

ALPOLIC®

TECHNICAL BULLETIN MCM, Combustibility and the Building Code 2/19/2020

How do you know if a material is non-combustible?

Defining what is non-combustible is a matter of setting the conditions under which flaming does NOT occur. These conditions are set by National or Regional entities in the various building codes. This results in varying tests for combustibility (or non-combustibility) based on the local codes. The tests for combustibility are very different in the US from Japan, from Canada, from Australia, from the European Union, etc.

In the US International Building Code (IBC), the test for non-combustibility of material is ASTM E136 (Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750°C). This test subjects a sample of material to a specific heat, for a specific time and sets specific limits for flaming, mass loss and temperature rise. If the sample passes these conditions, that material is considered “non-combustible”. If the final product is a composite (such as Metal Composite Material, MCM), all materials must be tested separately (core, skin and, if used, adhesive) and pass to be considered non-combustible. The Canadian test for combustibility is CAN/ULC S114 (Standard Method of Fire Test of Exterior Wall Assemblies). It uses similar temperatures, samples and general criteria as the E136, but time and criteria limits are different.

If a material (or any of its components) does not meet the requirements of E136, then the IBC may set other criteria for a material’s use in non-combustible construction. For MCMs, those requirements are an ASTM E84 (Standard Test Method for Surface Burning Characteristics of Building Materials) grade of Class A and, if over 40’ from grade, successful NFPA 285 testing. The NFPA 285 is a large scale, full wall fire test which demonstrates the wall’s ability to limit flame spread up the exterior wall. Again, Canada has similar, but different, tests - CAN/ULC S102 and CAN/ULC S134 - for the same purpose.

The European Union uses a completely different system which doesn’t actually define “non-combustible”. This system uses small scale calorimeter tests, which measure heat release, and grades a material from less combustible to more combustible; A1, A2, B1, B2, and so on.

It is important to understand that these different national systems are not compatible with, nor interchangeable with, each other. For example, the European rating of A1 or A2 does NOT mean the material will pass the E136 and be considered non-combustible in the US. In fact, very few A1 materials and none of the A2 materials will meet the US standards for non-combustibility. The European standards are not recognized by the IBC, just as the ASTM E 136 is not recognized by France.

If you have a 70’ MCM project in Cleveland, you need a product that has been tested to ASTM E84 and NFPA 285, NOT, A1 or A2.