Ni Austenitic Stainless Steel UNS S31002 . . . . .	2591
29Cr-6.5Ni-2Mo-N Austenitic-Ferritic Stainless Steel UNS S32906 . . . . .	2295

Subject	Case
<b>SECTION VIII, DIVISION 1</b>	
<b>PRESSURE VESSELS (Cont'd)</b>	
27Cr-7.6Ni-1Mo-2.3W-N UNS S32808 Solution Annealed Austenitic-Ferritic Duplex Stainless Steel Plate and Seamless Tubing and Pipe . . . . .	2496
23Cr-35Ni-7.5Mo-N, UNS N08354, Austenitic Alloy . . . . .	2585
23Cr-25Ni-5.5Mo-N, UNS S32053, Austenitic Stainless Steel . . . . .	2445
2014-T6 Aluminum Hand Forgings for Nonwelded Construction . . . . .	2616
Type 304LN (Alloy UNS S30453) Austenitic Stainless Steel . . . . .	2127
Ultrasonic Examination of Welds Made by the Electron Beam Process . . . . .	2270
Unalloyed and Palladium or Ruthenium Corrosion Enhanced Titanium Grades With 58 ksi Minimum UTS, UNS R50400, R52400, R52402, and R52404 . . . . .	2497
Unfired Steam Boiler in Section I System . . . . .	1855
UNS J93380 (CD3MWCuN) . . . . .	2244
UNS S32202, 22Cr-2Ni-Mo-N Austenitic-Ferritic Lean Duplex Stainless Steel . . . . .	2669
UNS S32205 Plates, Bars, Seamless and Welded Pipe and Tube, Forgings, and Fittings . . . . .	2637
Use of A 213/A 213M-04 UNS S31060 Austenitic Stainless Steel Seamless Tubing and A 240/A 240M-04a1 UNS S31060 Austenitic Stainless Steel Plate . . . . .	2430
Acoustic Emission Examination in Lieu of Radiography . . . . .	1968
Appendix 23 for External Pressure Design of Copper and Copper Alloy Condenser and Heat Exchanger Tubes With Integral Fins at Elevated Temperatures . . . . .	2686
ASTM A106/A 106M-08 as SA-106/SA-106M . . . . .	2663
ASTM A414/A 414M-07 . . . . .	2619
Automated Ultrasound Leak Detection System in Lieu of Visual Inspections Required by UG-100(d) . . . . .	2324
Carbon and Low Alloy Steel Plate, AS 1548-2008 Grades PT430N/PT430NR, PT460N/PT460NR, and PT490N/ PT490NR . . . . .	2645
Existing Nameplates in Inventory for Construction . . . . .	2732
49Fe-24Ni-21Cr-6Mo-Cu-N (UNS N08367) Bolting Materials for Pressure Vessels . . . . .	2526
Friction Stir Welding (FSW) for 5052 Aluminum Alloy Bellows Expansion Joints for Pressure Vessels . . . . .	2593
Furnace Brazing for Lethal Service . . . . .	2249
Metric Units . . . . .	2523
Ni-Al Bronze C95820 Sand Castings for Pressure Vessels . . . . .	2230
Noncertificate Holders for Welding and Brazing . . . . .	2590
Noncode Pressure Relief Valves . . . . .	2675
Permanent Mold Cast Aluminum Alloys UNS A13560 and A03570 . . . . .	2239
Rod and Bar for Heads . . . . .	2155
Rod and Bar for Hollow Cylindrical-Shaped Parts Larger Than NPS 4 . . . . .	2156
SA/EN 10028-2, Grade 20MnMoNi4-5, Quenched and Tempered Steel Plate . . . . .	2748
SA/EN 10028-2, Grades P235GH and P265GH Steel . . . . .	2498
SA-193/SA-193M Grade B16 Bolting in Diameters Larger Than 7 in. (175 mm) . . . . .	2754
SA-268 Ferritic Stainless Steel Welded Tubing, TP430 Ti, UNS S43036 . . . . .	2419
SA-372 Grade E Class 55, Grade J Class 55, and Grade F, G, and H Class 55 and 65 Forgings, Quenched and Tempered . . . . .	2300
SA-705 Type 630 Forgings (UNS S17400) and SA-693 Type 630 Plate (UNS S17400) . . . . .	2223
304L Stainless Steel at Elevated Temperatures . . . . .	2224
316L Stainless Steel at Elevated Temperatures . . . . .	2577
Titanium-Clad Carbon Steel Plate in the As-Rolled Condition . . . . .	2296

Subject	Case	Subject	Case
<b>SECTION VIII, DIVISION 1</b>		<b>SECTION VIII, DIVISION 2</b>	
<b>PRESSURE VESSELS (Cont'd)</b>		<b>PRESSURE VESSELS (Cont'd)</b>	
Ultrasonic Examination in Lieu of Radiography . . . . .	2235	27Cr-7.6Ni-1Mo-2.3W-N UNS S32808 Solution Annealed Austenitic-Ferritic Duplex Stainless Steel Plate and Seamless Tubing and Pipe . . . . .	2496
UNS S32003 Stainless Steel . . . . .	2503	22Cr-5Ni-3Mo-N (UNS S31803) Use to 600°F (316°C) . . . . .	2727
UNS S38815 Stainless Steel to 800°F (427°C) . . . . .	2450	Use of	
UNS S82011 Stainless Steel . . . . .	2735	AS 1548-2008 Grades PT430N/PT430NR, PT460N/ PT460NR, PT490N/PT490NR . . . . .	2711
Vessel (Production) Impact Tests for Welded Construction of Austenitic Stainless Steels. . . . .	2704	ASTM A106/A 106M-08 as SA-106/SA-106M . . . . .	2663
Weld Joint Examination for Pneumatically Tested Pressure Vessels	1518	EN 10222-2:1999, Grade 18MnMoNi5-5, Steel Forgings. . . . .	2749
Welding of Aluminum Alloy Tube-to-Tubesheet Joints by Friction Stir Welding (FSW) Process . . . . .	2677	Fatigue Analysis Screening, Method A For Vessels Made of 1.25Cr-0.5Mo-Si and 2.25Cr-1Mo Steels. . . . .	2630
Welding of Tubes to Tubesheets by Deformation Resistance		15Cr-5Ni-3Cu (UNS S15500). . . . .	2416
Welding (DRW) Process. . . . .	2463	Metric Units . . . . .	2523
<b>SECTION VIII, DIVISION 2</b>		NF A 36-215, Grade P440 Nj4, Fine Grain Normalized Steel Plates. . . . .	2562
<b>PRESSURE VESSELS</b>		Nickel-Chromium-Molybdenum-Columbium Alloy UNS N06625 . . . . .	2468
Allowable Stresses and Design Stress Intensities for Bolting		9Ni, 8Ni, and 5Ni- $\frac{1}{4}$ Mo Materials in Welded Condition for Construction . . . . .	2681
Materials Listed in Both Tables 3 and 4 of Section II, Part D . . . .	2730	Noncertificate Holders for Welding and Brazing. . . . .	2590
Allowing Section VIII, Division 2 Design Rules to Be Used for Section VIII, Division 1 Pressure Vessel . . . . .	2695	SA/BS EN 10028-3, Grade P460NL1, Fine Grain Normalized Steel Plates . . . . .	2477
Alternative Diameter-to-Thickness Ratios for Spherical and Formed Heads With Openings . . . . .	2739	SA/EN 10028-2, Grade 13CrMoSi5-5+QT Steels . . . . .	2674
Alternative Method of Pressure Relief Device Marking . . . . .	2408	SA/EN 10028-3, Grade P355N, Fine Grain Normalized Steel Plates. . . . .	2611
Alternative Minimum Test Temperature for Hydrostatic Testing . .	2718	SA/EN 10028-3, Grade P460NL1, Fine Grain Normalized Steel Plates. . . . .	2594
Alternative Rules for Para. 4.17 When Controlled Bolting Is Used .	2659	SA-193/SA-193M Grade B16 Bolting in Diameters Larger Than 7 in. (175 mm) . . . . .	2754
Application of the ASME Certification Mark . . . . .	2714	SA-705 Type 630 Forgings (UNS S17400) and SA-693 Type 630 Plate (UNS S17400) . . . . .	2223
ASTM A841 / A 841M-98 Plate . . . . .	2130	SB-247, 6061-T6 Aluminum Alloy . . . . .	2478
Elevated Temperature Design of Bolting . . . . .	2655	SB-564 Nickel-Iron-Chromium-Molybdenum-Copper Alloy UNS N08825 Forgings . . . . .	2728
Fatigue Evaluation for SA-182 F22V, SA-336 F22V, SA-541 22V, SA-542 Type D, Class 4a, and SA-832 Grade 22V at Temperatures Greater Than 371°C (700°F) and Less Than or Equal to 454°C (850°F) . . . . .	2605	17Cr-4Ni-4Cu (UNS S17400). . . . .	2277
F-Number Grouping for Ni-Cr-Fe, Classification UNS W86152		Titanium-Clad Carbon Steel Plate in the As-Rolled Condition . .	2296
Welding Electrode . . . . .	2143	Ultrasonic Examination in Lieu of Radiography . . . . .	2235
Implementing in Parts 4 and 5 the Changes in ASCE/ SEI 7-10, Paras. 2.3.2 and 2.4.1 for Wind Load Factors. . . . .	2679	<b>SECTION VIII, DIVISION 3</b>	
Intermodal Transport Tanks (UN T50 Portable Tanks). . . . .	2624	<b>PRESSURE VESSELS</b>	
Manufacturer's Data Reports. . . . .	2738	Aluminum Alloy, UNS A96061 Temper T6 and UNS A96061 Temper T651 . . . . .	2563
Marking of Rupture Disk Devices Fully Enclosed in a Rupture Disk Holder or System . . . . .	2367	Application of the ASME Certification Mark . . . . .	2714
Method for Basing Design Values on Material Properties Affirmed by Material Manufacturers . . . . .	2556	ASTM A841/A 841M-98 <sup>e</sup> Plate . . . . .	2130
Omission of Lifting Device Requirements for Pressure Relief Valves on Air, Water Over 140°F, or Steam Service . . . . .	2203	Charpy Impact Test Specimens for SA-508 Grade 4N Classes 1 and 2 Forgings . . . . .	2280
Other Recognized Standards for Definition of Wind and Earthquake Loading in Lieu of ASCE/SEI 7 . . . . .	2680	Composite Reinforced Pressure Vessels for Gaseous H2 Service . .	2579
Precipitation-Hardening Nickel Alloy (UNS N07718) Used as Pressure Retaining Component Material . . . . .	2222	Fatigue Curves for Nonwelded Parts Having UTS Less Than 90 ksi (620 MPa). . . . .	2650
Precipitation-Hardening Ni-Cr-Mo Alloy (UNS N07725). . . . .	2217	Impulsively Loaded Pressure Vessels. . . . .	2564
SA-453, Grade 660, Class C, High Temperature Bolting Materials With Expansion Coefficients Comparable to Austenitic Steels . .	2610	Manufacturer's Data Reports. . . . .	2738
SA-736/SA-736M Plates and ASTM A859/A 859M-95 Forgings . . .	1932	Maximum Dynamic Pressure During Vented Deflagration for Vessels in Low Density Polyethylene Service . . . . .	2701
SA-765 Grade IV Forgings . . . . .	2242	Method for Basing Design Values on Material Properties Affirmed by Material Manufacturers . . . . .	2556
7% Ni Thermo-Mechanical Control Processed Steel Plate for Cryogenic Applications . . . . .	2737	Permit Testing a Single Forging to Represent Several Thicknesses .	2597
3 Chromium-1 Molybdenum- $\frac{1}{4}$ Vanadium-Columbium- Calcium Alloy Steel Plates and Forgings. . . . .	2151	Precipitation-Hardening Ni-Cr-Mo Alloy (UNS N07725). . . . .	2217
Tolerance for External Pressure Design Conditions . . . . .	2673	Recertification of Materials for Construction . . . . .	2601
Transfer of Vessel Parts From One Location to Another by Manufacturers With Multiple Locations Without Partial Data Reports. . . . .	2689	Replacement Parts for Pressure Vessels . . . . .	2678
25Cr-7Ni-4Mo-N (UNS S32750) Austenitic-Ferritic Stainless Steel .	2740	SA-705, Type XM-12, Conditions H1075, H1025, H925, and H900 Forging Materials . . . . .	2567
25Cr-22Ni-2Mo-N, UNS S31050, Austenitic Stainless Steel Forgings	2038	SA-736/SA-736M Plates and ASTM A859/A 859M-95 Forgings . . .	1932
29Cr-6.5Ni-2Mo-N Austenitic-Ferritic Stainless Steel UNS S32906 .	2295	Steel Plates Produced by Thermomechanical Control Process (TMCP) . . . . .	2451

Subject	Case	Subject	Case
<b>SECTION VIII, DIVISION 3 PRESSURE VESSELS (Cont'd)</b>		<b>SECTION IX WELDING QUALIFICATIONS (Cont'd)</b>	
Use of		63Ni-22Mo-15Cr Alloy (UNS N10362) Filler Metal	2653
ASTM A106/A 106M-08 as SA-106/SA-106M	2663	Instrumented Indentation Testing as Alternative Hardness Test for QW-290 Temper Bead Welding	2703
ASTM A514-00a Plate Material, All Grades	2515	Parallel Plate Explosion Welding for Butt Joints Between Dissimilar Metals.	2493
Chromium-Silicon Alloy Steel Wire ASTM A401/ A 401M UNS G92540	2516	Use of	
Chromium-Silicon Alloy Steel Wire ASTM A401/ A 401M-03 UNS G92540	2609	Metric Units	2523
Chromium-Silicon Alloy Steel Wire for Pressure Vessel Winding	2461	Metric Units Boiler and Pressure Vessel Code (For Case N-744, see Nuclear Components Code Cases)	N-744
EN 10025-2: 2004, Steel Name S355J2 + N (Steel Number 1.0577 + N)	2524	<b>SECTION X FIBERGLASS-REINFORCED PLASTIC PRESSURE VESSELS</b>	
High Strength Low Alloy Steel Castings	2698	Application of the ASME Certification Mark	2710
Metric Units	2523	Composite Class III Pressure Vessel Bath Cycle Testing	2743
Power Actuated Pressure Relief System for High Pressure Vessels Instead of Pressure Relief Valves or Rupture Disks	2530	Composite Class III Pressure Vessel Lower Cycle Pressure Limit	2742
Power-Actuated Pressure-Relief System for High-Pressure Vessels Instead of Pressure-Relief Valves or Rupture Disks	2561	Composite Pressure Vessel Analysis	2744
Power Actuated Pressure Relief Valve for High Pressure Vessels Instead of Pressure Relief Valves or Rupture Disks	2378	Composite Pressure Vessel Nozzle Design Change	2747
SA-182 F22V, SA-336 F22V, SA-541 22V, SA-542 Type D, Class 4a, and SA-832 22V to 850°F (454°C)	2514	Composite Pressure Vessel Pressurization Plate	2746
SA-638 Grade 660 (UNS S66286) Up to 900°F (482°C)	2700	Composite Pressure Vessels for High Pressure Fluids	2745
SA-705/SA-705M, XM-12, Condition H1025 for Yoke-Supported End Plugs	2759	Fabrication of Class I Vessels With Metallic Nozzles Not Meeting Minimum Wall Thickness Requirements	2729
SA-723/SA-723M Forgings, SA-705/SA-705M Forgings, and SA-564/SA-564M Bar for Bolting Material and Nuts	2661	Materials for Bodies, Bonnets, Yokes, Housings, and Holders of Pressure Relief Devices	1750
Welds That Are Not Ground or Machined	2592	Special Requirements for Filament-Winding Procedure Qualification (Class I Vessels)	2685
Values of Tensile Strength for SA-564 and SA-705, Grade XM-12, Condition H1100 Materials	2699	Use of	
<b>SECTION IX WELDING QUALIFICATIONS</b>		Method A as the Only Design Basis for Class II Vessels	2683
Alternative Welding Operator Performance Weld Qualification Test	2757	Metric Units	2523
F-Number Grouping for		<b>SECTION XII TRANSPORT TANKS</b>	
Cr-Fe-Ni-Mo-Cu, Classification UNS R20033 Filler Metal	2473	Alternative Method to Area Replacement Rules for Openings Under Internal Pressure	2554
Ni-Fe-Cr, Classification UNS N08087 Welding Electrode	2734	Application of the ASME Certification Mark	2710
Ni-Fe-Cr, Classification UNS N08087 Welding Filler Metal	2733	Revised Data Report Forms	2705
Ni-Cr-Fe Filler Metals	2142	Use of	
Ni-Cr-Fe, Classification UNS W86152 Welding Electrode	2143	ASTM A106/A 106M-08 as SA-106/SA-106M	2663
57Ni-30Cr-9Fe-1.8Nb Filler Metal (UNS N06043)	2660	Metric Units	2523
9Cr-1Mo-V FCAW Consumable	2297	Ultrasonic Examination in Lieu of Radiography	2235

(13) **INDEX OF MATERIAL SPECIFICATIONS REFERRED TO IN CASES**

Subject	Case	Subject	Case
<b>ASME Specification</b>		<b>ASME Specification (Cont'd)</b>	
SA-20/SA-20M .....	2451, 2642, 2674	SA-312 .....	2127, 2146, 2195, 2196, 2224, 2304, 2445, 2450, 2458, 2577, 2591, 2617, 2634, 2656, 2688, 2753
SA-105 .....	1876, 2624, 2697	SA-333 .....	2681
SA-106/SA-106M .....	1876, 2624, 2663	SA-334 Grade 8 .....	2344, 2681
SA-181 .....	1876, 2697	SA-335 .....	2179, 2180, 2199, 2327, 2353, 2440, 2630
SA-182 .....	2038, 2127, 2146, 2151, 2179, 2180, 2195, 2196, 2199, 2224, 2245, 2304, 2327, 2418, 2445, 2458, 2488, 2514, 2543, 2577, 2605, 2617, 2630, 2656, 2669, 2697, 2727, 2740	SA-335 Grades P11 and P22 .....	1876
SA-182 Grade F11 .....	1876	SA-336 .....	2151, 2327, 2514, 2577, 2605, 2630
SA-182 Grade F22 .....	1876	SA-336 Grades F22 and F22A .....	1876
SA-193/SA-193M .....	2445, 2754	SA-350 Grade LF2 .....	2606, 2624
SA-194 .....	2445	SA-351 Grade CK3MCuN .....	1750
SA-210 .....	1876	SA-352 Grade LCC .....	1750
SA-213/SA-213M .....	1876, 2127, 2146, 2179, 2180, 2196, 2199, 2224, 2304, 2327, 2328, 2353, 2450, 2458, 2512, 2540, 2577, 2581, 2591, 2598, 2630, 2639, 2656, 2687, 2688, 2723, 2724, 2752, 2753, 2755	SA-358 .....	2445, 2617
SA-216 .....	1876	SA-369 .....	2179, 2327
SA-217 .....	1876, 2192	SA-370 .....	2349, 2563, 2621
SA-234 .....	2327, 2630, 2697	SA-372 .....	2016, 2300
SA-240 .....	2127, 2146, 2195, 2196, 2197, 2224, 2245, 2295, 2304, 2345, 2418, 2427, 2445, 2450, 2458, 2488, 2496, 2503, 2534, 2543, 2546, 2577, 2582, 2603, 2617, 2620, 2621, 2634, 2643, 2656, 2669, 2688, 2696, 2707, 2708, 2722, 2724, 2727, 2735, 2740, 2758	SA-376 .....	2096, 2127, 2146
SA-240 Type/Grade 304 .....	2596	SA-387 .....	2576, 2630
SA-240 Type/Grade 304L .....	2571, 2596	SA-388 .....	2155, 2156
SA-240 Type/Grade 304N .....	2596	SA-403 .....	2146, 2195, 2196, 2224, 2304, 2315, 2445, 2450, 2577, 2617, 2634
SA-240 Type/Grade 904L .....	2546	SA-409 .....	2146, 2445, 2617
SA-240 Type 316 .....	2401, 2596	SA-414/SA-414M .....	2619
SA-240 Type 316L .....	2437, 2571, 2596	SA-420 .....	2607, 2681
SA-240 Type 316LN .....	2596	SA-423 .....	2494
SA-240 Type 316N .....	2596	SA-426 .....	2192
SA-249 .....	2146, 2195, 2224, 2304, 2445, 2450, 2458, 2577, 2617, 2654, 2656, 2688, 2724	SA-435/SA-435M .....	2621
SA-266 .....	1876	SA-450 .....	2494
SA-268 .....	2419, 2666, 2668, 2709, 2722, 2724	SA-453 .....	2610
SA-278 Class 30 .....	2329	SA-479 .....	2127, 2146, 2224, 2245, 2295, 2304, 2418, 2445, 2450, 2458, 2488, 2543, 2577, 2617, 2656, 2669
SA-278 Grades 20, 25, 30, and 35 .....	1849	SA-487 .....	2073
SA-299/SA-299M .....	2576, 2624	SA-508 .....	2151, 2489, 2630
SA-302 .....	2576	SA-508 Grade 4N, Classes 1 and 2 .....	2280
		SA-516/SA-516M .....	2296, 2576, 2624
		SA-541 .....	2151, 2514, 2605, 2630
		SA-542 .....	2514, 2605, 2630
		SA-553 .....	2736
		SA-557 .....	2313
		SA-564/SA-564M .....	2277, 2661, 2699
		SA-578 .....	2712
		SA-609/SA-609M .....	2698
		SA-612 .....	2377, 2624
		SA-638 .....	2700
		SA-645 .....	2681
		SA-688 .....	2313
		SA-693 Type 630 .....	2223, 2277
		SA-703 .....	2192, 2698
		SA-705/SA-705M Type 630 .....	2223, 2277, 2661

Subject	Case
<b>ASME Specification (Cont'd)</b>	
SA-705/SA-705M Type XM-12	2281, 2416, 2567, 2661, 2699, 2759
SA-705/SA-705M Type XM-13	2661
SA-709	2698
SA-723/SA-723M	2661
SA-736/SA-736M	1932
SA-789	2245, 2295, 2488, 2496, 2503, 2543, 2582, 2586, 2603, 2620, 2643, 2669, 2727, 2735, 2740
SA-790	2245, 2295, 2488, 2496, 2503, 2543, 2582, 2586, 2603, 2620, 2643, 2666, 2669, 2727, 2735, 2740
SA-803	2313
SA-813	2445, 2617
SA-814	2445, 2617
SA-815	2245, 2488, 2669, 2697
SA-832	2151, 2514, 2605
SA-841	2451, 2736, 2737, 2750
SA-905	2461
SA-965	2127, 2224
SA-995	2402
SA-995 Grade CD-4MCuN	1750, 2244
SA-1017/SA-1017M	2180, 2199, 2327
SA/EN 10028-2	2498, 2674, 2748
SA/EN 10028-3	2611, 2624
SB-42	2570
SB-43	2172
SB-75	2570
SB-108	2153, 2239
SB-111	2570
SB-148	2618
SB-152	2570
SB-160	2249
SB-161	2249
SB-162	2249
SB-163	1325, 1827, 2249, 2357, 2359
SB-166	1827, 2359, 2481
SB-167	1827, 2359, 2481, 2629, 2684
SB-168	1827, 2359, 2481
SB-209	2432, 2563
SB-210	2432, 2545, 2563
SB-211	2432
SB-221	2432, 2502, 2563, 2573
SB-241/SB-241M	2432, 2501, 2545, 2628
SB-247	2478, 2616
SB-249	1750
SB-265	2426, 2497, 2532, 2634
SB-308/SB-308M	2563
SB-338	2426, 2497, 2532
SB-348	2426, 2497, 2532
SB-363	2426, 2497, 2532, 2634
SB-366	1924, 2063, 2120, 2226, 2249, 2276, 2359, 2385, 2481, 2648, 2665, 2672, 2693, 2697, 2702
SB-367	1993, 2641, 2717
SB-381	2426, 2497, 2532
SB-395	2570
SB-407	1325, 2357, 2672
SB-408	1325, 2672
SB-409	1325, 2672

Subject	Case
<b>ASME Specification (Cont'd)</b>	
SB-423	1936
SB-424	1936, 2728
SB-425	1936
SB-435	2063, 2385, 2665, 2702
SB-443	1935, 2217, 2276, 2468, 2632
SB-444	1935, 2217, 2468
SB-446	1935, 2217, 2468
SB-462	2120, 2481, 2359, 2648, 2693, 2697
SB-514	2672
SB-515	1325, 2672
SB-516	2359, 2481
SB-517	2359, 2481
SB-551	2634
SB-564	1949, 2063, 2217, 2226, 2359, 2385, 2468, 2481, 2648, 2665, 2672, 2693, 2702, 2728
SB-572	2063, 2385, 2702
SB-574	1924, 2226, 2648
SB-575	1924, 2226, 2648
SB-584	2706
SB-619	1924, 2063, 2226, 2385, 2648, 2665
SB-622	1924, 2063, 2226, 2385, 2648, 2665, 2702, 2756
SB-625	2120, 2585
SB-626	1924, 2063, 2226, 2385, 2648, 2665, 2756
SB-637	1993, 2222
SB-649	2120, 2585
SB-658	2634
SB-668	1325
SB-673	2120, 2585
SB-674	2120, 2585
SB-675	2693
SB-676	2313, 2693
SB-677	2120, 2585
SB-688	2693
SB-690	2693
SB-691	2526, 2693
SB-704	1936, 2276, 2632
SB-705	2276
SB-709	1325
SB-751	1936
SB-861	2426, 2497, 2532, 2634
SB-862	2426, 2497, 2532
SB/EN 1706	2667
SD-570	2613, 2614
SFA-5.5	2192, 2514
SFA-5.8	2688
SFA-5.9	2127, 2666, 2724
SFA-5.11	2681, 2736, 2737, 2752, 2753
SFA-5.14	2581, 2653, 2660, 2736, 2737, 2752, 2753
SFA-5.23	2192, 2514
SFA-5.28	2192, 2514
SFA-5.29	2192
<b>ASTM Specification</b>	
A29	1750
A106/A 106M	2663
A108-88 Grades 1016, 1018, 1020, 1117, 1118, 1137, 1141, 1215, and 12L14	1750



<b>Subject</b>	<b>Case</b>
<b>ASTM Specification (Cont'd)</b>	
A126-84 .....	1750
A180 .....	2637
A182 .....	2637
A213/A213M .....	2430, 2639
A240/A240M .....	2430, 2636, 2637
A314-87 Type 303 .....	1750
A336/A336M .....	2179
A351 Grade CK3MCuN .....	1750
A401/A401M .....	2516, 2609
A414/A414M-07 .....	2619
A479 .....	2637
A480/A480M .....	2636
A494-87a Grade CY-40 .....	1750
A494-87a Grade CZ-100 .....	1750
A494-87a Grade M-35 .....	1750
A514-00a .....	2515
A542-95 .....	2151
A576 .....	2500
A576-87 Grades 1040, 1042, 1045, and 1117 .....	1750
A582 Types 303 and 416 .....	1750
A672-06 .....	2576
A691-98 .....	2576
A736M Grade A .....	1932
A744 Grade CK3MCuN .....	1750
A751 .....	2461
A789 .....	2637
A790 .....	2637
A815 .....	2637
A841M-95 .....	2130
A859M-95 .....	1932
A999 .....	2096
A1017/A1017M .....	2179
B16-85 .....	1750
B21-83b .....	1750
B26M-97 .....	2344
B43 .....	2172
B85-84 .....	1750
B148-93a .....	2230
B154 .....	1750
B167 .....	2652
B176-79 .....	1750
B211-88 .....	1750
B247-02a .....	2616
B248-01 .....	2404
B249-01 .....	2404
B283-86 .....	1750
B365 .....	1750
B366-81 .....	1924
B367 .....	2631
B371-84a .....	1750
B392 .....	1750
B393 .....	1750
B407 .....	2518
B441-02 .....	2404
B444-04 .....	2520
B453 .....	1750
B464 .....	2120

<b>Subject</b>	<b>Case</b>
<b>ASTM Specification (Cont'd)</b>	
B534-01 .....	2404
B557 .....	2563
B584-88 .....	1750
B673 .....	2120
B677 .....	2120
B708 .....	1750
B752 .....	2633
B858M .....	1750
D445-01 .....	2579
D1045-95(2001) .....	2579
D1652-97 .....	2579
D2196-99 .....	2579
D2290-00 .....	2579
D2343-95 .....	2579
D2344/D2344M-00e1 .....	2579
D2471-99 .....	2579
D2583-95(2001)e1 .....	2579
D2584-94 .....	2579
D3171-99 .....	2579
D3529 .....	2579
D3531 .....	2579
D4018-99(2004) .....	2579
D4349-93 .....	2411
E3 .....	2621
E45 .....	2461
E112 .....	2430, 2684
E338 .....	2563, 2684
E438 .....	2715
E602 .....	2563
E1002 .....	2324
E1475 .....	2476
E1820 .....	2127, 2698
E1921 .....	2564
E2546 .....	2703
F486-06 .....	2588
<b>AWS Specification</b>	
A5.9 .....	2473
A5.11 .....	2143, 2734
A5.14 .....	2142, 2733
A5.29 .....	2297
<b>International Specification</b>	
AS 1548 .....	2645, 2711
BS EN1706 .....	2382, 2483
BS EN10028-3 .....	2477
BS EN12164 .....	1750
BS EN12165 .....	1750
EN 515 .....	2627
EN 573-3 .....	2627
EN 755-1 .....	2627
EN 10002-1 .....	2627
EN 10025-2 .....	2524, 2720
EN 10028-3: 2003 .....	2594, 2624
EN 10088-2 .....	2719
EN 10204 .....	2524
EN 10217-1 .....	2721
EN 10222 .....	2749
GB 713 .....	2642
UNI 9006-1 .....	2627

— CUMULATIVE INDEX — INTERPRETATIONS VOLS. 12-

Subject	Case
<b>CHARTS FOR VESSELS UNDER EXTERNAL PRESSURE</b>	
Figs 1/1M Chart for Determining Shell Thickness of Components Under External Pressure Developed for Ni-23Cr-7W, UNS N06674 .....	2684
Figs 1/1M Chart for Determining Shell Thickness of Components Under External Pressure Developed for Titanium Grade 38 .....	2532
Figs 1/1M Chart for Determining Shell Thickness of Components Under External Pressure Developed for Titanium Grade 38, Ti 4Al-2.5V-1.5Fe .....	2717
Fig 1 Chart for Determining Shell Thickness of Components Under External Pressure When Constructed of Alloy C17510 .....	2404
Figs 1/1M Chart for Determining Shell Thickness of Components Under External Pressure When Constructed of Alloy UNS S31060 .....	2430

Subject	Case
<b>CHARTS FOR VESSELS UNDER EXTERNAL PRESSURE (Cont'd)</b>	
Figs 1/1M Chart for Determining Shell Thickness of Components Under External Pressure When Constructed of Alloy UNS S31277 .....	2458
Fig 1 Chart for Determining Shell Thickness of Cylindrical and Spherical Vessels Under External Pressure When Constructed of Austenitic Stainless Steel UNS S34565 ..	2146
Figs 1/1M External Pressure Chart .....	2497
Figs 1/1M External Pressure Chart for 2 <sup>1</sup> / <sub>4</sub> Cr-1Mo Steel Annealed at 1000°F/538°C .....	2676
Figs 1/1M External Pressure Chart for Stainless Steel Alloy UNS S30815 at 1650°F (900°C) .....	2682
Figs 1/1M External Pressure Chart Up To 1800°F/982°C .....	2671