



Technical Bulletin

Ecological Benefits of Metal Roofing

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The Ecological Benefits of Metal Roofing

Metal roofing has a long, successful history worldwide. Its proven track record spans all types of projects—new construction and remodeling for commercial, industrial, and residential buildings. With today's heightened interest in and demand for ecologically sound building materials, metal roofing rises to the top as the product of choice. The Metal Construction Association ardently supports metal roofing's inclusion in all lists of environmentally friendly or "green" roofing materials.

The ecological benefits of metal roofing include:

Sustainability

Metal roofing's durability can virtually eliminate the need to use future raw materials to produce roofing. Metal roofing is unaffected by the hot-cold/wet-dry weather cycles that break down other materials. Other roofing materials, however, are heavily affected by weather extremes. In addition, metal roofing is known for its ability to hold up against other weather forces—including windstorms, hail, ice, and snow. No other roofing material has greater ability to withstand a wider range of weather conditions. There are many handmade metal roofs still in existence that date back to the 1800s. Commercially produced metal roofing systems have been available since about 1910. Numerous profiles and types have been produced since then, and there are examples of these roofs across the country. While some metal roofs are quite lasting and durable, with exposed metallic surfaces, modern technology also has introduced quality paint systems that beautify metal roofing and are warranted for as long as 50 years. Metal roofs can, if necessary, be repainted for additional life. As America's homes and other structures age, it is imperative that we choose long-term building products: *Metal is the product of choice for sustainability.*

Recycled Content

As consumers, many of us are careful to collect our recyclable materials and turn them in for collection. In reality, though, we are offered very few consumer products through which we can "close the loop" by purchasing products that are high in recycled content. Metal roofing, however, offers that option to consumers by allowing them to choose a significant building product on the basis of its recycled content. *Most metal roofs have recycled content ranging from 25% to 95%.* This is in stark contrast to conventional roofing shingles, which have much shorter lives and use oil-based products as their primary raw material. The recycled content of metal roofing has been a compelling reason for several

state and local entities, such as solid waste districts and departments of natural resources, to include metal roofing on their list of "green" and recycled-content products.

Recyclability

While metal roofing is known for its extremely long life, it does have the added benefit of being *100% recyclable* if it is ever removed in the future, perhaps as part of a building renovation. Whereas other old roofing materials are disposed of by the ton each year in landfills across the country, the steel, aluminum, and copper used in metal roofing can be recycled in their entirety—even becoming, potentially, another metal roof.

Low Weight

Depending on the product chosen, *metal roofing has a weight that is from 1/3 to as little as 1/8 the weight of conventional roofing shingles!* In comparison to heavy tile and slate roofing, the weight of metal roofing is minuscule. This low weight serves several valuable purposes. First, it puts less weight load on a structure. This helps extend the life of buildings and also provides invaluable protection against the threat of roof cave-in in the event of seismic activity. However, with retrofit applications, many metal roofs can be installed over the old roofing material. This prevents the need to remove the old roof and fill up valuable landfill space. Each year, about 20 billion pounds of old composition roofing shingles are dumped into U.S. landfills. Metal roofing is the way to avoid this degradation of the environment. Additionally, metal's low weight and high strength present an ideal way to cover and encapsulate existing asbestos roofing shingles rather than create a health risk as a result of removing the asbestos and putting it in a landfill. State Environmental Protection Agency offices support this practice of asbestos shingle encapsulation. done only after coils are slit.

Product Safety

Metal roofing and the finishes used on it are inert, safe materials that do not pose a health risk. Furthermore, metal roofing is noncombustible, which provides additional fire protection for homes. Of course, one roofing material that has turned out to be very dangerous is asbestos shingle. Asbestos was used extensively many years ago and, now that we have realized the health hazards it poses, we're spending many millions of dollars each year to get rid of it. This worry does not exist with metal. Also, many consumers with chemical sensitivities are turning to metal roofing and finding that it does not have the allergy problems associated with other roofing materials. Today's commercially produced metal roofing systems are carefully tested on an ongoing basis for performance, wind resistance, fire resistance, and hail

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resistance. They are listed with various building codes and entities, including Underwriters Laboratories, International Congress of Building Officials, Dade County (FL), Southern Building Code Congress International, and others.

Energy Efficiency

Metal roofing is rapidly gaining acceptance as a very energy-efficient material. Property owners have reported *energy savings of as high as 20%* and even more after installing metal roofing. The reflectivity and subsequent energy efficiency of metal roofing has been confirmed in studies done by Florida Solar Energy Center, Florida Power and Light, Oak Ridge National Laboratory, and other independent organizations. Ongoing studies are conducted to continually substantiate and quantify the energy efficiency of metal roofing. Many available metal roofs are being documented to meet Energy Star requirements. *Prepainted metal roofing can display solar reflectance of at least 65% and thermal emittance of 80%. This can have a tremendous impact on energy usage by reducing air conditioning costs and the smog and pollution that are created by the production of that energy.* Additionally, the low thermal mass of metal roofing means that it dissipates heat very quickly once the sun goes behind a cloud or sets for the day. Other roofing materials have greater thermal mass and will continue to radiate captured heat into the structures beneath them even when the sun is not shining.

Conclusion

In light of metal roofing's benefits, the Metal Construction Association strongly encourages its consideration and inclusion on lists of "green" building products. Many state "green" programs have already included metal roofing products on their published lists. Roofing is a major component of any structure, and it is a component for which the product chosen can have a dramatic effect on the building's life cycle and energy costs. ***Metal roofing's many benefits—including sustainability, recycled content, recyclability, low weight, and energy efficiency—far outweigh virtually all other roof systems from an ecological standpoint.***

Founded in 1983, the *Metal Construction Association* brings together the diverse metal construction industry for the purpose of expanding the use of all metals used in construction.

MCA promotes the benefits of metal in construction through:

Technical guidance

- Product certification
- Educational and awareness programs
- Advocating for the interests of our industry
- Recognition of industry-achievement awards
- Monitoring of industry issues, such as codes and standards
- Research to develop improved metal construction products
- Promotional and marketing support for the metal construction industry
- Publications to promote use of metal wall and roof products in construction

For more information, please visit the MCA Web site at

www.metalconstruction.org