



REBREATHERS



BIOMARINE INC., A WHOLLY OWNED SUBSIDIARY OF NEUTRONICS INC.

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BioPak 240R Oxygen Cylinder Hydro-Testing Guidelines

Purpose: This guideline is intended to provide end users with procedures for the hydro-testing of BioPak 240R oxygen cylinders that have eclipsed their period of service between tests. End users should follow these guidelines to prevent out of warranty damage to the cylinder or cylinder valve.

This guideline applies to the following cylinders:

Bodok-Sealed Type Part Number	Description	O-Ring Sealed Type Part Number
B6-02-5001-98-0	Green, Empty	B6-02-5003-73-0
B6-02-5002-98-1	Green, Full	B6-02-5003-73-1
B6-02-5003-06-0	Black/White, Empty	B6-02-5003-74-0
B6-02-5002-06-1	Black/White, Full	B6-02-5003-74-1

Determination of Hydro-Test Need

Each oxygen cylinder will be labeled with the original date of manufacture or with an added-on label that indicates that last date of hydro-testing. Oxygen cylinders must be hydro-tested after 5-years of either the original manufacturing date or the last date of hydro-testing (or tested according to National Standards). The Biomarine website provides a document that depicts a sample label and how to read the oxygen cylinder label at:

<http://biopak240r.com/wp-content/uploads/2015/12/CarletonTechnologiesPressureTechnologyDivisionManufacturesComposite.pdf>

If at any time the end user is confused or needs consultation concerning oxygen cylinder hydro-testing, they should immediately contact their local Biomarine distributor or Biomarine directly for assistance.

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Hydro-Testing

Hydro-testing must be performed by an authorized and approved facility (authorized and approved as per National requirements) and should not be attempted by end users in the field. If an authorized and approved facility cannot be located it is strongly advised to contact Biomarine for hydro-testing services.

1. Readyng the Cylinder for Hydro-Testing

- Vent the oxygen cylinder of any internal pressure. Venting can be achieved by anchoring the cylinder either in the BioPak itself or in a suitable cylinder holding device and slowly opening the cylinder valve to vent internal oxygen. **Do not vent oxygen in the vicinity of open flames, high ambient surface temperatures, sparks or any other ignition source. Do not smoke while venting oxygen.**
- Inspect the oxygen cylinder for damage. An inspection guide is provided on the Biomarine website at:
<http://biopak240r.com/wp-content/uploads/2015/12/CarletonPressureTechnologySampleCylinderDamages.pdf>
- If the cylinder passes inspection, close the cylinder valve. Supply the empty cylinder and replacement o-rings, as listed below and available from Biomarine, to the authorized and approved testing facility. It is recommended that the testing facility replace both o-rings as depicted in the BioPak 240R Benchman manual each time the cylinder is hydro-tested.

B4-04-7060-00-0: Exterior O-Ring

B4-04-7060-07-2: Interior O-ring

2. Hydro-Testing Facility Requirements

- Cylinders shall be inspected against National Regulations and Guideline prior to testing. Any cylinder that fails the inspection shall be returned to the customer for replacement **after incapacitating by drilling a hole through the cylinder wall.**
- The cylinder valve **must** be removed for hydro-testing. Testing of the cylinder with the valve in place will cause damage to the valve pressure regulator, over-pressure vent and seals.
- The two o-rings of the valve assembly **shall** be replaced with each hydro-test and shall only be replaced with Biomarine-specified o-rings. Substitution of other o-rings, such as Teflon, will lead to cylinder leakage and violate the approval status of the cylinder.
- The cylinder **shall** be fully dried and cleaned for high-pressure oxygen service, as required by National standards and regulations, prior to re-installation of the cylinder valve. Failure to properly clean and dry the cylinder can lead to cylinder corrosion or explosion.
- If the cylinder is provided with no cylinder valve, the tested, dried and cleaned cylinder **shall** be returned to the customer with the valve connection port properly sealed to prevent contamination. The thread type of the cylinder valve connection is ¾-16 UNF-2B.
- **Do not** disassemble any part of the cylinder valve.
- **Installation** of the cylinder valve to the cylinder shall be made at 60 +/- 1 foot-pounds of torque. Verify that the cylinder valve is fully closed after installation.
- **Verify** that the cylinder valve vent plug is properly torqued to a minimum 55 inch-pounds.
- Contact Biomarine with any questions or issues that may be encountered during hydro-testing.

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3. Placing the Cylinder Back into Service

- Inspect the cylinder as received from the testing facility and verify that a new, dated hydro-test label has been affixed to the cylinder.
- Verify, through facility certification, that the cylinder has been properly tested, dried and cleaned for high-pressure oxygen service.
- Charge the cylinder with oxygen as required by the BioPak 240R Benchman Manual. Allow the cylinder to properly cool after filing (usually a minimum of 8-hours) and record the pressure reading on the cylinder pressure gauge. Allow the cylinder to sit for a 48-hour period and then compare the current pressure reading to the recorded pressure gauge reading. If the cylinder is not leaking the readings shall be identical. Note that ambient temperature changes will affect the pressure gauge readings as the oxygen expands or contracts with temperature. **Do not** place any oxygen cylinder into service that appears to be leaking. Contact Biomarine if leaking cylinders have been discovered.