UL 1469

Underwriters Laboratories Inc.

Standard for Safety

# Strength of Body and Hydraulic Pressure Loss Testing of Backflow Special Check Valves

UL Standard for Safety for Strength of Body and Hydraulic Pressure Loss Testing of Backflow Special Check Valves, UL 1469

Second Edition, Dated December 7, 2006

***Summary of Topics***

***These revisions are being issued to:***

Revise the Hydrostatic Test Pressure in the Strength of Body Test,

Make Corrections and add a valve size to Table 6.1 and

Include undated reference requirements.



The requirements in this Standard are now in effect, except for those paragraphs, sections, tables, figures, and/or other elements of the Standard having future effective dates as indicated in the note following the affected item. The prior text for requirements that have been revised and that have a future effective date are located after the Standard, and are preceded by a ″SUPERSEDED REQUIREMENTS″ notice.

Text that has been changed in any manner or impacted by UL's electronic publishing system is marked with a vertical line in the margin. Changes in requirements are marked with a vertical line in the margin and are followed by an effective date note indicating the date of publication or the date on which the changed requirement becomes effective.

The revised requirements are substantially in accordance with Proposal(s) on this subject dated October 30, 2009.

The following table lists the future effective dates with the corresponding reference.

| Future Effective Date | Reference |
|---|---|
| March 19, 2010 | Paragraphs 1.1, 2.2, 2A.1, 2A.2, 5.1; Tables 5.1 6.1 |

**DECEMBER 7, 2006**
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# UL 1469

## Standard for Strength of Body and Hydraulic Pressure Loss Testing of Backflow Special Check Valves

First Edition – May, 1995

**Second Edition**

**December 7, 2006**

Comments or proposals for revisions on any part of the Standard may be submitted to UL at any time. Proposals should be submitted via a Proposal Request in UL's On-Line Collaborative Standards Development System (CSDS) at http://csds.ul.com.

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## INTRODUCTION

### 1 Scope

1.1 These requirements cover backflow special check valves of 3/4 through 12 NPS (nominal pipe size) used in piping systems supplying water for fire protection service.

1.1 revised March 19, 2010

1.2 The backflow special check valves covered by these requirements are intended for installation and use in accordance with the Standards for:

a) Low Expansion Foam and Combined Agent Systems, NFPA 11;

b) Installation of Sprinkler Systems, NFPA 13;

c) Installation of Standpipe and Hose Systems, NFPA 14;

d) Water Spray Fixed Systems for Fire Protection, NFPA 15;

e) Deluge Foam-Water Sprinkler and Spray Systems, NFPA 16;

f) Installation of Centrifugal Fire Pumps, NFPA 20;

g) Water Tanks for Private Fire Protection, NFPA 22; and

h) Installation of Private Fire Service Mains and Their Appurtenances, NFPA 24.

1.3 A product that contains features, characteristics, components, materials, or systems new or different from those covered by the requirements in this standard and that involve a risk of fire, electric shock, or injury to persons shall be evaluated using the appropriate additional component and end-product requirements as determined necessary to maintain the acceptable level of safety as originally anticipated by the intent of this standard. A product whose features, characteristics, components, materials, or systems conflict with specific requirements or provisions of this standard cannot be judged to comply with this standard. Where considered appropriate, revision of requirements shall be proposed and adopted in conformance with the methods employed for development, revision, and implementation of this standard.

## 2 General

2.1 If a value for measurement is followed by a value in other units in parentheses, the second value may be only approximate. The first stated value is the requirement.

2.2 Any undated reference to a code or standard appearing in the requirements of this standard shall be interpreted as referring to the latest edition of that code or standard.

2.2 added March 19, 2010

## 2A Glossary

2A added March 19, 2010

2A.1 For the purpose of this standard, the following definitions apply.

2A.1 added March 19, 2010

2A.2 NPS (NOMINAL PIPE SIZE) – A dimensionless designator for pipe sizes. Defined in standards including the Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless, ASTM A 53/A 53M; the Standard Specification for Electric-Resistance-Welded Steel Pipe, ASTM A 135/A 135M; and the Standard Specification for Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for Fire Protection Use, ASTM A 795/A 795M; used to replace terms such as “Nominal Diameter” and “Nominal Size.”

2A.2 added March 19, 2010

# CONSTRUCTION

## 3 General

3.1 Valve sizes refer to the nominal diameter of the waterway through the end connections and to the nominal pipe size for which the end connections are intended. The diameter of the waterway through the valve may be reduced below that of the waterway through the end connections.

3.2 Backflow special check valves shall be provided with either:

a) An indicating type gate valve at each valve end; or

b) A marking referencing an indicating type gate valve conforming to the Standard for Gate Valves for Fire-Protection Service, UL 262, that is to be provided at installation. See 9.5.

*Exception: Backflow special check valves can be provided with attached indicating type system control valves, such as butterfly valves, if both valves have been tested for friction loss.*

## 4 Rated Pressure

4.1 A backflow special check valve shall be constructed for a minimum rated pressure of 175 psig (1.24 MPa).

## PERFORMANCE

## 5 Strength of Body Test

5.1 An assembled backflow special check valve, including trim and bypass components, shall withstand, without rupture, an internal hydrostatic test pressure equal to four times the rated pressure for a period of five minutes. During this test, the valve clapper is to be blocked open and bypass valves are to be in the open position to impress the test pressure on all parts of the valve assembly subject to rated pressure.

5.1 revised March 19, 2010

**Table 5.1**
**Hydrostatic test pressure**

Table 5.1 deleted March 19, 2010

5.2 The hydrostatic pressure test for strength of body castings, flanges, covers, and the like, is not considered a test for gaskets or seals. Gaskets used with castings or parts having large areas may be reinforced. Other materials that can withstand the pressure may be substituted for regularly used gaskets and seals.

## 6 Hydraulic Pressure Loss Test

6.1 Pressure losses for a backflow special check valve shall be determined from zero (0) flow to approximately 150 percent of the rated flow specified in Table 6.1, and back to zero (0).

**Table 6.1**
**Rated flows for backflow special check valves**

Table 6.1 revised March 19, 2010

| Valve size (nominal), inches | Rated flow, gpm | (L/s) |
|---|---|---|
| 3/4 | 30 | (1.89) |
| 1 | 50 | (3.15) |
| 1-1/4 | 75 | (4.73) |
| 1-1/2 | 100 | (6.31) |
| 2 | 160 | (10.09) |
| 2-1/2 | 225 | (14.20) |
| 3 | 320 | (20.19) |
| 4 | 500 | (31.55) |
| 6 | 1000 | (63.09) |
| 8 | 1600 | (100.94) |
| 10 | 2300 | (145.11) |
| 12 | 3000 | (189.27) |

6.2 Each backflow special check valve is to be tested with all associated trim and bypass components and with the intended indicating type system control valves.

6.3 To determine the valve differential at zero (0) flow, the valve assembly is to be filled with water and vented of all entrapped air. Transparent tubes are to be attached upstream and downstream of the valve and extended in a vertical position. The tube downstream of the valve is to be filled with water to a level of 6 in. above the highest point of the valve body assembly. The tube upstream of the valve is to be slowly filled with water until leakage past the valve check assembly occurs as evidenced by a drop in the level of water in the upstream tube. The difference in water level between the upstream and downstream tubes at the point of valve leakage is considered the differential. Other means to measure valve differential may be used if found to produce equivalent results to the procedure described herein.

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