Periodic Testing of Pressure Vessels • Fixed Fire Protection Systems

Generally fire extinguishing systems installed in accordance with ISO14520 and EN15004 use Transportable Pressure Vessels to store the fire extinguishants. These containers are filled in specialised facilities away from the installation site and moved to their intended position while pressurised. While installed in their intended position they are firmly fixed in position.

Inspections of the systems and pressure vessels are carried on site and in accordance with EN15004 every 6 months. This includes leak checking of the extinguishant container and checking for any damage or corrosion to the pressure vessel. Should any work be needed on the extinguishant pressure vessel then it is removed to a specialist off site facility. This includes the recovery of any extinguishant at the end of the systems life.

While installed on site the pressure vessels are securely fixed and connected to distribution pipe work. In this situation the containers and system come under the Pressure Equipment Directive which permits the use of Transportable Pressure Vessels.

Movement by road of the pressurised containers is covered by the Carriage of Dangerous Goods by Road (ADR 2011). This regulation requires the pressure vessel to be hydraulically pressure tested every 10 years. The ADR is supported by a number of European Standards e.g. EN1803 'Transportable gas cylinders – Periodic inspection and testing of welded carbon steel gas cylinders'. This provides guidance on the inspection periods and describes how to carry out the tests. The extract below provides guidance on the inspection period.

EN 1803:2002 (E)

3 Intervals between periodic inspection and test

In order to ensure continued safe operation, cylinders shall be periodically submitted to inspection and test in accordance with annex B. A cylinder shall fall due for a periodic inspection and test on its first receipt by a filler after the expiry of the interval in annex B.

NOTE Table B.1 gives a list of the intervals between periodic inspections for some gases which complies with the current RID/ADR regulations and also gives recommendations which could be subsequently adopted by the RID/ADR regulations.

Provided the cylinder has been subjected to normal conditions of use and has not been subjected to abusive and abnormal conditions rendering the cylinder unsafe, there is no general requirement for the user to return a gas cylinder before the contents have been used even though the test interval may have lapsed. However it is suggested that cylinders are retested within a period not exceeding twice the time interval.

In the case of cylinders used for emergency purposes (e.g. fire extinguishers, breathing apparatus), it is the responsibility of the person in possession (owner or user) to submit it for a periodic inspection within the interval specified in annex B or as specified in the relevant cylinder design standard/regulation, if this is shorter.

4 List of procedures for periodic inspection and test

Clause 3 of EN 1803 paragraph 1 allows the pressure vessel to be used beyond the inspection period (10 years for these types of containers) up to the 'first receipt by a filler.' The proviso in paragraph 2 is that the cylinder has not been abused. For fire protection system pressure vessels protecting valuable electronic equipment the containers are generally in a clean, dry and protected environment where any recharges after a fire are infrequent. Therefore the conclusion is that the fire protection system containers may remain in service up to 20 years if not activated after the initial10 years but the last paragraph appears to over-ride this conclusion.

Paragraph 3 issues special instructions for 'cylinders used for emergency purposes' and examples 'fire extinguishers'. Unfortunately the standard does not say why 'emergency purposes' is excluded from the extension of the periodic test period or what is intended under 'fire extinguishers' i.e. portable fire extinguishers and or fixed systems. It is not clear what the committee drafting the standard were concerned about. For a fireman's air cylinder it is conceivable that the pressure vessel may be subject to repeated charging and discharging, physical damage while the fireman is manoeuvring or even exposure to a fire. In this case it would be expected that the cylinder should be subject to a more rigorous inspection regime. The same could apply to portable fire extinguishers. For fixed fire protection systems these generally are installed in a cosseted environment and protected from damage and corrosion. These could be described as fixed storage containers that merely operate when required to discharge the contents onto an incipient fire before it becomes an emergency.

In conclusion the inspection period for fixed fire protection systems installed in accordance with EN15004 appears to hinge on the meaning of 'emergency use' and 'fire extinguisher'. Clarification on the intention of this clause should be requested from the EN Standard Committee. This can be a slow process.

Further guidance may be available from the Health and Safety Executive.