UL 1474

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Adjustable Drop Nipples for Sprinkler Systems

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UL Standard for Safety for Adjustable Drop Nipples for Sprinkler Systems, UL 1474

Fifth Edition, Dated September 27, 2004

Summary of Topics

This new edition of UL 1474 is a periodic re-issuance to ensure that UL's Standards remain up to date with regard to format and editorial issues such as numbering, pagination and cross referencing. This new edition also includes revisions/clarifications to requirements in Section 5, Table 11.1 and 11.2.

The requirements are substantially in accordance with UL's Bulletin(s) on this subject dated August 5, 2004. The bulletin(s) is now obsolete and may be discarded.

The UL Foreword is no longer located within the UL Standard. For information concerning the use and application of the requirements contained in this Standard, the current version of the UL Foreword is located on ULStandardsInfoNet at: http://ulstandardsinfonet.ul.com/ulforeword.html

The master for this Standard at UL's Northbrook Office is the official document insofar as it relates to a UL service and the compliance of a product with respect to the requirements for that product and service, or if there are questions regarding the accuracy of this Standard.

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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that have been revised and that have a future effective date are located after the Standard, and are preceded by a ″SUPERSEDED REQUIREMENTS″ notice.

New product submittals made prior to a specified future effective date will be judged under all of the requirements in this Standard including those requirements with a specified future effective date, unless the applicant specifically requests that the product be judged under the current requirements. However, if the applicant elects this option, it should be noted that compliance with all the requirements in this Standard will be required as a condition of continued Listing and Follow-Up Services after the effective date, and understanding of this should be signified in writing.

This Standard consists of pages dated as shown in the following checklist:

Page Date

UL 1474

Standard for Adjustable Drop Nipples for Sprinkler Systems

First Edition – October, 1977
Second Edition – February, 1987
Third Edition – July, 1990
Fourth Edition – January, 1996

Fifth Edition

September 27, 2004

An effective date included as a note immediately following certain requirements is one established by Underwriters Laboratories Inc.

Revisions of this Standard will be made by issuing revised or additional pages bearing their date of issue. A UL Standard is current only if it incorporates the most recently adopted revisions, all of which are itemized on the transmittal notice that accompanies the latest set of revised requirements.

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CONTENTS

INTRODUCTION

1 Scope

1.1 This standard covers adjustable pipe nipples intended for use with sprinklers to permit adjustment of the distance of the sprinkler from the sprinkler system branch line.

1.2 The products covered by this standard are intended for use in sprinkler systems installed in accordance with the Standard for Installation of Sprinkler Systems, NFPA 13; Standard for the Installation of Sprinkler Systems in Residential Occupancies up to and including Four Stories in Height, NFPA 13R; and Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes, NFPA 13D.

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, or

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 Unit of Measurements

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

4 Undated References

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.

CONSTRUCTION

5 General

5.1 An adjustable drop nipple shall be constructed for a minimum rated pressure of 175 psig (1.21 Mpa)

5.2 The inlet shall have at least 1 inch size male or female NPT pipe threads in accordance with the Standard for Pipe Threads, General Purpose (Inch), (Revision and Redesignation of ASME/ANSI B2.1) B1.20.1, or at least 3/4 [nominal 0.875 inches (22.2 mm) OD] copper tubing. The outlet shall have 1/2, 3/4 or 1 inch female NPT pipe threads. Drop nipples intended for use in installations where pipe threads other than NPT type threads are used shall be permitted provided the threads or connections are compatible with a national standard.

5.3 Adjustable drop nipples shall have provision for restraining the outlet end from movement during installation of a sprinkler without damaging the components used to effect the seal, or without destroying the integrity of the seal.

5.4 An adjustable drop nipple shall have a means to limit maximum and minimum length.

6 Metallic Materials

6.1 A pressure retaining part of an adjustable drop nipple constructed of ferrous metal shall have a wall thickness of not less than 0.109 inch (2.76 mm).

6.2 When dissimilar metals are used in an adjustable drop nipple in a configuration or in a proximity that results in galvanic corrosion, the adjustable drop nipple shall be subjected to the Salt Spray Corrosion Test, Section 12.

PERFORMANCE

7 Hydrostatic Pressure Test

7.1 When tested as specified in 7.2, an adjustable drop nipple shall show no evidence of distortion, leakage, or change in length.

7.2 A total of eight samples, representative of the construction of various types and ratings, are to be subjected to this test. Each test sample is to be fitted with pipe plugs, filled with water in such a manner as to exclude all air, and connected to a hydrostatic pressure source. The sample is to be adjusted to its shortest position, the hydrostatic pressure increased to five times the rated working pressure of the sample, held for 1 minute, and:

a) When the product is not intended to be adjusted under service pressure, the test pressure is to be reduced to zero, the sample adjusted to its longest position, and the test pressure increased to five times the rated working pressure and held for 1 minute; or

b) When the product is intended to be adjusted under service pressure, the test pressure is to be reduced to the rated working pressure of the product, the sample adjusted to its longest position while under pressure, and the test pressure increased to five times the rated working pressure and held for 1 minute; and

c) The test pressure is then to be reduced to the rated working pressure of the product, the sample adjusted to its shortest position while under pressure, and the test pressure then increased to five times the rated working pressure and held for 1 minute.

8 Mechanical Strength Test

8.1 An adjustable drop nipple incorporating mechanical stops subject to torsional forces shall withstand a torque of 60 pound-feet (81 N·m) applied to the outlet without deformation, fracture, or leakage when tested as specified in 8.2 – 8.4.

8.2 The base of the sample is to be secured and a 60 pound-foot (81 N·m) torque is then to be applied at the outlet for 10 seconds against each stop.

8.3 Following application of the torque, the sample is to be examined for deformation or fracture.

8.4 The test sample is then to be fitted with pipe plugs, filled with water in such a manner as to exclude all air, and connected to a hydrostatic pressure source. The hydrostatic pressure is to be increased to the rated working pressure of the sample. The pressure is to be applied for one minute with the drop nipple positioned against each stop.

9 High Temperature Exposure Test

9.1 When tested as specified in 9.2, an adjustable drop nipple shall show no evidence of distortion or leakage.

9.2 Two samples are to be prepared and subjected to a hydrostatic pressure of 500 psig (3.45 MPa) in accordance with 7.2. The samples are then to be allowed to dry and then exposed to an ambient temperature in accordance with Table 9.1 for 90 days. Following this exposure, the samples are to be individually subjected to a hydrostatic pressure of 500 psig (3.45 MPa) for 1 minute.

Table 9.1
Test temperatures

Highest temperature rating of sprinkler with which adjustable drop nipple is to be installed		Temperature classification	Test temperature	
°F	(°C)		°F	(°C)
135 – 225	(57 – 107)	Ordinary and intermediate	175	(79)
250 – 300	(121 – 149)	High	250	(121)
325 – 375	(163 – 191)	Extra high	300	(149)

10 Vibration Test

10.1 When tested as specified in 10.2, an adjustable drop nipple shall show no evidence of leakage, distortion, or change in length.

10.2 Two samples are to be prepared and subjected to a hydrostatic pressure of 500 psig (3.45 MPa) in accordance with 7.2. The samples are to be extended to their intermediate position, locked, filled with water, and mounted in the pendant position on a test fixture attached to the table of a vibration machine. The samples are to then be pressurized with air at a pressure of 175 psig (1.21 MPa), vibrated vertically for 60 hours, and then vibrated horizontally for 60 hours. The amplitude of the vibration is to be 0.04 inch (1.02 mm), and the frequency is to be continuously varied between 18 and 37 hertz. When resonance is encountered in either the vertical or horizontal vibration mode, the sample is to be vibrated at the resonant frequency for the balance of the 60 hour period. Following each mode of vibration, the Hydrostatic Pressure Test, Section 7, is to be repeated at a pressure of 500 psig (3.45 MPa).

11 Flow Characteristics

11.1 Discharge coefficient

11.1.1 When tested as specified in 11.1.2, the discharge coefficient of an adjustable drop nipple at each pressure, when extended to its full length, shall be in accordance with Table 11.1.

Table 11.1
Discharge coefficients

Nominal Sprinkler K-factor	Minimum K-factor of drop nipple
8.0 or less	8.5
11.2	12.0
14.0	15.0

11.1.2 Water is to be discharged in the intended direction of flow through an adjustable drop nipple extended to its full length. The water pressure is to be initially set at 7 psig (0.048 MPa) and then varied in 5 psig (0.035 MPa) increments over the range of 10 psig (0.069 MPa) through 100 psig (0.69 MPa), and the flow rates, in gallons per minute (liters/s x 15.87), is to be recorded at each pressure. See Figure 11.1. The discharge coefficient ″K″ is to be calculated for each pressure setting, according to the formula:

$$K = \frac{Q}{\sqrt{P}}$$

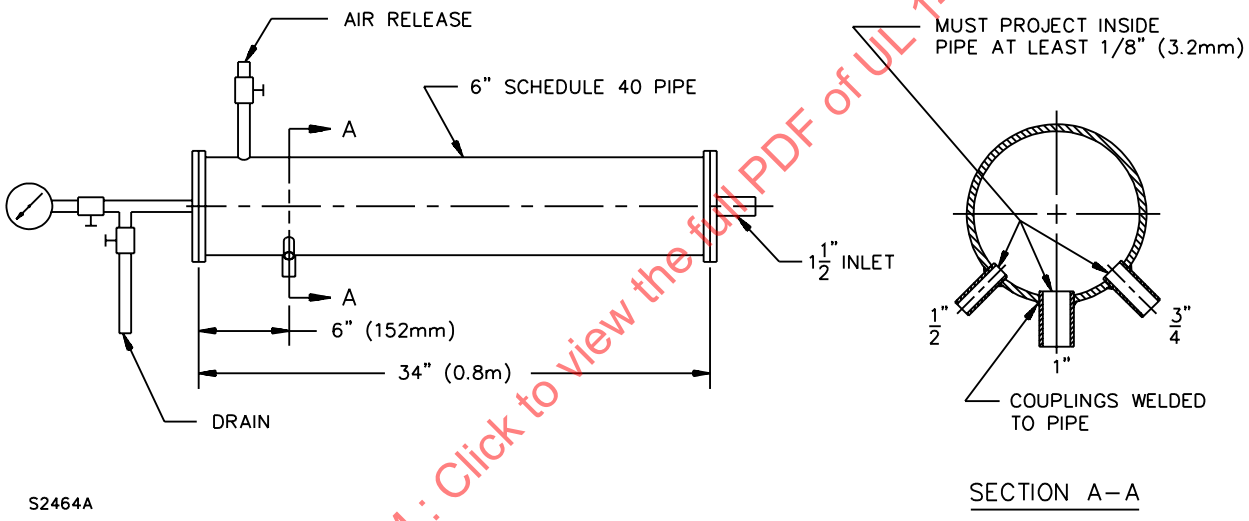
in which:

K = Discharge coefficient;

Q = flow in gallons per minute (liters/s x 15.87); and

p = pressure in psig (MPa x 145).

Figure 11
Calibration test equipment



11.2 Equivalent length

11.2.1 When tested as described in 11.2.2, the pressure loss of a fully extended adjustable drop nipple, expressed in equivalent length of 1 inch [nominal 1.315 inches (33 mm) OD] Schedule 40 steel pipe, shall not be more than the equivalent length values published in the installation instructions.