

# VLCT PACIF Loss Control Resource

## SCBA Cylinder Hydrostatic Testing

Hydrostatic testing is the most common way to check an SCBA cylinder for leaks or flaws. During a hydrostatic test, the cylinder is examined to ensure it can safely hold its rated pressure. SCBA cylinder hydrostatic testing is crucial as such containers can explode if they fail when containing compressed gas.

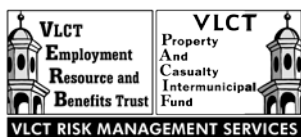
A hydrostatic test consists of filling the cylinder with a nearly incompressible liquid—usually water—and examining it for leaks or permanent changes in shape. The test pressure is always considerably more than the operating pressure to give a margin for safety. Typically, 150% of the operating pressure is used. Water is commonly used as it is almost incompressible and will only expand by a very small amount. If high-pressure gas was used, the gas could expand up to several hundred times its compressed volume, running the risk of serious injury.

All SCBA cylinders require periodic hydrostatic testing as required by 49 CFR 180.205. The frequency of the maintenance depends upon the cylinder material.

- Steel cylinders should be tested every five years and have an indefinite service life until they fail a hydro test.
- Aluminum cylinders (not including hoop-wrapped) should be tested every five years and have an indefinite service life until they fail a hydro test.
- Hoop-wrapped cylinders should be tested every three years and have a 15-year service life.
- Fully wrapped fiberglass cylinders should be tested every three years and have a 15-year service life.
- Fully wrapped Kevlar cylinders should be tested every three years and have a 15-year service life.
- Fully wrapped carbon fiber cylinders should be tested every five years and have a 15-year service life.

Cylinders should not be filled if they have exceeded their valid service life or re-test dates. Cylinders which show evidence of exposure to high heat or flames (paint turned to a brown or black color, decals missing or gauge lens melted) need to be removed from service and re-hydrostatic tested prior to recharging. If there is any doubt about the suitability of the cylinder for recharge, it should be returned to a certified hydrostatic test facility for examination and retesting. Any evidence of a crack, defect or damage requires the cylinder to be removed from service.

Visual inspections should also be performed on a regular basis as recommended by the Department of Transportation (DOT). The visual inspection should include, but is not limited to, removing the cylinder valve, inserting a high-intensity light probe and angled mirror into the cylinder and examining the inner surfaces of the cylinder. This inspection is necessary to aid in identifying defects in the inner surfaces of the neck and shoulder area of the cylinder.



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In addition to the mandatory SCBA cylinder hydrostatic testing and visual inspections, it is also suggested to submit cylinders for non-destructive testing in between the required hydrostatic testing. These types of tests are usually ultrasonic tests or eddy current tests.

The DOT requires that hydrostatic retesting and re-qualification be conducted by registered agents who have been certified by the DOT and who have been issued a valid Re-testers Identification Number (RIN) by the DOT Research and Special Programs Administration (RSPA). The recommended visual inspections do not have to be conducted by a DOT-certified RIN holder. However, the visual inspection should be performed by an individual who has the proper training and is competent in performing visual inspections.

Many fire departments have the equipment and trained personnel to perform the SCBA cylinder hydrostatic testing. The SCBA manufacturer or the distributor it was purchased through should be able to direct you to a test facility in your area.

### Commonly Asked Questions

- Q.** *How do I know when a hydrostatic test was most recently performed on my cylinder?*
- A.** According to 49 CFR 180.213, the cylinders should be clearly and permanently marked on the metal of the cylinder with the date the cylinder was manufactured and the date(s) of subsequent hydrostatic tests. Marking on the cylinder sidewall is prohibited. It is very important to check for valid re-test dates before refilling cylinders.

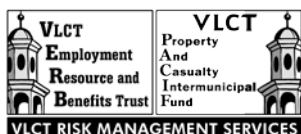
### Sources

49 CFR 180.205

NIOSH (National Institute of Safety and Health)

Survivair

MSA (Mine Safety Appliances Company)



**VLCT PACIF Loss Control Services**

Email: [losscontrol@vlct.org](mailto:losscontrol@vlct.org)

Phone: 800-649-7915

Web: [www.vlct.org](http://www.vlct.org)

Vermont League of Cities and Towns  
89 Main St. Suite 4, Montpelier, VT 05602

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