

The Risk of Using a Modified ASTM E84 Standard Test method for Surface-Burning Characteristics

by Bill Bliss

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Recently the industry has started to see the term “modified” on testing reports. However, “modified” does not mean the outcome meets the strict building code requirements. This modification to the standard is creating all sorts of confusion and risk, especially for the person responsible for approving the project, and the liability of allowing the use of a modified test of a product on your project.

Building codes, including plumbing and mechanical codes, limit certain materials from being used in locations susceptible to fire. The standard used for testing these materials is ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials, which was developed by the ASTM E05 Committee on Fire Standards. The standard ensures that the products used in a structure will not put people in danger during a fire event. For example, the standard limits the flame and smoke-developed ratings of materials within plenums, which are used for air conveyance, ensuring that occupants are not exposed to excessive smoke and that fire is not allowed to travel from room to room or floor to floor through the plenum.

It is critical to test materials in a consistent manner to best understand how the materials react in a fire situation. Most often, the building inspector will look for the product’s mark of conformity proving that the material has met the ASTM E84 standard test requirements, as well as the flame and smoke index number derived from the test. The data is then printed on the product itself for easy recognition of compliance.

For the ASTM E84 test, the testing parameters should be consistent for all materials. For example, the test samples must be tested at the full width and length of the Steiner test tunnel, utilize a uniform flame location, temperature curve, measurement (flame spread index and smoke-developed index), and draft or pressure. All materials are not created equally and may require minor adjustments, mostly for geometry of the product being tested. Confusion occurs when the test parameters are manipulated in an attempt to get the product to meet the minimum flame and smoke characteristics—lowering the number of a specific product during the test. This can be managed by using creative mounting techniques. After the modification takes place, a “Modified” ASTM E84 test report is generated.

Although the standard has strict provisions, there is a trend to “modify” the minimum safety test provisions to get a specific product to meet the lowered standard parameters. However, in reality the product itself should be “enhanced” to meet the minimum safety standard tests, and not the other way around.

The ASTM E84 scope states: “1.4 The use of supporting materials on the underside of the test specimen has the ability to lower the flame spread index

from those which might be obtained if the specimen could be tested without such support. These test results do not necessarily relate to indices obtained by testing materials without such support.” This could create a situation where a product exhibits an FSI or SDI low enough for use and that would not necessarily meet the code values without the modification to the testing.

Some manufacturers have made a concerted effort to weaken the E84 test parameters by expanding the scope of the standard to include other (less stringent) standards. These “product” based analyses move away from a direct material comparison to include assumptions on what configuration, form, and quantity a product of a certain material might be installed within any given building. Still, these manufacturers have attempted to modify E84 to “recognize” these product-based alternative tests in the ASTM process to make them appear equivalent. They’ve also made similar proposals to do the same in the national model plumbing and mechanical codes. Thus far, these actions have not made a lot of headway; however, one must always be on the lookout for concerted efforts to weaken the flame and smoke ratings, and in turn, the safety of a building.

How to Spot a “Modified” Test

How can you identify if a test has been “modified”—especially if it is not obvious? The answer is to do your research! The manufacturers’ information is a good place to begin. Some manufacturers will indicate in their product literature that the test performed was modified, while others may not. If they do indicate that it was in fact modified, they still do not typically indicate exactly how the test was manipulated. The next piece of research will be the listing or listings for the product by the listing agency. This is where you must become an investigator, since most listings indicate the modification information buried deep within the listing. Since the testing laboratory that produced the report worked for the manufacturer, only the manufacturer can release the report. This will contain a great deal of technical information, including the modifications that took place for the test of the specific product or material. The report will state whether they performed a full tunnel test, used correct support for materials that melt, bend, or flex, or if these items were modified in a way that allows a lower FSI or SDI than if it were done properly.

To avoid major confusion, the best way is to install the materials with the correct assets to protect the building and the occupants within. It’s a life safety matter. Building codes do not have exceptions for modified testing for the building products; therefore, specifiers should not allow them to be considered. ■

About the Author

Bill Bliss has been in the industry for more than 40 years and has held a Master Plumber license in the state of Oklahoma. Currently, Bill is a Technical Consultant for McWane Plumbing Group. He is a veteran of the U.S. Army, having served in Vietnam after being drafted into service in 1968. Following his time in military service, Bill worked at Oklahoma State University for 17 years, where he taught plumbing, pipe fitting, and welding in their School of Technology. Following his teaching career, he was hired by Tyler Pipe in Tyler, Texas, and through the years he has served as a Regional Sales Manager, National Sales Manager in both the Utility Division and Soil Pipe Divisions, VP of Sales and Marketing at Tyler Pipe, and most recently VP of the McWane Plumbing Group. Bill has been a member of the Cast Iron Soil Pipe Institute (CISPI) Technical Committee since 1987 and served as President for a term. In addition, Bill has applied his vast experience by serving on various codes and standards committees and task groups and code development groups including IPC, UMC, IMC, UPC, and ASTM, ASME, CSA, and AWWA. He has been a member of the ASTM committee since 1987 as and has held several roles including Committee Chairman and most recently Membership Chairman. Bill is actively involved with the CSA B70 and B602 Committees, ASTM E05 Committee on Fire Standards, and A04 Iron Castings and is a member of ASTM C24 on Building Seals and Sealants, ASME B16 Committee for valves, flanges, fittings, and gaskets, and the AWWA committee for waterworks fittings. Bill is proud to have held a Master Plumber license in state of Oklahoma.