

SUMMARY OF TOPICS

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

1. Revision of Requirements in Section 20.2 to Not Allow a Higher RTI Ratings for Candidate Materials Based on Abbreviated Program Options

STP BALLOTS AND ALL COMMENTS DUE: November 19, 2018

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

1. Revision of Requirements in Section 20.2 to Not Allow a Higher RTI Ratings for Candidate Materials Based on Abbreviated Program Options

RATIONALE

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The standard UL 746B currently allows assigning higher temperature ratings for materials based on an abbreviated aging program. This proposal is being made to revise this allowance so that no higher RTI ratings are assigned to the candidate materials unless aged and justified through a full 4-temperature program. The rationale to justify this revision is listed below:

1. The standard allows using abbreviated program options for "Related" materials OR materials that are "Similar" in formulation to those already carrying elevated RTI ratings according to Paragraph 20.2.1. The available abbreviated program options are intended to be used to demonstrate equivalence in LTTA performance between control and candidate (variant) materials and hence are not intended to be used to demonstrate/assign a higher temperature rating. Therefore, no higher RTIs should be assigned to the related materials when any of the available abbreviated programs are used.
2. The abbreviated programs are carried out at one/two aging temperatures by assuming parallel slope for both control and candidate materials. This assumption should be considered valid only for demonstrating similar LTTA performance of control and the related materials. When assigning a higher temperature rating for the candidate than control, the actual individual slope of control and candidate materials should be used. This is possible only when a full 4-temperature program is run.
3. Therefore, this proposal is aimed at restricting the candidate RTI to same as the control rating if the extrapolated temperature of the candidate material exceeds the basic material's RTI by more than 5°C, but less than 10°C. Also, if the extrapolated temperature of the candidate material is less than that of the basic material's RTI by more than 5°C, but less than 10°C, then a 10° lower RTI value has to be assigned to the candidate material.

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4. In case where the extrapolated temperature of the candidate material exceeds the basic material's RTI by 10°C or more, then the evaluation has to be made using a full 4-temperature program.

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

PROPOSAL

20.2.2 In cases where the limits in Table 9.1 of UL 746A are exceeded, and where the polymer variation is not expected to affect the material's thermal endurance characteristics, testing will include one or two temperature aging (UL 746B) using the unaltered basic material as the control reference. Both the impact and non-impact mechanical properties tested in the nominal 3 mm thickness can be considered representative of other properties and thicknesses, however, if a lowering of the non-impact mechanical index is indicated, then the electrical index not tested will be automatically lowered by the same amount and materials may need to be checked after additional aging for retention of flame retardancy.

20.2.11 If comparison of the results of aging at the two mid-temperatures, used in the investigation, on having the same slope as the basic material but displaced so as to have the best fit with the two new points, extrapolates to within 5°C (9°F) of the relative thermal index of basic material, the related material is to be assigned the same relative thermal index as that determined for the basic material. ~~In the event that the extrapolation is to a temperature in excess of 5°C (9°F) of the basic material's relative thermal index, the related material is to be assigned a relative thermal index at the corresponding reduced value.~~ See 20.2.15 for an illustrative example.

20.2.12 ~~A related material is to be assigned a temperature rating not more than 10°C (18°F) above the rating of the basic material based on extrapolation of an Arrhenius curve having the same slope as the original curve but displaced so as to have the best fit with the results of aging of the related material at the two mid-temperatures of the investigated basic material.~~ If the extrapolated temperature of the related material exceeds the basic material's relative thermal index, the related material is to be assigned the same relative thermal index as that determined for the basic material.

20.2.13 ~~A related material is to be assigned a temperature rating more than 10°C (18°F) above the rating of the basic material.~~ If the extrapolated temperature of the related material is less than the basic material's relative thermal index by 5 to 10°C, the related material is to be assigned a relative thermal index value 10°C lower than that determined for the basic material. In the event that the extrapolated temperature result is lower by more than 10°C (18°F) of the basic material's relative thermal index, the related material can be assigned a relative thermal index only on the basis of an aging program at four temperatures.

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