



August, 2005



Recycled Content of Steel Building Products

The construction industry is a vital part of the growth and success of a country. It is responsible for building the physical infrastructure that provides transportation and facilities for citizens, businesses, industries and institutions. Construction has a major influence on the economic wealth, societal well-being and sustainability of the built environment. The North American construction industry is growing at an annual rate of 2.7% and is the largest manufacturing sector and one of the top employers. It accounts for up to 12% of the continent's gross domestic product, with a total value of more than one trillion dollars in 2004.

Construction also has a profound impact on our natural environment. In North America, the built up environment accounts for approximately one third of all the greenhouse gas (GHG) emissions, as well as energy, water and materials consumption. Given the increased awareness of "green" construction, there is growing interest in using steel because of the major recycled content and recyclability attributes it provides to architects, engineers and specifiers in the construction industry. The steel industry, through the Canadian Sheet Steel Building Institute is committed to providing steel solutions that promote the use of sustainable materials in construction applications.

This fact sheet provides an overview of the two main methods used to produce steel, and describes the recycled content of the steels used to manufacture building products such as roofing, cladding, decking, structural and non structural framing and the many other construction products used in the industry.

Once iron ore is extracted and refined into steel, its life never ends. This makes steel an ideal material to deploy in sustainable

strategies for the construction industry. Today's steel is produced using two technologies both of which require "old" (recycled scrap) steel to make "new" steel. The combination of these technologies enables Canadian steel mills the flexibility to produce a variety of steel grades for a wide range of product applications.



Steel – The World's Most Recycled Material

Steel is the world's most recycled material, and in North America, over 70 million tonnes of steel are recycled or exported for recycling annually. This is done for economic reasons as scrap is a valuable commodity and the fact that recycling has significant environmental benefits. Even though two out of every three kilograms of new steel are produced from "old" steel, the fact that buildings, appliances, bridges and

other infrastructure products have such long service lives, makes it necessary to continue to mine some virgin ore to supplement the production of new steel.



A Car to a Bridge to Roofing or Cladding and Back to a Car...

Steel possesses a unique material property unrivalled by other materials in that it can be recycled both up and down the product value chain without degrading its structural strength & other chemical properties. Open loop recycling allows, for example, an old car to be melted down to produce a soup can, and then, as the new soup can is recycled, it is re-melted to produce new appliances, structural beams used in bridges or buildings, building products like roofing, cladding, decking and even new cars. Recycling in the steel industry is second nature. The North American steel industry has been recovering and recycling steel scrap for over 150 years through over 1,800 scrap processors and a network of 12,000 auto dismantlers across the Continent. As a result of the large quantities of “old” steel supplied to the steel manufacturers, the steel industry is Canada’s largest steel recycler recovering and re-using over 8 million tonnes of steel scrap every year.

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Canadian steel producers use the basic oxygen furnace (BOF) and electric arc furnace (EAF) technologies interchangeably to supply construction market end uses. The traditional BOF technology uses raw materials such as iron ore, coal and a component of recycled scrap to make new steel while the electric arc furnace (EAF) technology uses nearly 100% recycled steel scrap as its feedstock. In Canada, both these steel making processes are used to supply construction products such as commercial and architectural cladding, roofing, and steel studs, decking, floor joists, culverts and other drainage products, and underground water detention systems, where strength is the valued steel material characteristic.

The total recycled content found in Canadian manufactured steel used for STEEL BUILDING PRODUCTS is a minimum of 25% in the case of BOF and greater than 95% in the case of EAF. Both these values represent industry leading levels of recycled content. Specific recycled content information can be obtained from the steel supplier.

Better, Greener Construction Products

The Royal Architectural Institute of Canada (RAIC) and the American Institute of Architects based in the United States, have been actively encouraging its members to adopt sustainable and energy efficient building design practices. In response to this, the Canadian Green Building Council developed LEED™ Canada (Leadership in Energy & Environmental Design) – a green building rating system to provide a framework for sustainable construction. This program (originally developed by the U.S. Green Building Council for the U.S. Department of Energy) is currently more stringent for Canada to promote the architectural design and performance features of commercial buildings for “green and sustainable” attributes. The rating system places very high emphasis on site selection (brownfield versus greenfield), site design (materials, density, drainage), site access (transport issues) and heat island effects. Products made from steel by members of the Canadian Sheet Steel Building Institute can be credited with a significant number of points for this category as well as in the categories of Water Efficiency, Energy & Atmosphere, Materials & Resources, and Innovation aspects of the rating system. A document is available³ that provides guidance in the areas covered by LEED Canada where steel has the necessary attributes to qualify for LEED points.

Notes

- (1) Post Consumer Content – is defined as scrap steel resulting from end of life consumer products (e.g. steel cans, steel auto bodies, steel building materials)
- (2) Post Industrial Content – is defined as scrap steel resulting from product manufacturing operations (e.g. turnings, stampings from auto part manufacturers). The Post Industrial content stated above does not include internally generated scrap from steel making operations such as the BOF and EAF
- (3) LEED™ing with Steel by Dr. M Gorgolewski, School of Architecture, Ryerson University, available from www.cssbi.ca

