

The do's and don'ts of fire-rated roofing

The Technical Services Department of NRCA and the Fire Protection Department of Underwriters Laboratories (UL) frequently receive inquiries from roofing professionals about the basic work of UL and its fire rating of roof products and assemblies. To answer some of these questions, Bob LaCrosse, NRCA's technical director, prepared a document that describes UL's product approvals, listings, testing and criteria. LaCrosse's work was reviewed and refined by James R. Beyreis and Robert L. Donahue of UL.

The following selections from the document respond to some of the most frequently asked questions.

Q Many find the *UL Building Materials Directory* and *Fire Resistance Directory* difficult to read and understand. Is UL planning to release easy-to-understand explanations of the information in these documents?

A As a result of several meetings between members of UL, the roofing industry and NRCA, UL is developing a new format for the *Building Materials Directory* that will help clarify the document's contents. UL is also preparing a series of brochures that explains how to locate and apply the information found in both directories.

Q What is the difference between the three classes of UL fire ratings?

A Roof coverings with a Class A fire rating are the most fire-resistant. To receive a Class A rating a roofing material must not be readily flammable, and during a fire, it must not carry or communicate flames, slip from position, or be susceptible to flying brands. Class B roof coverings are resistant to only moderate fire exposures and Class C coverings are effective against only light fire exposures.

Answering
those
burning
questions

Q Are all aggregate surfaced built-up roofs automatically rated Class A?

A No, some are rated Class B. The fire rating of particular systems may be found on page 321 of the current *UL Building Materials Directory*.

Q Are all fiber glass composition shingles Class A?

A All asphalt glass mat shingles being labeled today are Class A. In the past, some shingles with lighter glass mats were rated Class B. Although manufacturers are no longer making Class B shingles, there is nothing to prevent them from doing so in the future. To be certain of a shingle's fire rating it is best to check the UL label on the bundles.

Q When installing a roof assembly, can a contractor mix and match components from different manufacturers and still maintain the system's published fire rating, or must all the components in the system be from the same manufacturer?

A To maintain a system's fire rating, contractors should use only the specific materials approved by UL for use with the system as listed in the *Building Products Directory*. Should the *Directory* make a generic reference to a system's components (when it specifies asphalt organic felt and hot mopping asphalt, for instance), any manufacturer's products may be used, and the contractor may mix products from different manufacturers in the assembly.

Q How do I retrofit a built-up roof if the original fire-rated assembly is no longer listed in the *Building Materials Directory*?

A Usually, the fact that the assembly does not appear in the current *Directory* only means that the material is no longer manufactured. If UL approved the original system, the fire rating previously published would apply. Information about the system's original fire rating can be obtained directly from UL. Once this information is received, retrofitting may proceed under the same guidelines that would be used for any roof with that particular rating.

Q Has UL approved the use of the newer insulations such as polyurethane, isocyanurate, expanded and extruded polystyrene and phenolic foam in fire-rated assemblies? Are composite roof insulation products approved as well?

A UL has classified numerous assemblies using the foam insulations cited. Composite insulation boards have also been classified for use in specific assemblies as described in the *Building Materials Directory*.

Q How may UL approval be obtained for a system that was originally fire-rated but now contains an insulation not previously tested by UL.

A The manufacturer that sponsored the testing of the original assembly should request authorization to specify an alternate insulation. In reviewing the request, UL's engineering department will determine if additional fire tests will be required to assess the suitability of the new insulation.

Q If a roof insulation product with higher thermal resistance is used in place of fiberboard, fiber glass or perlite roof insulation in a fire-rated assembly, can this reduce the fire-resistance of the assembly?

A Yes, because the increased thermal value of the insulation could allow higher temperatures to build up in the supporting structural membranes during a fire, increasing the chances of assembly failure.

Q If an insulation manufacturer changes the formulation of its product, will roofing systems that have been granted UL approval using the insulation need to be re-tested to maintain their fire rating?

A The systems may need to be tested with the new insulation if the insulation formula is changed significantly. Using the information UL has collected about the effects formula changes have on fire resistance, UL's engineers can determine if a particular change is extensive enough to require additional testing.

Q Do any of UL's wind uplift tests correspond to Factory Mutual's? Do the two organizations cooperate on product or assembly approvals?

A UL and FM do not engage in any cooperative wind uplift testing or product approval programs. In fact, there is a wide divergence in the two laboratories' test methods. UL subjects a 10-by-10-foot sample to positive pressure on the underside and negative pressure on the top to determine wind uplift resistance, while FM subjects a smaller sample to positive pressure only on the underside. UL's ratings for wind uplift resistance are Classes 30, 60 and 90, and FM's ratings are Classes I-60 and I-90.

Q Do the physical requirements for roofing materials in the American Society of Testing and Materials' (ASTM) standards correspond to requirements in the UL standards?

A Not completely. However, UL is conducting supplemental physical property tests on roofing products in response to requests from the roofing industry to coincide with ASTM's material standards.