

ASME PVHO-2–2019
(Revision of ASME PVHO-2–2016)

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

AN AMERICAN NATIONAL STANDARD



**The American Society of
Mechanical Engineers**



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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 ASME 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 ASME PVHO-1, which may be necessary throughout the service life of the window, are provided herein. Similarly, all necessary ASME PVHO-1 technical data applicable to service and repair (if required) are also provided in this Standard.

The 2019 edition of ASME PVHO-2 further develops and clarifies the in-service guidelines for PVHOs. The requirements for in-service pressure testing gauge calibration have been updated. Nonmandatory Appendix A, covering checklists and logs for PVHO operation, has been deleted, and the text under this appendix has been integrated into the general requirements of Section 1. New testing criteria for increasing the 40,000-hr design life of acrylic windows have been incorporated under Section 2. Additionally, new forms have been added, and some of the existing forms have been updated.

Sections on the following topics are in development and may be included in future editions: quality assurance for PVHO manufacturers, piping systems, medical hyperbaric systems, diving systems, and submersibles.

Previous editions of this Standard were issued in 2003, 2012, and 2016. The 2019 edition of this Standard was approved by the American National Standards Institute as an American National Standard on December 4, 2019.

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Secretary, PVHO Standards Committee
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<http://go.asme.org/Inquiry>

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.

Proposing a Case. Cases may be issued to provide alternative rules when justified, to permit early implementation of an approved revision when the need is urgent, or to provide rules not covered by existing provisions. Cases are effective immediately upon ASME approval and shall be posted on the ASME Committee web page.

Requests for Cases shall provide a Statement of Need and Background Information. The request should identify the Standard and the paragraph, figure, or table number(s), and be written as a Question and Reply in the same format as existing Cases. Requests for Cases should also indicate the applicable edition(s) of the Standard to which the proposed Case applies.

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.

Requests for interpretation should preferably be submitted through the online Interpretation Submittal Form. The form is accessible at <http://go.asme.org/InterpretationRequest>. Upon submittal of the form, the Inquirer will receive an automatic e-mail confirming receipt.

If the Inquirer is unable to use the online form, he/she may mail the request to the Secretary of the PVHO Standards Committee at the above address. The request for an 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 in one or two words.
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. Please provide a condensed and precise question, composed in such a way that a "yes" or "no" reply is acceptable.
Proposed Reply(ies):	Provide a proposed reply(ies) in the form of "Yes" or "No," with explanation as needed. If entering replies to more than one question, please number the questions and replies.
Background Information:	Provide the Committee with any background information that will assist the Committee in understanding the inquiry. 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 the format described above may be rewritten in the appropriate format by the Committee prior to being answered, which may inadvertently change the intent of the original request.

Moreover, ASME does not act as a consultant for specific engineering problems or for the general application or understanding of the Standard requirements. If, based on the inquiry information submitted, it is the opinion of the Committee that the Inquirer should seek assistance, the inquiry will be returned with the recommendation that such assistance be obtained.

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.

Attending Committee Meetings. The PVHO Standards Committee regularly holds meetings and/or telephone conferences that are open to the public. Persons wishing to attend any meeting and/or telephone conference should contact the Secretary of the PVHO Standards Committee.

ASME PVHO-2-2019

SUMMARY OF CHANGES

Following approval by the ASME PVHO Committee and ASME, and after public review, ASME PVHO-2-2019 was approved by the American National Standards Institute on December 4, 2019.

ASME PVHO-2-2019 includes the following changes identified by a margin note, **(19)**.

<i>Page</i>	<i>Location</i>	<i>Change</i>
2	1-3.4	Added
3	1-7	Added, from former Nonmandatory Appendix A
6	2-2.4	Revised
7	2-4.3	Last paragraph revised
8	2-4.8	Last sentence revised
11	2-6.8	Subparagraph (a) revised
13	2-8	Added
15	Table 2-4.1.1-1	(1) Title revised (2) General Note (g) added
17	Table 2-4.1.1-2	(1) Title revised (2) General Note (g) added
18	Table 2-4.1.1-3	(1) Title revised (2) General Note (c) added
19	Form VM-1	Former Form VP-1 redesignated, and “Window service life expended” line deleted
20	Form VM-2	Former Form VP-2 revised in its entirety
22	Form VM-3	Former Form VP-3 revised in its entirety
23	Form VT-1	Added
36	Form IV-1-2	“Window markings” line added
37	Form IV-5-1	“Window Identification” line replaced with “Window markings” line
40	VI-6	First value in third paragraph revised
41	Table VI-6-1	Title revised
42	Form VI-1	(1) Title revised (2) “Window markings” line added (3) “Test specimens are original submittal” line deleted
43	Form VI-2	Revised in its entirety
44	Nonmandatory Appendix A	Text moved to subsection 1-7

SPECIAL NOTE: ASME PVHO-2 Cases are no longer published with the edition.

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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 U.S. 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 autho-

rities 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 In-Service PVHO Evaluation and Testing

The owner shall be responsible for performing periodic pressure testing of the PVHO pressure boundary, pressurized systems, and PVHO operational systems. Test pressures shall be at maximum operating pressure and not exceed the maximum allowable working pressure of the components/systems being tested. These tests shall be performed and documented at a periodicity established by the user, manufacturer, and/or applicable jurisdiction.

Pressure testing shall be performed on any valve, fitting, and/or piping/tubing that penetrate the PVHO pressure boundary following reassembly or replacement. The test boundary shall include the first stop valve both upstream and downstream of the reassembled or replaced component.

Pressure testing after pressure vessel or piping weld repairs shall be a hydrostatic or pneumatic test and shall follow the applicable pressure vessel or system component code or standard.

New pressure boundary components (i.e., valve, piping, and windows) shall be hydrostatically or pneumatically tested in accordance with the applicable pressure vessel or system component code or standard.

1-3.2 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. 2-4.4](#) 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.

1-3.3 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 non-destructive examination, shall be applied to assess the potential impact to the structural integrity against the PVHO's original design specification and code. Alternatively, the PVHO can be evaluated to the current code provided it is applied to the entire PVHO.

(1) PVHOs designed, fabricated, and tested to ASME Boiler and Pressure Vessel Code (BPVC), Section VIII, or certified to ASME PVHO-1 alternative design rules, that show signs of flaws or damage may be evaluated using API 579-1/ASME FFS-1.

(2) PVHOs that are designed and fabricated to ASME PVHO-1 Code Cases shall be evaluated and repaired in accordance with requirements stated in the case.

(b) Pressure boundary repairs shall include a plan and repair and test procedures consistent with the applicable code. Repairs that do not bring the PVHO to the original "as designed" condition are considered a modification.

(1) For PVHOs stamped per ASME BPVC, Section VIII, the National Board Inspection Code (ANSI/NBBI NB-23) provides applicable weld repair and modification procedures.

(2) All other repairs shall be certified by a qualified Professional Engineer or Authorized Inspector to be in compliance with this Standard and applicable code(s).

(c) Pressure boundary modifications shall be performed in accordance with the most recent code regardless of the original year of fabrication. A Professional Engineer shall be responsible for the modification design and compliance with applicable code requirements.

(d) All pressure boundary parts that are replaced shall meet original manufacturer specifications.

(e) All repair, replacement, and modification documentation shall be maintained per [subsection 1-4](#), PVHO and PVHO Systems Documentation.

1-3.4 Pressure Gauge Calibration

(19)

Except where the jurisdictional authority requirements are specified, primary gauges that indicate system and chamber pressures or applicable system and diver depths shall be deadweight tested (or calibrated against a master reference gauge) every 12 months (± 30 days) or whenever there is a discrepancy greater than 2% of full scale between any two equivalent gauges.

1-4 PVHO AND PVHO SYSTEMS DOCUMENTATION

The owner shall be responsible for maintaining the following documentation for the service life of PVHOs and PVHO systems:

(a) documentation required by ASME PVHO-1, Section 1, General Requirements

(b) documentation generated during inspection, maintenance, repairs, and modifications

(c) documentation related to operational procedures and manuals

1-5 OWNER'S MANUAL

1-5.1 General

An Owner's Manual is required for each PVHO. It shall contain adequate information to safely operate and maintain the PVHO, its systems, and associated equipment. The owner shall be responsible for maintaining the manual.

1-5.2 Component Description

The Owner's Manual shall include the following:

(a) operating procedures that provide sufficient information to operate the equipment in a safe manner, including

(1) an overview of the PVHO and its systems

(2) procedures to operate the PVHO and its systems

(3) emergency procedures

(b) engineering drawings and schematics necessary for the operation and maintenance of PVHO systems.

(c) systems description that includes an overview and functional description of each system.

(d) equipment documentation that includes electrical and mechanical system descriptions, maintenance requirements, and operating instructions for components and equipment used. This may include collection of vendor-supplied data; supplier-recommended maintenance procedures; and designer-, fabricator-, or manufacturer-supplied data.

The manual shall be kept current, documenting system changes, equipment updates, and the addition or deletion of procedures, and including vendor-supplied documentation, and shall meet or exceed the requirements of applicable jurisdictional authorities.

1-5.3 Storage of Equipment

Documentation shall define storage requirements for the PVHO, its systems and subsystems, and associated equipment. Information to be provided shall include, but not be limited to

- (a) maximum and minimum temperature limits
- (b) maximum storage time limits, if applicable, for equipment, including windows, batteries, and nonmetallic materials
- (c) preservation requirements
- (d) for gas storage and hydraulic systems, purging requirements and pressure settings
- (e) special considerations for battery systems
- (f) maintenance requirements
- (g) reactivation considerations

1-6 MAINTENANCE REQUIREMENTS

Paragraph 1-6.1 outlines requirements for the in-service maintenance of the PVHO and its support systems.

1-6.1 General

It is the responsibility of the owner/operator to maintain a maintenance program for each PVHO. A maintenance program provides a formal approach to maintaining the PVHO and its support systems. The maintenance program shall be supported by a maintenance manual that organizes, defines, and formalizes the maintenance and inspection procedures required. The maintenance program shall be designed to allow updates and the addition or deletion of maintenance and inspection procedures. In addition to maintenance and inspection procedures generated by the PVHO designer, fabricator, owner, or operator, or any combination thereof, the program should rely on vendor-supplied documentation. The program shall be designed to meet or exceed the requirements of applicable jurisdictional authorities.

(19) 1-7 CHECKLISTS AND LOGS

Documented checklists, operating logs, and maintenance logs are an essential part of the safe operation of a PVHO.

All components, systems, subsystems, monitors, sensors, etc., of a PVHO shall be demonstrated, and documented, to be functioning in a safe and acceptable manner prior to operating a PVHO.

There are many different types of PVHOs including, but not limited to, diving bells, manned submersibles, saturation systems, and medical chambers. Each type and/or design will have unique operational characteristics and parameters requiring specific checklists, operating logs, maintenance logs, and record keeping.

It is the responsibility of the owner/operator to ensure that adequate checklists, operating logs, and maintenance logs are completed before, during, and following each operation of a PVHO.

No checklists or logs, other than those required by an operator located inside the PVHO, are to remain inside the PVHO during operations.

All checklists and logs shall be completed by a qualified person(s). All checklists and logs must be completely filled out, signed, and dated by the person(s) who completed the task.

1-7.1 Checklists

Before commencing operations, all preoperation checklists, including those for support equipment, shall be reviewed, signed, and dated by the person responsible for the operation of the PVHO, thereby confirming the PVHO and its support equipment are acceptable for the anticipated operational activities.

1-7.1.1 Preoperation Checklists. These are detailed list(s) of systems, subsystems, components, support equipment, control systems, monitors, and indicator systems, both internal and external, that shall be checked for proper function prior to commencing a PVHO operation.

Where applicable, measured values such as, but not limited to, quantities of supplies, including high-pressure air, breathing gases, battery status, consumables, etc., shall be recorded.

1-7.1.2 Post-Operation Checklists. These are detailed list(s) of systems, subsystems, components, support equipment, control systems, monitors, and indicator system that shall be checked at the conclusion of an operation.

1-7.1.3 Prestorage Checklists. If the PVHO is to be shut down for an extended period of time, a detailed checklist shall be prepared to cover storage requirements including items that can be adversely affected during storage.

1-7.2 Operating Logs

This log is a record of the status of systems, subsystems, monitors, sensors, gas supplies, temperatures, and other vital information, including significant communications and events, prior to, during, and upon completion of each operation of a PVHO. The time associated with each entry shall be recorded.

Each cycle of a PVHO shall be recorded, along with the maximum pressure or depth attained, to monitor the number of cycles on the PVHO pressure boundary, its viewports, and its components.

Any discrepancies affecting safety shall be documented on the operating log and appropriate corrective action(s) undertaken.

The status of the PVHO's normal and emergency life-support systems shall be documented at the beginning of, during, and upon completion of each operation.

1-7.3 Maintenance Logs

This log(s) constitute a record of all repairs, modifications, changes of equipment, equipment removal, or any other routine or nonroutine maintenance performed on the PVHO and support equipment.

This log is a valuable source of information in determining the history and frequency of repairs to any given system over the operational life of a PVHO. For these reasons, it is important to take the time required to fully describe any and all work done on the PVHO or its support equipment in this log.

Each entry shall be signed and dated by the person performing the work.

Section 2

Viewports

2-1 RESPONSIBILITIES

2-1.1 Window Designer's Responsibility

It is the window designer's responsibility to determine the window design requirements. The window designer shall define manufacturing tolerances and shall certify (by completing the applicable ASME PVHO-1 window design certification form) that the window design complies with the requirements of Section 2 of ASME PVHO-1.

2-1.2 Window Fabricator's Responsibility

The window fabricator shall manufacture the window in accordance with the designer's drawings and specifications and ASME PVHO-1. The fabricator shall be responsible for completion of all ASME PVHO-1 certification forms applicable to the manufacture, and shall comply with the data retention requirements of ASME PVHO-1.

2-1.3 Window User's Responsibility

The window user shall provide the designer with information regarding the service conditions that the window may encounter during its service life. The user shall protect the window from service life hazards, and ensure that the window is used within its 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 window and shall establish a program of periodic window inspection to determine the need for repair or replacement in accordance with [subsections 2-4 through 2-6](#).

2-1.4 Quality Assurance

The specific rules governing the window fabricator quality program during original window manufacture are detailed in ASME PVHO-1. Quality assurance of the window in-service is no less important. The user is responsible for

- (a) retaining all original forms
- (b) implementing a formal in-service window inspection program
- (c) retaining all maintenance inspection forms and all window repair forms, as applicable, throughout each window's service life

Repair of severely damaged windows shall be performed by a PVHO-1-Qualified Window Fabricator in accordance with the requirements of [Mandatory Appendix III](#).

2-2 FACTORS AFFECTING SERVICE LIFE

2-2.1 General

Temperature extremes and exposure to UV light, X-rays, and many chemicals are all detrimental to the longevity of windows. Specific attention should be given to limiting the window's exposure to detrimental environmental factors wherever possible.

2-2.2 Physical Abuse Factors

Physical abuse from dropping, impacts with foreign objects, excessive heat from lights, or scratches from cleaning with too coarse a cleaning cloth¹ are all damaging to windows.

Windows should be either removed or adequately protected prior to grit blasting and coating of the chamber surface near the window.

2-2.3 Temperature Abuse Factors

2-2.3.1 Heat Sources. External heat sources (e.g., lightning) shall NOT come in contact with or otherwise heat the surface of a window in excess of its maximum design temperature while pressurized.

Under no circumstances, including storage, should an acrylic window be exposed to temperatures in excess of 150°F (65°C).

2-2.3.2 Improper Operation of Lighting Equipment. Where applicable, light pipes shall not be operated with light bulbs of a wattage greater than the rated capacity of the lighting system, faulty temperature sensors, or an inoperative or disabled cooling fan. Under no circumstances shall the surface of the acrylic, due to the use of a lighting system, be permitted to exceed the window's maximum temperature rating.

¹ This can include use of some common paper towels.

(19) 2-2.4 Chemical Abuse Factors

It is the user's responsibility to confirm that any liquid, cleaning solution, vapor, or polish that comes in contact with the window will not cause damage to the acrylic. The user should review the Safety Data Sheet (SDS/MSDS) and [Mandatory Appendix V](#) for a partial list of harmful substances and acceptable products.

ASTM F484 can be used to assess the potential of any material to cause crazing in acrylic.

2-2.5 Radiation Exposure

PVHO acrylic material can be severely damaged by long-term exposure to UV radiation and X-rays. As UV radiation primarily affects the surface and does not penetrate deeply into the plastic, the designer and/or user may want to consider using separate acrylic covers to protect the window surface by absorbing most of the UV radiation before it reaches the window installed in the PVHO. A minimum thickness of 0.25 in. (6 mm) is recommended. Such covers, however, are not effective against X-rays, which will penetrate not only the cover but also the entire body of the PVHO window.

2-2.6 Cycles as Related to Above Factors

The user should also be aware that subjecting the window to a high number of pressure cycles (or extended sustained pressurizations) at or near the maximum design pressure also affects the window's service life. That is, stressors are both pressure and environment related, with cumulative effect.

2-2.7 Additional Service Factors

Water adsorption (and/or the repeated wetting and drying) of acrylic plastic can be detrimental to the physical properties at the surfaces of the windows.

2-3 HANDLING OF PVHO WINDOWS

The following general provisions apply to the handling of PVHO windows:

- (a) Always use care in handling the windows.
- (b) Do not use solvents when cleaning the windows.
- (c) Do not expose the windows to solvent-based paints or thinners.
- (d) Do not expose the windows to temperatures above 150°F (65°C).
- (e) Do not expose the windows to high radiation (above 4 Mrad).
- (f) Minimize exposure to sunlight and other UV light sources.
- (g) Inspect windows before every operation.
- (h) Use only the gasket, seal, and/or O-ring size and material specified on drawings.

(i) Ensure seals and gaskets are properly installed using adhesive sealants or lubricants compatible with acrylic window material.

(j) Do not operate the windows at temperatures or pressures above the design temperature or design pressure.

(k) Keep a protective cover on windows whenever possible.

(l) Never overtorque the window-retaining fasteners.

2-3.1 Cleaning and Polishing

2-3.1.1 Correct Methods. Windows may be cleaned to restore optical quality or clarity as the need arises. The window should only be wiped with a soft rag or cloth (or a very soft type of paper towel) wetted with warm water and an acceptable cleaning agent. As any use of power tools requires annealing, cleaning and/or polishing by hand is the only acceptable in-service method.

The recommended agent to clean windows is a detergent in solution in warm water not exceeding 120°F (49°C). Aliphatic naphtha or hexane are also acceptable, but only if the temperature of the window surface does not exceed 100°F (38°C).

After cleaning, window surfaces may be polished with compounds specifically endorsed by the manufacturer for polishing of acrylic. These compounds are also used for removing small scratches from the surface. See [Mandatory Appendix V](#) for a partial listing of acceptable cleaning products and polishing compounds.

2-3.1.2 Incorrect Methods. Solvents shall not be used for cleaning windows. If solvents are used on the seats, extreme care shall be taken to ensure that drying/evaporation of the solvent is complete prior to window installation. [Mandatory Appendix V](#) provides a list of harmful substances.

Power polishing shall not be performed unless the window is subsequently annealed and pressure tested, per the requirements set forth in [Mandatory Appendix IV](#).

2-3.2 Window Storage

An unused acrylic window may be stored for up to 10 yr from the date of fabrication without the storage time counting toward the service life, provided the storage conditions meet the following requirements:

- (a) The window is stored at a temperature not exceeding 125°F (52°C).
- (b) The window is protected from exposure to direct or indirect sunlight.
- (c) The window is protected from wetting and drying.
- (d) The window is protected from exposure to harmful chemicals (both liquid and gaseous).
- (e) Windows shall be stored flat and shall not be stacked; that is, they shall not be stored resting on their edges, or with any weight bearing on them.