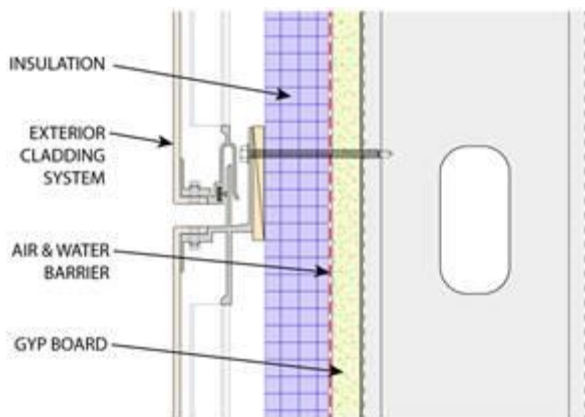


Use of MCM Wall Cladding with Foam Plastic Insulation in Combustible Wall Assemblies

Overview

With increased demands in energy conservation, designers are often looking for ways to include additional insulation on the exterior side of the wall assembly, behind the cladding, to meet the requirements of the code. Installation of this “continuous insulation” generally occurs in the free air cavity between the weather barrier and the exterior cladding material.



Installation Example

Two primary types of material are used to provide this additional insulation: mineral wool (also known as mineral fiber) insulation and foam plastic insulation. Mineral wool insulation is recognized as a noncombustible material in accordance with the International Building Code (IBC) Section 703.3.1. As a noncombustible material, the mineral wool does not contribute to the combustible components of the wall assembly.

The real question becomes when is the use of foam plastic insulation allowed and under what conditions is compliance with the NFPA 285 “Standard Fire Test Method for Evaluation of Fire

Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components” required?

This technical bulletin investigates the allowable use of foam plastic insulation as a component of a combustible wall assembly using MCM as an exterior cladding based on the requirements of the 2021 IBC.

Discussion

The IBC provides guidance on the use of Metal Composite Materials (MCM) in Section 1406 and foam plastic insulation in Section 2603.5.

Metal Composite Material

With several noted exceptions, the allowable use of MCM assemblies can be found in Sections 1406.10 Types I, II, III, and IV construction. Generally speaking, MCM systems can be installed to a height of 40 feet above grade before compliance with NFPA 285 must be considered.

These are “typical” conditions and avoid exceptions specifically identified in the code such as those for:

- Type V construction
- Non-Rated Construction
- Buildings with property line or proximity issues
- Building that are “non-standard” in size and dimension (there are sometimes considerations for overly large or unique shape buildings)

Foam Plastic Insulation

The use of foam plastic insulation, either as “board stock” or as a component of a wall, is specifically

regulated in IBC Section 2603.5.5. This section states that the wall assembly shall be tested in accordance with NFPA 285 for Type I, II, III, and IV construction.

There is an exception for one-story buildings in accordance with Section 2603.4.1.4, however the foam plastic is required to be covered with a minimum thickness of 0.032" aluminum. Typical MCM metal facers are 0.020" and it is not permitted to add the facers together to reach the minimum thickness.

Example

Wall construction to a building height up to 40 feet above grade made from Metal Composite Material (MCM) fabricated with a perimeter aluminum frame and attached by bolting the frame to the base structural wall. The wall assembly, starting from the exterior, consists of MCM cladding, 0.5" free air cavity, 2" of foam plastic insulation, weather barrier, and a layer of gypsum board on the exterior side of the structural wall. (Foam thickness, orientation of materials, and actual height above grade, up to 40', should not impact the results of the analysis.)

With the use of foam plastic insulation, this wall would need to conform to the requirements of NFPA 285 based on Section 2603.5.5 regardless of the height above grade.

If the foam plastic insulation were replaced with mineral wool, this assembly would remain a combustible wall cladding assembly due to the use of the MCM. The allowable height limitations for product use without compliance to NFPA 285 would be as defined in Section 1407.10.

Summary

The use of combustible components in the wall assembly may trigger the need for compliance with NFPA 285 at differing heights, however the use of foam plastic insulation in most applications of

Types I-IV construction will require compliance with NFPA 285 regardless of panel height (Section 2603.5.5).

For additional information on the correct product use for MCM reference the MCA Technical Bulletin titled "Choosing between Fire Retardant and Standard Core Metal Composite Material (MCM)".

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