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Recycled Content in Steel

Steel is manufactured today in two different types of factories. At large, integrated steel mills, *basic oxygen furnaces* (BOF) use natural gas to melt pig-iron and scraps of iron and steel to make new steel. These large factories house the processes that extract iron from iron ore, and they have enormous machines that can *cold-roll* newly minted steel into high-quality sheet material for car bodies, appliances, and other uses. In 2007 a total of 44.5 million tons of raw steel were produced in the U.S. at this type of steel mill.

Steel is also made at minimills that use *electric arc furnaces* (EAF) to melt scrap iron and steel into new steel. These plants are located close to sources of scrap material and don't have the ability to process raw iron ore. Some of the larger minimills can cold-roll steel but not typically to the highest grades—they can make sheet metal for ducts and studs but not for cars. Because EAFs at minimills use scrap almost exclusively, their products have very high levels of recycled content. Total U.S. EAF production for 2007 totaled 61 million tons.



The scrap used to make steel is a mix of internally generated waste (“home scrap”) and scrap purchased from other factories or from scrap yards. The home scrap is a mix of “runaround scrap” generated in the production process, which does not count as recycled material, and scrap from other internal operations, which does.

LEED and other programs recognize two types of recycled content: preconsumer material (also called “post industrial”) and post-consumer material. Based on a study by researchers at Fordham University, the Steel Recycling Institute (SRI) estimates that for 2007 80% of home scrap should count as preconsumer recycled material. Overall, SRI reports that steel from BOF operations contains 25.5% post-consumer material and 6.8% preconsumer material. For EAF minimills, post-consumer material represents 56.9% and the preconsumer share 31.4%.

The recycled-content credits in LEED are calculated by multiplying the cost of a material by the fraction that is post-consumer recycled plus one-half the fraction that is preconsumer recycled:

Recycled content value = Cost x (post-consumer + ½ preconsumer)

Steel is the only material for which LEED allows you to claim a default recycled-content value (25% post-consumer) without providing any documentation. Most steel has much more recycled content than that, however, so you're better off documenting the actual amount if you can.

It's best to get documentation from your suppliers showing their post-consumer and preconsumer recycled content. You can also ask them to document whether the steel you're using was made in a basic oxygen furnace (BOF) or an electric arc furnace (EAF). With that documentation, and by referencing the SRI report and using the numbers and formula shown above, you can claim a recycled-content value of 28.9% for BOF steel (typically hollow sections, steel studs, and decks) and 72.6% for EAF steel (typically beams, columns, and angles).

IMAGE CREDITS:

1. Illustration: Julia Jandrisits