Fiber-cement product performance

by **Mark S. Graham**

Fiber-cement roofing products that simulate the appearance of shingles, shakes and slate have been used successfully for years. However, the performance of some recently manufactured fiber-cement roofing products has been less than satisfactory.

Background

Fiber-cement roofing products have existed in the U.S. roofing market for more than 50 years. Early generations of fiber-cement roofing products were made primarily of portland cement, aggregate and asbestos-fiber reinforcement. Products of these compositions generally have performed well.

During the 1980s and early 1990s, as government regulations and concern about product liability made the use of asbestos in construction products virtually impossible, manufacturers began to substitute cellulose fibers for asbestos fibers used in fiber-cement roofing products. At the same time, several new manufacturers of fiber-cement products entered the U.S. market.

Performance concerns

During the past several years, reports to NRCA of problems associated with fiber-cement roofing products made from cellulose-fiber reinforcements have become relatively frequent. Problems reported include surface crazing, breakage, cracking, delamination, softening and discoloration after only a few years of service. Reports from throughout the United States have been received regarding products produced by numerous manufacturers.

In many instances, problematic fiber-cement roofing products have been represented by their manufacturers as having complied with ASTM C 1225, "Standard Specification for Non-Asbestos Fiber-Cement Roofing Shingles, Shakes, and Slates." In early 1995, NRCA questioned the adequacy of ASTM C 1225 and requested ASTM re-evaluate this material standard.

In June 1995, the ASTM subcommittee having jurisdiction over ASTM C 1225 appointed a task force to re-evaluate the standard. Since 1995, several relatively minor changes have been made to ASTM C 1225 that appear to have had little effect on improving the physical properties and performance of fiber-cement roofing products.

In December 1998, a research paper, "The Deteriorating Artificial Slate," was presented at a symposium of ASTM Committee D8 on Roofing, Waterproofing and Bituminous Materials. In this paper, the authors discussed problems associated with a specific fiber-cement roofing product and suggested revisions to ASTM C 1225 and ASTM C 1185, "Standard Test Methods for Sampling and Testing Non-Asbestos Fiber-Cement Flat Sheet, Roofing and Siding Shingles, and Clapboards."

To date, ASTM has neither taken any action to incorporate the revisions suggested in this research paper nor other credible steps to improve ASTM C 1225. Instead, the ASTM subcommittee responsible for the standard apparently is taking the approach that ASTM C 1225 is adequate. In response to negative votes cast on a recent ASTM ballot regarding ASTM C 1225, the committee indicated the standard is "based upon performance data from manufacturers of fiber-cement roofing complying with the standard that have a documented 15- [to] 20-year record."

It is apparent to some industry professionals that the failure rate associated with certain fiber-cement roofing products is beyond an acceptable rate. An example of this can be seen in the number of fiber-cement roofing product manufacturers that have reorganized or left the fiber-cement roofing market during the past several years. Also, the disproportionately large amount of complaints, claims and lawsuits, including class-action litigation involving fiber-cement roofing products, is evidence of less than satisfactory performance.

Recommendations

Although the performance of some fiber-cement roofing products using cellulose-fiber reinforcement has been adequate, caution should be exercised when specifying such products.

When specifying fiber-cement roofing products, do not rely upon ASTM C 1225 to define a product's physical properties or performance. Instead, consider specifying fiber-cement roofing products that have demonstrated suitability for their intended purposes and have established, long-term performance records.

Finally, be careful not to overrepresent the performance of fiber-cement roofing products. Although these products may simulate the appearance of roofing shingles, shakes and slate, there is little, if any, evidence to prove fiber-cement roofing products using cellulose-fiber reinforcements can duplicate these products' long-term performances.

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