

ENVIRONMENTAL PRODUCT DECLARATIONS

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Sustainability continues its growth on a global scale as an integral part of production, marketing, and communication strategies across every industry. Within the construction industry, performance of buildings and the materials from which they are constructed is increasingly being scrutinized. Design professionals are looking to life cycle assessment (LCA) to evaluate building performance and environmental impact of their projects. To support this analysis, environmental product information is needed for virtually all construction materials and products. However, credible and transparent environmental impact information on building materials is currently very limited, hampering the ability of designers to conduct accurate analysis and assessment.

Private and public entities are seeking data to fill this information void through environmental product declarations (EPDs). An EPD is based on life cycle assessment (LCA) of the materials production, which provides a basis for comparing broad environmental performance and substantiating marketing claims. Simply put, an EPD is a tool provided by manufacturers or service providers to communicate the environmental performance of their goods or services, in a credible, standardized report.

As manufacturer of building products, we are accustomed to providing information upon which to base product decisions. Product standards, product information sheets, and material data safety sheets are obvious examples. Similarly, proprietary product performance attributes such as strength, durability, aesthetics, and cost are voluntarily provided to decision makers. EPDs provide a similar level of information relevant to this new category of analysis – environmental performance.

The private sector in the United States has embraced environmental initiatives for market competitiveness at a slower pace than its counterparts in Europe. As a result, international protocols for science-based environmental labeling of products are well advanced. Because ASTM has only just begun developing such criteria, leading environmental practitioners use well established ISO





14025 standards, which were completed a decade ago, for drafting EPDs. Recent North American sustainability initiatives advocating LCA (with supporting EPD documentation) is now found in the International Green Construction Code, the latest version of LEED -v4, the National Association of Home Builders ICC 700 National Green Building Standard, and the Architecture 2030 Challenge for Products.

Why an EPD?

Environmental certifications, labels, and self-declaration claims abound in the marketplace, creating confusion among companies and consumers alike. An EPD is a comprehensive, internationally recognized report that compiles and standardizes technical sustainability information, eliminating the need to obtain and wrestle with a dozen or more individual sources. No other single certification or label combines all of these factors.

Often compared to the nutritional label found on virtually every food product, an EPD lists the relevant environmental impacts of a product or service in a clear, consistent, and concise manner. There is no evaluation of the environmental information since no predetermined environmental performance levels are set. Instead, an EPD builds on well-structured and quantitative data certified by an independent third party. It states factual information and leaves the decision of evaluation to the decision maker. Referring back to the food label analogy, your preferred brand of potato chips may have twice the fat of a “diet” competitor, but you might choose the “real thing,” based on taste rather than fat content. Conversely, if you are fighting a growing waistline, you might select the low-fat option.

EPDs disclose life cycle-based impact information based on data collected during an LCA of material production. It includes the environmental impacts associated with a product or service, such as raw material acquisition, energy use and efficiency, content of materials and chemical substances, emissions to air, soil and water, and waste generation. For marketing purposes, EPDs can also be used to show how the impact of production is reduced over time.

Design teams will compile EPD data from all project materials to develop a comprehensive sustainability impact footprint of their structure. Combined with operational modeling and end-of-life strategies, this will create a holistic view of the project and enable identification of strategies that offer optimal whole-life performance.

Rules for Data Collection

EPDs are only as accurate as the data quality from which they are based. Product category rules (PCRs) are established for each product type to ensure consistency. A product category is a group of products that can fulfill equivalent functions – for example, ‘floor finishes,’ ‘wall finishes’ or ‘insulation.’

PCRs set the guidelines, scope boundary rules, data quality requirements, and timeframe for the description and collection of data during the LCA.

Product Category Rules (PCR)

- Defines the product category
- Establishes data collection type, boundaries, and procedures via LCA
- Establishes reporting thresholds
- Requires open consultation of external stakeholders
- Register PCR through Program Operator

Conduct a Life Cycle Assessment (LCA)

- Evaluate impacts through cradle to gate life cycle assessment
- Follow requirements set by PCR and ISO 14040

Verify LCA

- Conduct a review of LCA by third party
- Verify assumptions and conformance to PCR

Create Environmental Product Declaration (EPD)

- Translates the LCA data into environmental impacts
- Follows ISO
- Include company and product information if desired

Verify EPD

- Conduct a comprehensive audit of the EPD by third party

Register EPD

- Publish EPD in public repository
- Maintain EPD updates at scheduled intervals or due to significant impact changes

It additionally sets how the calculations should be completed to transfer the data to the climate impact (functional unit, i.e. square meter) and how this information should be reported (unit of measurement, i.e. joule, megawatt, etc). Both inputs and outputs are reported. This includes raw materials (virgin or otherwise), energy consumption, waste, and emissions to air, water and soil. Generally, trivial emissions (less than 1% of a category) are excluded unless specifically identified on health safety and environmental concern lists.

PCRs are particularly useful where the environmental impacts of products within a category group are to be compared – perhaps as part of a product specification process. Product category rules provide a level playing field, enabling apples to be compared with apples, or, more appropriately, insulation to be compared with insulation or carpet with carpet.

Once the PCR identifies the key attributes to be reported in the EPD, collecting data through the LCA becomes much easier and more cost effective. Results from the PCR-based LCA are then synthesized into what becomes the EPD.

The creation of a PCR can be performed by a manufacturer, an industry, or a third party. For products that are very similar across an industry, as in the case of commodities like cement, the PCR is commonly prepared under the guidance of a trade or technical association. To ensure credibility, the rules are prepared with input from a wide range of stakeholders, and for globally distributed products, harmonized with international criteria.

Why Develop the PCRs and EPDs Now?

As mentioned during the introduction, designers and specifiers are increasingly adopting life cycle assessment to validate the performance of their projects. Some of the largest and most sophisticated architecture, engineering, and construction firms report that green construction is a significant if not majority of their business. According to McGraw-Hill Construction Data, green construction now accounts for

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approximately 25% of new construction and continues to grow. There are several advantages to proactive development of these documents. The most significant is that we control the process rather than having an industry outsider create one with little regard to our input. This also enables us to seek national harmonization across the industry, and with consideration of our global production members.

What's Next

Looking forward, design teams will incorporate this material input with energy modeling statistics and end-of-life information to assemble comparative whole life impacts of one building scheme to another. The advent of building information modeling (BIM) enables environmental impact information to be readily integrated into the design process, giving designers the ability to evaluate total building impact performance early in the design stage.

The point of environmental data reporting is to enable decision makers (designers and specifiers) to compare and evaluate products, in addition to existing data points such as cost, performance, durability, etc. Initially, most environmental product declarations will likely be industry averages for commodity products, but it is realistic to expect customers requesting EPDs on a company-wide basis and ultimately plant specific level in the not too distant future.