ASME PVHO-2–2012
[Revision of ASME PVHO-2–2003 (R2008)]

Safety Standard for Pressure Vessels for Human Occupancy: In-Service Guidelines

AN AMERICAN NATIONAL STANDARD

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The American Society of Mechanical Engineers

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The next edition of this Standard is scheduled for publication in 2015.

ASME issues written replies to inquiries concerning interpretations of technical aspects of this Standard. Periodically certain actions of the ASME PVHO Committee may be published as Cases. Cases and interpretations are published on the ASME Web site under the Committee Pages at http://cstools.asme.org/ as they are issued.

Errata to codes and standards may be posted on the ASME Web site under the Committee Pages to provide corrections to incorrectly published items, or to correct typographical or grammatical errors in codes and standards. Such errata shall be used on the date posted.

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FOREWORD

In 1998 a PVHO Task Group was formed to investigate the need for In-Service Rules and Guidelines for Pressure Vessels for Human Occupancy. Simultaneously, a Sub Task Group was formed to investigate the issue of acrylic window design life versus service life. The design life is based on the PVHO window being exposed to the maximum allowable working pressure (MAWP), at the maximum rated temperature, for the maximum number of (design) cycles, in an outdoor weathering environment. The majority of PVHOs are not operated to such extremes, and service life may indeed be longer than design life. Conversely, if a window is not properly cared for (i.e., becomes exposed, either operationally or nonoperationally, to other detrimental factors that are not, and cannot be, factored into the design life), then the actual service life could be much shorter than the design life. Thus, the recommendation was made that design life and service life be addressed as two different subjects. In 1999 the In-Service Task Group became a PVHO subcommittee, with the most immediate task being the establishment of in-service criteria for PVHO windows and viewports.

This Standard provides the necessary in-service criteria to supplement Section 2, Viewports, of ASME PVHO-1, which applies to new construction only. By comparison, this Standard applies to all PVHO-1 acrylic windows, regardless of their date of manufacture. This Standard consists of both Technical Criteria and Guidelines. They are intended to provide guidance to the User and/or the Jurisdictional Authority in regard to the establishment of potential Service Life, and the necessary care, inspection, and repair during that Service Life—depending on the actual service conditions to which the PVHO and windows have been, or will be, exposed.

Finally, this Standard was prepared as a "stand-alone" document. All Forms additional to those normally supplied with the window in accordance with PVHO-1, which may be necessary throughout the service life of the window, are provided herein. Similarly, all necessary PVHO-1 technical data applicable to service and repair (if required) are also provided in this Standard.

The 2012 Edition of PVHO-2 has been completely reorganized and expanded to include sections covering PVHOs and PVHO systems to bring it in line with the outline of the PVHO-1 standard. In this Edition, the requirements have been grouped into two sections: Section 1, General, covering requirements relevant to all PVHOs and PVHO systems; and Section 2, Viewports, covering requirements specific to acrylic windows.

The previous edition of this Standard was issued in 2003 and reaffirmed in 2008. The 2012 Edition of this Standard was approved as an American National Standard on December 22, 2012.

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CORRESPONDENCE WITH THE PVHO COMMITTEE

General. ASME Standards are developed and maintained with the intent to represent the consensus of concerned interests. As such, users of this Standard may interact with the Committee by requesting interpretations, proposing revisions, proposing PVHO cases, and attending Committee meetings. Correspondence should be addressed to:

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

Proposing Revisions. Revisions are made periodically to the Standard to incorporate changes that appear necessary or desirable, as demonstrated by the experience gained from the application of the Standard. Approved revisions will be published periodically.

The Committee welcomes proposals for revisions to this Standard. Such proposals should be as specific as possible, citing the paragraph number(s), the proposed wording, and a detailed description of the reasons for the proposal, including any pertinent documentation.

Interpretations. Upon request, the PVHO Standards Committee will render an interpretation of any requirement of the Standard. Interpretations can only be rendered in response to a written request sent to the Secretary of the PVHO Standards Committee.

The request for interpretation should be clear and unambiguous. It is further recommended that the inquirer submit his/her request in the following format:

Subject:	Cite the applicable paragraph number(s) and the topic of the inquiry.
Edition:	Cite the applicable edition of the Standard for which the interpretation is being requested.
Question:	Phrase the question as a request for an interpretation of a specific requirement suitable for general understanding and use, not as a request for an approval of a proprietary design or situation. The inquirer may also include any plans or drawings that are necessary to explain the question; however, they should not contain proprietary names or information.

Requests that are not in this format will be rewritten in this format by the Committee prior to being answered, which may inadvertently change the intent of the original request. ASME procedures provide for reconsideration of any interpretation when or if additional information that might affect an interpretation is available. Further, persons aggrieved by an interpretation may appeal to the cognizant ASME Committee or Subcommittee. ASME does not "approve," "certify," "rate," or "endorse" any item, construction, proprietary device, or activity.

PVHO Cases. The ASME PVHO Committee issues Cases. Although PVHO Cases do not constitute formal revisions of the Standard, they may be used as representing considered opinions of the PVHO Committee. Once approved, Cases are posted on the ASME PVHO Committee Web page at http://cstools.asme.org/ and are subsequently published with the next edition of this Standard. PVHO Cases are not part of the Standard and are included for information only following the nonmandatory appendices.

Requests for PVHO Cases shall provide the following:

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

(b) Background Information. Provide background information to support the revision(s) or addition(s) 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(s) or addition(s). Sketches, tables, figures, and graphs should be submitted as appropriate. When applicable, identify any pertinent paragraphs in the standard that would be affected by the revision(s) or addition(s) and paragraphs in the standard that reference the paragraphs that are to be revised or added. Furthermore, the proposed Case should be written as a question and a reply in the same format as existing Cases. Requests for PVHO Cases should also indicate the applicable edition to which the proposed Case applies.

Errata. ASME issues errata (corrections to errors introduced in the Standard during the publishing process; e.g., typographical errors, misspellings, grammatical errors, incorrect publication of revisions). Once approved, errata are posted on the ASME PVHO Committee Web page at http://cstools.asme.org/ and are subsequently published with the next edition of the Standard.

Attending Committee Meetings. The PVHO Standards Committee regularly holds meetings, which are open to the public. Persons wishing to attend any meeting should contact the Secretary of the PVHO Standards Committee.

ASME PVHO-2–2012
SUMMARY OF CHANGES

Following approval by the PVHO Committee and ASME, and after public review, ASME PVHO-2–2012 was approved by the American National Standards Institute on December 22, 2012.

ASME PVHO-2–2012 has been revised in its entirety.

SPECIAL NOTE:

The Cases to PVHO-2 follow the last page of this Edition. However, they are not part of the Standard itself.

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SAFETY STANDARD FOR PRESSURE VESSELS FOR HUMAN OCCUPANCY: IN-SERVICE GUIDELINES

Section 1
General

1-1 INTRODUCTION AND SCOPE

(a) This Standard provides technical requirements and guidelines for the operation and maintenance of PVHOs and PVHO systems that were designed, constructed, tested, and certified in accordance with ASME PVHO-1, Safety Standard for Pressure Vessels for Human Occupancy.

(b) This Standard provides technical criteria for the user to establish the serviceability of a PVHO acrylic window under its specific environmental service conditions. Windows in protected environments as well as those in severe environments are addressed. Judicious use of this Standard will allow the user and/or the jurisdictional authority to determine when a PVHO acrylic window requires replacement.

1-2 RESPONSIBILITIES AND JURISDICTIONAL CONSIDERATIONS

1-2.1 User's Responsibilities

The PVHO and PVHO systems user shall provide the designer with information regarding the service conditions that the PVHO and PVHO systems may encounter during their service life. The user shall protect the PVHO and its systems from hazards, and ensure they are used within their design limitations. It is the user, and not the designer or fabricator, who is responsible for determining the safe service life in accordance with the technical criteria and guidelines herein. The user is responsible for retaining all documentation for each PVHO and its associated systems, and shall establish a program of periodic inspection to determine the need for repair or replacement of any part, in accordance with the requirements listed in this Standard. For window repair and replacement requirements, refer to Section 2, Viewports.

1-2.2 Jurisdictional Considerations

The operation of each PVHO is typically governed under specific rules of the jurisdiction in which it is operated. (Examples include, but are not necessarily limited to, the state, the Food and Drug Administration, and the U.S. Coast Guard.) This Safety Standard is intended to complement the jurisdictional requirements (i.e., to provide guidance to both users and jurisdictional authorities in regard to in-service requirements for the PVHO, acrylic windows, and PVHO systems). The responsibility for compliance with jurisdictional in-service requirements, which may become invoked as a result of the technical criteria and guidelines as set forth herein, lies with the user.

1-3 IN-SERVICE EVALUATIONS, REPAIRS, AND MODIFICATION OF PVHOs

1-3.1 PVHO Windows and Viewports

The owner shall be responsible for ensuring that in-service viewport evaluations, window replacements, and inspections are performed in accordance with this Standard.

(a) PVHO acrylic windows shall be evaluated and, if necessary, repaired per subsections 2-4 through 2-6 of this Standard.

(b) The service life of acrylic windows shall be determined in accordance with para. 2-4.3 and subsection 2-7 of this Standard.

(c) Replacement windows shall meet PVHO design requirements for the viewport.

(d) Viewports in which PVHO acrylic windows are installed shall be evaluated and, if necessary, refurbished per subsection 2-4 of this Standard.

1-3.2 Pressure Boundary (Except for Windows)

When evidence of a flaw is detected or a modification of a PVHO pressure boundary is planned, the owner shall be responsible for ensuring that the PVHO is evaluated and repaired, replaced, or modified in accordance with the requirements of this Standard, applicable codes, and appropriate jurisdictional authorities.

(a) In-service flaw evaluation techniques, such as nondestructive examination, shall be applied to assess