

# Product category rules

EN 15804 +A2

NPCR 012

Part B for thermal insulation products

version 2.0

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## REVISION LOG

This is an overview of the changes made to this PCR. Typology of changes:

- Editorial (ed): Text or layout edited, with no change in content.
- Technical (te): Existing content has been changed.
- Addendum (ad): New content has been added.

Naming convention: Version x.y, where x is a major revision and y is a minor revision.

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Original version, issued 2018-06-06.		
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Editorial updated to accommodate for EN15804:2012+A2:2019		

2023.10.17 the validity has been extended until 2024.07.01

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## Introduction

These product category rules (PCR) are intended for companies preparing an environmental product declaration (EPD) for thermal insulation products. The PCR for thermal insulation products consists of two parts. This document contains PCR part B specific for insulation, which is the part of the PCR that is specific for insulation products. Part A contains the requirements that are common for all construction products. When preparing an EPD for thermal insulation products, all requirements outlined in part A and part B must be followed. In PCR part B, the requirements for PCR part A are referred to in each section where they occur. The purpose of this document is to define clear guidelines for performing the underlying life cycle assessment (LCA) to ensure comparability between EPDs. In addition, EN 16783 PCR for thermal insulation products is a normative reference to this PCR.

This PCR was developed from August 2017 to January 2018, by a Norwegian PCR working group (WG) with representatives from the thermal insulation products industry and with aid from Ostfold Research (Østfoldforskning), SINTEF Building and Infrastructure and the EPD programme operator The Norwegian EPD Foundation. The PCR has been developed in accordance with the requirements in the general programme instructions for the Norwegian EPD programme (EPD-Norway 2019 ). An editorial update was made by the secretariat in Q1 2022 to accommodate for changes in EN15804:2012+A2:2019.

### Members of the PCR working group (WG) for insulation products:

Håkon Hauan, The Norwegian EPD Foundation (EPD-Norge) Committee Leader  
Trine D. Pettersen, The Federation of Norwegian Construction Industries (BNL)  
Thomas Bjørhusdal, Glasopor AS  
John A. Bakke, Glava AS  
Anders E. Sørensen, Jackon AS  
Christer Hammarberg, Paroc AS  
Hans Joachim Motzfeldt, AS ROCKWOOL  
Michael Petersen, Saint-Gobain Nordic AS  
Thomas Løkken, Hunton Fiber AS  
Helle Fossheim, Leca Norge AS

### Consultants:

Lars Tellnes, Ostfold Research (Østfoldforskning PCR moderator)  
Christofer Skaar, SINTEF Building and Infrastructure, technical committee representative

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## 1 Scope

As in PCR part A and EN 16783, including the following additions:

Give further specification for creating EPDs for thermal insulation products on the Norwegian market. The core rules valid for all construction products given in standard EN 15804 and PCR part A, in addition to the complementary PCR for thermal insulation products in EN 16783, are expected to be known by those preparing the EPD.

## 2 Normative references

NPCR Part A: Construction products and services. Oslo: EPD-Norge.

EN 16783 Thermal insulation products. Product category rules (PCR) for factory made and in-situ formed products for preparing environmental product declarations.

If there are contradictions in requirements between PCR Part A and EN 16783, then PCR Part A shall be given priority.

## 3 Terms and Definitions

As in PCR part A and EN 16783.

In addition, the following product-specific terms and definitions are given:

### 3.1 Thermal insulation

Process of reducing heat transfer through a system, or the description of a product, component or system that performs this function

[ISO 9229:2007]

### 3.2 Thermal insulation material

Material that is intended to reduce heat transfer and that derives its insulation properties from its chemical nature and/or its physical structure

[ISO 9229:2007]

### 3.3 Thermal insulation product

Thermal insulation material in its finished form, including any facings or coatings

[ISO 9229:2007]

### 3.4 Composite insulation product

Product which can be faced or coated made from two or more layers bonded together by chemical or physical adhesion consisting of at least one factory made thermal insulation material layer.

[EN 13162:2012+A1:2015]

## 4 Abbreviations

EPD	Environmental Product Declaration
DU	Declared unit
FU	Functional unit
PCR	Product category rules
LCA	Life cycle assessment
LCI	Life cycle inventory
LCIA	Life cycle impact assessment
RSL	Reference service life
ESL	Estimated service life

## 5 General Aspects

### 5.1 Objective of PCR Part A and B

As in PCR part A and EN 16783.

### 5.2 Types of EPD in respect to life cycle stages covered

As in PCR part A and EN 16783, including the following additions:

Cradle-to-gate only EPDs are not valid according to this PCR. As a minimum, cradle-to-gate with options that include life cycle modules A4, C1-C4 and D are required.

### 5.3 Comparability of EPD of construction products

As in PCR part A and EN 16783.

### 5.4 Additional information

As in PCR part A and EN 16783.

### 5.5 Ownership, responsibility and liability for the EPD

As in PCR part A and EN 16783.

### 5.6 Communication format

As in PCR part A and EN 16783.

## 6 Product Category Rules for LCA

As in PCR part A and EN 16783.

### 6.1 Product Category

As in PCR part A and EN 16783, including the following additions:

The product group includes all kinds of thermal insulation products. The most common products and standards are listed here:



### 6.1.1 Mineral wool (MW)

Mineral wool insulation products are described in the following standards:

EN 13162 Thermal insulation products for buildings. Factory made mineral wool (MW) products. Specification.

EN 14064-1 Thermal insulation products for buildings. In-situ formed loose-fill mineral wool (MW) products. Part 1: Specification for the loose-fill products before installation.

EN 14064-2 Thermal insulation products for buildings. In-situ formed loose-fill mineral wool (MW) products. Part 2: Specification for the installed products.

EN 14303 Thermal insulation products for building equipment and industrial installations. Factory made mineral wool (MW) products – Specification.

EN 13964 Suspended ceilings - Requirements and test methods.

### 6.1.2 Expanded polystyrene foam (EPS)

Expanded polystyrene foam insulation products are described in the following standards:

EN 13163 Thermal insulation products for buildings. Factory made products of expanded polystyrene (EPS). Specification.

EN 14309 Thermal insulation products for building equipment and industrial installations. Factory made products of expanded polystyrene (EPS). Specification.

EN 14933 Thermal insulation and light weight fill products for civil engineering applications. Factory made products of expanded polystyrene (EPS). Specification.

### 6.1.3 Extruded polystyrene foam (XPS)

Extruded polystyrene foam insulation products are described in the following standards:

EN 13164 Thermal insulation products for buildings. Factory made products of extruded polystyrene foam (XPS). Specification.

EN 14307 Thermal insulation products for building equipment and industrial installations. Factory made extruded polystyrene foam (XPS) products. Specification.

### 6.1.4 Rigid polyurethane foam (PUR) and polyisocyanurate (PIR)

Polyurethane and polyisocyanurate insulation products are described in the following standards:

EN 13165 Thermal insulation products for buildings. Factory made rigid polyurethane foam (PUR) products. Specification.

EN 14308 Thermal insulation products for building equipment and industrial installations. Factory made rigid polyurethane foam (PUR) and polyisocyanurate foam (PIR) products. Specification.

### 6.1.5 Phenolic foam (PF)

Phenolic foam insulation products are described in the following standard:

EN 13166 Thermal insulation products for buildings. Factory made products of phenolic foam (PF). Specification.

### 6.1.6 Cellular glass (CG)

Cellular glass insulation products are described in the following standards:

EN 13167 Thermal insulation products for buildings. Factory made cellular glass (CG) products. Specification.

EN 14305 Thermal insulation products for building equipment and industrial installations. Factory made cellular glass (CG) products. Specification.

### **6.1.7 Wood wool (WW)**

Wood wool insulation products are described in the following standard:

EN 13168 Thermal insulation products for buildings. Factory made wood wool (WW) products. Specification.

### **6.1.8 Expanded perlite (EPB/EP)**

Expanded perlite insulation products are described in the following standards:

EN 13169 Thermal insulation products for buildings. Factory made products of expanded perlite (EPB). Specification.

EN 14316-1 Thermal insulation products for buildings. In-situ thermal insulation formed from expanded perlite (EP) products. Part 1: Specification for bonded and loose-fill products before installation.

EN 14316-2 Thermal insulating products for buildings. In-situ thermal insulation formed from expanded perlite (EP) products. Part 2: Specification for the installed products.

EN 15599-1 Thermal insulation products for building equipment and industrial installations. In-situ thermal insulation formed from expanded perlite (EP) products. Part 1: Specification for bonded and loose-fill products before installation.

EN 15599-2 Thermal insulation products for building equipment and industrial installations. In-situ thermal insulation formed from expanded perlite (EP) products. Part 2: Specification for the installed products.

### **6.1.9 Expanded cork (ICB)**

Expanded cork insulation products are described in the following standard:

EN 13170 Thermal insulation products for buildings. Factory made products of expanded cork (ICB). Specification.

### **6.1.10 Wood fibre (WF)**

Wood fibre insulation products are described in the following standard:

EN 13171 Thermal insulating products for buildings. Factory made wood fibre (WF) products. Specification.

### **6.1.11 Calcium silicate (CS)**

Calcium silicate insulation products are described in the following standard:

EN 14306 Thermal insulation products for building equipment and industrial installations. Factory made calcium silicate (CS) products. Specification.

### **6.1.12 Flexible elastomeric foam (FEF)**

Flexible elastomeric foam insulation products are described in the following standard:

EN 14304 Thermal insulation products for building equipment and industrial installations. Factory made flexible elastomeric foam (FEF) products. Specification.

### 6.1.13 Polyethylene foam (PEF)

Polyethylene foam insulation products are described in the following standard:

EN 14313 Thermal insulation products for building equipment and industrial installations. Factory made polyethylene foam (PEF) products. Specification.

### 6.1.14 Exfoliated vermiculite (EV)

Exfoliated vermiculite insulation products are described in the following standards:

EN 14317-1 Thermal insulation products for buildings. In-situ thermal insulation formed from exfoliated vermiculite (EV) products. Part 1: Specification for bonded and loose-fill products before installation.

EN 14137-2 Thermal insulation products for buildings. In-situ thermal insulation formed from exfoliated vermiculite (EV) products. Part 2: Specification for the installed products.

EN 15600-1 Thermal insulation products for building equipment and industrial installations. In-situ thermal insulation formed from exfoliated vermiculite (EV) products. Part 1: Specification for bonded and loose-fill products before installation.

EN 15600-2 Thermal insulation products for building equipment and industrial installations. In-situ thermal insulation formed from exfoliated vermiculite (EV) products. Part 2: Specification for the installed products.

### 6.1.15 Expanded clay lightweight aggregate (LWA)

Expanded clay lightweight aggregate insulation products are described in the following standards:

- EN 14063-1 Thermal insulation materials and products. In-situ formed expanded clay lightweight aggregate products (LWA). Part 1: Specification for the loose-fill products before installation.
- EN 14063-2 Thermal insulation materials and products. In-situ formed expanded clay lightweight aggregate products (LWA). Part 2: Specification for the installed products.
- EN 15732 Light weight fill and thermal insulation products for civil engineering applications (CEA) - Expanded clay lightweight aggregate products (LWA).

### 6.1.16 In-situ formed loose fill cellulose (LFCI)

In-situ formed loose fill cellulose (LFCI) insulation products are described in the following standards:

- EN 15101-1 Thermal insulation products for buildings - In-situ formed loose fill cellulose (LFCI) products - Part 1: Specification for the products before installation.
- EN 15101-2 Thermal insulation products for buildings - In-situ formed loose fill cellulose (LFCI) products - Part 2: Specification for the installed products.

### 6.1.17 Vacuum insulated panel (VIP)

Vacuum insulated panels (VIP) are a type of thermal insulation that consists of an air-tight enclosure around a rigid core, of which the air has been evacuated. There are currently no harmonised European standards for VIPs, however a harmonised European standard is under development in technical committee (TC) 88.

### 6.1.18 Aerogel

Aerogels are derived from gel (e.g. a silica gel) by extracting the liquid component and replacing it with gas. Aerogel insulation products are not described in any harmonised European standards.

## **6.2 Life cycle stages and their information modules to be declared**

### **6.2.1 General**

As in PCR part A and EN 16783.

### **6.2.2 A1-A3, Product stage, information modules**

As in PCR part A and EN 16783.

### **6.2.3 A4-A5, Construction process stage, information modules**

As in PCR part A and EN 16783, including the following clarification:

Transport in all life cycle modules shall include the following:

- Direct emissions during transport (exhaust, tyres, etc.)
- Upstream emissions from fuel extraction, processing and distribution
- Life cycle emissions of vehicles (raw materials, manufacturing, maintenance and disposal)
- Life cycle emissions of infrastructure (raw materials, manufacturing, maintenance and disposal)

### **6.2.4 B1-B5, Use stage, information modules related to the building fabric**

As in PCR part A and EN 16783.

### **6.2.5 B6-B7, Use stage, information modules related to the operation of the building**

As in PCR part A and EN 16783.

### **6.2.6 C1-C4 End-of-life stage, information modules**

As in PCR part A and EN 16783.

See also table 2 in 6.2.6 in CEN/TC 16970 for additional guidance.

### **6.2.7 Benefits and loads beyond the system boundary, information module**

As in PCR part A and EN 16783.

## **6.3 Calculation rules for the LCA**

For declaring insulation products, a functional or declared unit can be used. The functional unit should be applied when a specific function and scenario that is typically used is known for the product. If these typical functions and scenarios are many or not known, the declared unit should be used.

The scope and variations of products must be declared according to EPD-Norway guidelines. As of 2018, similar products in the same EPD can only be included if the variations of the results for each LCIA category does not exceed +/- 10 %. The variation shall be stated in the EPD. Special care must be given to composite insulation products.

### **6.3.1 Functional unit**

As in PCR part A and EN 16783, with the following additions:

The functional unit shall also specify:

- A reference quantity for the functional unit when integrated into the construction works.
- Quantified key properties of the product, when integrated into the construction works, facilitating a functional equivalent comparison with similar products.
- The defined conditions and time period for these performance characteristics.

For insulation batts, boards and/or similar, the functional unit shall be calculated to an R-value of 1 per m<sup>2</sup>.

**NOTE: R=1 is not necessarily representative for specific products. The purpose of using R=1 is to facilitate comparison between products. It is possible to create an EPD for a declared unit with a specific R-value.**

### 6.3.2 Declared unit

As in PCR part A and EN 16783, with the following additions:

For insulation batts, boards and/or similar, the declared unit shall be calculated to an R-value of 1.

For composite products (excluding pipes) and for a specific R-value of the product, as placed on the market, the declared unit shall be calculated in m<sup>2</sup>.

Life cycle modules A1-A4, C1-C4 and D shall be included as a minimum.

If the reference service life of the product is shorter than 60 years (assuming the building has a 60-year reference study period) independently of the application, then the replacement module B4 shall be included.

### 6.3.3 Reference service life (RSL)

As in PCR part A and EN 16783.

The reference service life of the thermal insulation product depends on the material itself and the building site location. When declaring the functional unit, the number of replacements of thermal insulation products shall be declared according to the reference study period of 60 years for the building.

### 6.3.4 System boundaries

As in PCR part A and EN 16783.

### 6.3.5 Criteria for the exclusion of inputs and outputs (cut-off)

As in PCR part A and EN 16783.

### 6.3.6 Selection of data

As in PCR part A and EN 16783.

### 6.3.7 Data quality requirements

As in PCR part A and EN 16783.

### 6.3.8 Scenarios at the product level

As in PCR part A and EN 16783, including the following additions:

*EN 15978:2011 provides additional guidance on developing scenarios.*

### 6.3.8.1 A4 Transport to the building site

Transport from the manufacturing site to the construction site is estimated based on information from the manufacturer and relevant for the intended market. The following default values can be used for developing scenarios at the product level:

- For domestic production, the default distance from manufacturing to building site (A4) is 300 km.
- For import, the distance is measured from the manufacturing site to a specific storage location, plus a transport distance from the storage location to the building site of 300 km (if not specified). If no specific storage location is given, then the capital city of the country that the product is being imported to may be used as an approximate location.

### 6.3.8.2 A5 Installation

As in PCR part A and EN 16783.

### 6.3.8.3 B1-B7 Use phase

As in PCR part A and EN 16783.

### 6.3.8.4 C1-C4 End-of-life

As in PCR part A and EN 16783. In addition:

Default scenarios for life cycle module C2 transport to waste processing should be based on representative data, e.g. national statistics.

More than one scenario for waste treatment and disposal should be included if there are several relevant common practices, but the most conservative scenario shall always be included. Default conservative scenarios for C3 waste processing and C4 waste disposal are listed Table 1.

*Table 1: Default conservative scenarios for life cycle modules C3 and C4*

Product types	C3	C4
MW, CS, EV, LWA	Central sorting of mixed construction waste	Landfilling of wasted product in sanitary landfill
EPS, XPS, PUR, PIR, PF, CG, WW, EPB, EP, ICB, WF, FEF, PEF, LFCI	Municipal incineration with energy recovery	Landfilling of ashes from incineration

### 6.3.9 Units

As in PCR part A and EN 16783.

## 6.4 Inventory analysis

As in PCR part A and EN 16783.

## 6.5 Impact assessment

As in PCR part A and EN 16783.

## 7 Content of the EPD

### 7.1 Declaration of general information

As in PCR part A and EN 16783, including the following aspects:

The material composition of the product shall be listed with specific weight of the main components as it is installed and included in the LCA. Usage areas and conditions must be specified in the EPD. The harmonised standard for which the product is produced according to must be specified in the EPD.

The scope of products declared in an EPD must be specified so that the product range can easily be identified by the customer. The ability of scaling LCA results to other dimensions must be specified. If the results cannot be scaled with a conversion factor, which gives results according to the deviation rules outlined by EPD-Norway, then this cannot be included in the EPD. For thermal insulation products with other units than declared, that are scalable with a conversion factor according to the deviation rules outlined by EPD-Norway, may be declared as within the scope of the EPD. Special care must be given to composite thermal insulation products.

### 7.2 Declaration of environmental parameters derived from LCA

#### 7.2.1 General

As in PCR part A and EN 16783.

#### 7.2.2 Rules for declaring LCA information per module

As in PCR part A and EN 16783.

#### 7.2.3 Parameters describing environmental impacts

As in PCR part A and EN 16783.

#### 7.2.4 Parameters describing resource use

As in PCR part A and EN 16783.

##### *7.2.4.1 Water use*

As in PCR part A and EN 16783.

##### *7.2.4.2 Electricity used in A3 Manufacturing*

As in PCR part A and EN 16783.

#### 7.2.5 Other environmental information describing waste categories and output flows

As in PCR part A and EN 16783.

#### 7.2.6 Accounting of biogenic carbon during the life cycle

As in PCR part A and EN 16783,

#### 7.2.7 Greenhouse gas emissions from land use change

As in PCR part A and EN 16783,

### 7.2.8 Carbonation

As in PCR part A and EN 16783,

## 7.3 Scenarios and additional technical information

### 7.3.1 General

As in PCR part A and EN 16783.

### 7.3.2 Construction process stage

#### *7.3.2.1 A4, Transport from the production site to the construction site.*

As in PCR part A and EN 16783, including the following additions:

Capacity utilization is calculated as % of the mass carried of the total load capacity of the vehicle. The number given shall be the average of the capacity utilisation on the trip to the construction site and the capacity utilisation on the return trip.

#### *7.3.2.2 A5, Installation*

As in PCR part A and EN 16783, including the following additions:

The EPD shall specify the following information about the installation scenario:

- The consumption of fasteners, adhesives and necessary accessories
- The amount of energy per energy carrier
- Guidance for installation, international standards/regulations or national standards/regulations in which the scenario is based on
- If the EPD deviates from the predefined scenarios, this shall be clearly stated and justified.
- Usage areas and conditions must be specified in the EPD.

### 7.3.3 Use stage

As in PCR part A and EN 16783, including the following additions:

Maintenance, repair and replacement scenarios for the thermal insulation product, that will be required to reach the reference study period of the building, shall be described according to manufacturers' guidelines.

### 7.3.4 End of life

As in PCR part A and EN 16783, including the following additions:

Capacity utilization shall be calculated as % of the mass carried of the total load capacity of the vehicle. The number given shall be the average of the capacity utilisation on the trip to the construction site and the capacity utilisation on the return trip.

## 7.4 Additional information

As in PCR part A and EN 16783.



#### **7.4.1 Additional information on release of dangerous substances to indoor air, soil and water**

##### ***7.4.1.1 Indoor air***

As in PCR part A and EN 16783, with the following additions:

Release of substances to indoor air is relevant when the product is used on the inside of the vapour barrier. The following standard should be applied for measuring emissions to indoor air:

- EN 16516:2017 Construction products: Assessment of release of dangerous substances - Determination of emissions into indoor air

##### ***7.4.1.2 Soil, ambient air and water***

As in PCR part A and EN 16783, with the following additions:

Release of substances to ground water or soil is relevant for thermal insulation materials when they are used in direct contact with the ground or rain water. Until horizontal standards for the measurement of leaching characteristics are available, the following reports should be used:

- CEN/TS 16637-3:2016 Construction products. Assessment of release of dangerous substances. Horizontal up-flow percolation test.
- CEN/TR 17105:2017 Construction products. Assessment of release of dangerous substances. Guidance on the use of ecotoxicity tests applied to construction products.

#### **7.4.2 Additional Norwegian requirements**

As in PCR part A.

##### ***7.4.2.1 Greenhouse gas emissions from electricity use in A3 Manufacturing***

As in PCR part A.

##### ***7.4.2.2 Dangerous substances and content declaration***

As in PCR part A,

##### ***7.4.2.3 Emission classification of building materials***

As in PCR part A.

#### **7.5 Aggregation of information modules**

As in PCR part A and EN 16783.

### **8 Project Report**

As in PCR part A and EN 16783.

## 9 Verification and Validity of an EPD

As in PCR part A and EN 16783.

Approved 31.03.2022, valid until 06.06.2023.

Norwegian EPD Foundation, Technical committee



Christofer Skaar

Leader of the Technical committee

## 10 Bibliography

As in PCR part A, including the following additions:

CEN/TS 16637-3:2016 Construction products. Assessment of release of dangerous substances. Horizontal up-flow percolation test.

CEN/TR 16970:2016. Sustainability of construction works. Guidance for the implementation of EN 15804.

EA NEN 7375. Leaching characteristics of moulded or monolithic building and waste materials. Determination of leaching of inorganic components with the diffusion test. "The tank test".

EN 13163. Thermal insulation products for buildings. Factory made products of expanded polystyrene (EPS). Specification.

EN 13164. Thermal insulation products for buildings. Factory made products of extruded polystyrene foam (XPS). Specification.

EN 13165. Thermal insulation products for buildings. Factory made rigid polyurethane foam (PUR) products. Specification.

EN 13166. Thermal insulation products for buildings. Factory made rigid polyurethane foam (PUR) products. Specification.

EN 13167. Thermal insulation products for buildings. Factory made cellular glass (CG) products. Specification.

EN 13168. Thermal insulation products for buildings. Factory made wood wool (WW) products. Specification.

EN 13169. Thermal insulation products for buildings. Factory made products of expanded perlite (EPB). Specification.

EN 13170. Thermal insulation products for buildings. Factory made products of expanded cork (ICB). Specification.

EN 13171. Thermal insulating products for buildings. Factory made wood fibre (WF) products. Specification.

EN 13964 Suspended ceilings - Requirements and test methods.

EN 14063-1 Thermal insulation materials and products. In-situ formed expanded clay lightweight aggregate products (LWA). Part 1: Specification for the loose-fill products before installation.

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