



Product Category Rule (PCR) Guidance for Building-Related Products and Services

Part B: Mechanical, Specialty, Thermal, and Acoustic Insulation Product EPD Requirements



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Product Category Rules for Part B: Mechanical, Specialty, Thermal, and Acoustic Insulation Product EPD Requirements, UL 10010-03

First Edition, Dated September 3, 2019

Summary of Topics

The First Edition of the Part B: Mechanical, Specialty, Thermal, and Acoustic Insulation Product EPD Requirements, UL 10010-03 has been issued.

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Publisher:

UL Environment

Tracking of versions

Version	Comments	History
1.0	Updated and republished under Part A and Part B format to conform with ISO 21930:2017 and EN 15804. The original Building Envelope Thermal Insulation PCR, published in 2011, included Mechanical Insulation in an update as an Appendix in 2014; this PCR is published as a standalone Part B to conform with ISO 21930, EN 15804 and be used with UL Environment's Part A	9/3/2019

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Editor's Note:

This PCR is valid for a period of five (5) years, set to expire in September 2024.

I. Background Information and Acknowledgements

These sub-category Product Category Rules (PCR) were developed to address the product specific rules for the creation of Environmental Product Declarations (EPD) for mechanical, specialty, thermal and acoustic insulation. When used to self-reference this document, "PCR" refers to "sub-category PCR."

Other PCRs and supporting documents considered in the original development of this PCR include:

- EN 16783:2017 - Product category rules (PCR) for factory made and in-situ formed products for preparing environmental product declarations. May, 2017.
- Life Cycle Assessment for CertainTeed Insulation Duct Wrap Insulation. November 2016.
- Life Cycle Assessment of Owens Corning® Air Handling Insulation: EcoTouch® Insulation for Flexible Duct, QuietR® Duct Board and SOFTR® Duct Wrap. December 11, 2015.
- Part B PCR for Insulated Metal Panels, Metal Composite Panels, and Metal Cladding. UL Environment, October, 2018.
- PCR prepared by Næringslivets Stiftelse for Miljødeklarasjoner (Norwegian EPD Foundation) for Insulation Materials. October, 2012.
- PCR Guidance-Texts for Building-Related Products and Services, From the range of Environmental Product Declarations of Institute of Construction and Environment e.V. (IBU), *Part B: Requirements for the EPD for Calcium silicate insulating materials*, v1.6, July 2014.
- PCR Guidance-Texts for Building-Related Products and Services, From the range of Environmental Product Declarations of Institute of Construction and Environment e.V. (IBU), *Part B: Requirements for the EPD for Insulating materials made of foam plastics*, v1.6, August 2014.
- PCR Guidance-Texts for Building-Related Products and Services, From the range of Environmental Product Declarations of Institute of Construction and Environment e.V. (IBU), *Part B: Requirements for the EPD for Mineral insulating materials s*, v1.6, August 2014.
- Part A: Life Cycle Assessment Calculation Rules and Report Requirements. UL Environment (September 2018, version 3.2)
- PCR Guidance for Building-Related Products and Services Part B: Building Envelope Thermal Insulation EPD Requirements. UL Environment. April 2018.
- ISO 21930:2017 - Sustainability in building construction -- Environmental declaration of building products. July 2017.

This PCR assumes a 75-year building service life to be consistent with ASTM E2921 (2013, Section 6.1.1), and ASHRAE 189.1 (2014, Section 9.5.1). This PCR assumes the building and its equipment will be maintained operationally for the life of the building.

Interested Parties

This Part B has been prepared with input from the following stakeholders:

Trade associations

- North American Insulation Manufacturers Association, Inc (NAIMA)

Manufacturers/Consultants

- Armacell US
- CertainTeed/Saint Gobain
- Intech Consulting
- Kingspan Insulated Panels
- Knauf Insulation
- Owens Corning
- Reflectix
- Thermaflex

Governance

The North American Insulation Manufacturers Association, Inc (NAIMA) and representatives of insulation manufacturers participated in the development of this Product Category Rule ("PCR") for mechanical thermal insulation. These parties represent a majority of the companies in their sector of the insulation industry. Moreover, the parties participating in the PCR update represent the vast majority of insulations types produced in North America. The very purpose and function of a trade association is to inform its members of important industry developments and to represent their interests in projects such as the update of a PCR affecting their products. This is important because it effectively demonstrates that a large percentage of the thermal insulation industry is represented in the effort to renew the PCR for insulation products.

The role of participants is to establish requirements and procedures to be applied in the development of EPDs for thermal insulation. This is an update to an existing PCR, and therefore, this effort begins with the vetting of required changes in scope and structure. A fundamental aspect of the utility of the LCA tool is demonstration of reduction of a product's environmental impact, so maintaining applicability of EPDs certified under the existing PCR is a critical consideration for participants. In the development of this document, Part B, participants are responsible for ensuring alignment with Part A and conformance with the scoped standards: ISO 21930, EN 15804, and ISO 14025.

Involvement of Interested Parties

"The Program Operator [UL Environment] shall be responsible for producing the PCR document by establishing an open consultation process that includes the involvement of interested parties (ISO 21930 Section 5.2 and 6.2.1). "Reasonable efforts should be made to achieve a consensus throughout the process" (ISO 14020:2000 Section 4.9.1, Principle 8 and cited in both ISO 14025 and ISO 21930). The Program Operator shall establish procedures for determination of consensus. Consensus is demonstrated by a vote of participating interested parties.

Insulation trade associations informed their memberships of the insulation PCR update through their regularly scheduled association and association committee meetings, newsletters, e-mail messages, and similar types of outreach. Trade associations operate at the behest of its members, and the fact that trade associations are participating in the update of a PCR for insulation products is an indication that their memberships are aware of this project and have authorized their association to represent them in this important endeavor.

UL Environment posted an open call for participation in this PCR update in July 2017 via its standards website, social media outlets, and outreach to original committee stakeholders.

Update Process

The PCR shall be revised five (5) years from the publication date. The PCR shall be revised before the five year date if the following occurs in the industry: a major regulatory change that alters the requirements for thickness; the Reference Service Life (RSL) in this PCR is no longer accurate; major shift in the markets such that a new material or system predominates that can no longer be characterized adequately by the definition of thickness¹, or RSL in this PCR.

As part of the 2017 update process, UL Environment communicated with all original committee members listed in the original publication of v1 of the Building Envelope Thermal Insulation PCR. Since 2011, that PCR was expanded in scope to include mechanical insulation in 2014. The PCR committee agreed in 2017 that mechanical insulation is

¹ Refer to declared unit in Section 3.1

best represented in a separate PCR document given functional differences between the product categories and the differences in calculation methods.

Review

The review process of this Part B PCR included a review through public consultation from January 18 – February 18, 2019 and a panel review.

This Part B was reviewed by the following panel:

Hugues Imbeault-Tétreault, Chair
Group AGECO
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Public Consultation

Public consultation was utilized during the PCR review process. The public consultation of the completed draft PCR included a minimum 30-calendar-day period for comments to be submitted to UL Environment. After public comments were submitted, the PCR committee reviewed and developed responses for all comments. All comments from the review panel and public consultation were addressed and satisfactorily resolved by the PCR committee prior to the publication of this PCR.

II. Scope

This document contains the Product Category Rule (PCR) requirements for a Mechanical, Specialty, Thermal, and Acoustic Insulation Environmental Product Declaration (EPD) published in accordance with the EN 15804 and ISO 21930 standards. The requirements for the background Life Cycle Assessment (LCA) project report used to inform the EPD are contained in UL Environment's Part A: Life Cycle Assessment Calculation Rules and Report Requirements. This Part B document, coupled with the Part A, conforms to the ISO 21930, EN 15804, and ISO 14025 European and international standards for EPD reporting.

General Guidance

The scope of this PCR applies to the product group “mechanical, specialty, thermal, and acoustic insulation” and includes all commercially available insulation products according to the standards or technical approvals shown under Section 9, regardless of material type, including but not limited to: mineral fiber insulation (rock, slag or glass), cellulose-based insulation, polymer-based insulation, cellular glass, and textile-based insulation. Types of insulation within the scope of this PCR include, but are not limited to: pipe, board, duct wrap, duct liner, blanket, and uncured insulation for molding, pipe and tank insulation.

Mechanical insulation is an important technology to reduce energy consumption in buildings by preventing heat gain/loss through the building's mechanical systems such as piping and heating, ventilation, air conditioning, and exhaust systems. Mechanical systems carry or store liquid, gas, air, or product and require insulation to maintain process temperatures which are impacted by ambient air temperatures. These systems must be insulated to maintain process temperatures for both cold and hot systems; to protect liquids from freezing; to provide burn protection for personnel from possible exposure to hot systems; and for sound attenuation. Mechanical insulation is a construction material with low thermal conductivity and the purpose of these materials is to save energy, provide process control, condensation control, noise control, and protect and provide comfort to occupants.

Specialty insulation includes products such as wall and ceiling liners that provide an opaque background for cosmetic, shielding, and sound dampening purposes. Acoustical insulation includes board products that are used to reduce and attenuate sound in buildings. These products may also provide thermal insulation as a secondary function.

Note: There is a separate sub-category PCR for building envelope thermal insulation that shall be used when creating EPDs for building envelope thermal insulation.

The following Construction Specification Institute (CSI) Masterformat codes cover the scope of this Part B:

- 23 07 00 HVAC Insulation
 - 23 07 13 Duct Insulation
 - 23 07 16 HVAC Equipment Insulation
 - 23 07 19 HVAC Piping Insulation
- 220716 Plumbing Equipment Insulation
- 220719 Plumbing Insulation
- 098100 Acoustic Insulation

The following United Nations Standard Products and Services Code (UNSPSC) codes cover the scope of this Part B:

- 30140000 Insulation
- 30141500 Thermal insulation
- 30141600 Specialty insulation
- 30141503 Foam insulation
- 30141512 Thermal insulation kits
- 30141515 Extruded polystyrene XPS insulation
- 30141516 Mineral wool insulation
- 30141505 Thermal insulation sleeving
- 30141508 Fiber insulation
- 30141514 Expanded polystyrene EPS insulation
- 30141601 Acoustical insulation
- 30141604 Spray coating insulation

NON-APPLICABLE PRODUCTS

Products that may provide the same function in a different application are not within the scope of this PCR. These excluded products include:

- Building envelope thermal insulation. This product category is covered in the Part B: Building Envelope Thermal Insulation published by UL Environment, 2017.
- Insulated metal [wall] panels (IMPs) (CSI 07 42 13 19). This product category is covered in the Part B: Insulated Metal Panels, Metal Composite Panels, and Metal Cladding: Roof and Wall Panels PCR published by UL Environment, 2018.
- Insulated Sectional Chimneys (CSI 23 51 33)
- Insulated Concrete Masonry Units (CSI 04 22 23)
- Structural Insulated Panels (SIPs)
- Exterior Insulation and Finish Systems (EIFS) (CSI 07 24 00)
- Insulated Doors

PCRs developed for these assemblies and categories should cross-reference this PCR.

Geography

This PCR applies to products sold and used in North American markets but may be manufactured within other geographies.

System Boundary

The system boundary for EPDs created using this PCR is cradle to gate with options.

The EPD requirements include:

- Requirements of the ISO 21930:2017 standard
- Requirements of the EN 15804 standard as a European core EPD for consistency between declarations in Europe and the United States.
- Requirements of the ULE General Program Instructions v 2.4, July 2018 (available upon request)
- The calculation rules for the Life Cycle Assessment and Requirements on the Project Report are specified in a separate document as Part A of the Product Category Rules, available at

<http://industries.ul.com/environment/transparency/product-category-rules-pcrs>. At the time of developing this PCR, the most current version of Part A is 3.2.

III. Industry-Average EPD and Report Requirements

Industry-Average EPD Scope

Only products defined by the standards in section 9 can be individually covered by an industry-average EPD created using this PCR.

Involvement of Interested Parties

A call for involvement of interested parties in the creation of an industry-average EPD shall be published in at least one industry trade publication. At a minimum, at least three (3) different manufacturing locations from no less than two (2) companies should be involved and represented in an industry-average EPD. The method for determining representativeness shall be justified and described per the requirements listed in Section 2.3.

Industry-Average EPD Participation

A manufacturer qualifies for participation in an industry-average EPD created using this PCR if they provide primary manufacturing data used in calculating the initial EPD average or demonstrates willingness to provide primary manufacturing data during the LCA data collection process.

Retroactive participation:

A manufacturer may apply for retroactive participation by providing relevant qualitative and quantitative manufacturing and product information to the Program Operator, as detailed below. The Program Operator will assess representativeness and will inform and provide the original industry-average EPD committee with this application. The participation decision ultimately resides with the Program Operator.

A manufacturer desiring retroactive inclusion in the industry-average EPD should provide the following representative manufacturing and product data information to the Program Operator for the reference year declared: 1) main process energy consumption by fuel source(s), if generated on-site; 2) applicable emission thresholds and permits; 3) main raw materials, including bill of materials with corresponding masses; 4) facility output; and 5) involved manufacturing process(es). All reported data shall be normalized by declared unit. If any of the reported data is greater than the maximum value in the range of normalized product inventory data in the background report, the manufacturer should not claim representation by the existing industry average. The Program Operator shall refer to the background report for the industry average to assess whether the provided information meet this criterion.

In case of industry-average EPDs, the background report shall contain the following information as the basis for evaluating retroactive participation:

- Maximum facility size included in the sample,
- Maximum production energy intensity per declared unit in the sample
- Maximum utilization rate included in the sample.

When determining a manufacturer's participation eligibility, the EPD Program Operator shall follow the recommendations of the manufacturer and/or its consultants unless the Program Operator has data or information to the contrary, in which case the Program Operator and manufacturer shall confer in an effort to reach consensus. All manufacturers who apply for retroactive participation should participate in the update process when the existing industry-average EPD expires.

Manufacturers seeking to publicly benchmark product-specific type III EPDs against the industry-average EPD shall have participated in the industry-average EPD process or retroactively via the options outlined above.

Governance

An industry organization, such as a trade association, shall inform all eligible industry participants through association meetings, newsletters, e-mail messages, and similar types of outreach, including public notices in the

trade press publications. Confidential business information shall be collected by a third party. Data from the third party shall be aggregated with no trace to the original source of data.

The development of an industry-average EPD and/or update of such an EPD should involve a series of meetings and exchanges in which all participants are invited and kept apprised of the developments. Advance notices as well as the minutes of these meetings shall be shared with all eligible participants regardless of whether they actively participate. These notices and meeting minutes should be preserved as documentation of the process and due diligence observed in the creation or renewal of the EPD.

Data Responsibility/Ownership

Trade associations that lead the development of industry-average EPDs may need to collect confidential business information from individual member companies. This data can include proprietary chemical formulations and processes or other confidential information. In this case, a designated third-party entity such as an LCA practitioner may be commissioned as the “industry agent”. The industry agent shall be responsible for activities including collection, secure storage and analysis of such data needed for the EPD development and will preserve the privacy of individual company information while executing these duties.

Refer to ISO 21930 Section 5.4 for ownership and development responsibilities of the EPD.

The group of manufacturers responsible for developing an industry-average EPD shall be responsible for, including but not limited to, insuring industry-average EPD updates are made based on the most recent LCA modeling software version and impact assessment version available.

Industry-Average EPD Updates

An update to the existing EPD, or new EPD, may need to be developed at the end of the five year validity period or at the discretion of the EPD owner prior to the five year validity period if there are: 1) significant² changes in the manufacturing process; 2) new industry participants; 3) significant changes or alterations in raw materials; 4) major regulatory changes that mandate or trigger changes to operational procedures; or 5) major technological changes would also justify creation of an updated EPD.

Additional companies may be added to an existing industry-average EPD at the end of the EPD validity period by submitting data and having the industry average impacts recalculated.

² As a general rule, significance is defined as +/- 10% for any given impact category

1. Content of an EPD

EPD PROGRAM AND PROGRAM OPERATOR NAME, ADDRESS, LOGO, AND WEBSITE	Program Operator Provided
GENERAL PROGRAM INSTRUCTIONS AND VERSION NUMBER	Program Operator Provided
MANUFACTURER NAME AND ADDRESS	
DECLARATION NUMBER	Program Operator Provided
DECLARED PRODUCT & FUNCTIONAL UNIT OR DECLARED UNIT	
REFERENCE PCR AND VERSION NUMBER	
DESCRIPTION OF PRODUCT'S INTENDED APPLICATION AND USE (AS IDENTIFIED WHEN DETERMINING PRODUCT RSL)	
PRODUCT RSL DESCRIPTION (IF APPL.)	
MARKETS OF APPLICABILITY	
DATE OF ISSUE	Program Operator Provided
PERIOD OF VALIDITY	Program Operator Provided
EPD TYPE	[Industry-average or product-specific]
RANGE OF DATASET VARIABILITY	[Industry-average only; mean, median, standard deviation]
EPD SCOPE	[Cradle to gate with options (specify options).]
YEAR(S) OF REPORTED MANUFACTURER PRIMARY DATA	
LCA SOFTWARE & VERSION NUMBER	
LCI DATABASE(S) & VERSION NUMBER	
LCIA METHODOLOGY & VERSION NUMBER	
The sub-category PCR review was conducted by:	Program Operator Provided
	Program Operator Provided
	Program Operator Provided
This declaration was independently verified in accordance with ISO 14025: 2006. The UL Environment "Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report," v3.2 (December 2018), based on ISO 21930:2017, serves as the core PCR, with additional considerations from CEN Norm EN 15804 (2012) and the USGBC/UL Environment Part A Enhancement (2017) ☐ INTERNAL ☐ EXTERNAL	
	Program Operator Provided
This life cycle assessment was conducted in accordance with ISO 14044 and the reference PCR by:	
	Program Operator Provided
This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:	
	Program Operator Provided
LIMITATIONS Environmental declarations from different programs (ISO 14025) may not be comparable. Comparison of the environmental performance of products using EPD information shall be based on the product's use and impacts at the building level, and therefore EPDs may not be used for comparability purposes when not considering the building energy use phase as instructed under this PCR. Full conformance with the PCR for Mechanical Thermal Insulation allows EPD comparability only when all stages of a life cycle have been considered. However, variations and deviations are possible". Example of variations: Different LCA software and background LCI datasets may lead to differences results for upstream or downstream of the life cycle stages declared.	