

Subject 746A

September 21, 2018

SUMMARY OF TOPICS

The following changes in requirements to the Standard for Polymeric Materials – Short Term Property Evaluations, UL 746A, are being proposed:

1. Revision of Lab Environment Conditions for Comparative Tracking Index (CTI) Tests in Section 24

STP BALLOTS AND ALL COMMENTS DUE: October 22, 2018

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

1. Revision of Lab Environment Conditions for Comparative Tracking Index (CTI) Tests in Section 24

RATIONALE

Proposal submitted by: Anil Ks, SABIC Innovative Plastics US LLC

This proposal was discussed in the UL 746 Standard Technical Panel meeting in June 2018. There were general consensus among members on this topic and hence I am submitting this proposal for ballot without any changes.

The current ASTM D3638 (Comparative Tracking Index of Electrical Insulating Materials) and IEC 60112 (Method for the determination of the proof and the comparative tracking indices of solid insulating materials) did not specify the percentage Relative Humidity that needs to be maintained while performing the CTI test. However the current UL 746A Standard (Section 9.5) says that, “unless otherwise specified in an ASTM or ISO material specification or in an individual test method, the standard atmospheric conditions surrounding the specimen for a minimum of 88 hours prior to and during the test shall be $23\pm2^{\circ}\text{C}$ ($73.4\pm3.6^{\circ}\text{F}$) and 50 ± 10 percent relative humidity (Class 2 in accordance with ISO 291)”. There is no technical reason why the CTI test needs to be conducted in a tightly controlled humidity environment. Moreover, it is practically not possible to maintain percent relative humidity of 50 ± 10 percent while performing the CTI test since the test is conducted in a closed chamber in the presence of a liquid contaminant. The proposal here is to eliminate the percentage humidity requirement and to align the laboratory temperature during CTI test to be consistent with the respective ASTM and IEC standards.

It is the proposal submitter's opinion that this proposal is a test requirement revision or clarification.

PROPOSAL

24.1 Note from the STP Project Manager: This proposal does not specify a revision of this requirement. This paragraph is provided for reference only. ASTM Method: the test method for determining the comparative tracking index of electrical insulation materials - which is the voltage, as

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determined under the conditions specified in the Standard Test Method for Comparative Tracking Index of Electrical Insulation Materials, ASTM D 3638, that causes a permanent electrically conductive carbon path with the application of 50 drops of electrolyte that is applied at the rate of one drop every 30 seconds to the specimen. This test is used as a measure of the susceptibility of the material to tracking.

24.2 Note from the STP Project Manager: This proposal does not specify a revision of this requirement. This paragraph is provided for reference only. The Comparative Tracking Performance Level Category (PLC) is to be assigned based on the ASTM D 3638 Comparative Tracking Index (voltage) in accordance with the ranges specified in Table 24.1.

~~24.3 IEC Method: The test method for determining the comparative tracking index of electrical insulation materials – which is the highest voltage, as determined under the conditions specified in the Method for determining proof and comparative tracking indices of solid insulating materials, IEC 60112, that does not cause a permanent electrically conductive carbon path within the application of 50 drops of electrolyte for 5 specimens without a persistent flame and is at least 25 volts higher than the highest voltage not to track for 100 drops for 5 specimens without a persistent flame. This test is used as a measure of the susceptibility of the material to tracking. For the ASTM method, all specimens are to be tested in a laboratory atmosphere of $20.0 \pm 5.0^{\circ}\text{C}$. All specimens are to be maintained at $23 \pm 2^{\circ}\text{C}$ and 50 ± 10 percent relative humidity for a minimum of 48 hours prior to testing.~~

~~24.4 Material grouping based on the comparative tracking performance as per the Method for the determination of the proof and the comparative tracking indices of solid insulating materials, IEC 60112, shall be assigned in accordance with the ranges specified in Table 24.2. IEC Method: The test method for determining the comparative tracking index of electrical insulation materials - which is the highest voltage, as determined under the conditions specified in the Method for determining proof and comparative tracking indices of solid insulating materials, IEC 60112, that does not cause a permanent electrically conductive carbon path within the application of 50 drops of electrolyte for 5 specimens without a persistent flame and is at least 25 volts higher than the highest voltage not to track for 100 drops for 5 specimens without a persistent flame. This test is used as a measure of the susceptibility of the material to tracking.~~

~~24.5 The test method for determination of the Comparative Tracking Index per ASTM D 3638 is to be supplemented by the procedure indicated in Figure 24.1. Material grouping based on the comparative tracking performance as per the Method for the determination of the proof and the comparative tracking indices of solid insulating materials, IEC 60112, shall be assigned in accordance with the ranges specified in Table 24.2.~~

~~24.6 For the IEC method, all specimens are to be tested in a laboratory atmosphere of $23.0 \pm 5.0^{\circ}\text{C}$. All specimens are to be maintained at $23 \pm 5^{\circ}\text{C}$ and 50 ± 10 percent relative humidity for a minimum of 24 hours prior to testing.~~

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