



Technical Bulletin

Recycled Content of Metal Roofing and Siding Panels

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Metal roofing and siding panels are made with the highest recycled content from the most recyclable materials on earth, making them a great choice not only for your use, but also for future generations' use. Your old car, soup can or washing machine may become part of your new roof! Some states are mandating energy-saving requirements for buildings or giving tax breaks for energy-efficient and energy-saving construction products. Because recycling saves much of the energy required to produce metal products, recycled content is also being recognized and rewarded. So, recycling is done for economic and environmental reasons.

New York, Pennsylvania and California are leading the way in energy-saving initiatives, using the LEED® rating system to certify "green" buildings under the system created and promulgated by the U.S. Green Building Council. LEED stands for "Leadership in Energy and Environmental Design."

Among numerous design considerations, such as landscaping that saves water or highly reflective metal roofs that reduce air conditioning load to save energy, this rating system considers the "postconsumer" and "postindustrial" recycled content of building materials. Although recyclability is not a part of the LEED rating system, it is still good to know that metal panels may be recycled when their useful life ends many years from now and contribute again to future products' recycled content.

Steel recycling

Steel is the world's, as well as North America's, most recycled material. In the United States alone, nearly 70 million tons of steel were recycled in 2002. Every ton of steel that is recycled saves 2,500 pounds of iron ore, 1,400 pounds of coal, and 120 pounds of limestone. New steel made with recycled material uses as little as 26% of the amount of energy that would be required to make steel from raw materials extracted from nature.

Two different processes, the basic oxygen furnace (BOF) and the electric arc furnace (EAF), produce steel. Both processes consume recycled scrap steel to produce new steel. Scrap steel may result from almost any end-of-life product.

According to the Steel Recycling Institute (www.recycle-steel.org) the total recycled content from BOF production of 50,114,300 tons of steel in North America during 2002 was 16,054,800 tons or 32.0% total recycled content. The post consumer recycled content was 22.6% and the postindustrial recycled content was 8.4%.

The total recycled content from EAF production of 49,156,000 tons of steel in North America during 2002 was 47,159,800 tons or 95.9% total recycled content. The post consumer recycled content is 59.0% and the postindustrial recycled content is 31.9%. As you can see, the EAF process uses almost all scrap steel.

One should not make inappropriate environmental comparisons between steel made by the BOF and EAF, because both are part of a complementary, steel-making system.¹

Aluminum recycling

Aluminum is also recycled extensively from both post-consumer and post-industrial sources and provides the most valuable component for most municipal recycling efforts. A survey in late 2003 indicated that the recycled content of domestically produced, flat-rolled products for the building and construction market was approximately 80–85%. In addition, at the end of their long, useful life, aluminum roofing and siding panels can be repeatedly recycled back into similar products with no loss of quality.

Producing aluminum from recycled material requires only 5% of the energy required to produce aluminum from bauxite ore, and every ton of recycled aluminum saves four tons of bauxite. Additionally, using recycled aluminum instead of raw materials reduces air pollution generation such as CO₂, SO_x, and NO_x by 95% and water pollution by 97%.²

Copper recycling

Copper also is a routinely recycled metal with the highest scrap value of any building metal. Copper's high cost makes it a favored product for collection and sale to nonferrous-scrap recycling companies. The scrap is melted down and reformed into a new, appropriate product. This remelting takes only about 15% of the total energy consumed in mining, milling, smelting, and refining copper from ore. The average recycled content of all copper products is 44.6%. Copper wire is the biggest consumer of copper and that copper must be pure. As a result, copper wire production uses little copper scrap. The remaining copper market, including copper roofing, contains 75% scrap. Almost 50% of this is post consumer scrap.³

Zinc recycling

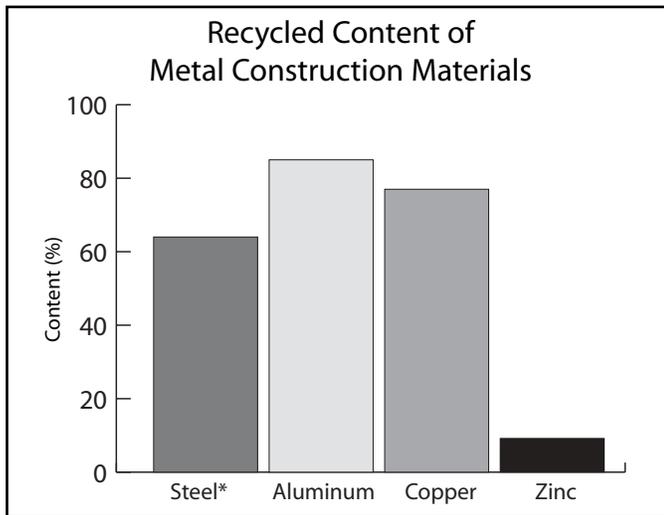
Over 30% of zinc used in all applications worldwide comes from recycling. That percentage is expected to increase to 39% before the end of 2004.^{4,5} In building applications, especially in Europe, more than 90% of old, rolled zinc products are recovered and generally recycled into other types of zinc products. At the end of its life, rolled zinc products used in building applications have an attractive residual value of up to 75% of the price for new zinc. The average recycled content of zinc in building products is estimated to be less than 9%.⁶

The amount of energy used to produce zinc from ore is the lowest of all non-ferrous metals on the market. Energy consumption is even lower when zinc is produced from recycled material: between 0.49% and 19.7% of the amount of energy used to produce zinc from ore.⁷

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Conclusions

The high recycled content and recyclability of steel, aluminum, copper, zinc, and other metals allow for metal construction products to be routinely included on listings for “green” or sustainable building materials.



*The steel value is an average of the 2002 recycled content data from EAF and BOF steel as reported on page one of this bulletin.

The LEED program recognizes the importance of the weighted total recycled content of a building project’s materials. Use of recycled metal can contribute greatly toward a building acquiring LEED certification points.

REFERENCES

- (1) Steel Recycling Institute (www.recycle-steel.org)
- (2) The Aluminum Association (www.aluminum.org)
- (3) Copper Development Association (www.copper.org)
- (4) International Zinc Association (www.zincworld.org)
- (5) “UM Recycling Workshop,” Report of proceedings, Brussels, June 10, 1999.
- (6) “Environment and Safety Report of UMICORE Group” 2002
- (7) “Le recyclage des métaux non ferreux” (Recycling non-ferrous metals), M.E.Henstock, Publication of the Conseil International des Métaux et de l’Environnement, May 1996

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.

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