R-value recommendation will apply until new standard is completed

by **Mark S. Graham**

Q: *Does NRCA's recommendation of an R-value of 5.6 per inch thickness of polyisocyanurate insulation still apply, even with the development of hydrochlorofluorocarbon (HCFC)-blown polyisocyanurate boards?*

A: In November 1987, NRCA and the Midwest Roofing Contractors Association (MRCA) issued a joint technical bulletin regarding the in-service R-value for polyisocyanurate and polyurethane roof insulation boards. The joint bulletin recommended the use of an in-service R-value of 5.6 per inch of foam thickness. The in-service R-value is intended to represent the thermal resistance of the insulation during the design life of a roof system.



During the years, many have criticized the recommendation in this technical bulletin, including a number of polyisocyanurate insulation manufacturers. Many manufacturers have disregarded the recommendation and have simply provided R-value information on their products by testing insulation boards that were laboratory conditioned in accordance with the Roof Insulation Committee/Thermal Insulation Manufacturers Association's (RIC/TIMA) conditioning procedure (RIC/TIMA 281-1). However, as was indicated in the joint bulletin, this conditioning procedure may not accurately simulate thermal performance during the product's service design life.

During the past several years, NRCA, the Polyisocyanurate Insulation Manufacturers Association and The Society of the Plastics Industry, in cooperation with Oak Ridge National Laboratory, have conducted research on alternative blowing agents for chlorofluorocarbon (CFC)-blown polyisocyanurate insulation. This research is leading toward the development of new methodology for the assessment of in-service R-values, taking into consideration several factors that influence long-term thermal performance. The development of a standard based upon this new methodology is in progress and should be completed in the next year. Once completed, this standard should replace the recommendation in the technical bulletin.

Until the research and development of a new standard have been completed, NRCA continues to recommend that designers use an R-value of 5.6 per inch thickness of foam for polyisocyanurate insulation boards, including the new HCFC-blown polyisocyanurate boards. To avoid confusion between manufacturers, specifying the product by either the in-service R-value or by the desired thickness (based upon in-service value) is recommended.

Q: *Are there guidelines for the maximum number of times a roof can be re-covered before a complete tear-off of the existing roofing material is required?*

A: Whether the roof covering on a building is a low- or a steep-slope roof system, the decision to re-cover the existing roof or completely remove the existing roofing material down to the deck is a complex decision. Considerations—such as the condition of the roof covering material, the presence of moisture in any underlying insulation, the configuration of detail conditions and the possibility of deterioration of the structural deck—need to be evaluated in making that decision. Another critical point, the total number of roof covering layers, also needs to be evaluated and may make it necessary to tear off a roof that would otherwise be a good candidate for re-covering.

For built-up membrane systems, the *NRCA/ARMA Manual of Roof Maintenance and Repair* indicates that roof replacement is generally recommended when two or more roof coverings exist on the structure.

For steep-slope asphalt shingle roofs, *The NRCA Steep Roofing Manual* indicates that at no time should more than three individual layers of shingles be applied to a building.

Also, the particular building code applicable to the jurisdiction of the building needs to be carefully evaluated when considering roof re-cover applications. The three model building codes (the BOCA [Building Officials & Code Administrators] National Building Code, the Standard Building Code and the Uniform Building Code) all provide varying language indicating that an additional roof covering cannot be added when the existing roof consists of two or more applications of any type of roof covering.

Individual states and municipalities may choose to adopt one of these three model codes, or they may adopt a separate standardized code or even develop their own building codes. Also, some states and municipalities choose to adopt one of the model or standardized codes, but make amendments to that code based upon local or regional practices. Some of these amendments may impact roofing applications.

It is recommended that roofing contractors and specifiers familiarize themselves with the applicable local building code when considering roof re-cover applications.

In the event a provision of a building code contradicts that of a manufacturer's or NRCA's recommendations, the provision of the local building code will typically prevail. PR

Each month in this column, Terrance R. Simmons, RRC, or Mark S. Graham, both NRCA deputy directors of technology and research, will answer readers' technical questions. If you have a specific question that you would like answered in this column, send it to Professional Roofing, *10255 W. Higgins Road, Suite 600, Rosemont, Ill. 60018-5607; or fax (708) 299-1183.*