

MBMA Environmental Product Declarations

Why they matter to architects

An interview with Jay D. Johnson, LEED AP, MBMA Director of Architectural Services

The Metal Building Manufacturers Association (MBMA) released industry-wide Environmental Product Declarations (EPDs) to meet the increasing demand for unbiased data. The new metal building system EPDs describe the environmental attributes of primary rigid framing, secondary framing, and metal cladding for roofs and walls.

MBMA partnered with the Athena Institute, as the Life Cycle Assessment (LCA) verifier, and UL Environment (ULE), as the EPD program operator, to verify that the cradle-to-gate EPDs are in compliance with ISO 14025 and ISO 21930 standards. The cradle-to-gate method describes the environmental impacts of producing the metal building envelope products, from raw material extraction (“cradle”), through processing, fabrication, and up to the finished product distributed by the manufacturer (“gate”).

Why did MBMA study the sustainable attributes of a metal building system?

Metal building systems are custom-engineered and fabricated in accordance with strict quality assurance standards, with almost no scrap generated. Designers are realizing that the structural efficiency of this approach brings tangible benefits, both from a sustainable and a cost-savings perspective. To validate the sustainable claims, Athena Institute conducted a LCA study to benchmark the environmental impacts of the primary framing, secondary framing and metal cladding. The information derived included the Life Cycle Inventory (LCI) data also incorporated into the Athena databases and the Athena Impact Estimator whole-building LCA software tool.

Designers can now perform whole-building LCA analyses to compare metal building system products to other forms of construction. Through these studies, MBMA has shown that the structural efficiency of metal building systems is a key contributor to their sustainable performance when compared to

conventional construction. To complete the MBMA sustainability resource package, ULE summarized the LCA study results into easy-to-read EPDs.

What is involved in creating the three EPDs?

EPDs are based on Product Category Rules (PCR) used to develop a LCA final report, which is summarized in the EPDs. The PCRs used include:

1. The “North American PCR for Designated Steel Construction Products,” published in May 2015, which provides the rules for the metal building primary and secondary framing used and/or sold in North America.
2. The “PCR for Preparing an EPD for Product Group: Insulated Metal Panels & Metal Composite Panels, and Metal Cladding: Roof and Wall Panels,” published October 2012, which provides the rules for the metal roof and wall cladding.

LCI data was collected from MBMA building systems members and summarized in the MBMA LCA final report. The 200-plus-page LCA final report was then summarized in the three EPDs. Since MBMA building systems members provided the LCI data, they are eligible to use these EPDs for their projects. Non-MBMA members cannot use the EPDs.

Why do architects need to know about the EPDs?

The MBMA EPDs provide transparent third-party documentation of the environmental impacts of products, including global warming potential, ozone depletion, acidification and other factors to meet green building codes, standards and rating systems. The driver is the USGBC’s LEED v4 rating system, scheduled to be fully implemented in November 2016. Other drivers include architectural firms stating their intent to specify products with EPDs, and the growing popularity of municipalities adopting the ICC International Green Construction Code (IgCC) and ASHRAE 189.1 green building standard. Lastly, the Green Building Initiatives’ Green Globes rating system promotes the use of EPDs in one of their credits.

Bottom line: The three EPDs provide architects with the ability to contribute to the LEED EPD credit or to similar provisions in the IgCC and ASHRAE

189.1 standards. The EPDs highlight the sustainable attributes of metal building products and contribute in the following areas:

- To receive one point in the LEED v4 rating system that applies to the EPD option, the designer must use at least 20 different permanently installed products that either have a publicly available critically reviewed LCA final report (worth 1/4 of a product each), industry-wide EPDs (worth 1/2 of a product each), or product-specific EPDs (worth one whole product each).
- The 2015 IgCC and ASHRAE 189.1-2014 standard calculation method is based on a percentage value, whether by cost, mass or volume, with industry-wide EPDs counting for one whole product and product-specific EPDs counting for two whole products each.

How can readers view the MBMA EPDs?

MBMA’s EPDs can be found on the UL Environment website: <http://productguide.ulenvironment.com/SearchResults.aspx?CertificationID=15&BrandID=2161>

What is the difference between single-attribute claims and multiple-attribute claims in the green rating systems, codes and standards?

Traditionally, LEED, and subsequently the IgCC and ASHRAE 189.1 standard, focused on single environmentally friendly attributes used in a building project, such as reusable or salvaged materials, recycled and recyclable materials, regional materials and bio-based products. Designers now have the option to use products that claim any of these single-attribute qualities and/or combine them with the multiple-attribute resources provided by product manufacturers.

Products that assess on a much broader scale evaluate the environmental footprint for all these attributes, across the various phases of the product’s life (including energy consumption during manufacturing, waste impacts and products’ maintenance). Multiple-attribute claims are covered by the MBMA LCA final report and the three EPDs at the cradle-to-gate level, and then are expanded to address the cradle-to-grave scope when performing a whole-

building LCA via the Athena Impact Estimator software tool.

How do metal building systems contribute to the single-attribute claims?

Metal buildings are predominately steel, which is the most recycled and recyclable building material. According to the Steel Recycling Institute (SRI), structural steel is continually recycled with a current recycling rate of 98 percent, meaning that steel will be in use in some form continually, lessening the impact on future generations. For more information about SRI, go to www.recycle-steel.org.

SRI also provides useful industry-wide resource for recycling rates and the "Steel Takes LEED with Recycled Content" document to help credit this attribute in the green rating systems, codes and standards. The components of a metal building may be reused or salvaged during the expansion of the building facility or relocated to a different project site when the need arises. Lastly, MBMA building systems members have a number of manufacturing facilities across the U.S. that may help meet the regional material provisions.

As a side note, the metal building systems designed by MBMA building systems members are custom-engineered based on local building code requirements to efficiently optimize the use of steel during the manufacturing process. The end result is

"There is a growing need to simplify and harmonize the decision-making processes for architects and specifiers who must choose building materials for construction," says Jay Johnson. "MBMA members are dedicated to educating others about the sustainable performance of metal building systems, and these EPDs will effectively do that for the design community."

that virtually no steel material waste occurs at the manufacturing plant and there is no waste at the job site, which assists the project construction waste management plan.

Does MBMA provide other sustainable resource materials?

The three EPDs are part of a much larger toolkit that MBMA has been building over the past few years.

The toolkit also includes:

- The industry-wide LCI data incorporated into the National Renewable Energy Laboratory (NREL) U.S. LCI Database to help LCA practitioners answer questions about environmental impacts of metal buildings, along with incorporating data into their whole building LCA software. For more information, go to www.lcacommons.gov/nrel/search.
- An industry-wide LCA final report that summarizes the environmental impacts of a metal building system, conforming the PCR-defined rules for boundary conditions, data used and systems inputs. For more information, go to

www.mbma.com.

- The industry-wide LCI data added to the Athena Institute databases and Impact Estimator whole building LCA software for designers to conduct detailed LCAs based on the Bills of Materials of metal building components. The Impact Estimator can be used to meet the whole-building LCA provisions of the green building rating systems, codes and standards based on a cradle-to-grave assessment. For more information, go to www.calculatelca.com.
- A 2015 white paper providing a detailed whole-building LCA comparing the environmental impacts of using a metal building system with conventional construction. This study was performed by a third party, Walter P. Moore and Associates Inc., to conduct a series of independent, whole-building life cycle assessments using the Athena Impact Estimator by way of the Bills of Materials option within the tool. For more information, go to www.mbma.com. 



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