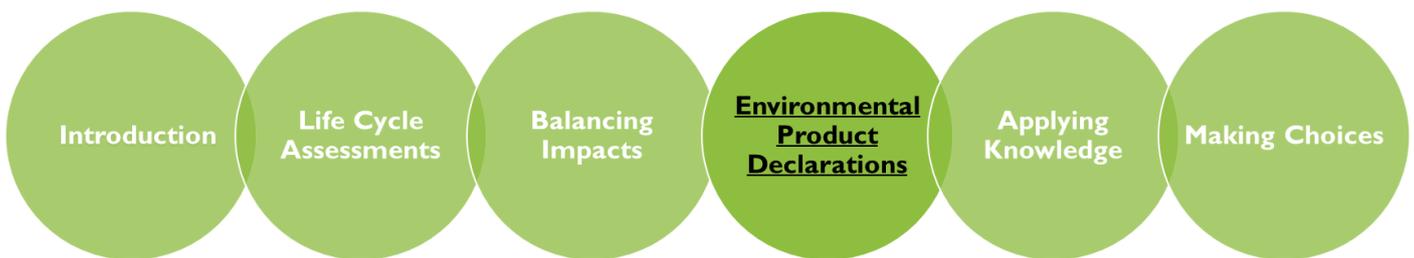


Evaluating the environmental impacts of hot and cold water supply systems in a building to aid product choice: Interpreting EPDs



Keywords

- Environmental Product Declaration (EPD)
- Life Cycle Assessment (LCA)
- BS EN 15804
- Sustainable solutions
- Product comparison
- Hot and cold water systems

Article Highlights

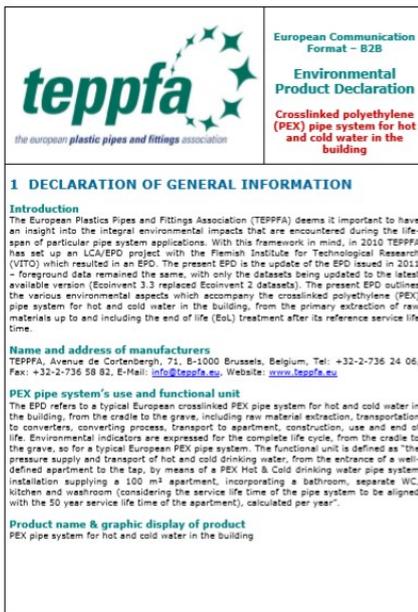
This is the fourth in a series of bulletins which together describe the environmental benefits of plastic piping in hot and cold water systems. The bulletins build a resource which supports the development of knowledge of Environmental Product Declarations (EPDs) and Life Cycle Assessments (LCAs) to select the best sustainable options.

What does the bulletin cover?

This bulletin shows how the LCA for a piping system is set out in the form of an EPD, the essential features, and the independent verification of claims which can be used by the building designer.

Introduction

The first three bulletins in this series introduced the concept of an Environmental Product Declaration (EPD) as a tool for objectively weighing up the evidence for the sustainable selection of piping systems inside buildings. Bulletins 1 and 2 explained the jargon used; presented the method for determining the environmental impact of a material, product or system through Life Cycle Assessment (LCA); and stressed the importance of considering all stages of a product's lifetime from cradle to grave. Importantly in Bulletin 3, the direct significance of the impact of the production and use of construction products on the international and national commitments to reduction of embodied carbon and green house gases is explained.



Put simply, an Environmental Product Declaration is a fair and consistent means of presenting the Life Cycle Assessment of a product.

The benefits of using an independently verified EPD to compare construction products are presented in Bulletin 1.

This bulletin draws on the EPDs for plastic piping systems inside buildings to demonstrate the key features.

TEPPFA, The European Plastic Pipes and Fittings Association, has EPDs for 21 application areas covering water supply, plumbing and wastewater. All EPDs are freely available at <https://www.teppfa.eu/>.

The Essential Features

An EPD is a standardised communication tool made according to International Standards for Environmental Management and supporting standards for the specific sector, i.e. BS EN 15804 for construction products.

Each EPD therefore needs to contain the same information:

- Exact description of the product — the manufacturer, the product name and description, the functional unit and components included (Bulletin 2 explains the concept of the functional unit);
- Robustness of process — the standards used, the date and period of validity and the independence i.e. credentials of the expert undertaking the work and the verifier (Bulletin 2 explains the critical review process);
- Life Cycle Assessment — the stages of product life considered, the calculated effect of each activity on environmental impacts, the use of resources and the creation of waste streams during production and use of the product (Bulletin 2 illustrates the 'cradle to grave' life cycle used for all TEPPFA EPDs. Bulletin 3 lists the impacts and what they mean for the global environment);
- Technical data — the values used to construct the LCA, the scenarios set e.g. reference service lifetime, transport distances, construction methods.

Plastic piping in hot and cold water systems

TEPPFA, The European Plastic Pipes and Fittings Association, commissioned independent studies by the Belgian research organisation (VITO) to measure the environmental footprint of various plastic pipe systems based on life-cycle assessment. The work was validated by the Denkstatt sustainability consultancy in Austria.

Environmental Product Declarations are available for four hot and cold water systems inside buildings:

- Cross-linked polyethylene pipe systems.
- Polymer/Aluminium/Polymer composite pipe systems.
- Polypropylene random copolymer pipe systems.
- Polybutene pipe systems .

Each of these pipe systems is defined by a European Standard (EN), adopted in the U.K. as a British Standard (BS EN). The EPD is therefore representative of the products made by BPF Pipes Group members and TEPPFA members and accredited to these standards.



Trust and transparency

Building construction (sourcing of materials, water use in construction etc.) and operation (thermal efficiency, heating fuels etc.) is under scrutiny. Designers and specifiers need trustworthy and transparent data presented in an easily usable form.

An independently verified EPD combines Life Cycle Assessment with a consistent set of rules in BS EN 15804 for construction products. It provides the most recognised method to quantify environmental impacts of products, processes and/or systems, showing the environmental effects of a product over its entire life cycle, from raw material extraction through materials processing, manufacture, distribution, use, repair and maintenance and disposal or recycling.

Comparing products

An EPD enables building specifiers to assess the environmental impact of a pipe system and allows comparisons to be made with alternative products, providing the same life cycle stages and functional unit have been considered. To support this process, independent comparative LCA studies have been carried out by VITO and reviewed by Denkstatt. For hot and cold water systems, an LCA has been prepared for copper pipe using the 'cradle to grave' life cycle and the same 'well-defined apartment' functional unit to show an exact comparison with plastic piping. This can be found at <https://www.teppfa.eu/lca-overview>.

In the next bulletin, we will illustrate how applying the knowledge gained from Bulletins 1 - 4, a TEPPFA EPD can be used to make a fact-based decision on the best environmental solution for a project.

Evaluating the environmental impacts of hot and cold water supply systems in a building to aid product choice

Bulletin 1: Introduction

Bulletin 2: Life Cycle Assessment (LCA)

Bulletin 3: Balancing the environmental impacts

Bulletin 4: Interpreting Environmental Performance Declarations (EPDs)

Bulletin 5: Applying your knowledge

Bulletin 6: Asking the right questions - making choices

About the BPF Pipes Group

Part of the British Plastics Federation, the BPF Pipes Group is a trade association representing manufacturers and material suppliers of plastic piping systems across the UK.

Committed to sustainable construction, its aims are to provide a forum for the exchange of technical expertise between member companies and to promote the importance of plastic as a pipework material, for the full spectrum of above and below ground, pressure and non-pressure applications. It also plays a key role in initiating and disseminating research and informing and influencing the standards bodies pertaining to plastic pipe systems. It works closely with TEPPFA, The European Plastic Pipes and Fittings Association.

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