

Massachusetts Office of Technical Assistance

Strategies for Streamlining Testing and Certification

Environmentally Friendly Wire and Cable

Introduction

The wire & cable-related sector of the plastics industry is important to the economy of Massachusetts, representing 1.6 billion dollars in sales, according to an industry source, and employing 1700.

Eliminating lead and other toxics from the compounding of formulations used, without affecting product quality, is a significant human health and environmental achievement. When cable manufacturers change their formulations (compounds or colorants) to eliminate lead or other materials of concern, the testing and approval process is similar to that required for most formulation changes. The purpose of this fact sheet is to review strategies for streamlining the testing and certification process – such streamlining can reduce time to market and costs.



Picture Courtesy of Alpha Gary

Do cable manufacturers that change their formulation need new approvals?

The extent of any re-testing depends largely on the potential effect the change will have on critical parameters of the insulation and/or jacket.

Certain types of changes require considerable testing, while others can be made without any. It is important to investigate with the testing authority the exact type of testing your change requires.

What is the recommended approach?

The primary rule in testing is that global changes are less expensive than taking a cable-by-cable approach. Where it may be possible to test a few cables to get approval for a whole family of products, testing individual cables can be costly and expensive. Follow these general steps to streamline your approach:

1. Contact the testing and certifying authority at the onset of the process.
2. Examine the range of products that will incorporate your new compound.
3. Use information from your testing file to determine which products passed testing requirements with the narrowest margin.
4. Classify the cables into families and select the worse case scenario products, in terms of testing results, from each family.
5. Your goal is a matrix wherein if the worst-case cables pass, then the others in the family will pass as well.

-----Global changes are less expensive than a cable-by-cable approach-----

Are Each Company's Negotiations Similar?

Yes and No. To the extent that two companies are substituting the same lead free heat stabilizer in the same type of product (e.g. Rise rated Cat 6 communications cable), the negotiations may be similar. However firms are usually making substitutes for families of products and only rarely do these families overlap to any great extent (e.g., different temperature ratings, wire pairings, wire gauges, etc.). Thus in many ways, each negotiation is to a large extent company specific.

What are the types of tests that are required for substitution of colorants such as those that replace lead, cadmium or hexavalent chromium?

Normally changes in colorants, not changes in the basic compound, do not require testing.

What are the types of tests that are required for substitution on non-lead heat stabilizers for lead based stabilizers?

While each case must be evaluated on its own, the following general testing requirements can be used as the basis for starting points.

Application Type	Testing and Approval
Wet-rated wire insulation – e.g., THWN	Standard for Thermoplastic Insulated Wires and Cables - UL 83. The water immersion test at rated temperature takes a minimum of 12 weeks and frequently is completed in 24 weeks
Power Limited Tray Cable (PLTC)	Cable Tray Flame Test (UL 1685) required and physical testing on samples of the cable jacket, unaged and after aging in an air oven (typically a seven-day test).
Riser-rated communications cable	Riser Cable Flame Test (UL 1666) and physical testing similar to PLTC cable
Plenum jacket	NFPA 262 Smoke and Flame Test required. Because of the difficulty in predicting outcomes of this test based on small changes in construction, more testing than for PLTC and CMR constructions may be required.
Flexible Cable – e.g., STP cord	No testing required a priori. Manufacturer responsible for providing assurance that the product meets the UL standard. UL will confirm that the product meets the standard during follow-up testing.
Generically authorized compounds	Substitutions are the responsibility of the cable manufacturer and need not be pre-authorized. UL will confirm that the product meets the standard during follow-up testing.

What type of savings in terms of time and cost can a company realize by testing families of products as opposed to a cable-by-cable approach?

It is not possible to predict a specific savings in time or dollars. It is safe to say that companies can achieve considerable savings in testing costs and sample manufacturing costs when testing a sample(s) that represents a larger group of products. For example, if a cable manufacturer uses the same jacket compound on three different constructions of Type PLTC cable, it may be possible to analyze previous flame test data and identify a single sample with the revised jacket compound that would represent all three constructions. Testing one cable rather than three could reduce costs by as much as 60%. Of course, the tests must show that the new compound is equal to or better than the original.

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Who is OTA?

This fact sheet is one in a series prepared by the Office of Technical Assistance (OTA), a branch of the Massachusetts Executive Office of Environmental Affairs. OTA's mission is to assist Massachusetts facilities with reducing their use of toxic chemicals and/or the generation of toxic manufacturing byproducts. Mention of any particular equipment or proprietary technology does not represent an endorsement of these products by the Commonwealth of Massachusetts. This information is available in alternate formats upon request. OTA's **non-regulatory** services are available at **no charge** to Massachusetts businesses and institutions that use toxics. For further information about this fact sheet or other OTA materials, or about OTA's technical assistance services, contact:

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