ASSE/ANSI 1057-2023



Performance Requirements for

Freeze Resistant Sanitary Yard Hydrants with Backflow Protection

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Mokena, IL
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Foreword

This foreword is not considered a part of the standard. However, it is offered to provide background information.

ASSE standards are developed in the interest of consumer safety.

ASSE International considers product performance standards to be of great value in the development of improved plumbing systems.

The working group that developed this standard was set up within the framework of the Product Standards Committee of ASSE International.

Recognition is made of the time volunteered by members of this working group and of the support of manufacturers who also participated in meetings for this standard.

This standard does not imply ASSE International's endorsement of a product which conforms to these requirements.

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It is currently recognized that the common garden or utility hose, when connected to a potable water supply by means of a hose threaded outlet, constitutes a potential cross connection. It is also currently recognized that the same cross connection may exist when a potable water supply is permitted to drain underground.

With specific reference to Freeze Resistant Sanitary Yard Hydrants, this standard has been developed to protect the potable water supply from backflow contamination and ground water contamination.

It has been recognized that five types of yard hydrants need to be considered to protect against freezing. The types considered are: Type 1 which provides protection with two check valves and an atmospheric vent and does not require removal of the hose to provide freeze protection; Type 2 which provides protection with two check valves and an atmospheric vent and requires removal of the hose to provide freeze protection; Type 3 which provides protection with one check valve and an atmospheric vent and does not require removal of the hose to provide freeze protection; Type 4 which provides protection with one check valve and an atmospheric vent and requires removal of the hose to provide freeze protection; Type 5 which has an air gap or removable backflow protection device and requires removal of the backflow protection device and hose to provide freeze protection;.

Compliance with this standard does not imply acceptance by any code body.

These devices shall be installed, consistent with local codes, by qualified and trained professionals.

This standard was promulgated in accordance with procedures developed by the American National Standards Institute (ANSI).

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Performance Requirements for Freeze Resistant Sanitary Yard Hydrant with Backflow Protection

1.0 General

1.1 Application

The purpose of freeze resistant sanitary yard hydrants, hereinafter referred to as the “device”, is to supply potable water without danger of damage to the device due to freezing, to provide protection of the potable water supply from contamination due to ground water, and to prevent backflow in accordance with the backflow prevention device selected. These devices shall only be used on systems where the low-head backpressure does not exceed that generated by an elevated hose equal to or less than 10.0 ft. (3.0 m) in height. This device shall not be subjected to continuous pressure. Continuous pressure shall mean 12 hours use in a 24 hour period.

1.2 Scope

1.2.1 Description

This standard covers design and performance requirements for freeze resistant sanitary yard hydrants to prevent backflow due to backsiphonage and backpressure. These units shall be classified as follows:

a) Type 1 devices shall consist of two independent checks, force loaded or biased to a closed position, with an atmospheric vent located between the two check valves, which is force loaded or biased to an open position, and a means for attaching a hose. When the hose is attached, the Type 1 device shall be freeze resistant.
b) Type 2 devices shall consist of two independent checks, force loaded or biased to a closed position, with an atmospheric vent located between the two check valves, which is force loaded or biased to an open position, and a means for attaching a hose. When the hose is removed, the Type 2 device shall be freeze resistant.
c) Type 3 devices shall consist of one check valve, force loaded or biased to a closed position, with an atmospheric vent which is force loaded or biased to an open position and means for attaching a hose. When the hose is attached, the Type 3 device shall be freeze resistant.
d) Type 4 devices shall consist of one check valve, force loaded or biased to a closed position, with an atmospheric vent which is force loaded or biased to an open position and means for attaching a hose. When the hose is removed, the Type 4 device shall be freeze resistant.
e) Type 5 devices shall consist of a removable mechanical backflow protection device with at least one check valve, force loaded or biased to a closed position, and an atmospheric vent which is force loaded or biased to an open position, and a means for attaching a hose. When the hose and backflow protection is removed, the Type 5 device shall be freeze resistant and shall not allow a hose to be attached.

1.2.2 Pressure

1.2.2.1 Operating Pressure Range
The device shall be designed to operate at pressures from 20 to 100 psi (138 kPa to 689 kPa) or the manufacturer's maximum working pressure, whichever is greater.

1.2.3 Temperature Range
The devices shall be designed for flow temperatures of 33.0°F to 140.0°F (4.4°C to 60.0°C) or the manufacturer's maximum rated temperature, whichever is greater.

1.2.4 Connections

1.2.4.1 Outlet Threads
Garden hose connection threads shall be 3/4 NH or 1 NH garden hose couplings in compliance with ASME B1.20.7.

1.2.4.2 Inlet Threads
Pipe threads shall comply with ASME B1.20.1.

1.2.5 Water Flow Capacity and Pressure Loss
Devices shall meet the flow rates and pressure losses that are referenced in Table 1.

1.2.6 Installation and Service
Devices shall be designed and built such that, after installation, repair or replacement of the elastomeric parts shall be accomplished without the need to excavate the soil surrounding the hydrant.

1.3 Reference Standards
- ASME B1.20.1-2013 (R2018), Pipe Threads, General Purpose (Inch)
- ASME B1.20.7-1991 (R2018), Hose Coupling Screw Threads (Inch)

ASME: American Society of Mechanical Engineers, Three Park Avenue,
New York, NY 10016-5990
Phone: (212) 705-7722

2.0 Test Specimens

2.1 Sample selection

Sample selection and scope of testing shall be as required by the laboratory or certification body When a manufacturer wishes to evaluate a series of devices which are identical except for the inlet sizes and length, the manufacturer shall furnish 3 production quality hydrants of each outlet size having the smallest inlet and longest length.

For section 3.9 details of the fouling procedure shall be provided by the manufacturer. When the lab is unable to foul the device, the listee may submit fouled samples for sections 3.9 to the lab. The listee shall supply a sample of the wire used to foul the device and a written description explaining how the device will be fouled. Wire specifications shall be provided to the lab, (i.e. gauge, material). The listee shall allow the lab to cut open the supplied samples for verification.

2.2 Samples Tested

The testing agency shall select 1of each type or model and size for the full test. Tests shall be performed in the order listed on 1 device of each size submitted.

2.3 Documentation

Assembly drawings and other data which are needed to enable a testing agency to determine compliance with this standard, together with installation drawings, shall accompany devices when submitted for examination and performance tests under this standard.

2.4 Rejection

Failure of 1 device shall be cause for rejection of that type or model and size.

3.0 Performance Requirements and Compliance Testing

3.1 Hydrostatic Pressure Tests

3.1.1 Purpose

The purpose of this test is to determine if the device withstands a hydrostatic pressure of 200 psi (1379 kPa) or 2 times the manufacturer's maximum rated working pressure, whichever is greater, without leakage.

3.1.2 Procedure

1. Install the device in the open position as shown in Figure 1 with the inlet connected to a water supply at ambient temperature.
2. Purge the device of air.
3. Close shut off valve # 2.
4. Increase pressure to 200 psi ± 5.0 psi (1379 kPa ± 34.5 kPa) or 2 times the manufacturer's maximum working pressure, whichever is greater.
5. Hold pressure for not less than 5 minutes.

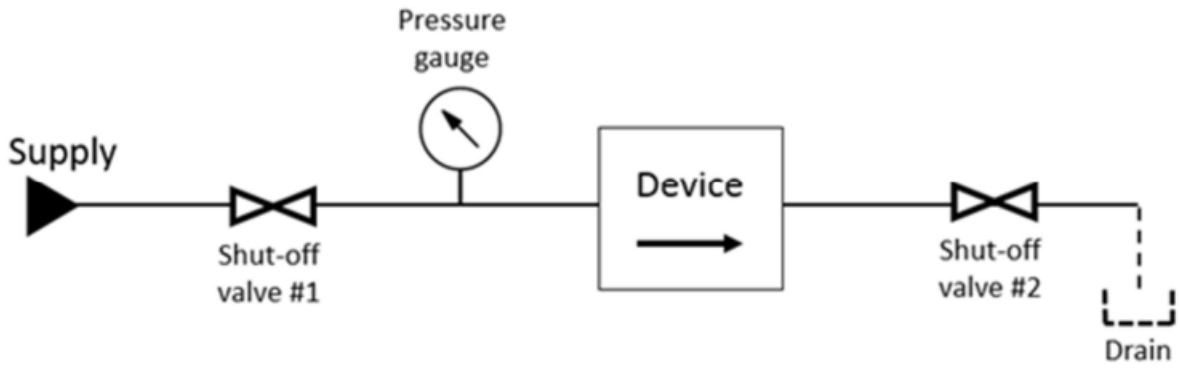

Figure 1

3.1.3 Criteria

Any indication of external leakage shall result in the rejection of the device.

3.2 Deterioration at Maximum Rated Temperature and Pressure

3.2.1 Purpose

The purpose of this test is to condition the device at the maximum rated temperature and pressure.

3.2.2 Procedure

1. Install the device in the open position in a test set-up. Circulate water through the device:
2. At a temperature of 140 °F ± 5.0 °F (60 °C ± 2.8 °C) or the manufacturer's maximum rated temperature, whichever is greater; and
3. At a pressure of 100.0 psi ± 5.0 psi (689 ± 34.5 kPa kPa) or the manufacturer's maximum working pressure, whichever is greater.
4. Run the test for 8 hours per day for a total of 10 days, or for 80 continuous hours at the manufacturer's request.

3.2.3 Criteria

Failure of the device to comply with the remaining sections of this standard shall result in a rejection of the device.

3.3 Life Cycle Evaluation

3.3.1 Purpose

The purpose of this test is to determine any deterioration of performance upon completion of 5000 cycles of operation.

3.3.2 Procedure

1. Install the device at a source of ambient temperature water which provides 100 ± 5.0 psi (689 ± 34.5 kPa) static pressure or the manufacturer's maximum working pressure, whichever is greater, at the inlet when the device's shut-off valve is closed. The device shall be provided with a flow restrictor at the outlet limiting the flow to 8.0 GPM (30.3 L/m).
2. The test equipment shall be capable of applying a closing force to the device necessary to produce a seal of the shut-off valve plus 10%.
3. Cycle the device opened and closed for 5000 cycles of operation at a rate not less than 15 rpm or exceeding 30 rpm for screw-type shut-off valves and a rate between 4 and 8 seconds for devices other than screw-type shut-off valves.

3.3.3 Criteria

Any indication of a change in the physical characteristics of the material which would prevent compliance with the remaining requirements of this standard shall result in a rejection of the device. Serviceable leakage from the packing nut shall not be cause for rejection of the device.

3.4 Resistance to Bending

3.4.1 Purpose

The purpose of this test is to determine if the device continues to function without leakage when subjected to a pull of 100.0 pounds (45.4 kg) on a hose applied perpendicular to the device.

3.4.2 Procedure

1. Install the device per the manufacturer's installation instructions.
2. Attach an O-ring seal and test mandrel to the outlet of the device.
3. Pressurize the device with ambient water to 100 psi ± 5.0 psi (689 kPa ± 34.5 kPa) or the manufacturer's maximum working pressure, whichever is greater.
4. Apply a force of 100 pounds (45.4 kg) to the mandrel 1.0 inch (25.4 mm) from the outlet end of the device per Figure 2. Hold for 3 minutes.

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