Building Green with Tile

By Bill Griese

Above: "Is tile sustainable? Mosaic tile from the 6th century still exists in the Basilica of Sant'Apollinare in Ravenna, Italy."

Trying to assign a single definition to the term "green" is a broad task. It is not a static subject, cannot be addressed narrowly, and its definition can vary depending on ecological building objectives, critical current events, and a person's point of view. Holistically, however, ecological building can be made up of several different categories that might include natural resource conservation, reduced burdens on surrounding environments and habitats, improved human health, sustainability, and affordability.

What are some of the green steps manufacturers are taking?

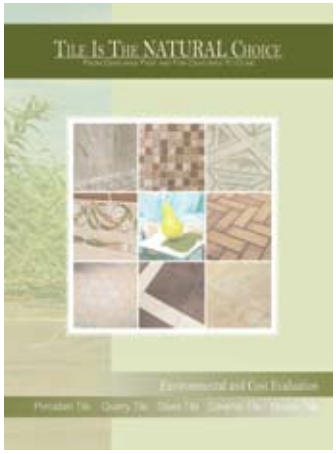
For years, tile and installation material manufacturers have made energy and resource conservation a priority. Tile is made from natural materials for which there are virtually endless supplies. The acquisition of these raw materials does not require the intense demolition of naturally thriving habitats. In addition, many manufacturers of tile and related installation materials use wide varieties of both pre-consumer and post-consumer recycled material in their processes. Tile with recycled content can contribute towards the acquisition of LEED MR Credits 4.1 and 4.2. Moreover, most factories salvage and reuse large percentages of both fired and unfired material recovered from quality control and pollution abatement operations.

How can the use of tile in a building benefit surrounding environments?

In North America, tile and installation materials often made from local raw materials are available within 500 miles of nearly every construction site. This results in low amounts of energy consumption and air emissions when transporting products to the job site. The use of regionally available tile products can contribute towards the acquisition of LEED MR Credits 5.1 and 5.2.

Tile can also reduce the amount of energy required to heat and cool a building. One way to do this is through the use of tiled external facades. Though not yet widespread in the U.S., ventilated facades can evacuate warm air in the summer and

TCNA answers environmental, sustainability questions



Tile is the Natural Choice - Environmental and Cost Evaluation

The Tile Council of North America (TCNA) has published Tile is the Natural Choice - Environmental and Cost Evaluation brochure. The brochure, featured in the 2009 TCA Handbook, addresses one of the main concerns in building design today – environmental sustainability.

Written by TCNA's Green Initiative Committee, it contains information on how tile can contribute LEED® points to a project, 12 reasons to choose tile, an independent life cycle cost analysis of 17 floor coverings, and how tile is environmentally-friendly.

Also of note are two significant additions to the 2009 Handbook – accessibility and sustainability. A new section on accessibility, written by TCNA staff at the request of the United States Access Board, provides accessibility criteria for tile installations. This section lists ways to make tile installations accessible and steps design professionals can take to minimize lippage and its effects.

Additionally, a new section on tile and the environment, written by TCNA's Green Initiative Committee, is included. It contains information on how tile can contribute LEED® points to a project, 12 reasons to choose tile, tile lifecycle costs, and how tile is environmentally friendly.

For information on these publications, visit www.tileusa.com, or call (864) 646-8453.

keep insulation dry in the winter. Tile can also contribute to a building's energy efficiency through radiant heat underlayment systems designed for use with tile. These systems are an energy efficient way to heat a building. Innovative technologies such as the ones mentioned above may be available for credit in LEED, and are accepted on a case-by-case basis for LEED ID Credits 1.1 through 1.4.

Another ecological use of tile includes its exterior use on site hardscapes that include sidewalks, parking lots, driveways, and courtyards. Light colored tile products tend to have higher solar reflectance indices than traditional paving materials, and can assist in lowering the thermal absorption of a development. By minimizing the development's "heat island effect," the thermal gradient difference between the developed and surrounding undeveloped areas is less severe. The use of tile on site hardscapes can contribute towards the acquisition of LEED SS Credit 7.1.

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How does the use of tile contribute towards improved human health?

One of the biggest human health issues associated with building materials is their effect on indoor air quality. One contributor to poor indoor air quality involves the emission of volatile organic compounds (VOCs) from building materials. Since tile is fired in kilns to very high temperatures, usually greater than 2,000°F, there are no volatile organics in the finished product that can be released into breathable air. New for LEED version 3, VOC-free tile can contribute towards the acquisition of EQ Credit 4.3. Also, most adhesives and grouts contain little to no VOCs. One would not typically expect VOCs in traditional sand/cement products, and manufacturers have either minimized or virtually eliminated levels of VOCs that might be traceable in mastics, reactive resins, and sand/cement products with latex re-dispersible powders. VOC-free and low VOC adhesives can contribute towards the acquisition of LEED EQ Credit 4.1.

Additionally, tile and hard surfaces in general are hypoallergenic. The use of tile can assist in eliminating dust mites, mold, germs, and bacteria in indoor environments. Moreover, the maintenance of tiled surfaces does not have a negative impact on indoor air quality, as tile is easily cleaned with warm water and usually does not require harsh chemicals.

Is tile sustainable?

Few would argue that tile can last a very long time. In fact, with proper installation, tiled surfaces can last as long as the building in which they are installed. The reuse of previously installed tiled surfaces in a major renovation can contribute towards the acquisition of LEED MR Credit 1.2. When evaluating the environmental footprint of a building material, it is necessary to divide by the building material's life expectancy. Tile's long life results in a minimal environmental footprint and a cost per year that is lower than competitive flooring products. A tiled flooring system that has undergone a third party Life Cycle Assessment (LCA) may be able to contribute towards the acquisition of a LEED Innovation and Design Credit, ID Credits 1.1 through 1.4.

Are other surface coverings green?

The carpet and resilient flooring industries have put forth quite a bit of effort in promoting the "low VOC" attributes of their products, and have implemented industry certification programs to establish lower, "tolerable" levels of VOCs.

However, most tiled floors contain "zero" VOCs. For competitive industries that have historically struggled with VOC-emitting products, a lowered quantity of VOCs is a great improvement. But in reality, "lowered" VOCs cannot compare with "zero" VOCs.

Other industries may also promote different steps they have taken to reduce energy and natural resource consumption associated with the production of their products. However, many of tile's competitive surface coverings are replaced every six to 10 years. For a 50-year building, this increases both the cost and environmental burden by up to eight times.

In summary

Green building is a dynamic subject, and the definition of green building products can vary depending on a person's point of view. Using tile can earn credits in LEED and other green building rating systems, and when compared with competitive floor coverings, tile fares exceptionally well from all ecological vantage points. **TILE**

Bill Griese

About the Author

Bill Griese, Standards Development and Green Initiative Manager for the Tile Council of North America, is involved in the development and revision of ASTM, ANSI, ISO, and other industry-specific standards, and the coordination of TCNA's environmental efforts. He serves as Chairman for the ASTM C21 Committee on Ceramic Whitewares and Related Products, and also works closely with TCNA's Product Performance Testing Laboratory. Griese is a LEED Accredited Professional and earned a Bachelor of Science degree in Ceramic and Materials Engineering from Clemson University in Clemson, SC.