An update on direct-to-deck polystyrene insulation

by **Mark S. Graham**

During the past several years, there has been considerable discussion regarding the use of polystyrene insulation in low-slope roof systems without an additional thermal barrier layer of insulation (e.g., gypsum board). This configuration is referred to as a direct-to-deck roof assembly.



In November 1997, NRCA issued a *Special Report* titled "Direct-To-Deck Polystyrene Insulation." This report notified NRCA members about the issue; explained building code-related concerns; and provided recommendations for manufacturers, designers and contractors involved in projects using polystyrene insulation for direct-to-deck roof assemblies.

Since the issuance of the *Special Report*, there have been several developments relating to this issue.

UL 1256

Underwriters Laboratories Inc.'s (UL's) standard UL 1256, "Standard for Fire Test of Roof Deck Constructions," is a long-standing, widely recognized test method used in the United States to determine roof assemblies' fire resistances. On March 31, 1998, UL published a revised edition of UL 1256 that contained several notable additions.

The two previous editions of UL 1256, published in 1985 and 1993, are based solely on the Steiner tunnel method, which uses a 17¾-inch- (451-mm-) wide, 25-foot- (7.6-m-) long, 12-inch- (305-mm-) high test apparatus. The roofing industry generally believes that polystyrene insulation in direct-to-deck roof assemblies does not satisfy the conditions of acceptance of the Steiner tunnel test method.

UL 1256's new edition adds two test apparatuses to the standard: a white house test apparatus, which is a 20-foot- (6.1-m-) wide, 100-foot- (30.5-m-) long, 10-foot- (3.1-m-) high test structure, and an intermediate-size, laboratory-scale test apparatus measuring 8 feet (2.4 m) wide, 12 feet (3.7 m) long and 8 feet (2.4 m) high.

In UL 1256's current edition, the white house test method is designated as Part I, the Steiner tunnel test method from the previous editions is Part II, and the intermediate-size, laboratory-scale test method is Part III. The standard stipulates that any roof assembly needs to pass only one of the three parts to comply with UL 1256.

To date, NRCA is not aware of a specific direct-to-deck roof assembly that has been tested and found to comply with AC142.

Reportedly, certain direct-to-deck roof assemblies have satisfied the conditions of acceptance for Part I or Part III.

Although polystyrene insulation used in direct-to-deck roof assemblies now may comply with UL 1256, roofing professionals should realize this may indicate compliance with only the standard's 1998 edition and not the previous editions of UL 1256.

Currently, the 1998 edition of UL 1256 is not recognized in the model building codes (i.e., *Uniform Building Code [UBC], Standard Building Code* and *The BOCA* [Building Officials and Code Administrators International Inc.] *National Building Code*) or most code jurisdictions.

ICBO ES

In September 1998, ICBO Evaluation Service Inc. (ICBO ES), a subsidiary corporation of the International Conference of Building Officials (ICBO), published criteria for evaluating direct-to-deck roof assemblies for compliance with *UBC's* 1997 edition. These criteria, designated as AC142, are titled "Acceptance Criteria for Foam Plastic Insulation Applied Directly to Steel Roof Decks."

AC142 uses a white house test method similar to UL 1256, Part I. However, the ICBO ES acceptance criteria contain some modifications from the UL method that reportedly prohibit direct test result transfer from UL 1256, Part I.

In addition, AC142 stipulates that buildings with direct-to-deck roof assemblies must contain automatic fire-extinguishing systems that comply with *UBC*. It also stipulates limits on roof re-cover applications over direct-to-deck assemblies and requires specific product labeling on each insulation board.

Roofing professionals should realize AC142 is a test and product evaluation method and *not* an approval of direct-to-deck roof assemblies. To date, NRCA is not aware of a specific direct-to-deck roof assembly that has been tested and found to comply with AC142.

NRCA recommendations

Despite recent developments regarding this issue, NRCA still has concerns about direct-to-deck roof assemblies' compliance with building codes. Roofing professionals considering installing direct-to-deck roof assemblies should refer to NRCA's *Special Report.* PR

Editor's note: *NRCA's* Special Report *is available on NRCA's Fax-On-Demand at 1-888-455-6722, Document 1301; UL 1256 is available from Global Engineering Documents at (800) 854-7179; and ICBO ES AC142 is available from ICBO ES at (562) 699-0543.*

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