

5.3.1.3 Where one sprinkler within a representative sample fails to meet the test requirement, all sprinklers within the area represented by that sample shall be replaced.

The number of sprinklers selected for testing as specified in 5.3.1.2 is not very large and will not guarantee that all problems will be discovered. As a result, when a single sprinkler fails, there is a very high probability that other sprinklers will also fail. Therefore, 5.3.1.3 requires that all of the sprinklers represented by the sample be replaced.

5.3.1.3.1 Manufacturers shall be permitted to make modifications to their own sprinklers in the field with listed devices that restore the original performance as intended by the listing, where acceptable to the authority having jurisdiction.

5.3.2* Gauges.

A.5.3.2 The normal life expectancy of a gauge is between 10 and 15 years. A gauge can be permitted to have a reading with an error of ± 3 percent of the maximum (full scale) gauge reading. For example, a gauge having 200 psi (13.8 bar) maximum radius installed on a system with 60 psi (4.1 bar) normal pressure can be permitted if the gauge reads from 54 psi (3.7 bar to 4.5 bar).

The gauge pictured in Exhibit 5.23 has a maximum radius of 300 psi (20.7 bar). If the normal pressure on the system into which it is installed is 125 psi (8.6 bar) as shown, the actual pressure in the system can vary from 116 psi to 134 psi (8 bar to 9.2 bar). This range is acceptable.

5.3.2.1 Gauges shall be replaced every 5 years or tested every 5 years by comparison with a calibrated gauge.

5.3.2.2 Gauges not accurate to within 3 percent of the full scale shall be recalibrated or replaced.

Subsection 5.3.2 of NFPA 25 requires gauges to be tested every 5 years by comparison with a calibrated gauge. Gauges not accurate to within 3 percent of the full scale are required to be recalibrated or replaced.

Many of the inspections and tests prescribed in NFPA 25 rely on the accuracy of pressure gauges. It is not the intent of 5.3.2 to require that each and every gauge be individually calibrated. It is acceptable to compare the reading of one gauge with that of a calibrated gauge. Other gauges on systems that are installed in similar positions and elevations (e.g., on an adjacent riser) that show similar readings are acceptable.

5.3.3 Waterflow Alarm Devices.

5.3.3.1 Mechanical waterflow alarm devices including, but not limited to, water motor gongs, shall be tested quarterly.

5.3.3.2* Vane-type and pressure switch-type waterflow alarm devices shall be tested semiannually.

A.5.3.3.2 Data concerning reliability of electrical waterflow switches indicate no appreciable change in failure rates for those tested quarterly and those tested semiannually. Mechanical motor gongs, however, have additional mechanical and environmental failure modes and need to be tested more often.

The testing frequency for waterflow alarms was changed from quarterly to semiannually for the 2002 edition of NFPA 25 but included vane-type devices only. For the 2008 edition of NFPA 25, the technical committee changed the testing frequency for pressure switch-type waterflow devices to semiannually to match that of vane-type devices. The initial change to a semiannual frequency was made to correlate the testing frequency for waterflow switches with that of NFPA 72®, *National Fire Alarm and Signaling Code*. In 1996, NFPA 72 changed

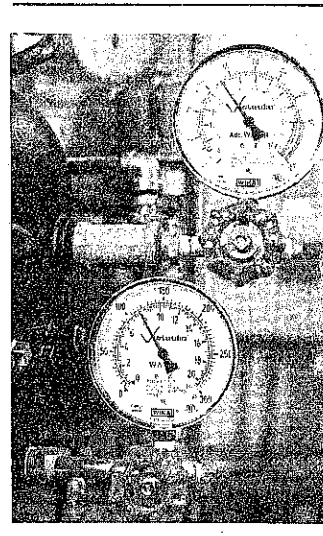


EXHIBIT 5.23 System Pressure Gauge.

◀ FAQ

Does NFPA 25 require that sprinkler system pressure gauges be tested for accuracy or calibration? If so, how often do they have to be tested?

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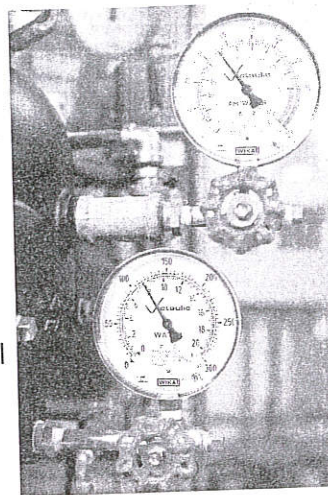


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and tested as required. Dry-type sprinklers are custom made in exact lengths, and therefore NFPA 13 does not require spare dry-type sprinklers in the spare sprinkler cabinet unless all the lengths are the same. When the age of a building or system appears to be approaching 10 years, or if the age is unknown, the inspector should perform a close inspection of a sampling of the sprinklers themselves to determine the date on the sprinklers. In cases where only a few dry sprinklers are installed or where corrosion is noted, it may be more cost-effective to replace the sprinklers rather than test them.

The 10-year threshold requirement was added to NFPA 25 in the 2002 edition because not all of the conditions that cause failure are well understood, and because the frequency of failure is higher for sprinklers that have been in service for more than 10 years. Design changes have been made to dry sprinklers, and it is expected that there will be an improvement in the performance of these sprinklers.

Paragraph 5.3.1.1.6 refers to the listed dry-type sprinkler. The requirement does not apply to standard spray sprinklers installed on a dry pipe system.

FAQ ▶

Does 5.3.1.1.6 apply to listed dry sprinklers, or does it apply to all sprinklers installed in a dry pipe system?

A.5.3.1.1.6 See 3.3.30.3.

5.3.1.1.2* Where sprinklers are subjected to harsh environments, including corrosive atmospheres and corrosive water supplies, on a 5-year basis, either sprinklers shall be replaced or representative sprinkler samples shall be tested.

A.5.3.1.1.2 Examples of these environments are paper mills, packing houses, tanneries, alkali plants, organic fertilizer plants, foundries, forge shops, fumigation areas, pickle and vinegar works, stables, storage battery rooms, electroplating rooms, galvanizing rooms, steam rooms of all descriptions including moist vapor dry kilns, salt storage rooms, locomotive sheds or houses, driveways, areas exposed to outside weather, around bleaching equipment in flour mills, all portions of cold storage areas, and portions of any area where corrosive vapors prevail. Harsh water environments include water supplies that are chemically reactive.

FAQ ▶

Are walk-in refrigerators and walk-in freezers considered "harsh environments," and therefore subject to this standard?

Paragraph A.5.3.1.1.2 provides examples of areas that are considered to be harsh environments, including "cold storage areas." While A.5.3.1.1.2 does not further describe cold storage areas, a walk-in refrigerator or walk-in freezer could fall into this category.

5.3.1.1.3 Where historical data indicate, longer intervals between testing shall be permitted.

5.3.1.2* A representative sample of sprinklers for testing per 5.3.1.1.1 shall consist of a minimum of not less than four sprinklers or 1 percent of the number of sprinklers per individual sprinkler sample, whichever is greater.

The requirement in 5.3.1.2 for a minimum sample of 4 sprinklers or 1 percent of the total of sprinklers installed is intended to balance the cost of testing with the likelihood of identifying a possible problem. The sample should be somewhat random and should be representative of the sprinklers installed in the system. For example, sprinklers should be selected from different floors or areas of the building and not selected simply because they are more accessible than other sprinklers. In addition, the selection should take into consideration the age and types of sprinklers as well as environmental conditions to which they are subjected.

The inspector and/or the owner can determine which groups of sprinklers the sprinkler sample represents. Keep in mind that if a single sprinkler from the sample fails the plunge test, all the sprinklers that the sample represents must be replaced. The sample can represent an entire system or one floor of a multi-story building.

Note that only sprinklers that have been exposed to service conditions must be tested. The sprinklers in the spare sprinkler cabinet, for example, have not been exposed to service conditions and may not reveal any deficiencies.

FAQ ▶

Can the sprinklers in the spare sprinkler cabinet be used to comply with 5.3.1.2?

A.5.3.1.2 Within an environment, similar sidewall, upright, and pendent sprinklers produced by the same manufacturer could be considered part of the same sample, but additional sprinklers would be included within the sample if produced by a different manufacturer.