UL 1486

STANDARD FOR SAFETY

Quick Opening Devices for Dry Pipe Valves for Fire Protection Service

UL Standard for Safety for Quick Opening Devices for Dry Pipe Valves for Fire Protection Service, UL 1486

Fourth Edition, Dated September 21, 2023

SUMMARY OF TOPICS

This new Fourth Edition of ANSI/UL 1486 dated September 21, 2023 incorporates editorial changes including renumbering and reformatting to align with current style.

The requirements are substantially in accordance with Proposal(s) on this subject dated July 7, 2023.

No Text on This Page

UL 1486

Standard for Quick Opening Devices for Dry Pipe Valves for Fire Protection Service

First Edition – May, 1979
Second Edition – August, 1993
Third Edition – January, 2004

Fourth Edition

September 21, 2023

This ANSI/UL Standard for Safety consists of the Fourth Edition.

The most recent designation of ANSI/UL 1486 as an American National Standard (ANSI) occurred on September 21, 2023. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, and Title Page.

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

No Text on This Page

CONTENTS

No Text on This Page

INTRODUCTION

1 Scope

1.1 This Standard covers quick opening devices intended for attachment to dry pipe valves to reduce the time delay in operation of the valve following opening of one or more sprinklers. The quick opening devices consist of accelerators and exhausters for use with a specific dry pipe valve design.

1.2 The products covered by this Standard are intended for use in fire protection service as outlined by the Standard for Installation of Sprinkler Systems, NFPA 13.

2 Components

2.1 Except as indicated in 2.2, a component of a product covered by this Standard shall comply with the requirements for that component.

2.2 A component is not required to comply with a specific requirement that:

a) Involves a feature or characteristic not required in the application of the component in the product covered by this Standard;

b) Is superseded by a requirement in this Standard.

2.3 A component shall be used in accordance with its rating established for the intended conditions of use.

2.4 Specific components are incomplete in construction features or restricted in performance capabilities. Such components are intended for use only under limited conditions, such as certain temperatures not exceeding specified limits, and shall be used only under those specific conditions.

3 Units of Measurement

3.1 Values stated without parentheses are the requirement. Values in parentheses are explanatory or approximate information.

4 Referenced Publications

4.1 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.

4.2 The following publications are referenced in this Standard:

NFPA 13, *Installation of Sprinkler Systems*

UL 157, *Gaskets and Seals*

5 Glossary

5.1 For the purpose of this Standard, the following definitions apply.

5.2 ACCELERATOR – A device intended to induce dry pipe system air into a chamber of a dry pipe valve to reduce the trip time.

5.3 ANTIFLOODING DEVICE – An automatic valve that is either an external or internal part of the quick opening device, and that allows system air to pass into the quick opening device then automatically closes to prevent the entrance of water or foreign matter into the device. See 10.2.1.

5.4 EXHAUSTER – A device intended to discharge dry pipe system air directly to atmosphere.

CONSTRUCTION

6 General

6.1 Quick opening devices shall have a minimum working pressure of 175 pounds per square inch gauge (psig) (1.21 MPa).

6.2 When a quick opening device does not require the entrance and passage of water to function, it shall incorporate an antiflooding feature or be provided with an antiflooding device. See 5.3.

6.3 Clearances between moving parts constructed of metallic materials other than brass or metals having equivalent corrosion resistant properties shall be not less than 1/8 inch (3.2 mm).

6.4 Orifices shall be constructed of brass or of material having equivalent corrosion resistant properties.

6.5 A quick opening device generally consists of one of the following two constructions that are intended to reduce the time delay between the operation of the first sprinkler and the entrance of water into the sprinkler piping of a dry pipe system.

a) Accelerator (see 5.2); or

b) Exhauster (see 5.4).

PERFORMANCE

7 General

7.1 Representative samples of the quick opening device are to be subjected to the tests described in these requirements. Additional samples of parts constructed of nonmetallic materials, such as rubber gaskets and diaphragms are required for physical tests.

8 Elastomeric Parts (Except Gaskets) Test

8.1 An elastomeric part used to provide a seal shall have the following properties when tested as specified in UL 157:

a) For silicone rubber (having poly-organo-siloxane as its constituent characteristic), a minimum tensile strength of 500 psi (3.4 MPa) and a minimum ultimate elongation of 100 %;

b) For natural rubber and synthetic rubber other than silicone rubber, a minimum tensile strength of 1500 psi (10.3 MPa) and minimum ultimate elongation of 150 %; or a minimum tensile strength of 2200 psi (15.2 MPa) and a minimum ultimate elongation of 100 %; and

c) Those properties relating to maximum tensile set; minimum tensile strength and elongation after oven aging; and hardness after oven aging, all as specified in UL 157. The maximum service temperature used to determine the oven time and temperature for oven aging is considered to be 60 °C.

8.2 UL 157 provides for the testing of either finished elastomeric parts or sheet or slab material. Sheet or slab material is to be tested when the elastomeric parts are O-rings having diameters of less than 1 inch (25.4 mm). The material tested is to be the same as that used in the product, regardless of whether finished elastomeric parts or sheet or slab material is tested.

9 10-Day Moist Ammonia Air Stress Cracking Test

9.1 After being subjected to the conditions described in 9.2 – 9.4, a brass part containing more than 15 % zinc when examined using 25X magnification shall:

a) Show no evidence of cracking; or

b) Comply with the Operation Test, Section 10, and the Leakage Test, Section 12, when there is evidence of cracking.

9.2 Each test sample is to be subjected to the physical stresses normally imposed on or within a part as the result of assembly with other components. Such stresses are to be applied to the sample prior to and maintained during the test. Samples with threads, intended to be used for installing the product in the field, are to have the threads engaged and tightened to the torque specified in Table 9.1. Polytetrafluoroethylene (PTFE) tape or pipe compound are not to be used on the threads.

Table 9.1
Torque Requirements for Threaded Connections

Nominal thread size, inches	Torque pound-inches (N·m)	
1	1200	(135.6)
1-1/4	1450	(163.8)
1-1/2	1550	(175.1)
2	1650	(186.4)
2-1/2	1750	(197.7)
3	1800	(203.4)

9.3 Three samples are to be degreased and then continuously exposed in a set position for ten days to a moist ammonia-air mixture maintained in a glass chamber approximately 12 by 12 by 12 inches (305 by 305 by 305 mm) having a glass cover.

9.4 Approximately 600 ml (20.3 oz) of aqueous ammonia having a specific gravity of 0.94 is to be maintained at the bottom of the glass chamber below the samples. The samples are to be positioned 1-1/2 inches (38.1 mm) above the aqueous ammonia solution and supported by an inert tray. The moist ammonia-air mixture in the chamber is to be maintained at atmospheric pressure and at a temperature of 93 °F (34 °C).

10 Operation Tests

10.1 Quick opening devices

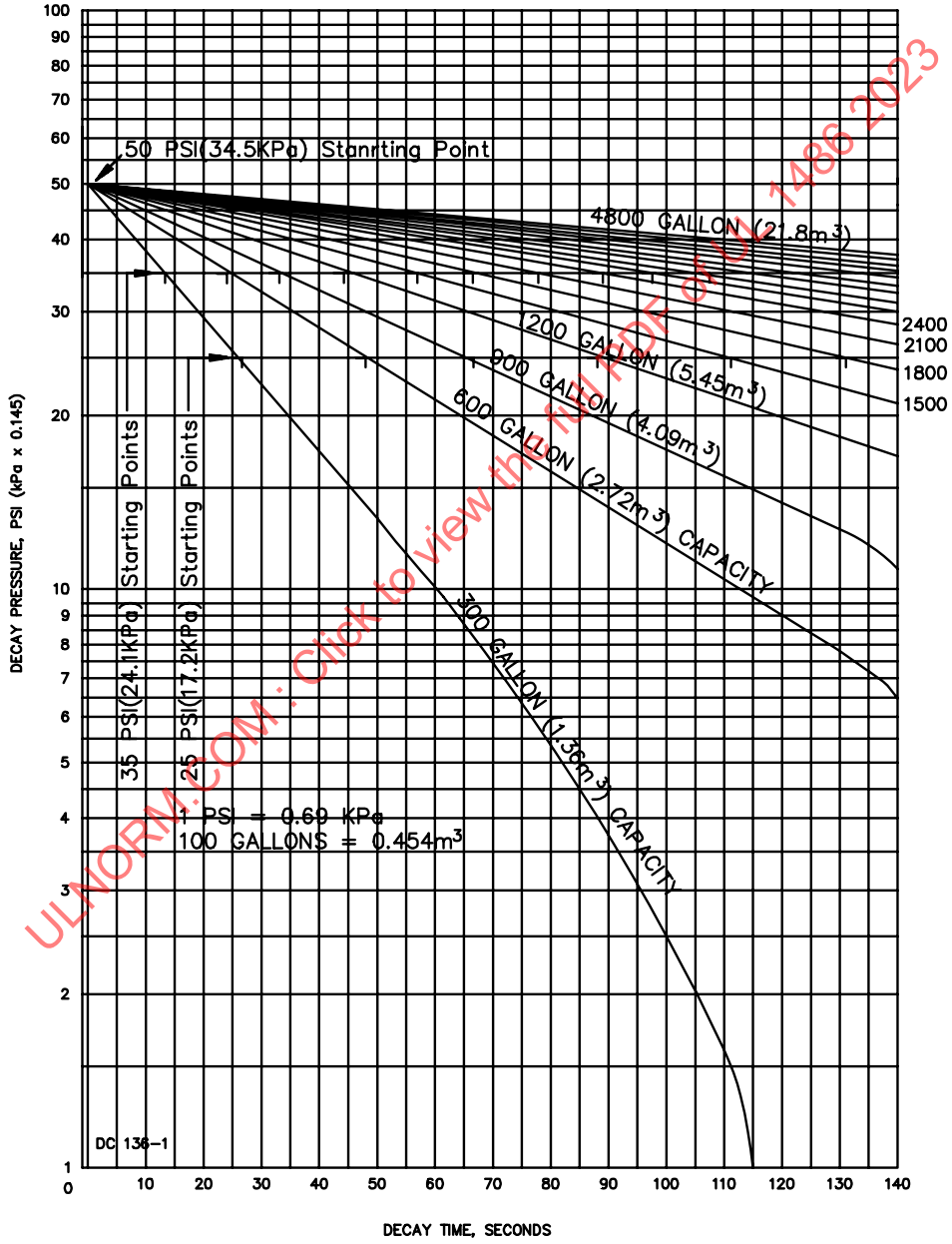
10.1.1 A quick opening device shall operate before the pressure drop exceeds 5.0 psig (0.034 MPa) after the quick opening valve controlling the flow of air to the orifice is opened.

10.1.2 The inlet of a quick opening device, with separate or integral antiflooding mechanism, is to be connected to the air space of a pressure tank. The tank is to be calibrated so that air volumes of simulated sprinkler system capacities ranging from 300 to 1200 gallons (1.14 to 4.54 m^3) or more, in increments of

300 gallons (1.14 m^3), can be established. An orifice, controlled by a quick opening valve connected to the air space, is to be used as the method of dropping the air pressure in accordance with the pressure decay curves illustrated in Figure 10.1. A quick opening device rated for use in systems having a maximum volume of 750 gallons (2.84 m^3) is to be tested using a maximum volume of 1200 gallons. A quick opening device rated for use in systems having volumes in excess of 750 gallons is to be tested using a maximum volume of approximately 1.6 times the rated valve capacity. See Table 10.1.

Figure 10.1

Decay Curves



SM662