

Subject 1821

March 17, 2017

SUMMARY OF TOPICS

The following changes in requirements to the Standard for Safety for Thermoplastic Sprinkler Pipe and Fittings for Fire Protection Service, UL 1821, are being proposed:

1. Transition from Carbon Arc to Xenon Arc

STP BALLOTS AND ALL COMMENTS DUE: April 17, 2017

If you are interested in applying for STP 1821 membership or are aware of potential candidates for this STP, please contact the STP Project Manager, kevin.hf.wu@ul.com.

For your convenience in review, proposed additions to existing requirements are shown underlined and proposed deletions are shown ~~lined-out~~.

1. Transition from Carbon Arc to Xenon Arc

RATIONALE

Proposal submitted by: Jeff Hebenstreit, UL LLC

The carbon-arc exposure replacement equipment traditionally used for the accelerated light exposure has become less available. Xenon-arc equipment is considered a suitable alternative for the exposure and is more available. The proposal provides the option to use the xenon-arc as an alternate test methodology as described. Research has supported the duration of 500 hours xenon-arc exposure as equivalent to 360 hours carbon-arc exposure. The xenon-arc methodology along with the change in duration for the transition from carbon-arc is currently utilized in other UL standards.

PROPOSAL

29.1.2 The surfaces of test samples are to be subjected to the following exposures:

- a) Water immersion specified in 29.3, for 30, 90, and 180 days;
- b) Air-oven aging specified in 29.4, for 30, 90, and 180 days; and
- c) Accelerated light and water specified in 29.5, ~~for 360 hours~~.

Exception: If the pipe and fittings are shipped from the manufacturer in a manner that protects the product from the sunlight such as by the use of special packaging, the exposure period for the test noted in 29.1.2(c) is allowed to be reduced to 45 hours for carbon arc exposure or 65 hours for xenon arc exposure.

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29.5 Light and water exposure

29.5.1 The test samples are to be exposed for 360 hours to light and water in an accelerated light and water exposure apparatus, as specified in 29.5.2 and 29.5.3.

29.5.2 The apparatus used is to provide ultraviolet light from two enclosed carbon arcs formed between vertical electrodes 1/2 inch (12.7 mm) in diameter, located at the center of a revolvable vertical metal cylinder 31 inches (787 mm) in diameter and 17-3/4 inches (451 mm) high. The arcs are to operate with approximately 15 to 17 amperes ac and the potential across the arcs is to be approximately 120 to 145 volts. The arcs are to be enclosed by clear globes of No. 9200-PX Pyrex glass.

29.5.3 The samples are to be vertically mounted on the inside of the cylinder, facing the arcs, and the cylinder is to be rotated about the arcs at one revolution per minute. A system of nozzles is to be provided so that each sample is sprayed in turn with water as the cylinder revolves. During each 20 minute operating cycle, each sample is to be exposed to light from the arcs for 17 minutes and to water spray with light for 3 minutes. The temperature within the cylinder is to be $145 \pm 9^{\circ}\text{F}$ ($63 \pm 5^{\circ}\text{C}$) while the apparatus is in operation.

29.5.4 As an alternate to the test in sections 29.5.1-29.5.3, the test samples are to be exposed for 500 hours to light and water in accordance with 29.5.5.

29.5.5 Specimens are to be exposed to ultraviolet light and waterspray by using a Xenon-arc lamp in accordance with the Standard Practice for Exposing Nonmetallic Materials in Accelerated Test Devices That Use Laboratory Light Sources, ASTM G151, and the Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Nonmetallic Materials, ASTM G155. The spectral power distribution of the xenon lamp shall conform to the requirement in Table 1 in ASTM G155 for a xenon lamp with daylight filters. A programmed cycle of 120 minutes consisting of a 102-minute light exposure and an 18-minute exposure to water spray with light shall be used. The apparatus shall operate with a spectral irradiance of $0.35 \text{ W/m}^2 \text{ nm}$ at 340 nm and a black-panel temperature of $145.4 \pm 5.4^{\circ}\text{F}$ ($63 \pm 3^{\circ}\text{C}$).

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