

Technical Bulletin

RECYCLING OF METAL ROOFING AND SIDING PANELS

Metal roofing and siding panels are made with the most recyclable materials on Earth, making them a great choice for building materials now and for future generations. An old car, clothes washer, or soup can, may become part of a new metal roof! Some states are mandating energy saving requirements for buildings or giving tax breaks for energy efficient and energy saving construction products. Since recycling saves much of the energy required to produce metal products, their 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 recycled content of the materials used. This recycled content is defined as the “Post Consumer” recycled content plus half the “Post Industrial” recycled content of building materials. Under the LEED program a building receives 1 point if the average recycled content of all the building materials used in the project is at least 5% and 2 points if it is at least 10%. (See Technical Bulletin 726) Since metal has a higher recycled content than most of the material used in construction, it can help to offset other materials that have a lower recycled content. While recyclability is not a part of LEED, it is still good to know that metal panels can be recycled when their useful life is over, many, many years from now and contribute again to the recycled content of future products. Sentrigard uses some of the scrap we generate as cover sheets for packaging and the rest is all recycled back to the mills. Naturally, 100% of these cover sheets and 100% of our panels can be recycled when their useful life is over.

Steel Recycling

Steel is the world’s as well as North America’s most recycled material. In the United States alone, almost 73 million tons of steel were recycled in 2006. Every ton of steel that is recycled saves 2500 pounds of iron ore, 1400 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.

Steel is produced by two different processes; the Basic Oxygen Furnace (BOF) and the Electric Arc Furnace (EAF). Both processes consume recycled scrap steel to produce new steel. Scrap steel can come from almost any end-of-life product.

By the numbers, the total recycled content from the Basic Oxygen Furnace in 2008 was 13,867,000 tons of ferrous scrap to produce 42,206,000 tons of steel. This is a 32.9% total recycled content from the BOF process. The Post-Consumer recycled content is 25.6% and the Pre-Consumer recycled content is 6.8%. Most of Sentrigard’s steel products are produced by the BOF process.

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The total recycled content from the Electric Arc Furnace was 50,563,000 tons of ferrous scrap to produce 56,369,000 tons of steel during 2008. This is a 89.7% total recycled content from the EAF process. The Post-Consumer recycled content is 50.6% and the Pre-Consumer recycled content is 33.3%. As you can see, the Electric Arc Furnace process uses almost all scrap steel.

You should not make inappropriate environmental comparisons between steel made by the BOF and EAF since both are part of a complementary steel making system. This information was obtained from the Steel Recycling Institute and may be downloaded from www.recycle-steel.org.

Aluminum Recycling

Aluminum is also extensively recycled with the aluminum beverage can recycling rate at 56% in 2001. To produce aluminum from recycled material only requires 5% of the energy required to produce aluminum from bauxite ore. The energy saved by recycling 1 aluminum beverage can, for example, would light a 100 watt bulb for 3 ½ hours. Every ton of recycled aluminum saves 4 tons of bauxite. In addition, using recycled aluminum instead of raw materials reduces the generation of air pollution, such as CO₂ So_x, and NO_x by 95% and water pollution by 97%. According to the Aluminum Association's numbers from 2008, the total average recycled content from all their producers is 85% with the post-consumer recycled content 60% and the post industrial recycled content 25%.

Copper Recycling

Copper is also a routinely recycled metal with the highest scrap value of any building metal. The high cost of copper makes it a favored product for people to collect and sell 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 very pure. As a result, copper wire production uses very little copper scrap. The remaining copper market, including copper roofing, contains 75% scrap. Almost 50% of this is post-consumer scrap with the remaining 25% post-industrial.