

## Recycled Steel Content

Steel produced by the Electric-Arc Furnace process contains at least 90% recycled content, and the majority of structural steel made in the United States is produced in this manner. The alternate production method, the Basic Oxygen Furnace process, contains around 25% recycled steel content. This process is used to produce mainly non-structural steel. All steel formulated by either method is completely recyclable, and approximately 98% of structural steel is recycled at the end of its life. The creation and use of steel is therefore a cradle-to-cradle process, meaning the material is continuously reused without entering a landfill.

Despite the high levels of recycled steel present, a small amount of virgin steel is generally used in the production of new steel. The amount of virgin steel used is largely determined by the availability of scrap metal. Due to the material's long lifespan the demand for new material is typically higher than the amount of used material returned to the cycle. The recycled steel used to make new steel is made up of pre-consumer and post-consumer material. Pre-consumer material is steel that has never actually been put to use and is mainly composed of the scrap leftover in production plants. Post-consumer material has entered the cycle as some type of consumer product and is at the end of its life where it would otherwise be deposited into a landfill. This includes anything from structural steel in a demolished building to car frames.

The LEED program awards points if structural materials used in a building contain a certain percentage of recycled content. One point is awarded for use of materials with at least 10% recycled content, with an additional point awarded if the recycled content exceeds 20%. The percentage is calculated using the weight of the material and is based on the sum of the post-consumer recycled content plus one half of the pre-consumer recycled content.

In November 2009, Nucor Steel released a memo related to recycled content in its steel products. The average recycled content (sum of the post-consumer and pre-consumer steel) for the company's steel is:

Steel Bar	97.7%
Steel Plate	92.5%
Steel Beams	76.2%
Sheet Metal	70.2%

For all Nucor products combined, the amount of post-consumer recycled content used is 78%, and the amount of pre-consumer recycled content used is 11%. While these numbers can vary based on the fabricator and the availability of scrap metal, they can serve as preliminary values for determining LEED criteria and comparing the sustainability impact of various structural systems.

## Useful Links

AISC Sustainability Page: <http://www.aisc.org/content.aspx?id=17560>

Steel Recycling Institute: <http://www.recycle-steel.org/>

EPA Comprehensive Procurement Guideline Program:

<http://www.epa.gov/epawaste/conserves/tools/cpg/index.htm>