

## Recycled Content of Corrugated Steel Pipe Products

Construction has a profound impact on our natural environment. In North America, the built up environment accounts for approximately one third of the greenhouse gas (GHG) emissions, as well as energy, water and materials consumption. Given the increased awareness of “green” construction, there is a tremendous opportunity to promote steel because of the major recycled content and recyclability attributes it brings to the designer and specifying community. The steel industry, through the Corrugated Steel Pipe Institute, is committed to providing steel solutions that promote sustainability in construction applications.

This fact sheet provides an overview of the methods used to produce steel, and describes the recycled content of the steels used to manufacture Corrugated Steel Pipe (CSP) drainage products such as culverts.

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” steel to make “new” steel. The combination of these technologies gives Canadian steel mills the flexibility to produce a variety of steel grades for a wide range of product applications.



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### 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 both economic and environmental reasons. It is always economical to recycle steel. 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 a Culvert 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. 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 a new appliance, a structural beam used in a bridge or building, or corrugated steel drainage products like culverts. Unlike competing materials, 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 consuming over 8 million tonnes of steel scrap every year.

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Canadian steel producers use both, basic oxygen furnace (BOF) and electric arc furnace (EAF) technologies interchangeably, to supply construction market end uses. The traditional BOF technology uses typically 25% steel scrap (“old” steel) to make new steels. Steels manufactured by the BOF method are used to produce products where formability is a key material requirement. These products include automotive outer body panels, automotive axle shafts, hydroformed tube applications, exterior panels for appliances, residential door skins, packaging, as used in soup cans as well as construction products.

The scrap based electric arc furnace (EAF) technology uses close to 100% steel scrap as its feedstock. EAF steels are used in construction products such as culverts and other drainage products, underground water detention systems, commercial roofing and cladding, steel studs, decking, and floor joists where the major required material characteristic is strength.

The average recycled content found in Canadian manufactured steel used for CORRUGATED STEEL PIPE PRODUCTS is over 50 %. These values represent industry leading levels of recycled content especially when compared to drainage products made from other materials such as plastic or concrete, which have little or no recycled content. A detailed breakdown of specific recycled contents is shown below:

Post Consumer Content (1) 13.83 %

Post Industrial Content (2) 36.87 %

Total Recycled Content 50.7 %\*

(1) Post Consumer Content – is defined as scrap steel resulting from end of life consumer products (e.g. steel cans, steel auto bodies, building materials)

(2) Post Industrial Content – is defined as scrap steel resulting from product manufacturing operations (e.g. turnings, stampings from auto part manufacturers) and does not include internally generated scrap from steel making operations such as the BOF and EAF

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### Better, Greener Construction Products

The Royal Architectural Institute of Canada 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 has created the LEED™ (Leadership in Energy & Environmental Design) 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) has been made 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 Corrugated Steel Pipe Institute can be credited with a significant number of points for this category as well as in the categories of Water Efficiency, Energy & the Atmosphere, Materials & Resources, and Innovation aspects of the rating system.

