industry focus

BY RYAN REED

Much ado about testing

Thermoplastic-core reflective insulation makers defend their fire ratings

Manufacturers of foil-faced "bubble-pack" and other thermoplastic-core insulation products are taking on claims made by fiberglass insulation manufacturers that their products are not properly rated for fire resistance.

The Reflective Insulation Manufacturers Association released a statement calling results of fire tests commissioned by the North American Insulation Manufacturers Association "suspect" and labeling that organization's attacks on its manufacturers' test results "unethical." Individual manufacturers have also hit back, with one company posting an array of bulletins and test videos on its Web site.

The controversy erupted last fall when NAIMA, which represents fiberglass insulation manufacturers, released a video and bulletin documenting the results of fire testing it commissioned on thermoplastic-core products. NAIMA asked Omega Point Labs to run the ASTM E 84 Steiner Tunnel test without the poultry netting customarily used to support the material. The test generated high flame spread indexes and smoke generated. NAIMA says the tests were also run with the material "mechanically attached" to the tunnel roof.

Most RI products are rated "Class A" based on their flame spread and smoke generated performance in ASTM E 84. RIMA contends that NAIMA's testing without using poultry netting support is a manipulation of the test protocol, since the netting is explicitly suggested by ASTM. NAIMA argues that the flexible products are sufficiently stiff to be tested without the customary poultry netting support, and cites language in the ASTM protocol suggesting that an alternative fire test may be required for proper evaluation.

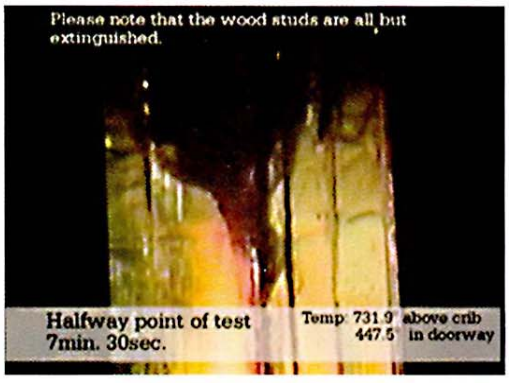
NAIMA then conducted a second test, the UL 1715 corner room test, which included exposed insulation on an 8-foot high ceiling as well as insulation mounted on two walls. The test quickly resulted in flashover conditions and high levels of smoke.

Several RI manufacturers have objected to the test on the grounds that the low ceiling does not represent a typical application. RI is typically left exposed only in post-frame or metal buildings with very high ceilings, which cannot be simulated in the 1715 test. NAIMA responds that reflective insulation manufacturers do not distinguish between safe and unsafe ceiling heights in their installation guides.

All along, manufacturers of thermoplastic-core insulations have insisted that the E 84 test is sufficient for the Class A rating, and that poultry netting is an appropriate and necessary support for the test. Fiberglass insulation, they point out, is also customarily supported by rods in the E 84 test, but this option isn't possible with the thin RI material. The interpretation of these issues and the test protocols eventually becomes almost legalistic in complexity.

But at least one company is offering more graphic evidence of its product's safety. Environmentally Safe Products, which manufactures a foil-laminated closed-cell polyethylene foam material called Low-E, has mounted on its Web site (www.low-e.com) videos of both

ESP Images



Environmentally Safe Products' tests of its thermoplastic-core material yielded dramatically different results than NAIMA's testing. In a water heater wrap test (above), the flames from a wood crib barely mar the foil. Flames from the crib used in the UL 1715 test (right) melts away the foil material, but does not ignite it.

its UL 1715 test, conducted in 1991, and a 1994 California water heater wrap fire test.

If nothing else, the videos offer visual evidence that the polyethylene material is not flammable in conventional, everyday understanding of the term. In ESP's wrap test, a large wood crib is ignited at the base of a water heater wrapped in Low-E. After 20 minutes the insulation shows only a few square inches of damage.

In the UL 1715 test (conducted without the 8-foot ceiling used in the NAIMA test) a 30-pound wood crib was ignited adjacent to two walls wrapped in Low-E. Temperatures in the 8x8 room reach more than 1,500 degrees F; after 20 minutes, the material is damaged and melted, but does not ignite.

In a talk to sales reps and the press at the Frame Building Expo, ESP president Cory Groft dismissed NAIMA's attack as "propaganda from a competing industry," and suggested it was prompted by his industry's increasing presence in pre-engineered metal buildings.

ESP also charges that some fiberglass insulation sales reps have drawn comparisons between the reflective products, generally made with polyethylene or polypropylene materials, and the highly flammable polyurethane packaging material suspected as a major contributor to the Rhode Island nightclub fire that killed 99 people in February. Robin Bectel, NAIMA director of communications, calls that comparison irresponsible and wrong. "We would definitely discourage anyone from doing that," she says.

Several RI manufacturers say NAIMA, a well-funded association of industry giants Owens Corning, Knauf, Johns Manville, and CertainTeed, is using its legal muscle to threaten its small organization of small companies. Some have noted parallels between the current dispute and the fiberglass industry's dealings with the Cellulose Insulation Manufacturers Association, which reportedly had to go to court to stop NAIMA members from spreading misleading information on cellulose's R-values and mold resistance.

According to Groft, reflective insulation products went through a round of testing in 1983-86 at the Weyerhaeuser Laboratories that satisfied fire officials and insurance companies of the material's safety. That position can be found the ISO certification of major insurance companies and in Factory Mutual's data sheets, he says. ◆

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RIMA: NAIMA manipulated test methods

Submitted by the Reflective Insulation Manufacturers Association

In recent months, RIMA has been monitoring the activities of the North American Insulation Manufacturers Association (NAIMA) with respect to the distribution of information intended to substantiate a claim that reflective insulation materials have unfavorable fire performance. In an attempt to discredit reflective insulation, NAIMA has resorted to the manipulation of industry recognized test methods in order to achieve a desired result. This practice not only represents an abuse of test methods developed by industry members, but also represents an unethical approach to competitiveness.

The recent video distributed by NAIMA describes surface burning and large-scale room corner fire testing of two reflective insulation products. NAIMA implies that these tests were conducted in accordance with industry recognized test methods.

To investigate NAIMA's claims, RIMA obtained the services of Hughes Associates, Inc., a respected fire science laboratory known for their work on building codes and ASTM committees, to conduct an independent engineering evaluation of the fire performance of reflective insulation.

The Hughes Associates report supports RIMA's position that the unfavorable surface burning tests of the reflective insulation referenced in the NAIMA video were not conducted in strict accordance with ASTM E 84 and that the test was modified to achieve a desired result. In addition, it is RIMA's position that the room corner fire test was conducted with the reflective insulation installed in a way that does not represent a typical installation.

To understand fire performance, one must understand that almost all building materials are combustible, that is, they will all burn under extreme fire conditions. Industry recognized fire test methods are designed to characterize the fire performance of materials using detailed methodology that must be strictly followed in order to obtain accurate and repeatable results. When testing is conducted using a modified test method, the test laboratory must state this, and provide an explanation of the modification.

The surface burning test results referenced in the NAIMA video were not

conducted in strict accordance with ASTM E 84. As indicated in the Hughes Associates report, ASTM E 84 clearly indicates that materials that will not remain in the original test position must be supported using one of the methods described in ASTM E 84. All known flexible insulation products, including fiberglass, are supported in the ASTM E 84 tunnel tests. ASTM E 84 states "The material, product, or assembly shall be capable of being mounted in the test position during the test."

For thermoplastic insulation materials that do not remain in the original position, ASTM E 84 requires the use of steel rods and hexagonal wire netting. When a material falls from the original test position to the bottom of the Steiner Tunnel, it will be re-ignited by small pieces of burning material. This means that the material is subjected to a second ignition source after the test has started. When reflective insulations are installed, they are supported by roof purlins or other attachment devices because they are flexible and will fall if not supported. In no application are they unsupported. For this reason, they must be supported when tested in accordance with ASTM E 84. The building code requirements for surface burning relate only to materials tested in accordance with ASTM E 84 and do not relate to results obtained from modified test methodology.

The NAIMA video also shows segments of a UL 1715/UBC Standard 26-3 room corner fire test in which the reflective insulation performs unfavorably, but does not provide specifics of the test. Again, when conducting large-scale fire testing, it is critical that the test assembly be constructed to simulate the end-use conditions in which the product is typically installed.

The NAIMA video does not show enough detail to enable one to determine why the material tested performed unfavorably. Presently, RIMA considers the room corner fire test shown in the NAIMA video to be suspect, since RIMA has knowledge of reflective insulation manufacturers who have conducted room corner fire testing in strict accordance with UBC 26-3/UL 1715 with favorable results.

It is unfortunate that NAIMA resorted to modifying industry recognized test methods in an attempt to discredit competitive products rather than promoting the positive attributes of its own member's products. The effort raises serious concerns regarding NAIMA's creditability as a trade association.

For more information or for a copy of the test report, contact RIMA at (800) 279-4123 or visit our Web site at www.rima.net. ◆

NAIMA: Further testing needed

By Charles C. Cottrell
Director, Technical Services, NAIMA

Editor's note: Rural Builder *asked NAIMA to comment on both the RIMA statement and the fire tests posted on the Environmentally Safe Products Web site, www.low-e.com.*

First, NAIMA recognizes that reflective insulation products can be used safely, and believes each product must be evaluated separately in its installed configuration.

Omega Point Laboratories conducted the ASTM E 84 tests for NAIMA in strict accordance with the ASTM E 84 standard. The standard states that when poultry netting and rods are used to support the material, the flame spread index is usually low and other tests should be conducted. NAIMA chose to perform the UL 1715 corner room tests because we believed that it simulates an actual metal building installation. In anticipation of the critique that the material tested without wire mesh had a high flame spread index because it fell into the tunnel, NAIMA also had Omega Point perform an E 84 test with the material mechanically attached to the roof of the tunnel; this resulted in a FSI of 340. We shared our results and testing methods with RIMA and its consultants, as well as building code officials, and will share them with other interested parties if requested.

As for the ESP tests, the UL 1715/UBC test that is posted on the ESP Web site had the reflective insulation installed only on two adjoining vertical walls. This is clearly stated in the accompanying test report. This configuration does not accurately model the way many metal building jobs are actually being installed and therefore probably does not accurately portray how the material would burn in a building with the material on the walls and roof.

Section 6.1 of the UL 1715 standard "Fire Test of Interior Finish Material" states: "The mounting of the test specimens on the framing or support system shall include backing material, insulation, and air gaps, or gaps without backing materials or insulation, as appropriate for the intended application." And section 6.3 states: "Either

wall, or wall ceiling, or both wall and ceiling material assemblies are to be mounted in the wall-ceiling relationship intended for the anticipated end-use(s)."

This language supports, if not mandates, running the test with the material on the walls and ceiling as this is a very common application of the materials. I have found many instances in manufacturer literature and on Web sites showing the product being used on both walls and ceilings in occupied buildings.

In order to understand why it is important to run this test with the materials on the two walls and ceiling it is necessary to understand some of the physics of a fire and what can cause it to spread. When a material begins to burn it produces some heat in the form of radiant energy. This is primarily the heat one feels when standing across the room from a fireplace. In the case of a "corner room" test, this heat energy impinges on the adjoining wall and ceiling, increasing the temperature and the conditions for combustion. Running the test on only two walls not only ignores the fact that many buildings are configured with the materials mounted on both the walls and ceiling, but also greatly lessens the severity of the test. This is an industry-accepted test that is representative of the actual conditions these materials might be exposed to.

The furring strips used in the ESP test may have also reduced the test's severity, which is acceptable if that is the only way this manufacturer recommends installing this product. But manufacturers' literature typically shows many other installation scenarios and no warnings or caveats that one must install the product on furring strips.

Regarding the water heater test, NAIMA believes there may be safe products available and safe installation scenarios. Installing this material on a water heater in the fashion shown may be acceptable if it meets the California Water Heater test requirements and if it meets local codes' requirements for flame and smoke spread indices. However, if the water heater is located in a room lined with exposed reflective insulation with a plastic core, the same concerns brought to light in our testing may apply. A fire near the surface of the water heater may radiate heat to another surface, such as a reflective insulation-lined wall and create the conditions for a possibly catastrophic fire.

To date, unfortunately, only one member of RIMA that we know of — CGI/Silvercote, Inc., which manufactures a fiber glass-core reflective insulation product — has recognized the validity of NAIMA's testing and challenged the other RIMA members to address the real issue, which is good product stewardship and realistic fire testing of their materials.

We stand behind the accuracy of the tests and invite RIMA and its members to produce substantive fire tests that show how plastic-core reflective insulations perform in all tests suggested by ASTM. NAIMA welcomes the opportunity to discuss these issues in any forum and encourages your magazine to consult a qualified, third party, fire safety expert to evaluate all these test results. ◆