10.12.2012

PRODUCT-CATEGORY RULES

EN 15804

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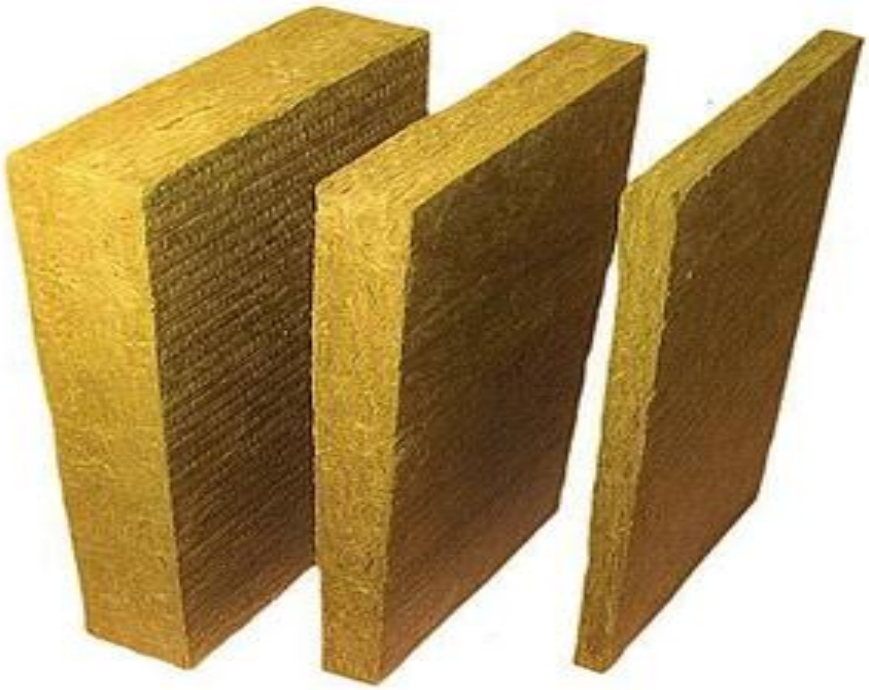
Insulation materials



Contents

Introduction

These product category rules (PCR) are intended for companies preparing an Environmental Product Declaration (EPD) for all kind of Insulation products like mineral wool (MW), expanded polystyrene (EPS), extruded polystyrene (XPS), rigid polyurethane foam (PUR), phenolic foam (PF), cellular glass (CG), wood wool (WW), expanded perlite (EPB), expanded cork (ICB), wood fibre (WF), calcium silicate (CS), flexible elastomeric foam (FEF), polyethylene foam (PEF), exfoliated vermiculite (EV), expanded clay lightweight aggregate (LWA), aerogel. The purpose of this document is to define clear guidelines for performing the underlying life cycle assessment (LCA) to ensure comparability between EPDs.

The PCR is based on and represent a supplement to the European standard EN15804: 2012 - *Sustainability of construction works – Environmental Product Declarations – core rules for the product category of construction products.* The PCR complies with the standard ISO14044: 2006, *Environmental management – Life cycle assessment – Requirements and guidelines* and ISO14025: 2006, *Environmental management – Type III environmental declarations – Principles and procedure*.

The EPDs based on this PCR-document are covering three perspectives:
1. EPD – cradle to gate
2. EPD – cradle to gate with options
3. EPD – cradle to grave

The three perspectives will present data that has been aggregated over the relevant life cycle stages as described in chapter 5 and shown in Figure 2.

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The members of the Norwegian PCR Work Group have prepared this PCR.

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This PCR is a common European PCR with an appendix A1 giving specific guidelines according to Norwegian requirements.

Cross references

Table 1 sums up the most important aspects defined distinctively for this particular product category. More details are given in the following chapters.

Table 1: PCR for Technical - Chemical products for the building- and construction industry executive summary

Chapter	**Topic**	**PCR –** Insulation materials	**Cross references**			
			ISO 14044	**ISO 14025**	**ISO 21930**	**EN 15804**
1	Scope	• Thermal insulation of building envelope • Thermal insulation of technical installations in buildings (e.g. ventilation, heating systems) • Frost protection of water supply and sewage systems • Thermal insulation of industrial installations (e.g. pipes and tanks used in the process industry) • Thermal insulation in roads, in railway tracks and tracks for light rail (streetcars and similar) • Thermal insulation of marine and offshore structures (e.g. thermal insulation of hull and decks, comfort insulation , pipes, pipelines, fire protection) • Thermal insulation for fire protection			1	1
3	Terms and definitions		3	3	3	3
5.2	Type of EPDs with respect to life cycle stages covered	• Cradle to gate for all products (A1-A3)[1)] • Cradle to gate with options for all products (A1-A3 mandatory, A4-C4 and D optional)[1)] • Cradle to grave for all products (A1-C4 mandatory, D optional)[1)]				5.2

1) The modules A1-A3, B1-C4 and D are explained in figure 1 and the subsequent text.

Table 1, continued: PCR for Technical - Chemical products for the building- and construction industry executive summary

Chapter	Topic	PCR – Insulation materials	Cross references			
			ISO 14044	ISO 14025	ISO 21930	EN 15804
5.2	Type of EPDs with respect to life cycle stages covered	• Cradle to gate for all products (A1-A3)[1)] • Cradle to gate with options for all products (A1-A3 mandatory, A4-C4 and D optional)[1)] • Cradle to grave for all products (A1-C4 mandatory, D optional)[1)]				5.2
6.1	Definition of product category	Insulation materials		6.7.1 6.7.2	6.2.2	6.1
6.3.1	Functional unit	EPD Cradle to gate with options and/or EPD Cradle to grave:	4.2.3.2		6.2.4	6.3.1
6.3.2	Declared unit	EPD Cradle to gate: 1 m^2 of insulation material with a			6.2.3	6.3.2
6.3.3	Reference service life	EPD Cradle to gate with options and/or EPD Cradle to grave: To be specified.[2)] Not relevant for EPD Cradle to gate.				6.3.3
6.3.4	System Boundaries	EPD Cradle to gate: A1-A3[1)] EPD Cradle to gate with options: A1-A3 mandatory, A4-C4 and D optional[1)] EPD Cradle to grave: A1-C4[1)]	4.2.3.3 4.3.3.4		6.2.5 5.5	6.3.4
6.3.7	Data quality		4.2.3.6		6.2.6 6.2.8	6.3.7
6.4.3	Allocation rules	Allocation according to mass [kg]	4.3.4		6.2.7.1	6.4.3
7.3	Scenarios[2)]	EPD Cradle to gate with options and Cradle to grave: A4-A5, B1-C4[1)]				6.3.8 7.3
7.4	Additional information[1)]	The content of harmful substances/ chemicals, as well as impacts on indoor environment must be declared in EPD		7.2.3 7.2.4		7.4 8.2

1) The modules A1-A3, B1-C4 and D are explained in figure 1 and the subsequent text.
2) Data specific for Norwegian conditions is given i Appendix A1.

1 Scope

The intended application of this Product Category Rules (PCR) is to give guidelines for development of Environmental Product Declarations (EPD) for all kind of insulation materials and to further specify the underlying requirements of the LCA. The core rules valid for all construction products are given in standard EN 15804, and are expected known by those preparing the EPD.

The Product Category Rules for insulation materials cover the following range of applications:

- Thermal insulation of building envelope
- Thermal insulation of technical installations in buildings (e.g. ventilation, heating systems)
- Frost protection of water supply and sewage systems
- Thermal insulation of industrial installations (e.g. pipes and tanks used in the process industry)
- Thermal insulation in roads, in railway tracks and tracks for light rail (streetcars and similar)
- Thermal insulation of marine and offshore structures (e.g. thermal insulation of hull and decks, comfort insulation, pipes, pipelines, fire protection)
- Thermal insulation for fire protection

2 Normative references

ISO14025: 2006, Environmental management – Type III environmental declarations – Principles and procedure.
ISO 21930: 2007, Sustainability in building and construction – Environmental declaration of building products.
ISO14044: 2006, Environmental management – Life cycle assessment – Requirements and guidelines.
ISO15686-1: 2000, Buildings and constructed assets — Service life planning — Part 1: General principles
ISO15686-8: 2008, Buildings and constructed assets – Service life planning – Part 8: Reference service life
EN15804: 2012, Sustainability in construction works – Environmental product declarations – Core rules for the product category of construction products.
EN15942: 2011, Sustainability of construction works — Environmental product declarations — Communication formats: business to business

3 Terms and definitions

General definitions are given in the standard EN 15804, chapter 3.

3.1 Environmental product declaration (EPD)

environmental declaration provides quantified environmental data using predetermined parameters and, where relevant, additional environmental information.

[EN 15804:2012]

3.2 Life cycle assessment (LCA)

compilation and evaluation of the inputs, outputs and the potential environmental impacts of a product system throughout its life cycle

[ISO 14044: 2006]

3.3 Declared unit

quantity of a construction product for use as a reference unit in an EPD for an environmental declaration based on one or more information modules. Information modules
[EN 15804:2012]

[EN 15804: 2012]

3.4 Functional unit

quantified performance of a product system for use as reference unit.

[EN 15804: 2012]

3.5 Insulation material

materials used to prevent heat loss

4 Abbreviations

EPD Environmental product declaration
PCR Product category rules
LCA Life cycle assessment
LCI Life cycle inventory analysis
LCIA Life cycle impact assessment
RSL Reference service life
ESL Estimated service life

5 General aspects

5.1 Objective of this PCR

The objective of this PCR is to:

- define the parameters to be declared and the way in which they are collated and reported,
- describe which stages of a product's life cycle are considered in the EPD and which processes are to be included in the life cycle stages,
- define rules for the development of scenarios, including the rules for calculating the Life Cycle Inventory and the Life Cycle Impact Assessment underlying the EPD, including the specification of the data quality to be applied

5.2 Types of EPD

This PCR cover the following types of EPD (see **Figure 1**):

- EPD 1: Cradle to gate for all insulation products (A1-A3 mandatory)
- EPD 2: Cradle to gate with options for all insulation products, i.e. cradle to gate and selected further life cycle stages (A1-A3 mandatory, B1-C4 and D optional)
- EPD 3: Cradle to grave (A1-C4 mandatory, D optional)

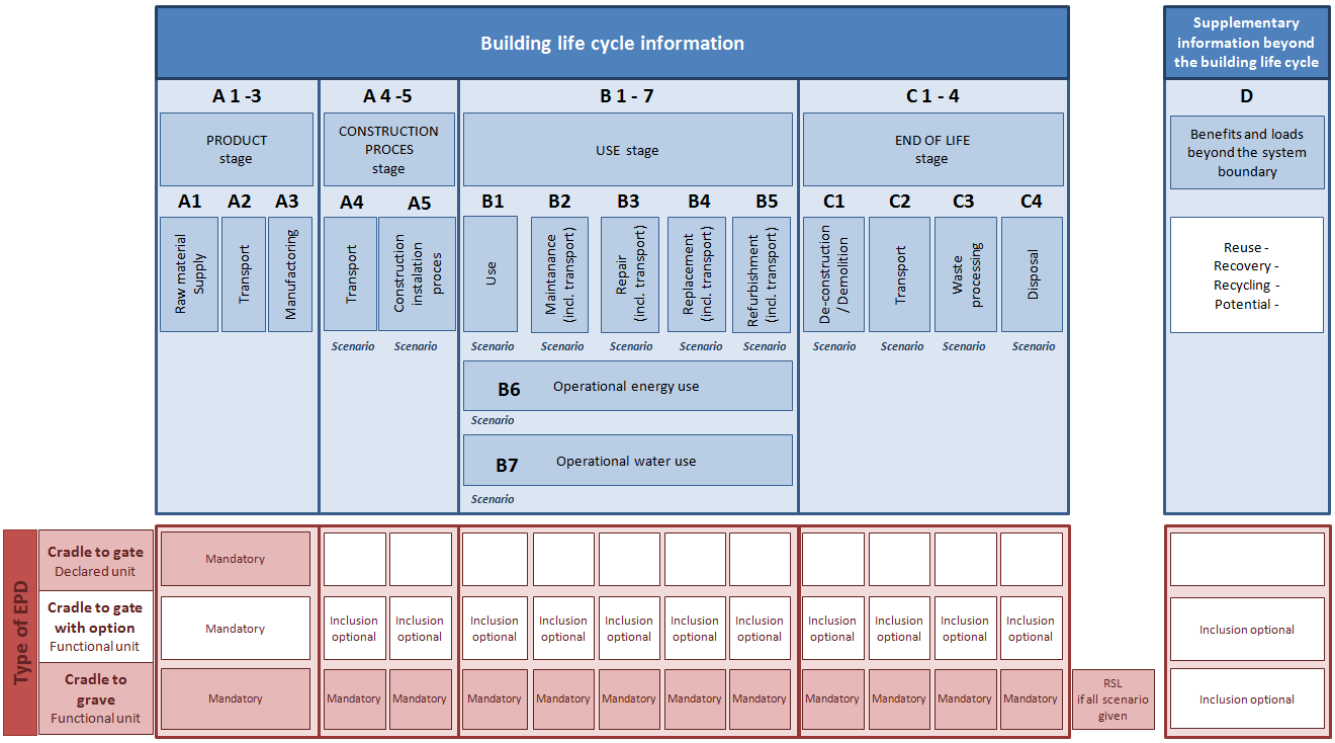

Figure 1: Types of EPD with respect to life cycle stages and modules covered for the building assessment

5.3 Comparability of EPD of construction products

Comparison of the environmental performance of construction products using EPD information shall be based on the product's use in and its impacts on the building, and shall consider the complete life cycle (all information modules). But, it is possible to compare at the sub-building level. See the standard EN 15804, clause 5.3 for further requirements how to maintain the principle that the basis for comparison of the assessment is the entire building in such cases.

A justification shall be given for any excluded aspects. Contents of EPD project report and EPD shall be as specified in chapter 8, in EN 15804: 2012.

5.4 Additional information

See clause 7.4.

5.5 Ownership, responsibility and liability for the EPD

The manufacturer or a group of manufacturers are the sole owners and have liability and responsibility for an EPD.

5.6 Communication format

The communication format of the EPD shall be in accordance with EN15942: 2010.

6 Product Category Rules for LCA

6.1 Product Category

The product group "*Insulation materials*" comprises all kind of *Insulation materials* prepared for trade made of different materials not only those shown in 6.1.1. to 6.1.15.

6.1.1 Mineral wool (MW)

Mineral wool insulation products are described in the following standards:

- EN 13162:2008 "Thermal insulation products for buildings. Factory made mineral wool (MW) products. Specification"
- EN 14064-1:2010. "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 14064-2:2010. "Thermal insulation products for buildings. In-situ formed loose-fill mineral wool (MW) products. Part 2: Specification for the installed products"
- EN 14303:2009 "Thermal insulation products for building equipment and industrial installations. Factory made mineral wool (MW) products – Specification"

6.1.2 Expanded polystyrene foam (EPS)

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

- EN 13163:2008. "Thermal insulation products for buildings. Factory made products of expanded polystyrene (EPS). Specification"
- EN 14309:2009. "Thermal insulation products for building equipment and industrial installations. Factory made products of expanded polystyrene (EPS). Specification"
- EN 14933:2007. "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 13164:2008. "Thermal insulation products for buildings. Factory made products of extruded polystyrene foam (XPS). Specification"
- EN 14307:2009. "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 13165:2008. "Thermal insulation products for buildings. Factory made rigid polyurethane foam (PUR) products. Specification"
- EN 14308:2009. "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 13166:2008. "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 13167:2008. "Thermal insulation products for buildings. Factory made cellular glass (CG) products. Specification"
- EN 14305:2009. "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 13168:2008. "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 13169:2008. "Thermal insulation products for buildings. Factory made products of expanded perlite (EPB). Specification"
- EN 14316-1:2004. "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 14316-2:2007. "Thermal insulating products for buildings. In-situ thermal insulation formed from expanded perlite (EP) products. Part 2: Specification for the installed products"
- EN 15599-1:2010. "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 15599-2:2010. "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 13170:2008. "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 13171:2008. "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 14306:2009. "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 14304:2009. "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: 2009. "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 14317-1:2004. "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 14137-2:2007. "Thermal insulation products for buildings. In-situ thermal insulation formed from exfoliated vermiculite (EV) products. Part 2: Specification for the installed products"
- EN 15600-1:2010. "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 15600-2:2010. "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 standard:

- EN 14063-1:2004. " Thermal insulation materials and products. In-situ formed expanded clay lightweight aggregate products (LWA). Part 1: Specification for the loose-fill products before installation"

6.1.16 Aerogel

Aerogels are derived from a 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

Which modules or life cycle stages to include depend on the defined type of EPD as given in chapter 5.1. EPDs based on this PCR include the following life cycle stages or modules as given (shaded) in figure 1:

EPD Cradle to gate (EPD 1):

- Information modules A1-A3 (mandatory)

EPD Cradle to gate with options (EPD 2):

- Information modules A1- A3 (mandatory)
- Information modules A4- A5 (optional)
- Information modules B1-B7 (optional)
- Information modules C1-C4 (optional)
- Information module D (optional)

EPD Cradle to grave (EPD 3):

- Information modules A1- A3 (mandatory)
- Information modules A4- A5 (mandatory)
- Information modules B1-B7 (mandatory)
- Information modules C1-C4 (mandatory)
- Information module D (optional)

The stages may be further subdivided.

6.2.2 A1-A3, Product stage, information modules

The product stage shall include as given in standard EN 15804: 2012, clause 6.2.2:

- A1, raw material extraction and processing, processing of secondary material input (e.g. recycling processes),
- A2, transport to the manufacturer,
- A3, manufacturing, including provision of all materials, products and energy, as well as waste processing up to the end-of waste state or disposal of final residues during the product stage.

Module A1, A2 and A3 may be declared as one aggregated module A1-3. Module A1-A3 is mandatory for EPD 1, EPD 2 and EPD 3.

6.2.3 A4-A5, Construction process stage, information modules

The construction process stage shall include for EPD Cradle to gate with options and/or EPD Cradle to grave as given in standard EN 15804: 2012, clause 6.2.3:

- A4, transport to the building site

- A5, installation into the building

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

The use stage, related to the building fabric shall include for EPD Cradle to gate with options and/or EPD Cradle to grave as given in standard EN 15804: 2012, clause 6.2.4:

- B1, use
- B2, maintenance
- B3, repair
- B4, replacement
- B5, refurbishment

6.2.5 B6-B7, use stage, information modules related to the operation of the building

The use stage, related to operation shall include for EPD Cradle to gate with options and/or EPD Cradle to grave as given in standard EN 15804: 2012, clause 6.2.5:

- B6, operational energy use.
- B7, operational water use.

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

The end-of-life stage shall include for EPD Cradle to gate with options and/or EPD Cradle to grave as given in standard EN 15804: 2012, clause 6.2.6:

- C1, de-construction, demolition
- C2, transport to waste processing
- C3, waste processing for reuse, recovery and/or recycling
- C4, disposal

6.2.7 D, Benefits and loads beyond the system boundary, information module

Module D includes reuse, recovery or recycling and/or recovery potentials.

6.3 Calculation rules for the LCA

6.3.1 Functional unit

The functional unit for EPD Cradle to gate with options and EPD Cradle to grave is defined as:

> 1 m^2 of insulation material with a thickness that gives a design thermal resistance of R=1 m^2 K/W with an expected service life to be specified (see appendix A for service life specific to Norway).

Results shall be displayed both per declared unit (cradle to gate) and per functional unit based on scenarios for modules A4-A5, B1-B7 and C1-C4, see chapter 6.3.8.

6.3.2 Declared unit

The declared unit (cradle to gate – A1-A3) is defined as:

1 m^2 of insulation material with a thickness that give a declared thermal resistance of R = 1 m^2 K/W.

The moisture level, temperature and material age at which the declared thermal resistance was measured must be specified in the EPD.

6.3.3 Reference service life (RSL)

Service life has to be defined in compliance with EN15804 or as minimum based on verified European statistic data for the considered Insulation Products.

6.3.4 System boundaries

6.3.4.1 General

Life cycle stages and information modules, which are included, are shaded in figure 1.

6.3.4.2 Product stage

The product stage includes:

A1 Extraction and processing of raw materials (e.g. mining processes) and biomass production and processing;
A1 Reuse of products or materials from a previous product system;
A1 Processing of secondary materials used as input for manufacturing the product, but not including those processes that are part of the waste processing in the previous product system;
A1 Generation of electricity, steam and heat from primary energy resources, also including their extraction, refining and transport;
A1 Energy recovery and other recovery processes from secondary fuels, but not including those processes that are part of waste processing in the previous product system;
A2 Transportation up to the factory gate and internal transport;
A3 Production of ancillary materials or pre-products;
A3 Manufacturing of products and co-products;
A3 Manufacturing of Packaging;
A1-A3 Processing up to the end-of-waste state or disposal of final residues including for any packaging not leaving the factory gate with the product.

6.3.4.3 Construction stage

The construction stage includes:

A4: Transport from production gate to construction site.
A5: Installation of the product into the building including the use of ancillary materials and any energy or water required for installation.

6.3.4.4 Use stage

The use stage includes:

B1: Use of the installed product in terms of any emissions to the environment
B2: Maintenance
B3: Repair
B4: Replacement
B5: Refurbishment
B6: Energy use to operate building integrated technical systems
B7: Operational water use by building integrated technical systems

6.3.4.5 End of life stage

The end of life stage includes:

C1: Deconstruction, including dismantling or demolition, of the product from the building, including initial on-site sorting of the materials
C2: Transportation of the discarded product as part of the waste processing
C3: Waste processing
C4: Waste disposal including physical pre-treatment and management of the disposal site

6.3.4.6 Benefits and loads beyond the product system boundary in module D

D: Optional module that is not included in the calculations.

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

General cut-off criteria are given in standard EN 15804: 2012, clause 6.3.5.

6.3.6 Selection of data

General requirements and guidelines concerning use of generic and specific data and the quality of those are described in the standard EN 15804: 2012, clauses 6.3.6 and 6.3.7. In addition the following rules should be applied, see also figure 2:

- For manufacturing of a product, specific annual data shall be applied
- Actual data age (when data was collected) shall be stated.
- For upstream processes data from the manufacturer preferably as EPDs shall be used if available. If not available then EPDs for similar products should be used and lastly generic data if this is the only available option.
- The electricity shall be the grid mix in the country where main energy consuming processes take place. The mix of electricity (calculation procedure) shall be documented. Any deviations from this shall be justified.
- When PCRs are available for other background data, the procedures in the respective PCRs shall be followed.

MODULES	Module A1-A3		A4 and A5	B1-B7	C1-C4
	Production of commodities, raw materials (upstream	Product manufacture (processes the manufacturer has influence over)	Installation processes (downstream processes)	Use processes (downstream processes)	End-of-life processes (downstream processes)
Data type	1. Data from the producer of the raw material, preferably as EPD 2. EPD for a similar product 3. Generic data	Manufacturer's average or specific data	Generic data		

Figure 2: Application of generic and specific data. Table based on: EN 15804:2012, table 1, clause 6.3.6.

6.3.7 Data quality requirements

The quality of the data used to calculate an EPD shall be addressed in the project report (see chapter 8 and ISO 14044: 2006, 4.2.3.6). Specific requirements apply for construction products given in EN 15804: 2012, clause 6.3.7. In addition the following requirements shall be applied:

- When calculating cradle to gate data for input data, the PCR for the given product shall be used. E.g. for directly consumed heat and electricity, infrastructure shall be included in accordance with PCR for Electricity, Steam, and Hot and Cold Water Generation and Distribution, PCR CPC 17 [7].
- Hazardous waste shall be specified according to relevant national regulations (specific and/or average background).

6.3.8 Developing product level scenarios

Scenarios shall support the calculation of modules B1-C4. Scenarios shall be developed as given in EN 15804:2012, chapter 7.3.

6.3.9 Units

SI units shall be used.

6.4 Inventory analysis

6.4.1 Collecting data

Data collection shall follow the guidelines provided in ISO 14044:2006, clause 4.3.2

6.4.2 Calculation procedures

The calculation procedures described in ISO 14044:2006 clause 4.3.3 shall apply.

6.4.3 Allocation of input flows and output emissions

The allocation rules given in the standard EN 15804: 2012 chapter 6.4.3 shall be followed.

Transport shall be allocated based on weight or volume. Generic data may be used for emission factors from the transportation vehicle.

Resource use (material and energy) shall be reported in the LCA-report according to EN 15804: 2012, chapter 7.2.3, table 3.

6.5 Impact assessment

The characterisation factors in the European Reference Life Cycle Database (ELCD) provided by the European Commission shall be used.

Parameters shall be declared and reported according to standard EN 15804: 2012, chapter 7.2.3.

Environmental impact shall be declared as stated in EN 15804: 2012, chapter 7.2.3:

- Global warming potential, GWP, in kg CO_2 equivalents, 100 years
- Depletion potential of the stratospheric ozone layer, ODP, in kg CFC 11equivalents, 20 years
- Acidification potential of land and water sources, AP, in kg SO_2 equivalents
- Eutrophication potential, EP in kg $(PO_4)^{3-}$ equivalents
- Formation potential of tropospheric ozone photochemical oxidants, POCP, in kg C_2H_4 equivalents
- Abiotic depletion potential (ADP-elements) for non fossil resources, in kg Sb-equivalents
- Abiotic depletion potential (ADP-fossil fuels) for fossil resources, in MJ, net calorific value

Waste to disposal should be declared as:

- Hazardous waste (kg) according to EU directive 91/689/EEC and 75/442/EEC or relevant national regulations
- Non hazardous waste (kg)
- Radioactive waste (kg)

7 Content of the EPD

7.1 Declaration of general information

The content of the EPD shall follow the instruction given in EN 15804: 2012 clauses 7.1 and 7.2.
The declaration of material content of the product shall list as a minimum substances contained in the product that are listed in the “Candidate list of Substances of Very High Concern for authorization” when their content exceeds the limits for registration with the European Chemicals Agency.

7.2 Declaration of environmental parameters derived from LCA

7.2.1 General

Documentation of technical information for the construction process shall follow the requirements given in EN15804: 2012 clause 7.3.2.

Transport shall be allocated based on weight or volume. Generic data may be used for emission factors from the transportation vehicle.

7.2.2 Rules for declaring LCA information per module

The rules shall follow EN15804: 2012, clause 7.2.2.

7.2.3 Parameters describing environmental impacts

Parameters shall be according to EN15804: 2012, table 3.

7.2.4 Parameters describing resource use

Parameters shall be according to EN15804: 2012, table 4.

7.2.5 Other environmental information describing waste categories and output flows

Parameters shall be according to EN15804: 2012, table 5 and 6.

7.3 Scenarios and additional technical information

7.3.1 General

Scenarios for construction, use, end of life and transport shall be described and documented in the LCA- report according to EN 15804: 2012, clause 7.3, tables 7-12.

7.3.2 A4-A5 Construction process stage

Documentation of technical information for the construction process shall follow the requirements given in EN15804: 2012 clause 7.3.2.

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

Transport from production gate to construction site shall be calculated based on information requirements given in standard EN 15804: 2012, clause 7.3.2 Table 7 and reported in the LCA-report.

If no European information is available, national transport scenarios and distances may be used and documented in the EPD project report.

Any deviations from the scenario described above shall be justified and explained.

7.3.2.2 A5, Installation

Information to specify the product's installation scenarios shall be provided as given in standard EN 15804:2012, clause 7.3.2 Table 8 and shall be reported in the LCA-report.

The installation phase includes all materials and activities connected to installation. If the EPD deviates from the predefined scenarios, this shall be clearly stated and justified.

7.3.3 B1-B7 Use stage

B1: Release of substances to indoor air, soil or water is reported as additional information, see clause 7.4.

B2-B5: Information relating to maintenance, repair, replacement and refurbishment shall be provided as given in standard EN 15804:2012, clause 7.3.3 Table 9 and shall be reported in the LCA-report. Maintenance and replacements are to be modelled according to manufacturers' guidelines. Maintenance of Insulation Products that will be required to reach the expected reference service life shall be described.

B6-B7: Information relating to use of energy and use of water shall be provided as given in standard EN 15804:2012, clause 7.3.3.3 Table 11 and shall be reported in the LCA-report. Use of energy and use of water are to be modelled according to manufacturers' guidelines

The reference service life of the Insulation Products depends on the material itself and the location. The number of replacements of Insulation Products shall be declared according to the building's reference service life.

Information relating to reference service life of the Insulation Product shall be provided as given in standard EN 15804:2012, clause 7.3.3 Table 10 and shall be reported in the LCA-report.

7.3.4 End of life

C1-C4: Information relating to deconstruction/demolition, transportation of the discarded product, waste processing and disposal shall be provided as given in standard EN 15804:2012, clause 7.3.4 Table 12 and shall be reported in the LCA-report.

7.4 Additional information

7.4.1 Indoor air

If the horizontal standards on measurement of release of regulated dangerous substances from construction products using harmonised test methods according to the provisions of the respective technical committees for European product standards are not available, the EPD can lack this information.

7.4.2 Soil and water

A description of toxicity effects, occurring in the use of the product, e.g. in processes such as leaching, shall be given. Releases to ground and surface water during the use shall be declared in accordance with national standards and practice.

7.5 Aggregation of information modules

Indicators declared in the individual information modules shall not be added up in any combination of the individual information modules into a total or sub-total of the life cycle stages A, B, C or D, with exception of A1, A2 and A3 that may be aggregated.

8 Project report

The project report is the systematic and comprehensive summary of the project documentation supporting the verification of an EPD. The project report shall record that the LCA based information and the additional information as declared in the EPD meet the requirements of this European Standard. It shall be made available to the verifier with the requirements on confidentiality stated in ISO 14025. The project report is not part of the public communication.

The project report shall follow the instructions given in ISO 14044 clause 5.2 and EN15804: 2012 clause 8.

9 Verification and validity of an EPD

The process of verification of an EPD shall be in accordance with EN ISO14025, clause 8 and ISO21930, clause 9. After verification an EPD is valid for a 5 years period. An EPD does not have to be recalculated after 5 years, if the underlying data has not changed significantly.

Approved 10.12.2012, valid until 10.12.2017

Norwegian EPD Foundation, Verification committee

Sverre Fossdal

Sverre Fossdal
Panel chairman/Dr. Ing

10 Bibliography

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EN 13165:2008. Thermal insulation products for buildings. Factory made rigid polyurethane foam (PUR) products. Specification

EN 13166:2008. Thermal insulation products for buildings. Factory made rigid polyurethane foam (PUR) products. Specification

EN 13167:2008. Thermal insulation products for buildings. Factory made cellular glass (CG) products. Specification

EN 13168:2008. Thermal insulation products for buildings. Factory made wood wool (WW) products. Specification

EN 13169:2008. Thermal insulation products for buildings. Factory made products of expanded perlite (EPB). Specification

EN 13170:2008. Thermal insulation products for buildings. Factory made products of expanded cork (ICB). Specification

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ISO 16000-6:2011 Indoor air. Part 6: Determination of volatile organic compounds in indoor and test chamber air by active sampling on Tenax TA sorbent, thermal desorption and gas chromatography using MS or MS-FID

ISO 16000-9:2006 Indoor air. Part 9: Determination of the emission of volatile organic compounds from building products and furnishing. Emission test chamber method

ISO 21930:2007. Sustainability in building construction. Environmental declaration of building products

Appendix 1

(informative)

1 Norwegian requirements

This appendix describes Norwegian requirements given by the program operator The Norwegian EPD Foundation.

2 Communication format and content of the Norwegian EPD

The communication format of the EPD shall be in accordance to EN15942: 2010 and the presentation template shown in www.epd-norge.no

3 Treatment of electricity

The electricity used shall be shown in the EPD as emissions of kg CO_2 equivalents per kWh or kg CO_2 equivalents per MJ.

The electricity mix and the year that the electricity mix refers to shall be stated in the EPD document.

4 Reference service life

The reference service life of a building is defined as 60 years. The reference service life of other built structures shall be defined. The service life of the insulation material, determined according to EN 15804:2012 Annex A, is provided by the manufacturer.

5 Key Environmental Parameters

On page two of the EPD the key environmental parameters (max 5) shall be shown in a table surrounded by a red frame. Parameters to be shown are:

- Global warming potential, GWP (100 years), in kg CO_2 equivalents
- Total energy consumption in MJ
- Hazardous chemicals type and justification

5.1 Hazardous substances

If the Insulation Product contains any of the following substances, they shall be declared in the EPD document and justified:

- substances on the Candidate list of substances of very high concern for authorisation (SVHC), see http://www.echa.europa.eu/web/guest/candidate-list-table
- substances on the Norwegian Priority list, see http://www.miljostatus.no/no/Tema/Kjemikalier/Kjemikalielister/Prioritetslisten/
- substances that are not in compliance with the regulatory levels set in the Norwegian Regulations related to restrictions on the manufacture, import, export, sale and use of chemicals and other products hazardous to health and the environment (Product Regulations/Produktforskriften), see http://www.lovdata.no/

See also the requirements in BREEAM-NOR A-20 list.

If no such substances occur the following statement shall be given in the EPD:

“The following substances have not been added to the product: substances on the Candidate list of substances of very high concern, substances on the Norwegian Priority list and substances that lead to the product being classified as hazardous waste. The chemical content of the product complies with regulatory levels as given in the Norwegian Product Regulations”.

6 Scenarios

6.1 A4-A5 Construction-installation process

Transport from the manufacturing site to the construction site is estimated based on information from the manufacturer.

Insulation material wastage at the building site is estimated based on information from the manufacturer. If no estimate is possible, the value is set to 5 per cent by weight.

The thermal resistance of a material is a measure of its ability to resist heat flow. The thermal resistance depends on the age, temperature and moisture content of the material. The declared thermal resistance is a value that is measured at a specific temperature, moisture level and age (usually 10 °C, dry and aged material). The design thermal resistance is the thermal resistance that the insulation material has when it is incorporated in the building. The design thermal resistance will differ from the declared thermal resistance if the temperature and moisture levels of the insulation material, when it is installed in the building, deviate from the temperature and moisture levels that were used when the thermal resistance was measured. The thermal values of building materials, i.e. thermal resistance and thermal conductivity, are explained in SINTEF Building Research Design Guides 573.344, 471.008 and 471.010 and in EN ISO 10456:2007.

A consequence of the above is that the amount of insulation material that is required to give a thermal resistance of 1 m2 K/W to an area the size of 1 m^2, will depend on where the insulation material is used. Under moist conditions and at elevated temperatures the thermal resistance is reduced compared to dry conditions.

SINTEF Building Research Design Guide 573.344 and the national appendix to EN ISO 10456:2007 show examples of the dependence of thermal values on the usage area in buildings. See also SINTEF Building Research Design Guides 471.011, 471.012, 471.013, 471.014 and 525.207.

Usage areas and conditions must be specified in the EPD.

6.2 B1 Use stage

Release of substances to indoor air is relevant when the product is used on the inside of the vapour barrier. Until horizontal standards for the measurement of emissions to indoor air are available the following standards can be used:

- EN ISO 16000-9:2006 or EN ISO 16000-10:2006 in combination with ISO 16000-3:2011 for emissions of formaldehyde, other aldehydes and ketones to indoor air.
- EN ISO 16000-9:2006 or EN ISO 16000-10:2006 in combination with ISO 16000-6:2011 for the emissions of volatile organic compounds (VOC) to indoor air.

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

- EA NEN 7375:2004.

The release of substances to indoor air or to ground or soil is provided as information, see chapter 7.4 in EN 15804:2012, and is not taken into the calculations.

6.3 B2-B5 Maintenance, repair, replacement and refurbishment

Maintenance, repair, replacement and refurbishment is given by the manufacturer depending on the area of utilization.

6.4 B6-B7 Operational energy and water use

Generally, insulation materials require no energy or water to operate. Even so, energy and water use shall be modelled.

6.5 C1-C4 End of life

Transport from the building/demolition site to the waste treatment/recycling site is estimated based on information from the manufacturer.

7 Bibliography of appendix 1

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