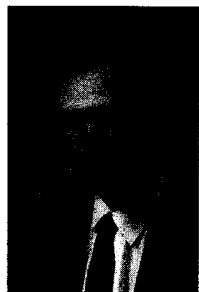


## A review of synthetic steep slope coverings

by Thomas L. Smith, AIA, CRC

**T**he term "synthetic steep-slope roof coverings" refers to a broad category of materials that simulate various types of traditional roof coverings, such as slate and wood shingles and shakes. The term "imitation" has also been used to describe these products.



This article will discuss the synthetic products and present considerations for their use to help ensure that you and your customers are satisfied with their appearance and performance.

### Synthetic materials

- **Metal shingles/tiles.** These products simulate tiles or wood shakes. Some of these products are available with stone granule surfacing.
- **Wood fiber shingles.** These shingles simulate wood shingles. They are made of wood fibers that are bonded together during manufacturing.
- **Polymer composite shakes and slates.** These products simulate wood shakes and slate. They are made of polymer composite materials and high-density rigid foam.
- **Cement-fiber shakes, shingles and slate.** These products simulate wood shakes, wood shingles and slate. They also have replaced most of the traditional asbestos-cement shingles.

The cement-fiber category includes many different products as a function of the fiber additives. These additives include cellulose, wood fiber, "organic" fibers, acrylic fibers and perlite.

### Selection considerations

It is recommended that you consider the following when selecting synthetic steep-slope roof coverings:

- **Appearance.** Some of the synthetic products do a superb job in simulating their natural counterparts, while others are not as successful. To ensure that the building owner is satisfied with the appearance of the roof, the owner should look at full-size samples of the proposed product, along with manufacturers' brochures. It is even more helpful if the owner has the opportunity to visit a building that is roofed with the proposed product.

However, it may be difficult to determine if the product's appearance will adversely change over time. Many synthetics have surface-applied coatings that may not be durable or color-stable. Because many synthetics are relatively new (from a couple of years to about 20 years), there is a lack of in-service history available to inform us if appearance problems will occur during the product's warranty or service life.

- **Fire ratings.** Most synthetics can achieve an ASTM E 108 Class A rating. However, to achieve this rating, there may be limitations on minimum slope, underlayments and deck thickness. Check the manufacturer's literature for these requirements.
- **Load capacity.** Some synthetics are extremely lightweight and may be advantageous for recovering roofs that have a limited load capacity. On the other hand, some synthetics are fairly heavy, but less so than normal weight concrete or clay tiles or natural slate. One manufacturer advises that its product can be installed over an existing roof without additional structural reinforcement. But because its product weighs about 4 pounds/square foot, it would be

prudent for the building owner to have the structure evaluated before this much additional load is installed.

- **Wind.** Many synthetics are described as being wind-resistant. Unfortunately, at the present time, there is no consensus standard for analytical or testing evaluation for these types of products. One synthetic manufacturer references ASTM D 3161, but this test is for asphalt shingles and may not be appropriate for the product tested. Other manufacturers use pressure differential tests that are used for membrane roofing. These tests may also be inappropriate.

The National Tile Roofing Manufacturers Association (NTRMA) and the Asphalt Roofing Manufacturers Association (ARMA) have undertaken major research programs to develop better ways to assess their members' products for wind-resistance. Manufacturers of synthetics also need to do work in this area, perhaps drawing upon the work performed by NTRMA and ARMA.

- **Hail and freeze-thaw.** Some of the products claim hail and freeze-thaw resistance, but there is a lack of consensus standards on testing and performance criteria.
- **Longevity.** Perhaps the greatest uncertainty of synthetics is their durability. Many synthetics have warranties ranging from 30 to 50 years. Yet, without performance criteria and test methods, it is difficult to know what service life these various products will ultimately offer.
- **Standards.** There is a critical lack of standards for synthetic products. And, unfortunately, there appears to be little effort underway to develop them. Hopefully, this will soon change. **[PR]**

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