

December 21, 2020

DuPont Performance Building Solutions
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RE: Interior Finish Requirements for Use of DuPont™ Thermax™ Insulation Material Exposed on Interior Face of Concrete or CMU Walls
JENSEN HUGHES Project No. 1JJB05306.011

To Whom It May Concern:

Jensen Hughes is providing this letter to address the interior finish requirements for the use of the DuPont™ Thermax™ foam plastic insulation material installed only on the interior side of concrete or concrete masonry units (CMU) walls. It is assumed that the walls under consideration are constructed of concrete (poured in-place, tilt-up construction, etc.) or CMU and that the DuPont™ Thermax™ foam plastic insulation is installed only on the interior face of these walls. The DuPont™ Thermax™ foam plastic or other combustibles on the exterior face of the wall assemblies is outside the scope of this analysis but these items are addressed in other letters or analyses previously provided to DuPont™.

Typically, per Section 2603.5.5 of the IBC (2000 through 2018 editions), all exterior wall assemblies containing a foam plastic insulation material must comply with NFPA 285, *Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components*. Compliance with the NFPA 285 test standard ensures excessive vertical and/or lateral flame spread does not occur up the face of the exterior wall assembly.

When installed on the interior face of the concrete or CMU wall, the foam plastic is required to be covered by a thermal barrier material as specified in Section 2603.4. Per Section 2603.9, Special Approval, the foam plastic is not required to be covered by a thermal barrier where specifically approved based on large-scale room corner type testing such as, but not limited to, NFPA 286, FM 4880, UL 1040, or UL 1715. Such testing is required to be related to the actual end-use configuration (in this case left exposed) and be performed on the finished manufactured foam plastic assembly in the maximum thickness intended for use. Foam plastic insulation materials that are used as interior finish on the basis of special tests shall conform to the flame spread and smoke developed requirements of Chapter 8. Assemblies tested shall include seams, joints, and other typical details used in the installation of the assembly and shall be tested in the manner intended for use (in this case left exposed with no additional covering material).

In the specific exterior wall assembly construction under consideration, the DuPont™ Thermax™ insulation will be installed only on the interior face of the exterior wall, as shown in Figure 1. When the DuPont™ Thermax™ is used in this condition, compliance with NFPA 285 is not required because the fire performance of the DuPont™ Thermax™ installation can be addressed via an analysis such as the one herein. This analysis is

based on the Vertical Fire Separation condition and the Horizontal Fire Separation conditions described below being met.

Vertical Fire Separation

When the DuPont™ Thermax™ is installed on the interior face of the concrete or CMU wall, it must be vertically separated from the floor above by minimum 4-inch thick, minimum 4 pcf mineral wool insulation at each floor line. The mineral wool insulation must be unfaced and securely friction fit or mechanically installed against the concrete or CMU wall. The mineral wool insulation must extend from the face of the edge of the floor slab to the back face of the concrete or CMU. This installation provides a vertical barrier to the spread of fire either over or through the DuPont™ Thermax™, as shown in Figure 1.

Lateral Fire Separation

The DuPont™ Thermax™ insulation cannot horizontally bypass or go around any fire-resistance rated fire wall or interior fire barrier wall that intersects the exterior wall. As with the vertical separation, the fire wall or the interior fire barrier wall must interrupt the DuPont™ Thermax™ for the thickness of the wall, or if a gap occurs, it must be sealed with mineral wool insulation for the full height and thickness of the interior wall. This determination is based on the premise that an interior fire will potentially involve all of the combustibles within the fire area. However, the fire cannot be allowed to move beyond the fire area bounded by fire walls or fire barrier walls.

Room Corner Testing

The interior face of the DuPont™ Thermax™ can be left uncovered (exposed) in this exterior wall configuration only since it has been shown based on full-scale fire tests that a Thermal Barrier is not required. Section 4.1.1 of ICC-ES Report ESR-1659 states "Thermax™ insulation board, at a maximum thickness of 4¼ inches (108 mm), may be used as nonstructural insulating material without a thermal barrier on any or all surfaces (wall or floor/ceiling assembly in any type of structure."

Surface Burning Characteristics

Per Section 3.3 of ICC-ES Report ESR-1659, the DuPont™ Thermax™ insulation boards have a flame spread index of 25 or less and a smoke developed index of 450 or less when tested in accordance with UL 723/ ASTM E84 at a maximum thickness of 4¼ inches, making it a Class A material.

The information contained in ICC-ES ESR-1659 supports the use of the DuPont™ Thermax™ insulation boards installed exposed on the inside face only of a concrete or CMU exterior wall without the need for a thermal barrier.

If you have any questions regarding the above analysis, please feel free to contact me at (443) 313-9891 or aparker@jensenhughes.com.

Sincerely,



Arthur J. Parker, P.E.
Sr. Fire Protection Engineer

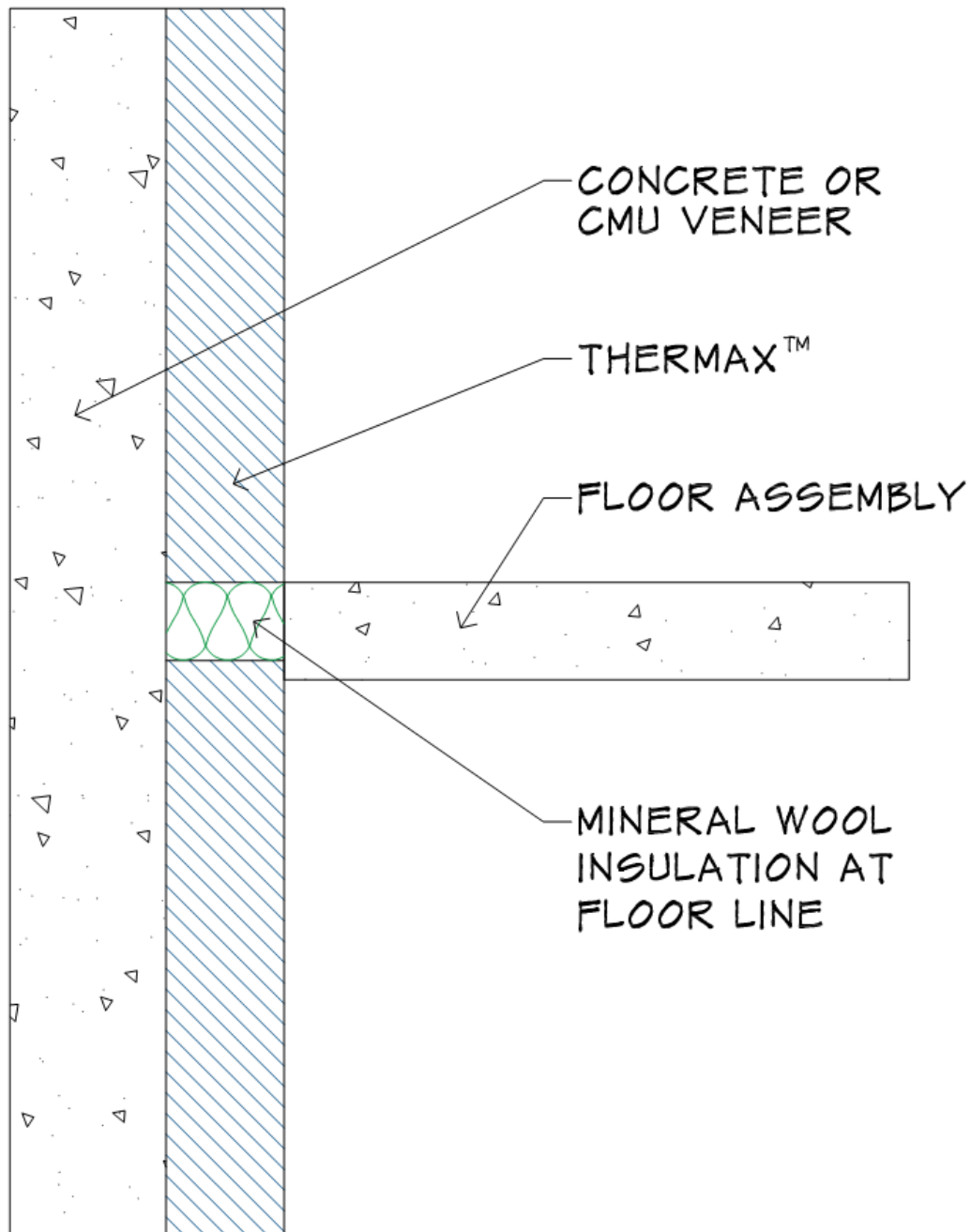


Figure 1. Representative exterior wall construction elevation