Monthly Safety Notice

December 2019 National Baromedical Services, Inc.

Acrylic Inspection and Maintenance

Background

PVHO-2-2012 is a technical standard that provides requirements and guidelines for operation and maintenance of Pressure Vessels for Human Occupancy (PVHO) designed, constructed, tested, and certified in accordance with American Society Mechanical Engineers (ASME) PVHO-1-2012 Safety Standard for PVHO. This standard provides technical criteria to establish service ability of a PVHO acrylic window under specific environmental requirements.

The Issue

By definition in hyperbaric chamber design, a window is the monoplace chamber tube and the view port(s) in a multiplace chamber. This standard provides information on acrylic window "Design Life" and "Service Life". Design life is the forecasted life expectancy of a product (in this case a chamber window) based upon original design criteria. Service life is the forecasted actual life expectancy based on real world use. Design life of the window is whichever comes first between 10 years, 10,000 chamber cycles or 40,000 hours. When fully incorporated, this standard's inspection guidelines serve to extend service life up to an additional 10 years or additional 10,000 cycles, providing "Life Extension Viewport Inspection" occurs on or before the end of the design life (10 years or 10,000 cycles). Maintenance viewport inspections (MVIs) must also be completed at regularly suggested intervals (every 18-24 months).

The standard lists two levels of inspections. One is an Operational Viewport Inspection (OVI), the other a MVI. OVI requires viewport visual inspection prior to the first pressurization if pressurized more than once per day. MVIs must be performed every 24 to 36 months for windows that have not reached design life, and 18 to 24 months for windows greater than design life. Sechrist Industries now offers PVHO-2 Ten (10) Year Life Extension Viewport Inspection and Maintenance Viewport Inspection (MVI). Ten (10) Year Life Extension Viewport Inspection involves complete mapping and documentation of the cylinder as well as inspection of seat and seal, and includes repair and refinishing of scratches. Maintenance Viewport Inspection (MVI) involves repair and refinishing of scratches on acrylic cylinder.

Bottom Line

In order to ensure that the chamber's acrylic components remain in a safe and compliant state, the chamber team, under the direction of the Hyperbaric Safety Director, must adhere to its daily inspection schedule. Any signs of damage or deterioration must be documented and reported and every effort should be made to determine their cause. Strategies to prevent a recurrence of identified causes should be introduced. Attempts to repair minor damage by polishing and buffing should only be undertaken by trained hyperbaric personnel. More significant damage should be reported to the chamber manufacturer and likely result in a visit by their technical representative.

Acrylic inspection underway