

Where Metal Really Shines

Dispelling the four most common myths about metal roofs and walls

Metal. One of the most dazzling building materials available today, it is also one of the most under-rated and misunderstood

by buildings professionals. A recent focus group comprised of experienced facilities managers confirmed this perspective:

- “Metal [roofing] is for a warehouse application and is inexpensive.”
- “My vision is that [a metal wall panel] is for industrial and light commercial, and that it is low in cost. We would probably give it the least consideration because it’s the low-end, least durable, and least pleasing.”

As illustrated throughout the following pages, metal is anything but. Yes, it is affordable - particularly with respect to its life-cycle and maintenance costs - but the bottom line is that metal is a high-end design material that has proven its longevity. Just think: The Chrysler Building’s chrome, nickel, and steel roof looks as stunning today as it did in 1929. And thanks to continuing advances in coatings and corrosion resistance, today’s metals offer even greater durability.

Earlier this year, The Metal Initiative (TMI), a

coalition of manufacturers, individuals, and associations in the metal industry, launched an extensive educational and promotional campaign to increase the use of metal in the commercial construction market. Included in the campaign are roundtable meetings with top-tier building owners, industry symposia and forums directed at leading owner-executives and architects, public relations and advertising efforts, conference sessions and continuing education classes, and more. In addition to promoting the use of metal in building projects, TMI’s efforts are also focused on addressing - then dispelling - the most common misconceptions about metal roofs and walls. Rick Mowrey, director of market development for TMI, spoke with *Buildings* to offer further insight into the four most common myths about metal roofs and walls.

Myth #1: “Metal is not green.”

Consider the facts:

- *Metal contains post-industrial recycled content.* Specifically, the recycled content for steel used in metal roofs and walls is at least 25 percent by weight, which also helps earn points in the U.S. Green Building Council’s Leadership in Energy and Environmental Design (LEED) Green Building Rating System®. The recycled content of domestically produced, flat-rolled aluminum construction products is approximately 80 to 85 percent. Additionally, the average recycled content of all copper and zinc products is 44 percent and 9 percent, respectively. Copper roofing contains approximately 75-percent recycled material.
- *Metal is recyclable.* Steel, aluminum, copper, and zinc used in metal roof panels is 100-percent recyclable, contributing to future products’ recycled content. Of the metals used in roofs and walls, steel is the most recycled. The annual recycling rate exceeds





About The Metal Initiative

An industry-wide consortium of individuals, companies, and associations have banded together to increase the use of metal in the commercial construction market. Known as The Metal Initiative (TMI), the Glenview, IL-based coalition seeks to expand market share for its products through an educational and promotional campaign directed primarily toward building owners, architects, construction specifiers, consultants, and contractors.

Currently, metal accounts for approximately 20 percent of roofing and 24 percent of

wall panels in the commercial, industrial, and institutional markets. TMI's goals are to increase the metal roof and wall market share by 25 percent; achieve an increase of over 600,000 tons of steel, aluminum, and copper; and to increase sales of metal products by \$2 billion. Members of the coalition, including the Metal Construction Association (MCA), the Aluminum Association, and the American Iron and Steel Institute (AISI) funded initial research among architects prior to creating The Metal Initiative.

According to the coalition's spokespeople, it's time for the metal industry to take a unified approach. "This collective effort to grow the metal roof and wall business will increase opportunities... for the entire industry," says Rick Mowrey, director of market development for TMI, as well as director of marketing and business development for Moon Township, PA - based CENTRIA. "It's time for our industry to tell the correct story."

Dick Bus, president of Allentown, PA-based ATAS Intl. and current MCA president, agrees that collective power is vital. "I have always believed that the industry, whether through MCA or any other trade association, is in a better position to reach out as one voice to the end-user than any individual company."

A broad range of information on the features and benefits of metal materials used in commercial construction is available on TMI's website at (www.themetalinitiative.com). The site addresses the key benefits of roofing and wall systems made of steel, aluminum, copper, and zinc, including green and cool-roof design, life-cycle costing, durability, design flexibility, and sustainability. In addition to a section for case studies and a photo gallery of metal in application, other site components include an "Ask the Expert" section; a news room; and industry, contact, and search links.

70 percent, and its recovery rate is even higher - near 90 percent. Easily separated from other materials via magnetics, steel is reclaimed through a vast collection and processing network. Like steel, aluminum building products can be repeatedly recycled back into similar products with no loss of quality.

▪ *Metal is sustainable.* Metal roofs and walls are extremely durable and have long service lives. Metal roofing, for example, is unaffected by the hot-cold/wet-dry weather cycles and weather extremes that can break down other roofing materials. Metal roofing also has the ability to hold up against other weather forces, including wind, hail, ice, and snow. Also contributing to the extended service life of metal roofs and wall panels are today's generation of metal coating systems that not only protect and beautify, but are also warranted for 20 to 30 years. Another sustainability plus: Metal roofs can be installed over old flat roofs. This eliminates the need to remove the old roofing material and helps preserve valuable landfill space.

▪ *Metal roofs are "cool."* Metal roofs with heat-deflecting coatings can reduce energy consumption by lowering cooling loads. In fact, cool metal roofing can achieve reflectance values over 70 percent and emittance values as high as 90 percent. An Oak Ridge National Laboratory study showed painted metal roofs maintain 95 percent of their reflectance value over time - an important finding, considering that many building codes assume reflective performance of all roof materials degrades at the same rate. Additionally, cool metal roofing can reduce the urban heat island effect by reducing ambient temperatures.

According to Mowrey, "With the recycling of aluminum and steel so prevalent in our society, [the 'metal is not green' myth] was the one misconception that most surprised us. When we pushed a little into that perception, we had a few building professionals say, 'We know metal can be recycled, but when you paint it, you can't separate the paint from the metal so the [material] would probably go to the landfill. That's simply not true. For years, formal recycling centers have been heating the metals and using scrubbers; the coatings are emulsifying, and all the metals are 100-percent recyclable at end of life - no matter what substrate or coating.'"



Myth #2: “Metal doesn’t offer enough design flexibility.”

The facts speak for themselves:

- *Metal roof systems* offer a wide choice of substrates, shapes, styles, profiles, colors, seam types, module widths, and rib patterns.
- *Metal wall systems* offer a wide choice of products, panel sizes, profiles, colors, finishes, textures, and vertical and horizontal installations.

While many owners think that metal is only corrugated or ribbed, entirely vertical, or

marred by unsightly screws, the reality of design options is entirely different, says Mowrey. “There are 15 different substrates, 10 different textured finishes that can be applied to those substrates, painted and unpainted, 57 different shapes, profiles, shadows, and sight-lines - and double that when they are used horizontally and vertically. And I can’t think of any one of the panels or metal curtainwall systems that are used on new construction that could not also be used on a renovation.”



Metal roofing is available in both structural (low- and steep-slope) and architectural applications. Both curb appeal and exceptional performance are an owner’s goal for any system, according to TMI, with the coalition noting a growing trend toward steeper slopes and overstated, extended, or molded roof fascias.

Low-Slope Roofing Life-Cycle Cost Analysis

Bloomfield Hill, MI-based Ducker Research Co. conducted an in-depth case study analysis of 36 roofing systems across the United States in 2004 for The Metal Initiative. The primary purpose of the research was to compare three different types of low-slope systems - metal, asphalt, and single-ply systems - on three different measures: total service life, life-cycle cost,

and maintenance costs. Average size of the roofs was 92,000 square feet, and each had been in service life for at least 10 years at the time of the study. Conclusions for the analysis also involved 41 interviews with building owners and managers. Key findings follow:

Expected Roof Service Life

Roof Type	Years
Metal	40
Asphalt	23
Single-Ply	20

Comparative Life-Cycle Cost

Roof Type	Per Year
Metal	30 cents per square foot
Asphalt	37 cents per square foot
Single-Ply	57 cents per square foot

Comparative Maintenance Costs

Roof Type	% of Total Installed Costs Over Roof Life
Metal	3.5%
Asphalt	28.5%
Single-Ply	19%

Purchase Criteria of All Roofing Materials

(1=not at all important; 5=extremely important)

Criteria	Factor Importance (1-5 Scale)
Service Life	4.78
Life-Cycle Cost	4.63
Weatherability	4.61
Familiarity/Past History	4.60
Low Maintenance	4.53
Environmentally Friendly	4.28
Annual Maintenance Cost	4.26
Energy Efficiency	4.08
Initial Cost	4.08
Appearance	3.10





[Advertising Section]

Myth #3: “Metal rusts and has a short service life.”

Fact: Today’s highly durable protective coating systems are designed to last for decades - and have proven their longevity.

Says Mowrey, “We started putting metal cladding on structures in 1910, continued that into our industrial era in the ’20s, ’30s, and ’40s, and a lot of those [buildings] are still around - even though the quality of protective coatings wasn’t as good. That is where some of the misconceptions rest. Thirty-eight years ago, Kynar was developed, which gave us [the resin technology] to develop high-quality coatings to protect the metal so it won’t chalk, fade, or rust.”

Most finishes are applied during the manufacturing process in a controlled environment to help ensure even greater protection and longevity.



Myth #4: “Metal is too costly.”

TMI notes a number of facts to dispel this myth:

Metal can reduce construction costs.

- Metal roof and wall systems are light in weight, which can reduce structural requirements. Metal systems also install quickly because they are not affected by weather conditions. This reduces labor costs, minimizes construction delays, gets the building closed-in quicker, and speeds up completion.

■ *Metal can reduce maintenance costs.*

Non-coated natural materials are virtually maintenance-free. As noted earlier, the highly durable coatings applied to metal skins to protect the panels are designed to last for decades.

Metal Wall Panels: Did You Know?

- For decades, pre-formed or roll-formed metal wall panels have served building owners and architects as one of the best combinations of economy, service, and design. They still do today. Why? Recent improvements in the manufacturing process have resulted in a wider selection of profiles. New developments in coating technology provide even longer life-spans for the panels. And a multitude of new design options have allowed pre-formed panels to make their way into the mainstream of commercial building design.

- Building professionals looking to make a design statement should look at today’s generation of metal composite materials for the exterior cladding of their structure. The high-tech image these wall panels can impart to a building because of their ability to be bent, curved, and joined together in an almost limitless range of geometric configurations. In addition, the panels exude a lustrous visual when they are initially installed and continue to do so for years to come with minimal maintenance.

- Factory-engineered insulated panels (FEIPs), which are created through a process that involves injecting a liquid insulating foam (usually polyurethane) between two metal face sheets (typically steel or aluminum), can provide building professionals with the opportunity to lower a building’s initial construction cost, but also its energy and maintenance costs over the life of the building. The impermeable metal faces ensure that high insulating values are maintained for the life of the building by completely encapsulating the insulating material and protecting it from degradation by air or moisture.



- *Metal can reduce operating costs.*

Cool metal roofs lower energy costs by reducing cooling loads. Insulated panels lower energy costs by providing uniform performance.

- *Metal roofs are a cost-effective roofing system*, confirmed by a 2004 study from Bloomfield Hills, MI-based Ducker Research Co. (See Life-Cycle Cost Analysis results, page 54.)

“In our research with owners and architects,” says Mowrey, “they felt that to get *quality* metal, it was too expensive. Before we had good craftsman and certified installation, [and] before we had good warranties, that may have been more true. However, today’s systems are developed with less pieces, and certified installers are ensuring high-quality installations. “A very important aspect of the [Ducker] research was in determining [the total cost of ownership] - from installation through service life. As the numbers indicate, metal is a good value, both initially and long-term.”