TECHNICAL BULLETIN

Hydrostatic Retest Requirements for ANSUL® Pressure Vessels

Portables, Wheeled Units, and Pre-Engineered Pressure Vessels

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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 Johnson Controls 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 tables, designed to show what Johnson Controls understands 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 Code of Federal Regulations, (DOT, MSHA, and OSHA). It is important to understand the jurisdiction of these two authorities and how it may affect 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.

DOT'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, DOT rules apply only when the container is reshipped in a charged condition or being re-filled.

MSHA has safety jurisdiction over mines and generally references the appropriate NFPA and DOT 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. However, appropriate retest intervals and test pressures have been determined for such vessels through the NFPA Committee process and/or Johnson Controls 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 Johnson Controls 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, refer 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 at:

Compressed Gas Association
14501 George Carter Way, Suite 103
Chantilly, VA 20151
Phone: 703-788-2700
Email: cga@cgnet.com

***TABLE 1 AND TABLE 2 REFERENCE NUMBERS FOR CODE OF FEDERAL REGULATIONS CFR-49**

1. Part 180.209 (e) *Periodic retesting, re-inspection and marking of cylinders*. Reference the table in this paragraph that specifies cylinder retest pressure and retest period. (Proposed 2006)

2. Part 180.209 (b) The periodic retest must be performed by an authorized re-tester and a test by interior hydrostatic pressure in a water jacket or other apparatus suitable for determination of the expansion of the cylinder. (Proposed 2006)

3. Part 180.209 (6) (b) (2) 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 2006)

4. Part 180.209 Table 1 (1) All cylinders not exceeding 2 inches outside diameter and length less than 2 feet are exempted from hydrostatic retest. (Proposed 2006)

5. Part 180.209 (b) (i) 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 2006)

6. Part 180.209 (e) 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 2006)

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

Additional Notes for the Tables :

– Service pressure and operating pressure are the same.

– Dry Powder Extinguishers should be tested at the same intervals and pressures as Dry Chemical Extinguishers

– Factory test pressures are indicated on the extinguisher nameplate.

– Recording of hydrostatic testing shall be in accordance with NFPA-10 recommendations.

TABLE 1: Hand Portables and Wheeled – Principle Authorities

PRESSURE VESSEL	NFPA			CODE OF FEDERAL REGULATIONS (DOT, MSHA, and OSHA)		
	STD. NO.	RETEST PERIOD	TEST PRESSURE	REF. NO.*	RETEST PERIOD	TEST PRESSURE
ANSUL Stored Pressure Dry Chemical, HFC-236fa Halon 1211 Extinguishers (Agent Tanks)	10	12 Years	Factory test pressure (not to exceed 3X the normal operating pressure)	1	12 Years	Factory test pressure (not to exceed 3X the service pressure)
ANSUL Stored Pressure Water and Wet Chemical Hand Portable Extinguishers (Agent Tanks) (See notes in Table 1a)	10	5 Years	Factory test pressure (not to exceed 3X the normal operating pressure)	1	5 Years	Factory test pressure (not to exceed 2X the service pressure)
ANSUL CO_2 Hand Portable Extinguishers (aluminum and steel Agent Tanks) DOT 3A-1800, 3AA-1800, 3AL-1800 and 3AA-2015	10	5 Years	5/3 service pressure as stamped into the cylinder	1	5 Years	5/3 service pressure
ANSUL Cartridge-Operated and Wheeled Dry Chemical Extinguishers, Spill Control Applicators (Agent Tanks)	10	12 Years	Original factory test pressure as shown on the nameplate or shell	N/A	N/A	N/A
ANSUL Model 33-D AFFF Wheeled Extinguishers (Agent Tank)	10	5 Years	Original factory test pressure as shown on the nameplate or shell	N/A	N/A	N/A
ANSUL Halon 1211 Wheeled Extinguishers (DOT 4BW-240 Agent Tanks)	10	Per DOT marking (See notes next page)	Factory test pressure (not to exceed 3X the normal operating pressure)	3, 6	7 or 12 years (See Ref. No. 6)	2X service pressure
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	None Required
N_2 Cartridges for 20 and 30 Low Temperature Extinguisher Models	10	Per DOT or CTC markings		2, 5	Per stamped markings 5 or 10 years	
N_2 Cylinders for all ANSUL Wheeled Extinguishers	10	5 or 10 Years	5/3 service pressure as stamped into the cylinder	2, 5	Per stamped markings, 5 or 10 years	5/3 service pressure

* See page 2 for REF. NO. to Code of Federal Regulations

TABLE 1a: Hand Portables and Wheeled – Johnson Controls

PRESSURE VESSEL (Matches first col. in Table 1)	JOHNSON CONTROLS RECOMMENDS		
	RETEST PERIOD	TEST PRESSURE	NOTES
ANSUL Stored Pressure Dry Chemical, HFC-236fa Halon 1211 Extinguishers (Agent Tank)	12 Years	Check test pressure on nameplate for 3X normal operating pressure	Agent hose assemblies with a shut-off nozzle must be tested @ 300 psi (20.7 bar).
ANSUL Stored Pressure Water and Wet Chemical Hand Portable Extinguishers (Agent Tanks) (See notes)	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. ■ Agent hose assemblies must be tested at same intervals @ 100 psi (6.9 bar) or at service pressure, whichever is higher.
ANSUL CO_2 Hand Portable Extinguishers (aluminum and steel Agent Tanks) DOT 3A-1800, 3AA-1800, 3AL-1800 and 3AA-2015	5 Years	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. ■ Agent hose assemblies must be tested at same intervals @ 2,000 psi (137.9 bar) or at service pressure, whichever is higher.
ANSUL Cartridge-Operated and Wheeled Dry Chemical Extinguishers, Spill Control Applicators (Agent Tanks)	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
ANSUL Model 33-D AFFF Wheeled Extinguishers (Agent Tank)	5 Years	600 psi (41.4 bar)l	■ Agent hose assemblies must be tested at same intervals @ 300 psi (20.7 bar), or at service pressure, whichever is higher
ANSUL Halon 1211 Wheeled Extinguishers (DOT 4BW-240 Agent Tanks)	7 or 12 Years	480 psi (33.1 bar)	■ Agent hose assemblies must be tested at same intervals @ 300 psi (20.7 bar)
CO_2 Cartridges for 5, 10, 20, and 30 Models N_2 Cartridges for 5 and 10 Low Temperature Extinguisher Models	None Required		■ Exempt because of size and stamp.
N_2 Cartridges for 20 and 30 Low Temperature Extinguisher Models	5 or 10 Years	5/3 service pressure	
N_2 Cylinders for all ANSUL Wheeled Extinguishers	5 or 10 Years	5/3 service pressure	

TABLE 2: Pre-Engineered Systems – Principle Authorities

PRESSURE VESSEL	NFPA			CODE OF FEDERAL REGULATIONS (DOT, MSHA, and OSHA)		
	STD. NO.	RETEST PERIOD	TEST PRESSURE	REF. NO.*	RETEST PERIOD	TEST PRESSURE
Pre-Engineered 101/LVS Agent Tanks	17	12 Years	Original factory test pressure as shown on the nameplate or shell	N/A	N/A	N/A
Industrial Dry Chemical Systems ANSUL Model SPA-50 and IND-X (DOT 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	Factory test pressure (not to exceed 2X the operating pressure)
ANSUL I-101 (DOT 4BW-350)	17	12 Years	Factory test pressure (not to exceed 2X the normal operating pressure)	1, 3, 6	7 or 12 Years	Factory test pressure (not to exceed 2X the operating pressure)
ANSUL R-102 Wet Chemical Agent Tanks (carbon steel and stainless tanks) PIRANHA	17A	12 Years	Factory test pressure (not to exceed 3X the normal operating pressure)	N/A	N/A	N/A
ANSUL Model H-1000 and H-101 (DOT 4BW-500 Agent Tanks)	12A	12 Years	Factory test pressure (not to exceed 2X the normal operating pressure)	3, 6	7 or 12 Years	Factory test pressure (not to exceed 2X the operating pressure)
ANSUL Model H-1000 with 3A or 3AA DOT Stamp (Agent Tanks)	12/ 12A	5 Years	5/3 service pressure as stamped into the cylinder	1	5 Years	5/3 service pressure
Pre-engineered System Cartridges — **Except** LT-5, LT-10, and 101-10	17/ 17A	12 Years	Factory test pressure	2, 5	Per stamped markings 5 or 10 years	Factory test pressure
Pre-engineered System Cartridges — LT-5, LT-10, and 101-10	17/ 17A	None Required Per DOT 3E Stamp		1	None Required Per DOT 3E Tank	

* See page 2 for REF. NO. to Code of Federal Regulations.

TABLE 2a: Pre-Engineered Systems – Johnson Controls

PRESSURE VESSEL (Matches first col. in Table 2)	JOHNSON CONTROLS RECOMMENDS		
	RETEST PERIOD	TEST PRESSURE	NOTES
Pre-Engineered 101/LVS Agent Tanks	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. ■ At same interval, test 1/4 in. actuation hose @ 1000 psi (68.9 bar).
Industrial Dry Chemical Systems ANSUL Model SPA-50 and IND-X (DOT 4BW-500 Agent Tanks)	7 or 12 Years	1000 psi (68.9 bar)	■ At same interval, test 1 in. discharge hose and 1/4 in. actuation hose @ 1000 psi (68.9 bar), or at service pressure, whichever is higher.
ANSUL I-101 (DOT 4BW-350)	7 or 12 Years	700 psi (48.3 bar)	■ At same interval, test 1 in. discharge hose and 1/4 in. actuation hose @ 1000 psi (68.9 bar), or at service pressure, whichever is higher.
ANSUL R-102 Wet Chemical Agent Tanks (carbon steel and stainless tanks) PIRANHA	12 Years	330 psi (22.8 bar)	■ At same interval, test 1/4 in. gas hose assembly @ 220 psi (15.2 bar), or at service pressure, whichever is higher.
ANSUL Model H-1000 and H-101 (DOT 4BW-500 Agent Tanks)	7 or 12 Years	1000 psi (68.9 bar)	■ At same interval, test 1 in. discharge hose and 1/4 in. actuation hose @ 1000 psi (68.9 bar), or at service pressure, whichever is higher.
ANSUL Model H-1000 with 3A or 3AA DOT Stamp (Agent Tanks)	5 Years	5/3 service pressure	
Pre-engineered System Cartridges — **Except** LT-5, LT-10, and 101-10	12 Years	Factory test pressure	
Pre-engineered System Cartridges — LT-5, LT-10, and 101-10	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.

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Note: The converted metric values in this document are provided for dimensional reference only and do not reflect an actual measurement.

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