

UNDERWRITERS LABORATORIES INC. CERTIFICATION REQUIREMENT DECISION

This Certification Requirement Decision is prepared by UL LLC. It is normative for the applicable UL Product Certification Program(s); however, it is currently not part of the UL Standard(s) referenced below.

Product Category (CCN): VIWT, VIXR, VIWF, VIXO, VIXH

Standard Number: UL 1821

Standard Title: Standard for Thermoplastic Sprinkler Pipe and Fittings for Fire Protection Service

Edition Date: August 25, 2015

Edition Number: 3

Section / Paragraph Reference: New Clauses 1.4 and 29A

Subject: Pipe and Fittings Embedded in Concrete

DECISION:

(NEW)

1.4 The requirements covered by this standard do not address compatibility of plastic pipe and fittings with materials or products that they may be in contact with in storage, handling, or use.

29A Concrete Embedment Test

29A.1 Pipe and fittings intended to be embedded in concrete shall be evaluated to the following test method described in 29A.2 through 29A.5.

29A.2 A straight test assembly shall be assembled with pipe, a fitting, and a cap using the assembly methods in the manufacturer's installation instructions. The distance between the fitting and cap of the test assembly shall be a minimum of 10 pipe outside diameters (ODs) of exposed pipe length. The distance between the fitting and the concrete edge, where the pipe extends outside of the concrete, shall be a minimum of 2 pipe ODs of exposed pipe length.

29A.3 The concrete used for embedment shall be made from a mixture of one part Portland cement, two parts torpedo sand, and four parts crushed limestone or gravel, or of a mixture of these proportioned so that a minimum compressive strength of 2500 psi is achieved. The concrete is to be reinforced with wire mesh or steel rods and formed with the assembly embedded in the concrete and cured for 28 days. Samples of the concrete in the form of test cylinders shall be prepared at the same time as the test assembly for measuring the compressive strength on day 28 in accordance with ASTM C39.

29A.4 After the test assembly has properly cured, the assembly shall pressure tested with water at 2 times the rated pressure for 5 minutes to verify that there are no leaks. This test assembly shall then be embedded in concrete, in accordance with the manufacturer's installation instructions, with the open end extending beyond the concrete edge. The assembly shall be covered by a minimum of 2 in. of concrete in all directions. The open end of the assembly extending beyond the concrete edge shall represent the manufacturer's requirements for protrusion from a concrete embedment.

29A.5 After curing, the entire embedded test assembly shall be filled with water and pressurized to the rated pressure at a temperature of 70 ±5°F (21 ±3°C). The pressurized test assembly shall then undergo the Temperature Cycling Test, Section 25. After being subjected to the temperature cycling test, the test assembly shall comply with the Hydrostatic Pressure Test, Section 23. Any evidence of leakage/failure of the assembly shall be considered unacceptable.

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RATIONALE FOR DECISION:

UL 1821 did not contain specific requirements for pipe products when they are intended to be embedded in concrete. New Section 29A of this CRD provides evaluation criteria for products intended to be embedded in concrete, based on embedding the product as intended, and then subjecting the entire assembly to applicable temperature cycling and hydrostatic tests that are already defined within UL 1821.

Section 1.4 provides additional clarity, that although pipe embedded in concrete is permissible, there are no requirements within the document to assess pipe and fittings for compatibility with ancillary products they may come into contact with.

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