

Subject 6

May 18, 2018

SUMMARY OF TOPICS

The following changes in requirements to the Standard for Electrical Rigid Metal Conduit – Steel, UL 6, are being proposed for preliminary review and comment only:

- 1. For Preliminary Review Only: Annex A Normative References Update***
- 2. For Preliminary Review Only: Interpretation of Flammability Test Result for a Thin Nonmetallic Topcoat (Outermost Layer) of an Alternate Corrosion Protection System***
- 3. For Preliminary Review Only: Removal of Chamfer Angle Requirement for Couplings***
- 4. For Preliminary Review Only: Clarification to Elbow Requirements, Test Bend Radius, and Editorial Changes***

COMMENTS DUE: June 17, 2018

If you are interested in applying for STP 6 membership or are aware of potential candidates for this STP, please contact the STP Project Manager, Joshua.Johnson@ul.com.

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

1. For Preliminary Review Only: Annex A Normative References Update

RATIONALE

Proposal submitted by: David Gerstetter, Underwriters Laboratories Inc.

The normative references in Annex A, for installation codes in particular, require updating in order to support other standard proposals being submitted, e.g. removal of bend radius.

PROPOSAL

Annex A (normative)

A.1 Normative References

(See Clause 2.1)

Reference item no.	Clause where referenced	United States	Canada	Mexico
1	1.1	NFPA 70-2005, <i>National Electrical Code</i>	CSA C22.1-06, Part 1, <i>Canadian Electrical Code</i>	NOM-001-SEDE, <i>Standard for Electrical Installations</i>
2	1.2	UL 6A <i>Electrical Rigid Metal Conduit – Aluminum, Red Brass, and Stainless Steel</i>	CSA C22.2 No. 45, ~~2-M1981 (R2003)~~ , <i>Electrical Rigid Metal Conduit</i>	NMX-576-ANCE-2005, <i>Aluminum Rigid Conduit for Electrical Conductor Protection and Fittings Electrical Rigid Metal Conduit - Aluminum, Red, Brass, and Stainless Steel</i>
3	5.3.3.2	UL 514B <i>Conduit, Tubing and Cable Fittings</i>	CSA C22.2 No. 18.3-04, <i>Conduit, Tubing and Cable Fittings</i>	NMX-J-017-ANCE-2005, <i>Conduit, Tubing and Cable Fittings - Specifications and Test Methods</i>
4	5.3.5.2	UL 746A <i>Polymeric Materials – Short Term Property Evaluations</i> , and UL 514B <i>Conduit, Tubing and Cable Fittings</i>	CAN/CSA C22.2 No. 0.17-00 (R2004), <i>Evaluation of Properties of Polymeric Materials</i> and CSA C22.2 No. 18.3-04, <i>Conduit, Tubing and Cable Fittings</i>	NMX-J-023/1-ANCE-2005, <i>Electrical Products – Metallic Outlet Boxes Part 1: Specifications and Test Methods</i> and NMX-J-017-ANCE-2005, <i>Conduit, Tubing and Cable Fittings – Specifications and Test Methods</i>
5	5.4.1.1	ASME B1.20.1-1983 (R2001), <i>Pipe Threads, General Purpose (INCH)</i>	ASME B1.20.1-1983 (R2001), <i>Pipe Threads, General Purpose (INCH)</i>	NMX-J-554-ANCE-2004, <i>Threads for Conduit and Fittings, Specifications and Test Method</i>
6	5.7.6	UL 514B <i>Conduit, Tubing and Cable Fittings</i>	CSA C22.2 No. 18.3-04, <i>Conduit, Tubing and Cable Fittings</i>	NMX-J-017-ANCE-2005, <i>Conduit, Tubing and Cable Fittings – Specifications and Test Methods</i>
7	6.2.1.5	UL 746A <i>Polymeric Materials – Short Term Property Evaluations</i>	CAN/CSA C22.2 No. 0.17-00 (R2004), <i>Evaluation of Properties of Polymeric Materials</i>	NMX-J-023/1-ANCE-2000, <i>Electrical Products – Metallic Outlet Boxes Part 1: Specifications and Test Methods</i>
8	6.2.2.11	ASTM A 239-95 (2004), <i>Standard Practice for Locating the Thinnest Spot in a Zinc (Galvanized) Coating on Iron or Steel Articles</i>	ASTM A 239-95 (2004), <i>Standard Practice for Locating the Thinnest Spot in a Zinc (Galvanized) Coating on Iron or Steel Articles</i>	NMX-H-013-1984, <i>Coating – Zinc – Locating the Thinnest Spot on Galvanized Steel Articles – Test Method (Preece Test)</i>
9	6.2.4.1	UL 514B <i>Conduit, Tubing and Cable Fittings</i>	CSA C22.2 No. 18.3-04, <i>Conduit, Tubing and Cable Fittings</i>	NMX-J-017-ANCE-2005, <i>Conduit, Tubing and Cable Fittings – Specifications and Test Methods</i>

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Reference item no.	Clause where referenced	United States	Canada	Mexico
10	6.2.4.5.2	ASTM D 1654-05, <i>Procedure A, Method 2, Standard Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments</i>	ASTM D 1654-05, <i>Procedure A, Method 2, Standard Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments</i>	NMX-J-023/1-ANCE-2000, <i>Electrical Products – Metallic Outlet Boxes – Part 1: Specifications and Test Methods</i>
11	6.2.4.5.3	ASTM G 153-04, <i>Standard Practice for Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials</i>	ASTM G 153-04, <i>Standard Practice for Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials</i>	NMX-J-023/1-ANCE-2000, <i>Electrical Products – Metallic Outlet Boxes Part 1: Specifications and Test Methods</i>
12	6.2.4.5.4	ASTM G 155-05, <i>Cycle 1, Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials</i>	ASTM G 155-05, <i>Cycle 1, Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials</i>	NMX-J-023/1-ANCE-2000, <i>Electrical Products – Metallic Outlet Boxes Part 1: Specifications and Test Methods</i>
13	6.2.4.6.1	ASTM B 117-03, <i>Standard Practice for Operating Salt Spray (Fog) Apparatus</i>	ASTM B 117-03, <i>Standard Practice for Operating Salt Spray (Fog) Apparatus</i>	NMX-D-022-1973, <i>Method of Test for Corrosion – Resistance of Coated Metal Parts Used in Motor Vehicles Salt Spray (Fog) Method</i>
14	6.2.4.6.2	ASTM D 1654-05, <i>Procedure A, Method 2, Standard Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments</i>	ASTM D 1654-05, <i>Procedure A, Method 2, Standard Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments</i>	NMX-J-023/1-ANCE-2000, <i>Electrical Products – Metallic Outlet Boxes Part 1: Specifications and Test Methods</i>
15	6.2.4.7.2	ASTM D 1654-05, <i>Procedure A, Method 2, Standard Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments</i>	ASTM D 1654-05, <i>Procedure A, Method 2, Standard Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments</i>	NMX-J-023/1-ANCE-2000, <i>Electrical Products – Metallic Outlet Boxes Part 1: Specifications and Test Methods</i>
16	6.2.4.8.1	ASTM D 638-03, <i>Standard Test Method for Tensile Properties of Plastics</i>	ASTM D 638-03, <i>Standard Test Method for Tensile Properties of Plastics</i>	NMX-E-082-2002, <i>Plastic Industry-Tensile Strength of Plastic Materials-Test Methods</i>
17	6.2.4.9.2	ASTM D 3359-02, <i>Standard Test Methods for Measuring Adhesion by Tape Test</i>	ASTM D 3359-02, <i>Standard Test Methods for Measuring Adhesion by Tape Test</i>	NMX-H-013-1984, <i>Coating – Zinc – Locating the Thinnest Spot on Galvanized Steel Articles – Test Method (Preece Test)</i>

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Reference item no.	Clause where referenced	United States	Canada	Mexico
18	6.2.4.10.2	ASTM D 2444-99 (R2005), <i>Standard Test Method for Determination of the Impact Resistance of Thermoplastic Pipe and Fittings by Means of a Tup (Falling Weight)</i>	ASTM D 2444-99 (R2005), <i>Standard Test Method for Determination of the Impact Resistance of Thermoplastic Pipe and Fittings by Means of a Tup (Falling Weight)</i>	NMX-E-012-SCFI-1999, <i>Plastics Industry – Pipes and Connections – PVC Pipes and Connections without Plastification for Electrical Installations – Specifications</i>
19	6.2.4.11.3	ASTM D 5025-05, <i>Standard Specification of Laboratory Burner Used for Small-Scale Burning Tests on Plastic Materials</i>	ASTM D 5025-05, <i>Standard Specification of Laboratory Burner Used for Small-Scale Burning Tests on Plastic Materials</i>	NMX-J-192-ANCE-1999, <i>Electrical Products – Wires and Cables – Flame Test on Electrical Cables – Test Methods</i>
20	6.2.4.11.3	ASTM D 5207-03, <i>Standard Practice for Confirmation of 20-mm (50-W) and 125-mm (500-W) Test Flames for Small-Scale Burning Tests on Plastic Materials</i>	ASTM D 5207-03, <i>Standard Practice for Confirmation of 20-mm (50-W) and 125-mm (500-W) Test Flames for Small-Scale Burning Tests on Plastic Materials</i>	NMX-J-192-ANCE-1999, <i>Electrical Products – Wires and Cables – Flame Test on Electrical Cables – Test Methods</i>

ASME: American Society of Mechanical Engineers

ASTM: American Society for Testing and Materials

NFPA: National Fire Protection Association

2. For Preliminary Review Only: Interpretation of Flammability Test Result for a Thin Nonmetallic Topcoat (Outermost Layer) of an Alternate Corrosion Protection System

RATIONALE

Proposal submitted by: David Gerstetter, Underwriters Laboratories Inc.

Present requirements do not address the consumption, at the point of flame contact when no flame propagation occurs, of the thin layer of a nonmetallic topcoat applied as the final layer of a multilayer alternate corrosion protection system applied to conduit e.g. zinc “3 dips worth” finish coated with lacquer. To address this need the addition of a note to clause 6.2.4.11.1 is intended to provide guidance to interpret test results.

PROPOSAL

6.2.4.11.1 Vertical specimens of finished conduit provided with a nonmetallic alternate corrosion-resistant coating shall not flame for longer than 5 s following any of three 60-s applications of flame, the period between applications being 30 s. A specimen shall not:

- Emit flaming or glowing particles or flaming drops at any time that ignite the cotton on the burner, wedge, or floor of the enclosure (flameless charring of the cotton shall be ignored),
- Continue to flame longer than 5 s after any application of the gas flame, or

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- c) Have the coating completely consumed during or after any application of the gas flame.

Note: When an alternate corrosion protection system employs a thin exterior nonmetallic topcoat such as lacquer or paint, measuring less than or equal to 0.125 mm (0.005 in) in thickness, over a confirmed 3 dips worth of zinc, a specimen may display a total consumption of the top coat at the point of flame contact to the conduit without any measureable flame propagation as long as it meets the requirements of 6.2.4.11.1 a and b. Confirmation of 3 dips zinc coating presence is accomplished using the Zinc Coating test, clause 6.2.2 as part of a separate test.

3. For Preliminary Review Only: Removal of Chamfer Angle Requirement for Couplings

RATIONALE

Proposal submitted by: David Gerstetter, Underwriters Laboratories Inc.

This proposal is to remove the chamfer angle and chamfer diameter requirements for couplings from the certification standard. Unlike the minimum required length of couplings, the chamfer angle and chamfer diameter requirements currently included in the standard are not safety critical and should be removed. The purpose of this proposal is not to prohibit couplings from being chamfered by a manufacturer.

PROPOSAL

~~5.7.4 Each end of a coupling shall be chamfered. Chamfer angle shall not be smaller than 11 degrees and shall not be larger than 15 degrees. The chamfer and~~ The thread of a coupling shall have pitch diameters shall be within the limits specified in Table 5.6. See Figure 3.

Note: Each end of a coupling may be chamfered per the industry standard; however, chamfering the ends of a coupling is not a requirement and shall not be verified as a part of the certification program. Industry standard information can be referenced under Annex F.