MAINTENANCE AND TESTING OF PORTABLE FIRE EXTINGUISHERS

Introduction

In order to ensure that they are available and operate properly when needed, both federal certification requirements and state licensure requirements mandate that health care facilities properly inspect, test and maintain their portable fire extinguishers [see NFPA 101(12), Sections 18.3.5.12/19.3.5.12 and 9.7.4.1; MSFC(15), Sec. 906.2]. Unless otherwise indicated, this guide will focus on federal certification requirements.

Applicable standards

NFPA 101(12), Sec. 9.7.4.1 and MSFC(15), Sec. 906.2 require that portable fire extinguishers be inspected and maintained in accordance with NFPA 10, *Standard for Portable Fire Extinguishers*. NFPA 101(12), Sec. 2.2 and MSFC(15), Chapter 80 reference the 2010 edition of NFPA 10. For purposes of this guide, all code references will be based on the 2010 edition of NFPA 10.

Visual inspections

"Inspection" is defined as a quick check to ensure that each extinguisher is in its designated place, that it has not been actuated or tampered with, and that there is no obvious physical damage or condition that would interfere with its use or operation. The inspection requirements applicable to portable fire extinguishers are covered in NFPA 10(10), Sec. 7.2. Portable fire extinguishers are required to be visually inspected when initially placed in service and at least monthly **at a minimum of 30-day intervals** thereafter [see NFPA 10(10), Sec. 7.2.1]. These inspections can be performed by facility staff. As an alternate to the monthly visual inspection, electronic monitoring is allowed. Where electronic monitoring is used and the specific extinguisher cannot be verified electronically, the extinguisher is expected to be continually monitored for location.

A pressure gauge in the "normal" or "operable" range is not a 100 percent guaranty that the extinguisher will perform as intended. A broken seal, for example, may be an indication that someone has used the extinguisher and discharged a portion of the contents too small to affect the pressure gauge. NFPA 10(10), Sec. 7.2.2, therefore, requires that the monthly inspection or electronic monitoring verify a number of things including:

- Extinguishers are in their designated places
- There are no obstructions to access or visibility
- Pressure gauge readings are in the proper range or position
- Fullness – confirmed by weighing or lifting

Other things to look for include:

- Safety seals are not broken or missing
- There is no evidence of physical damage, corrosion, leakage or clogged nozzle
- Operating instructions are legible and facing outward [see NFPA 10(10), Sections 6.1.3.9.1 and 6.1.3.10.3]

Where circumstances warrant, some fire extinguishers may have to be inspected more frequently. Examples of such circumstances might include extinguishers that are oftentimes found obstructed during monthly inspections or extinguishers located in areas where they are subject to tampering, theft or mechanical injury.

Obviously, any problems found during the monthly inspection must be corrected immediately. Some problems trigger a need for full maintenance or even replacement of the extinguisher. For example:

1. Full maintenance procedures must be performed whenever an inspection of a rechargeable fire extinguisher reveals that pressure gauge readings are not in the operable range or position – or – fullness cannot be confirmed, as determined by weighing or lifting [see NFPA 10(10), Sec. 7.2.3.1].

2. When an inspection of a nonrechargeable dry chemical extinguisher reveals that pressure gauge readings are not in the operable range/position, or fullness cannot be confirmed, as determined by weighing or lifting, or push-to-test pressure indicators do not provide a satisfactory reading, the extinguisher must be removed from use, discharged, and either destroyed or returned to the manufacturer [see NFPA 10(10), Sec. 7.2.3.2].
    - Nonrechargeable extinguishers can be identified by looking for markings similar to the following: "Discharge and Dispose of After Any Use", "Discharge and Return to Manufacturer After Any Use", or simply "Nonrechargeable".

Maintenance

"Maintenance" is a thorough examination and repair, as needed, of your facility's portable fire extinguishers and is covered in NFPA 10(10), Sec. 7.3. Maintenance is required at least once a year – more frequently when indicated by a routine monthly inspection, as discussed earlier. Maintenance is also required whenever extinguishers undergo hydrostatic testing.

Because maintenance is required to include a thorough examination of the mechanical parts, extinguishing agent and expelling means of each portable fire extinguisher, it must be performed by a trained technician who has the proper tools, listed parts and appropriate manufacturer's service manual(s). Maintenance procedures are outlined in NFPA 10(10), Sec. 7.3.2. A more detailed look at what annual maintenance entails can be found in Annex A – see NFPA 10(10), Sec. A.7.3.2. It should be noted that new tamper seals are required to be installed whenever maintenance is performed on rechargeable fire extinguishers [see NFPA 10(10), Sec. 7.3.2.2.1].

Internal examination

Every 6 years, stored pressure fire extinguishers that require a 12-year hydrostatic test (e.g. dry chemical extinguishers) must be emptied and subjected to an internal examination by a trained technician in accordance with procedures detailed in the manufacturer's service manual and NFPA 10(10), Sec. 7.3.1.2. The exception to this rule is nonrechargeable extinguishers, which are required to be removed from service 12 years from the date of manufacture [see NFPA 10(10), Sec. 7.3.1.2.1.3].

It must be noted that some types of extinguishers are required to undergo an internal examination at more frequent intervals as specified in NFPA 10(10), Sec. 7.3.1.1.2 and Table 7.3.1.1.2. For example, stored-pressure loaded-stream and antifreeze type extinguishers are required to be internally inspected annually. Carbon Dioxide (CO_2) and wet chemical (e.g. K-type) extinguishers are required to be internally inspected every 5 years.

Hydrostatic testing

"Hydrostatic testing" involves pressure testing of the extinguisher to verify its strength against rupture. The requirements applicable to hydrostatic testing can be found in NFPA 10(10), Chapter 8. This testing requires special training and equipment and needs to be performed by persons who have the necessary testing equipment and appropriate manufacturer's service manual(s).

Hydrostatic testing intervals for fire extinguishers are outlined in NFPA 10(10), Sec. 8.3.1 and Table 8.3.1. Test intervals for some of the most commonly found extinguishers are as follows:

- Pressurized water, water mist, carbon dioxide and wet chemical (e.g. K-type) extinguishers – every 5 years
- Dry chemical extinguishers with stainless steel shells – every 5 years
- Dry chemical extinguishers – every 12 years

As mentioned earlier, the exception to the rule for hydrostatic testing is nonrechargeable stored pressure extinguishers (e.g. dry chemical extinguishers), which are required to be removed from service 12 years from the date of manufacture [see NFPA 10(10), Sec. 7.3.1.2.1.3].

A couple of things to keep in mind…

- NFPA 10 makes the owner responsible for ensuring that the extinguishers in the building are being properly inspected, tested and maintained, not the fire extinguisher service company nor the contractor who may be doing construction work in your building. It is important, therefore, that you know the various types of extinguishers you have in your facility to ensure that they are being properly maintained [see NFPA 10(10), Sec. 7.1.1].
- When fire extinguishers are removed from your building for maintenance or recharging, they are expected to be replaced by an extinguisher suitable for the type of hazard being protected and be of at least equal rating [see NFPA 10(10), Sec. 7.1.3].

Documentation Requirements

Almost as important as conducting required inspection, testing and maintenance is documenting the fact that it occurred. NFPA 10 requires that these services be properly recorded. Obviously, in order to ensure that all portable fire extinguishers in your building are inspected tested and maintained as required, you need to know where they are. One way to do this is to have an inventory of all of your portable fire extinguishers. Floor plan maps showing the location of your portable fire extinguishers can also be very helpful.

What follows is a brief synopsis of some of the major documentation requirements you need to be aware of.

Monthly inspections

NFPA 10(10), Section 7.2.4 requires that records be kept of all extinguishers inspected, including those needing corrective action. The date the inspection was performed and the initials of the person performing the inspection must be recorded on a tag or label attached to each extinguisher, on an inspection checklist maintained on file, or by an electronic method.

Fire extinguishers inspected via electronic monitoring, where the extinguisher causes a signal at a control unit when a deficient condition occurs, must be capable of providing an electronic event log at the control panel. Records need to be kept for all extinguishers found to require corrective action.

Maintenance

Annual maintenance is also required to be recorded on a tag or label attached to each extinguisher that indicates the month and year the maintenance was performed, the name of the person performing the service and the name of the company performing the service [see NFPA 10(10), Section 7.3.3].

Six-year maintenance is required to be recorded on a metallic label, or similar durable weatherproof material, affixed to each extinguisher that is a minimum 2 in. x 3½ in. in size [see NFPA 10(10), Section 7.3.3.1]. The label needs to indicate the month and year the maintenance was performed (by means of a perforation similar to that made with a hand punch), the initials or name of the person performing the service, and the name of the company the person represents [see NFPA 10(10), Section 7.3.3.1.3]. Labels are expected to be affixed to the shell by a heatless process and old maintenance labels must be removed at the time any new labels are affixed to the extinguisher [see NFPA 10(10), Section 7.3.3.1.1].

Verification-of-service collar (Maintenance or Recharging)

Each extinguisher that has undergone an internal examination or that has been recharged is required to have a verification-of-service collar installed around the neck of the extinguisher [see NFPA 10(10), Section 7.3.3.2]. This collar, usually made of aluminum or polyethylene, serves as visual proof that the extinguisher was disassembled and maintenance performed. It must be of a type that cannot be removed without the removal of

the valve assembly and must indicate the month and year the service was performed (by means of a perforation similar to that made with a hand punch) and the name of the company performing the maintenance or recharge.

Cartridge- or cylinder-operated extinguishers (i.e. extinguishers in which the expellant gas is in a separate container from the agent storage container) are exempt from this requirement [see NFPA 10(10), Section 7.3.3.2.2].

Hydrostatic testing

Low-pressure cylinders (e.g. dry chemical, wet chemical, pressurized water) that pass the hydrostatic test must have the test information recorded on a metallic label, or similar durable weatherproof material, affixed to each extinguisher that indicates the month and year the test was performed (by means of a perforation similar to that made with a hand punch), the test pressure used, and the initials or name of the person performing the service and the name of the company they represent [see NFPA 10(10), Section 8.7.2]. Labels are expected to be affixed to the shell by a heatless process and be a minimum 2 in. x 3½ in. in size [see NFPA 10(10), Section 8.7.2.2].

High-pressure cylinders (e.g. CO_2) that pass the hydrostatic test must be stamped with the tester's identification number and the month and year of the test [see NFPA 10(10), Sec. 8.7.3].

Extinguisher record

In addition to the required tags and labels, it is recommended that a permanent record be kept for each portable fire extinguisher in your building that indicates at least the following, as applicable:

- Type of extinguisher (e.g. ABC, CO_2, K-type, etc.)
- Date of extinguisher manufacture
- The date maintenance was last performed and by whom
- The date the extinguisher was last recharged and by whom
- The date maintenance (e.g. annual or 6-year, etc.) was last performed and by whom
- The date the extinguisher was last hydrostatically tested and by whom

It is important that at least two people in your facility know where the documentation on your facility's fire extinguishers is kept to increase the likelihood that it can be readily provided if requested during an inspection. This documentation should be maintained for the life of the extinguisher.