

Subject 1581

September 28, 2018

SUMMARY OF TOPICS

The following changes in requirements to the Standard for Reference Standard for Electrical Wires, Cables, and Flexible Cords, UL 1581, UL 1581, are being proposed:

1. Addition of EVA Requirements, Revised Table 47.1, New Tables 50.246 and 50.247

STP BALLOTS AND ALL COMMENTS DUE: OCTOBER 29, 2018

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

1. Addition of EVA Requirements, Revised Table 47.1, New Tables 50.246 and 50.247

RATIONALE

Proposal submitted by: Susan Stene, UL LLC

Currently, there are no short-term aging requirements for thermoplastic EVA in UL 1581, Section 50. Manufacturers are increasingly requesting the use of this material as part of their halogen-free product offering.

UL has compiled the long-term (150 day) aging data performed by UL on a variety of different compounds. This data shows consistent results. Therefore, UL has determined that there is sufficient data to propose short-term aging requirements for EVA, 90 and 105°C rated insulation and jacket.

Using the methods described in UL 2556 section 4.3, the data was evaluated for compliance with the 300 day extrapolation. Once compliance was determined, the methods described in Annex D were used to set the short-term requirements. Based on the chemistry of EVA compounds and the aging temperatures used for the 105°C rated product, residual cross-linking occurs during the oven aging. This results in the tensile strength increasing in value. As the increase in tensile strength is considered a characteristic of the compound and not an adverse reaction process, this requirement is deemed reliable for use in evaluating EVA compounds.

The percent EVA in a compound is calculated as shown in the table below.

Example:

Ingredient	Percent VA in polymer	PHR	Polymer percent	Percent VA in polymer system	Compound percent	Percent VA in compound
Ethylene Vinyl Acetate (EVA) with 28 Percent VA	28.0	50.0	50.0	14.00	18.87	5.28
Ethylene Vinyl Acetate (EVA) with 14 Percent VA	14.0	25.0	25.0	3.50	9.43	1.32ents
High Density Polyethylee (HPDE)	0.0	20.0	20.0	0.00	7.55	0.00
Polymer Coupling Agent	0.0	5.0	5.0	0.00	1.89	0.00
Aluminum Trihydroxide (ATH)		160.0		0.00	60.38	0.00
Other Additives		5.0		0.00	1.89	0.00
Total		265.0	100.0	10.50 *17.50	100.00 *100.01	6.60

The percent VA in each individual ingredient is known, as is the percentage of that ingredient as part of the overall polymer package and in the overall system. The percent VA as part of the overall system for each component is calculated. The percent of each component is then added together to get the overall percentage of VA in the system. This results in a 10.5 percent VA content in the polymer.

PROPOSAL

Note from the STP Project Manager: For brevity, only the affected portion of Table 47.1 is shown.

Table 47.1
Index to insulation and jacket materials

Material	Applicable table(s) or paragraphs in this standard
EPCV	
90°C Insulation	Table 50.62
EVA	
90°C insulation and jacket	Table 50.246
105°C insulation and jacket	Table 50.247

(NEW TABLE)

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