

Number 50

Hydrostatic Retest Requirements for ANSUL Portables, Wheeled Units, and Pre-engineered Vessels

Federal laws (and in some cases state and municipal statutes) require that most of the pressure vessels associated with ANSUL hand portable and wheeled extinguishers must be periodically hydrostatically retested to ensure their safety. In addition, the laws require hydrostatic retesting of vessels which show evidence of corrosion or mechanical injury.

The purpose of this bulletin is to 1) indicate what Tyco Fire Suppression & Building Products understands to be the **legal** requirements, and 2) provide guidance for the user in determining recommended retest practices and procedures for such vessels.

We have prepared a chart, designed to show what we understand to be the current **legal** requirements for periodic retest, indicating both test intervals and pressures. These requirements are shown for the two principal authorities having jurisdiction over this type of product, the National Fire Protection Association (NFPA); and the Codes of Federal Regulations, (D.O.T., M.S.H.A., and O.S.H.A.). It is important to understand the jurisdiction of these two authorities and how it may effect the product in question. You may wish to refer directly to these principal authorities to make your own interpretation of the current legal requirements.

NFPA standards have no force of law in and of themselves unless adopted by a regulatory entity that is empowered by statute to enforce regulations. However, as consensus standards developed by teams of recognized experts, they represent sound fire safety principles, practices and procedures, and we recommend that they be observed in the case of hydrostatic retesting. Moreover, some states and municipalities have adopted NFPA standards as a part of their fire protection codes, including those parts dealing with the maintenance and hydrostatic retesting of extinguishers.

OSHA has safety jurisdiction over most workplaces in the U.S., and as such its regulations have the force of federal law. OSHA has not adopted NFPA standards for hydrotesting per se, but its requirements follow NFPA standards closely.

D.O.T.'s hydrostatic retest requirements apply only to charged pressure vessels which are transported in commerce in the U.S. or to foreign countries. Once the product reaches its original destination, D.O.T. rules apply only when the container is reshipped in a charged condition or being refilled.

M.S.H.A. has safety jurisdiction over mines and generally references the appropriate NFPA and D.O.T. regulations for additional guidelines on extinguisher hydrostatic testing.

It will be noted that there are some gaps and overlapping in the legal requirements for periodic hydrostatic retesting of some vessels, which may be due to an oversight or other reason. However, appropriate retest intervals and test pressures have been determined for such vessels through the NFPA Committee process and/or Tyco Fire Suppression & Building Products' own research and experience. In many cases, compliance to the NFPA standards may put you in compliance with OSHA (refer to the National Consensus Standards, Appendix B, Subpart L). A Tyco Fire Suppression & Building Products recommendation is indicated for each of the pressure vessels addressed by this Bulletin.

Hydrostatic testing should only be performed by trained, qualified persons with suitable testing equipment and facilities. For additional guidance you are referred to CFR-49, CFR-29, NFPA-10, the current ANSUL manual "Hydrostatic Test Instructions for Portables, Wheeled Units, and Pre-engineered Systems," Form No. F-7602 and the Compressed Gas Association pamphlets "C-6," "C-6.1" and "C-1" which cover the visual inspection and hydrostatic test methods. To secure a copy of CGA Pamphlet "C-6," "C-6.1," or "C-1," contact the:

Compressed Gas Association Inc.
1235 Jefferson Davis Highway
Arlington, VA 22202

PERIODIC HYDROSTATIC RETEST REQUIREMENTS FOR PRESSURE VESSELS IN ANSUL

PRESSURE VESSEL	N.F.P.A.			REF. NO.*	CODE OF RETEST PERIOD
	STD. NO.	RETEST PERIOD	TEST PRESSURE		
▶ ANSUL Stored Pressure Dry Chemical, FE-36, and Halon 1211 Extinguishers (Agent Tanks)	10	12 years	Factory test pressure (not to exceed 3X the normal operating pressure)	1	12 years
▶ ANSUL Stored Pressure Water and Wet Chemical Hand Portable Extinguishers (Agent Tanks) (See note)	10	5 years	Factory test pressure (not to exceed 3X the normal operating pressure)	1	5 years
▶ ANSUL CO ₂ Hand Portable Extinguishers (aluminum and steel Agent Tanks) D.O.T. 3A-1800, 3AA-1800, 3AL-1800 and 3AA-2015	10	5 years (See note)	5/3 service pressure as stamped into the cylinder	1	5 years
▶ ANSUL Dry Chemical, Cartridge-Operated and Wheeled Extinguishers and Spill Control Application (Agent Tanks)	10	12 years	Original factory test pressure as shown on the nameplate or shell	N/A	N/A
▶ ANSUL Model 33-D AFFF Wheeled Extinguishers (Agent Tank)	10	5 years	Unspecified	N/A	N/A
▶ ANSUL Halon 1211 Wheeled Extinguishers (D.O.T. 4BW-240 Agent Tanks)	10	Per D.O.T. marking (See notes)	Factory test pressure (not to exceed 3X the normal operating pressure)	3, 6	7 or 12 years (See Ref. No. 6)
CO ₂ Cartridges for 5, 10, 20 and 30 Models N ₂ Cartridges for 5 and 10 Low Temperature Extinguisher Models	10	None Required		1, 4	None Required
N ₂ Cartridges for 20 and 30 Low Temperature Extinguisher Models	10	Per D.O.T. or C.T.C. markings		2, 5	Per stamped markings 5 or 10 years
▶ Nitrogen Cylinders for all ANSUL Wheeled Extinguishers	10	5 or 10 years	5/3 service pressure as stamped into the cylinder	2, 5	5 or 10 years
Pre-Engineered 101 Agent Tanks	17	12 years	Original factory test pressure as shown on nameplate or shell	N/A	N/A
▶ ANSUL Model SPA-50 and IND-X (D.O.T. 4BW-500 Agent Tanks)	17	12 years	Factory test pressure (not to exceed 2X the normal operating pressure)	1, 3, 6	7 or 12 years
▶ ANSUL R-102 Wet Chemical Agent Tanks (carbon steel and stainless tanks)	17A	12 years	Factory test pressure (not to exceed 3X the normal operating pressure)	1	12 years
▶ ANSUL Model H-1000 and H-101 (D.O.T. 4BW-500 Agent Tanks)	12A	12 years	Factory test pressure (not to exceed 2X the normal operating pressure)	3, 6	7 or 12 years
▶ ANSUL Model H-1000 with 3A or 3AA D.O.T. Stamp (Agent Tanks)	12/ 12A	5 years	5/3 service pressure as stamped into the cylinder	1	5 years
Pre-engineered System Cartridges —Except LT-5, LT-10 and 101-10	17/ 17A	12 years	Factory test pressure	2, 5	5 or 10 years
Pre-engineered System Cartridges —LT-5, LT-10 and 101-10	17/ 17A	None Required Per D.O.T. 3E Stamp		1	None Required D.O.T. 3E Tank

- As used in this chart, service pressure and operating pressure are the same.
- Dry Powder Extinguishers should be tested at the same intervals and pressures as Dry Chemical Extinguishers.

PORTABLES, WHEELED UNITS, AND PRE-ENGINEERED VESSELS

FEDERAL REGULATIONS TEST PRESSURE	TYCO RECOMMENDS		NOTES
	RETEST PERIOD	TEST PRESSURE	
Factory test pressure (not to exceed 2X the service pressure)	12 years	600 PSI (41.4 bar)	• Agent hose assemblies with a shut-off nozzle must be tested @ 300 psi (20.7 bar).
Factory test pressure (not to exceed 2X the service pressure)	5 years	200 PSI (13.8 bar)	• Exception: Does not apply to ANSUL ENSIGN Model WF-2 1/2 fiberglass extinguishers which were recalled in 1973. Under no circumstances are these units to be hydrostatically tested or recharged.
5/3 service pressure	5 years (See note)	5/3 service pressure	• Aluminum tanks suspected of being exposed to temperatures in excess of 350 °F (177 °C) shall be removed from service and subjected to a hydrostatic retest.
N/A	12 years	600 PSI (41.4 bar)	• Agent hose assemblies must be tested at same intervals @ 300 PSI (20.7 bar), or at service pressure, whichever is higher.
N/A	5 years	600 PSI (41.4 bar)	• Agent hose assemblies must be tested at same intervals @ 300 PSI (20.7 bar), or at service pressure, whichever is higher.
2X service pressure	7 or 12 years	480 PSI (33.1 bar)	• Agent hose assemblies must be tested at same intervals @ 300 PSI (20.7 bar).
None Required	None Required		• Exempt because of size and stamp.
Per stamped markings 5/3 service pressure	5 or 10 years	5/3 service pressure	
5/3 service pressure	5 or 10 years	5/3 service pressure	
N/A	12 years	600 PSI (41.4 bar)	• Agent hose assemblies must be tested at same intervals @ 300 PSI (20.7 bar), or at service pressure, whichever is higher.
Factory test pressure (not to exceed 2X the normal operating pressure)	7 or 12 years	1000 PSI (68.9 bar)	• Test 1 inch discharge hose and 1/4 inch actuation hose @ 1000 PSI (68.9 bar).
Factory test pressure (not to exceed 2X the normal operating pressure)	12 years	300 PSI (20.7 bar)	• Test 1/4 inch gas hose assembly @ 300 PSI (20.7 bar).
Factory test pressure (not to exceed 2X the normal operating pressure)	7 or 12 years	1000 PSI (68.9 bar)	• Test 1 inch discharge hose and 1/4 inch actuation hose @ 1000 PSI (68.9 bar).
5/3 service pressure	5 years	5/3 service pressure	
Factory test pressure	12 years	Factory test pressure	
		None Required	• LT-5-L, LT-5-R, LT-10-L, LT-10-R, 101-10 and K-101-10 exempt because of size and stamp.

- Factory test pressures are indicated on the extinguisher nameplates.
- Recording of hydrostatic testing shall be in accordance with NFPA-10 recommendations.

* See next page for references to Code of Federal Regulations.

REFERENCE NUMBERS FOR CODE OF FEDERAL REGULATIONS CFR-49

1. Part 173.34 (e) *Periodic retesting, reinspection and marking of cylinders*. Reference the table in this paragraph that specifies cylinder retest pressure and retest period.
2. Part 173.34 (e) (1) The periodic retest must be performed by an authorized retester and a test by interior hydrostatic pressure in a water jacket or other apparatus suitable for determination of the expansion of the cylinder. [Proposed 1996: 173.34 (e) (1), (2), (3), and (4)]
3. Part 173.34 (e) (9) Note 2 The 10 year retest period may be extended to a 12-year period, and the 5 year retest period may be extended to a 7-year period after expiration of the first 12-year period. [Proposed 1996: 173.34 (e) (12) Note 2]
4. Part 173.34 (e) (12) All cylinders not exceeding 2 inches outside diameter and length less than 2 feet are exempted from hydrostatic retest. [Proposed 1996: 173.34 (e) (15)]
5. Part 173.34 (e) (15) For DOT-3A or 3AA cylinders manufactured after Dec. 31, 1945 and stamped with a five pointed star after the most recent test date the retest interval may be extended to 10 years. [Proposed 1996: 173.34 (e) (18)]
6. Part 173.34 (e) (18) Cylinders tested without determination of expansion (modified hydrostatic test method) will have the first retest performed 12 years after the original test date, and at 7-year intervals thereafter. If the water jacket method is used, retest must be performed every 12 years. [Proposed 1996: 173.34 (e) (21)]

Additional References:

CFR-29 Part 1910.157 (OSHA)

CFR-30 (MSHA)

Part 56 Surface Metal/Non metal

Part 57 Underground Metal/Non Metal

Part 75 Underground Coal

Part 77 Surface Coal

CFR-49 Part 173.309 Fire Extinguishers