



29.1 * Approval of Sprinkler Systems.

29.1.1

The installing contractor shall do the following:

- (1) Notify the authority having jurisdiction and the property owner or the property owner's authorized representative of the time and date testing will be performed
- (2) Perform all required acceptance tests (*see Section 29.2*)
- (3) Complete and sign the appropriate contractor's material and test certificate(s) (*see Figure A.29.1*)
- (4) Remove all caps and straps prior to placing the sprinkler system in service

29.1.2

The approval of sprinkler systems shall be permitted to be witnessed remotely in accordance with NFPA 915.

29.1.3

The requirements of 29.2.7 shall apply when acceptance tests are automated.

29.2 Acceptance Requirements.

29.2.1 * Hydrostatic Tests.

29.2.1.1

Unless permitted by 29.2.1.3 through 29.2.1.6, all piping and attached appurtenances subjected to system working pressure shall be hydrostatically tested at 200 psi (14 bar) and shall maintain that pressure without loss for 2 hours.

29.2.1.2

Loss shall be determined by a drop in gauge pressure or visual leakage.

29.2.1.3

Portions of systems normally subjected to system working pressures in excess of 150 psi (10 bar) shall be tested as described in 29.2.1.1, at a pressure of 50 psi (3.4 bar) in excess of system working pressure.

29.2.1.4

Where a fire pump is used for a system, the test pressure shall be determined using the shutoff pressure of the pump plus the maximum static pressure of the water supply adjusted for elevation.

29.2.1.4.1

Where a fire pump uses a pressure limiting device or variable speed motor, the test pressure shall be based on the set pressure of the main relief valve.

29.2.1.4.2

Where a main relief valve is not provided, the pressure shall be calculated ignoring the settings of the pressure limiting device.

29.2.1.5

Where cold weather will not permit testing with water, an interim air test shall be permitted to be conducted as described in 29.2.2. This provision shall not remove or replace the requirement for conducting the hydrostatic test as described in 29.2.1.1.

29.2.1.6 *

The test pressure shall be read from a gauge located at the low elevation point of the system or portion being tested. The pressures in piping at higher elevations shall be permitted to be less than 200 psi (14 bar) when accounting for elevation losses. Systems or portions of systems that can be isolated shall be permitted to be tested separately.

29.2.1.7 *

Additives, corrosive chemicals such as sodium silicate, or derivatives of sodium silicate, brine, or similar acting chemicals shall not be used while hydrostatically testing systems or for stopping leaks.

29.2.1.8

Piping between the fire department connection and the check valve in the fire department inlet pipe shall be hydrostatically tested in the same manner as the balance of the system.

29.2.1.9

When systems are being hydrostatically tested, tests shall be permitted to be conducted with pendent or horizontal sidewall sprinklers or plugs installed in fittings. Any plugs shall be replaced with pendent or horizontal sidewall sprinklers after the test is completed, and a second hydrostatic test shall not be required.

29.2.1.10

When deluge systems are being hydrostatically tested, plugs shall be installed in fittings and replaced with open sprinklers after the test is completed, or the operating elements of automatic sprinklers shall be removed after the test is completed.

29.2.1.11

Provision shall be made for the proper disposal of water used for flushing or testing.

29.2.1.12 * Test Blanks.

29.2.1.12.1

Test blanks shall have painted lugs protruding in such a way as to clearly indicate their presence.

29.2.1.12.2

The test blanks shall be numbered, and the installing contractor shall have a recordkeeping method ensuring their removal after work is completed.

29.2.1.13

When subject to hydrostatic test pressures, the clapper of a dry pipe valve shall be in the position as stated by the manufacturer's published instructions to prevent damaging the valve.

29.2.2 Dry Pipe and Double Interlock Preaction System(s) Air Test.

29.2.2.1

In addition to the standard hydrostatic test, an air pressure leakage test at 40 psi (2.8 bar) shall be conducted for 24 hours. Any leakage that results in a loss of pressure in excess of 1 ½ psi (0.1 bar) for the 24 hours shall be corrected.

29.2.2.2

Pipe or tube specifically investigated for suitability in dry pipe and double interlock preaction system(s) and listed for this service, shall be permitted to be tested in accordance with their listing limitations.

29.2.3 System Operational Tests.

29.2.3.1 Waterflow Devices.

Waterflow detecting devices shall be flow tested through the inspector's test connection and shall result in an audible alarm on the premises in accordance with the requirements of Section 7.7.

29.2.3.1.1

Where a fire alarm system is monitoring waterflow, an alarm signal shall activate in accordance with the requirements of the adopted fire alarm code.

29.2.3.2 * Dry Pipe and Double Interlock Preaction Systems.

29.2.3.2.1

A working test shall be made by opening the inspector's test connection.

29.2.3.2.2

Where a quick-opening device is present, the trip test described in 29.2.3.2.1 shall be sufficient to test the quick-opening device as long as the device trips properly during the test.

29.2.3.2.3 *

The test shall measure the time to trip the valve and the time for water to be discharged from the inspector's test connection.

29.2.3.2.3.1

All times shall be measured from the time the inspector's test connection is completely opened.

29.2.3.2.3.2 *

Systems calculated for water delivery in accordance with 8.2.4.3 shall be exempt from any specific delivery time requirement.

29.2.3.2.4

Systems shall be filled with air through the approved air supply until the required set pressure of the valve is met.

29.2.3.2.4.1

The system shall reach the required set pressure within 30 minutes from the time the air supply is opened.

29.2.3.2.4.2

Systems maintained at or below 5°F (-15°C) shall be permitted to reach the required set pressure within 60 minutes.

29.2.3.2.5

The results shall be recorded using the contractor's material and test certificate for aboveground piping (*see Figure A.29.1*) and the general information sign (*see Figure A.29.6*).

29.2.3.3 Deluge and Preaction Systems.**29.2.3.3.1**

The automatic operation of a deluge or preaction valve shall be tested in accordance with the manufacturer's instructions.

29.2.3.3.2

The manual and remote control operation, where present, shall also be tested.

29.2.3.4 Main Drain Valves.**29.2.3.4.1**

The main drain valve shall be opened and remain open until the system pressure stabilizes.

29.2.3.4.2 *

The static and residual pressures shall be recorded on the contractor's material and test certificate (*see Figure A.29.1*) and the sprinkler system general information placard (*see Figure A.29.6*).

29.2.3.5 Operating Test for Control Valves.

Each control valve shall be operated through its full range and returned to its normal position under system water pressure to ensure proper operation.

29.2.3.6 Wet Pipe System Air Venting Valves.**29.2.3.6.1**

Where manual valves are installed in accordance with Section 16.7 to meet the air venting requirements of 8.1.5, they shall be operated during filling of the system.

29.2.3.6.2

Manual valves shall remain open until water reaches the valve and trapped air has escaped.

29.2.4 Pressure-Reducing Valves.**29.2.4.1**

Each pressure-reducing valve shall be tested upon completion of installation to ensure proper operation under full flow and no-flow conditions.

29.2.4.2

Testing shall verify that the device properly regulates outlet pressure at both maximum and normal inlet pressure conditions.

29.2.4.3

The results of the flow test of each pressure-reducing valve shall be recorded on the contractor's material and test certificate (see *Figure A.29.1*).

29.2.4.4

The results shall include the static and residual inlet pressures, static and residual outlet pressures, and the flow rate.

29.2.5 Backflow Prevention Assemblies.

29.2.5.1

The backflow prevention assembly shall be forward flow tested to ensure proper operation.

29.2.5.2

The minimum flow rate shall be the system demand, including hose stream allowance where applicable.

29.2.6 Exposure Systems.

Operating tests shall be made of exposure protection systems upon completion of the installation, where such tests do not risk water damage to the building on which they are installed or to adjacent buildings.

29.2.7 Automated Inspection and Testing Devices and Equipment.

29.2.7.1

Automated inspection and testing devices and equipment installed on the sprinkler system shall be tested to ensure the desired result of the automated inspection or test is realized.

29.2.7.1.1

Automated inspection devices and equipment shall be tested to verify that the image received allows for an effective visual examination of the system or component being inspected.

29.2.7.1.2

Automated testing devices and equipment shall be tested to verify that they produce the same action as required by this standard to test a device.

29.2.7.1.2.1

The testing shall discharge water where required by this standard and NFPA 25.

29.2.7.2

Testing shall verify that failure of automated inspection and testing devices and equipment does not impair the operation of the system unless indicated by an audible and visual trouble signal in accordance with *NFPA 72* or other applicable fire alarm code.

29.2.7.3

Testing shall verify that failure of a system or component to pass automated inspection and testing devices and equipment results in an audible and visual trouble signal in accordance with *NFPA 72* or other applicable fire alarm code.

29.2.7.4

Testing shall verify that failure of automated inspection and testing devices and equipment results in an audible and visual trouble signal in accordance with *NFPA 72* or other applicable fire alarm code.

29.2.8 Negative Pressure Systems.

29.2.8.1

Vacuum dry pipe systems shall meet all of the acceptance testing requirements for dry pipe systems.

29.2.8.2

Vacuum preaction systems shall meet the acceptance testing requirements for preaction systems.

29.3 Instructions.

The installing contractor shall provide the property owner or the property owner's authorized representative with the following:

- (1) All literature and instructions provided by the manufacturer describing proper operation and maintenance of any equipment and devices installed
- (2)* NFPA 25

29.4 * Hydraulic Design Information Sign (Hydraulic Data Nameplate).

29.4.1

The installing contractor shall identify a hydraulically designed sprinkler system with a permanently marked weatherproof metal or rigid plastic sign secured with corrosion-resistant wire, chain, or other approved means.

29.4.2

Such signs shall be placed at every system riser, floor control assembly, alarm valve, dry pipe valve, preaction valve, or deluge valve supplying the corresponding hydraulically designed area unless the authority having jurisdiction approves an alternate location.

29.4.3

The sign shall include the following information:

- (1) Location of the design area or areas
- (2) Size (area) of or number of sprinklers in the design area
- (3) Discharge densities over the design area or areas
- (4) Required flow and residual pressure demand at the base of the riser or fire pump where applicable
- (5) Occupancy classification or commodity classification and maximum permitted storage height and configuration
- (6) Hose stream allowance included in addition to the sprinkler demand
- (7) Name of the installing contractor

29.5 Pipe Schedule Design Information Sign (Nameplate).

29.5.1

The installing contractor shall identify a pipe scheduled sprinkler system with a permanently marked weatherproof metal or rigid plastic sign secured with corrosion-resistant wire, chain, or other approved means.

29.5.2

Such signs shall be placed at the corresponding system riser.

29.6 * General Information Sign.

29.6.1

The installing contractor shall provide a general information sign used to determine system design basis and information relevant to the inspection, testing, and maintenance requirements required by NFPA 25.

29.6.1.1

Such general information shall be provided with a permanently marked weatherproof metal or rigid plastic sign, secured with corrosion-resistant wire, chain, or other acceptable means.

29.6.1.2

Such signs shall be placed at each system riser.

29.6.2

The sign shall include the following information:

- (1) Name and location of the facility protected
- (2) Edition of NFPA 13
- (3) Occupancy classification
- (4) Commodity classification
- (5) Presence of high-piled and/or rack storage
- (6) Maximum height of storage planned
- (7) Aisle width planned
- (8) Encapsulation of pallet loads
- (9) Presence of solid shelving
- (10) Flow test data

- (11) Presence of flammable/combustible liquids
- (12) Presence of hazardous materials
- (13) Presence of other special storage
- (14) Location of venting valve
- (15) Location of auxiliary drains and low point drains on dry pipe and preaction systems
- (16) Original results of main drain flow test
- (17) Original results of dry pipe and double interlock preaction valve test
- (18) Name of installing contractor or designer
- (19) Indication of presence and location of antifreeze or other auxiliary systems
- (20) Where injection systems are installed to treat MIC or corrosion, the type of chemical, concentration of the chemical, and where information can be found as to the proper disposal of the chemical
- (21) Indication of presence of nitrogen where used to allow for increased *C* value in dry or preaction systems

29.6.3

Combination hydraulic design information and general information shall be permitted.