

April 5, 2017

To Whom It May Concern,

I was asked to comment on the use of FSK (foil-scrim-kraft) paper as a thermal or ignition barrier over sprayed polyurethane foam (SPF) insulation in the interior of buildings. Although FSK paper is a flame retardant foil and kraft facing that has historically been used to cover insulation materials, this product has no testing that I could identify for protection over foam products, specifically to meet the thermal or ignition barrier requirements of the International Code Council (ICC).

All foam plastics, including SPF, require a code-approved thermal barrier over foam in interior applications. Prescriptive thermal barriers listed in the International Residential Code (IRC) are 1/2" gypsum board or, as added in 2015 IRC, 23/32" structural wood panels. There are some exceptions to the thermal barrier requirement, but tests would be required to determine if the coating/covering could be used instead of a thermal barrier or ignition barrier.

First, let's look at the tests to determine if a material meets the alternative requirements for a thermal barrier.

- NFPA 275: Method of Fire Tests for the Evaluation of Thermal Barriers (2 parts)
  - Part 1: Temperature transmission fire test, where the temperature rise of the unexposed surface of the barrier material is limited to 250 degrees or less (as an average)
  - Part 2: Integrity fire test that establishes the barrier material stays in place during a fire scenario by complying with one of the following 15-minute corner wall fire tests: NFPA 286, UL 1715, FM 4880, or UL 1040
- If the material passes the NFPA 275 thermal barrier tests, then it could be installed over any foam plastic in a residential construction.
- It would still require additional assembly tests for exterior walls in commercial applications.
  - Fire resistive wall assembly must be tested in accordance with ASTM E-119 or UL 263
  - Wall assembly tested in accordance with NFPA 285
  - Potential heat of foam not to exceed potential heat measured in NFPA 285 test
  - Foam plastic tested in accordance with NFPA 259
  - Exterior walls tested in accordance with NFPA 286
  - Must not sustain flames
  - Tested in minimum and maximum thickness

Each type of wall assembly (wood, concrete, metal of various types) has to be tested separately. The International Code Council (ICC) does not allow extrapolated data.

There are exceptions to the thermal barrier requirements, and ICC Acceptance Criteria 456 details the tests and procedures to qualify an assembly (SPF and coating/covering) that can be used without passing the thermal barrier test.

- ICC Evaluation Services Acceptance Criteria 456: Acceptance Criteria for Fire-Protective Coatings Applied to Spray-Applied Foam Plastic without a Code-Prescribed Thermal Barrier.
  - This criterion uses tests such as NFPA 286, UL 1715, FM 4880 or UL 1040 to determine if the assembly can be used without a code-approved thermal barrier.

When using these criteria, however, the specific coating/covering must be tested with the specific SPF.

In attics and crawl spaces where access is limited to service of utilities, an ignition barrier may be used in place of a thermal barrier. Building codes specifically identify ignition barriers as:

- 1.5 inches of mineral fiber
- 0.25 inch of wood structural panel, particle board or hardboard
- 0.375 inch of gypsum wallboard
- 0.16 inch of corrosion resistant steel

An exception to the ignition barrier requirement is provided in the ICC Evaluation Services Acceptance Criteria 377:

- ICC Evaluation Services Acceptance Criteria 377, Appendix X.
  - Appendix X was developed to provide a way to test the fire resistance of SPF in attics and crawl spaces as an exception to the ignition barrier requirements listed in the ICC codes. The test protocol is less severe than the thermal barrier or exception to the thermal barrier tests.

When using these criteria, the specific coating/covering must be tested with the specific SPF as well.

Unless FSK paper has been tested and approved in accordance with the above listed tests and procedures, it would not be considered a code-approved thermal or ignition barrier covering over SPF. To my knowledge, FSK paper has not been tested within this scope and would likely not perform in a manner to protect the SPF in a fire scenario.



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