

How POLYMELT PPR pipe systems contribute to green building rating systems (like LEED) and what the LCA and EPD of PP-R pipes and fittings mean for planners, engineers, and building owners.

We would like to explain the process of obtaining an Environmental Product Declaration (EPD) and demonstrate how POLYMELT pipes offer significant environmental benefits compared to competing piping materials. In addition, we will show how POLYMELT products can be of benefit for your sustainable building.

Overview of Relationships Among PCRs, LCAs, and EPDs

Product Category Rules (PCRs)

PCRs specify data requirements for creating life-cycle assessments for manufactured products. Within a PCR, detailed instructions for data collection and reporting are provided. There are over 100 different product categories for which PCRs have been published. Some sources for published PCRs include the "PCR Public Library" of the Environmental & Development Foundation and "UL's Product Categories (PCRs)," available online. All rules and requirements for these PCRs are based on ISO 14025, "Environmental Labels and Declarations - Type III Environmental Declarations."

POLYMELT refers to the "Environmental Product Declaration POLYPROPYLENE RANDOM COPOLYMER (PP-R) PIPE SYSTEM FOR HOT AND COLD WATER IN THE BUILDINGS" by the European Plastic Pipes and Fittings Association. The PCR provides a standard method for data collection, allowing for the evaluation of different products in specific environmental impact categories. These categories include Climate Change, Depletion of the Stratospheric Ozone Layer, Eutrophication, Formation of Photochemical Oxidants, Depletion of Fossil Energy Resources, Depletion of Mineral Resources, and Hazardous and Non-Hazardous Waste.

Life-Cycle Assessments (LCAs)

LCAs offer a comprehensive evaluation of the upstream and downstream energy and environmental impacts associated with a product. The techniques for creating LCAs are described in ISO 14040 "Environmental Management - Life-Cycle Assessment - Principles and Framework" and ISO 14044 "Environmental Management - Life-Cycle Assessment - Requirements and Guidelines."

These include the boundaries of the LCA, which are set for the product being evaluated. Typical boundaries are Cradle-to-Gate (from raw material extraction through manufacturing and product distribution) or Cradle-to-Grave (from raw material extraction through manufacturing, distribution, use, repair, maintenance, disposal, and recycling). LCAs use information from various databases to analyze the product's life cycle.

Performing the LCA for a product is the second step in creating an EPD. LCAs consist of five parts: Goal, Scope, Life-Cycle Inventory Analysis, Results, and Interpretation.

Environmental Product Declarations (EPDs)

EPDs provide a mechanism for certifying information about a product's life-cycle environmental impacts. The EPD is the document used to convey the LCA results to the product's users and specifiers. It focuses on information about a product's environmental impact, such as global warming, ozone depletion, water pollution, ozone creation, and greenhouse gas emissions. It can also include other impacts of particular interest to the discloser, such as human toxicity, risks, and corporate social responsibility.

EPDs are disclosure tools that help purchasers better understand a product's sustainable qualities and environmental repercussions, allowing them to make a more informed product selection.

EPDs are typically verified following the processes described in ISO 14025, EN 15804, and ISO 21930 for construction products. These steps include:

1. Finding or developing a PCR;
2. Generating the input data and performing an LCA according to a specific PCR;
3. Compiling information in the EPD;
4. Verification of the EPD and the LCA;
5. Registration and publication.

In "LEED for Building Design and Construction," Option 1 of the Materials and Resources (MR) Credit section, three types of EPDs are defined. These include the product-specific declaration with an LCA conforming to ISO 14044, the industry-wide (generic) EPD conforming to ISO 14025, ISO 14040, ISO 14044, and either EN 15804 or ISO 21930, and the product-specific Type III EPD conforming to ISO 14025, ISO 14040, and ISO 14044 and either EN 15804 or ISO 21930.

The EPD for PPR piping systems is a product-specific Type III EPD that conforms to ISO 14025, ISO 14040, and ISO 14044. It is a third-party verified EPD, not created or commissioned by POLYMELT, but can be comprehensively applied to POLYMELT products.



LCA/EPD Summary and Conclusions

The “Environmental Product Declaration POLYPROPYLENE RANDOM COPOLYMER (PP-R) PIPE SYSTEM FOR HOT AND COLD WATER IN THE BUILDINGS” by the European Plastic Pipes and Fittings Association refers to a typical European PP-R pipe system for hot and cold water from cradle to the grave, including raw material extraction, transportation to converters, converting process, transport to apartment, construction, use and end of life for a typical European PP-R H&C pipe system.

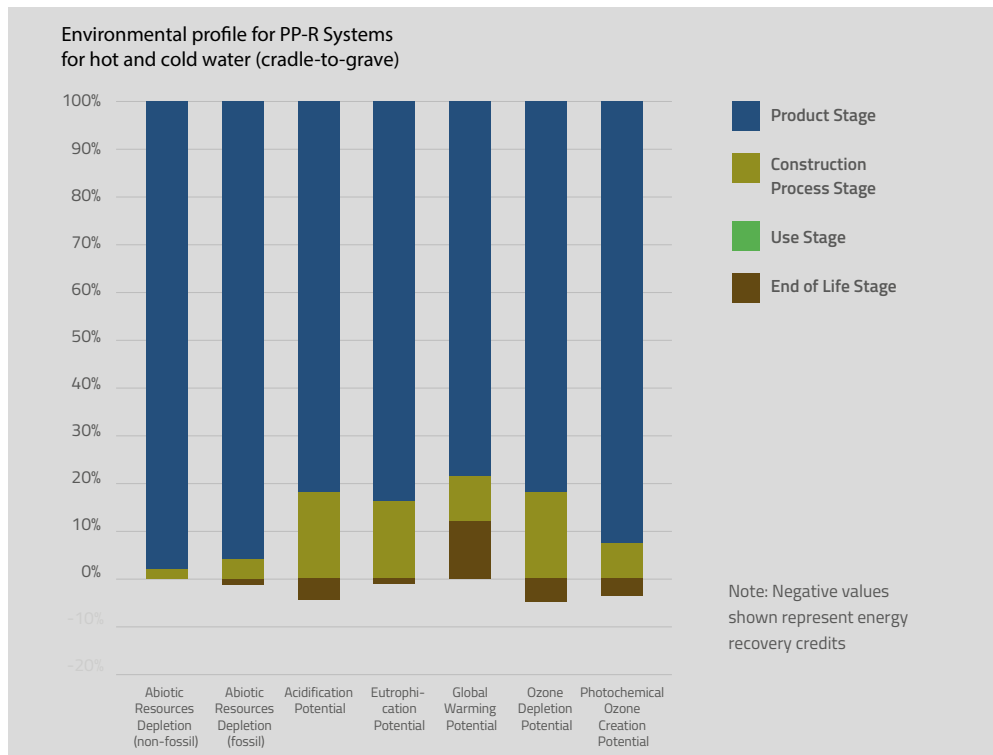
This is representative for an anticipated European typical PP-R and PP-rCT pipe system, like Polymelt Product lines:

- POLYMELT ECOSAN
- POLYMELT POLYMUTAN
- POLYMELT UV
- POLYMELT MECHANICAL
- POLYMELT TERSIA

How Is the EPD for PPR Piping Systems Relevant to LEED Points?

The EPD for PPR pipes and fittings was developed in accordance with ISO 14025 and ISO 14044/14040. The EPD enables to earn points under the LEED rating system.

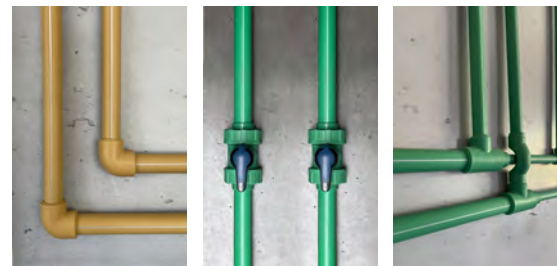
LEED incorporates point structures to encourage the use of products and materials that have environmentally, economically, and socially preferable life-cycle impacts. Point structures were developed to reward the selection of products from manufacturers



who have demonstrated improved environmental life-cycle impacts. The “MR Credit in the Building Product Disclosure and Optimization - Environmental Product Declarations” of LEED allows LEED credits to apply to the following uses:

- New Construction (1-2 points),
- Core & Shell (1-2 points),
- Schools (1-2 points),
- Retail (1-2 points),
- Data Centers (1-2 points),
- Warehouses & Distribution Centers (1-2 points),
- Hospitality (1-2 points),
- Healthcare (1-2 points).

For more information on the “Environmental Product Declaration POLYPROPYLENE RANDOM COPOLYMER (PP-R) PIPE SYSTEM FOR HOT AND COLD WATER IN THE BUILDINGS” by the European Plastic Pipes and Fittings Association, visit www.teppfa.eu.



Would you like to learn more about our products? We look forward to your message.

POLYMELT Pipe Systems GmbH
Kirnachstraße 17
87640 Ebenhofen, Germany

T. +49 8342 70060
E. mail@polymelt.com
W. www.polymelt.com