

PRODUCT-CATEGORY RULES (PCR)

For preparing an environmental declaration (EPD)
for Product Group

**Technical - Chemical products for the building- and
construction industry**

NPCR 09
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1 Introduction

These product category rules (PCR) are intended for companies preparing an Environmental Product Declaration (EPD) for Technical - Chemical products for the building- and construction industry, mortar, smoothing compound and surface treatment, adhesive, binder, sealant, additives and others. 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 coming European standard EN 15804:2011 - *Sustainability of construction works – Environmental Product Declarations – core rules for the product category of construction products* [1]. The PCR complies with the standard ISO 14044:2006 [3] and ISO 14025:2006 [2].

The EPDs based on this PCR-document are covering two perspectives:

1. EPD – cradle to gate
2. EPD – cradle to gate with options

and will present data that has been aggregated over the relevant life cycle stages as described in chapter 5 and shown in figure 1.

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This PCR is a common PCR, but with an appendix A1 giving specific guidelines for national conditions and requirements.

2 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 – Technical - Chemical products for the building- and construction industry	Cross references			
			ISO 14044	ISO 14025	ISO 21930	EN 15804
4	Terms and definitions	Mortar, smoothing compound and surface treatment, adhesive, binder, sealant and additives	3	3	3	3
5.2	Type of EPDs with respect to life cycle stages covered	Cradle to gate for all products (A1 – A3) Cradle to gate with options for Mortar, smoothing compound and surface treatment (A1 – A5, B2)				5.2
6.1	Definition of product category	Technical - Chemical building products		6.7.1 6.7.2	6.2.2	6.1
6.3.1	Functional unit Only valid for Mortar, smoothing compound and surface treatment	EPD Cradle to gate with options: 1 m ² of treated surface, with a specified function, with proper maintenance in an expected average service life of 60 years.	4.2.3.2		6.2.4	6.3.1
6.3.2	Declared unit	EPD Cradle to gate: 1 kg of produced Technical-chemical product			6.2.3	6.3.2
6.3.3	Reference service life	EPD Cradle to gate with options: 60 years Not relevant for EPD-Cradle to gate				6.3.3
6.3.4	System boundaries	EPD Cradle to gate: A1-A3 EPD Cradle to gate with options: A1-A5 and B2-B3	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
6.3.8	Construction stage A4-A5	EPD Cradle to gate with options				6.3.8
6.3.8	Use B1- B7	Only B2 and B3 - EPD Cradle to gate with options				6.3.8
6.3.8	End of life C1-C4	Not relevant				6.3.8
6.4.1	Allocation rules	Allocation according to mass [kg]	4.3.4		6.2.7.1	6.4.3
7.4	Additional information	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

3 Scope

The intended application of this Product Category Rules (PCR) is to give guidelines for development of Environmental Product Declarations (EPD) for *Technical - Chemical products for the building- and construction industry* and to further specify the underlying requirements of the LCA. The core rules valid for all construction products are given in standard EN 15804 [1], and are expected known by those preparing the EPD.

4 Terms and definitions

General definitions are given in the standard EN 15804:2011, clause 3.

4.1 Environmental product declaration (EPD)

Environmental declaration providing quantified environmental data using predetermined parameters and, where relevant, additional environmental information

[EN 15804:2011]

4.2 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]

4.3 Declared Unit

The 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 are illustrated and given numbers in figure 1.

[EN 15804:2011]

4.4 Functional Unit

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

[EN 15804:2011]

4.5 Technical - Chemical products for the building- and construction industry

Building fabric – Construction products that are fixed to the building in a permanent manner, so that the dismantling of the product changes the performance of the building and the dismantling or replacement of product constitute construction operation.

Binder - is an ingredient used to bind together two or more other materials in mixtures. Its two principal properties are adhesion and cohesion.

Adhesive - or adhesive is a mixture in a liquid or semi-liquid state that adheres or bonds items together. Adhesives may come from either natural or synthetic sources.

Membrane - One or more layers of materials that act as a barrier between the water and the building structure, preventing the passage of water.

Mortar - is a workable paste used to bind construction blocks together and fill the gaps between them or to create a levelled surface from a very uneven masonry or concrete wall. Modern mortars are typically made from a mixture of sand, a binder such as cement, gypsum or lime, and water.

Sealant - is a viscous material that changes state to become solid, once applied, and is used to prevent the penetration of air, gas, noise, dust, fire, smoke or liquid from one location through a barrier into another.

Smoothing/spackling compound - A type of plaster paste used to fill holes and other surface irregularities in a variety of materials to provide a smooth surface when set.

Surface treatment - might be plastering mortars and other treatment to protect and decorate the building surface (indoor or outdoor). Paints are **not** included in this PCR.

5 General aspects

5.1 Types of EPD

This PCR cover the following type of EPD (see figure 1):

- EPD 1: Cradle to gate for all products (A1 – A3)
- EPD 2: Cradle to gate with options for Mortar, smoothing compound and surface treatment (A1 – A5, B2)

5.2 Comparability of EPD of construction products

General rules for comparability are given in the standard EN 15804:2011, clause 5.3.

Contents of EPD project report and EPD shall be as specified in EN 15804:2011, clause 8

6 Product Category Rules for LCA

6.1 Product Category

The product group *Technical - Chemical products for the building- and construction industry* includes:

EPD Cradle to gate:

- Mortar, smoothing compound and surface treatment, adhesive, binder, sealant and additives

EPD Cradle to gate with options:

- Mortar, smoothing compound and surface treatment, produced from all types of materials.

Paints are not included in this PCR.

6.2 Life cycle stages and their information modules to be declared

6.2.1 General

Which modules or life cycle stages to include depends on defined type of EPD 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:

- information modules A1-A3

EPD Cradle to gate with options:

- Information modules A1- A3
- Information modules A4- A5
- Information modules B2- B3

The stages may also be further subdivided, (see figure 1).

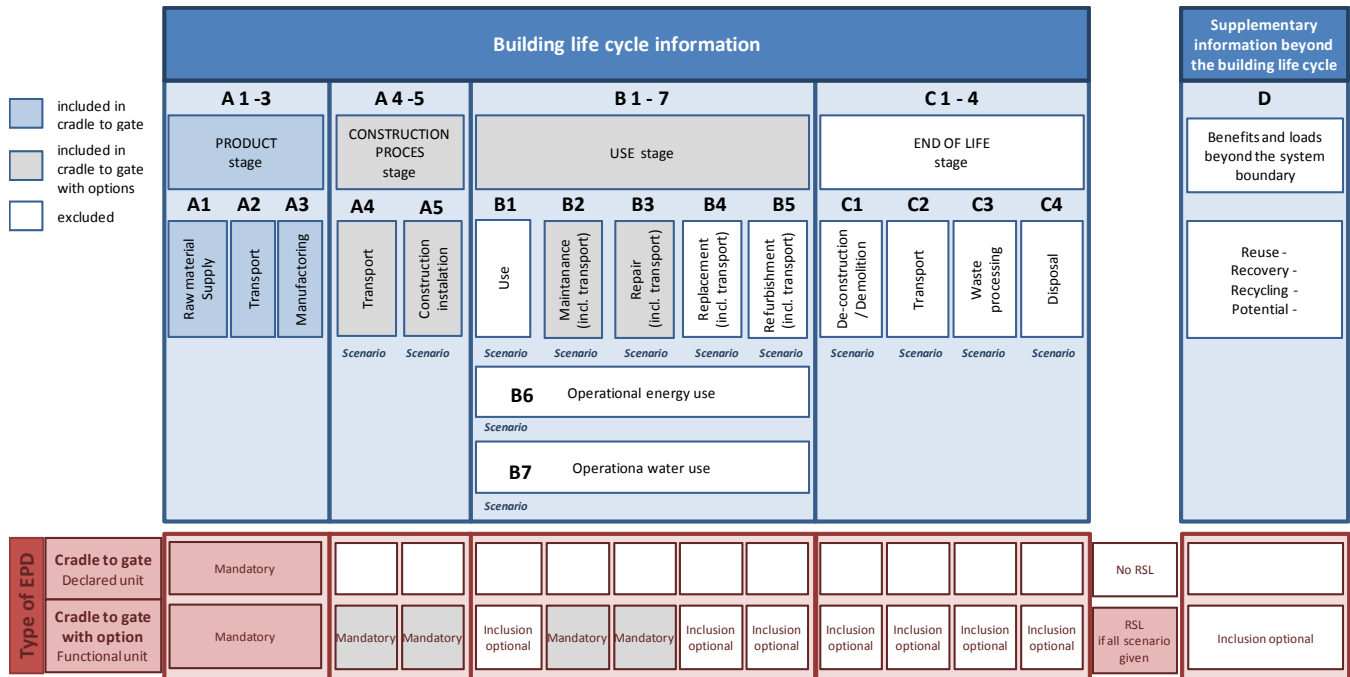


Figure 1 Types of EPD with respect to life cycle stages and modules covered for the building assessment. Modules A1-A3 are mandatory for EPD Cradle to gate and modules A1-A5 and B2-B3 are mandatory for EPD Cradle to gate with options.

6.2.2 A1-A3 Product stage, information modules

The product stage shall include for EPD Cradle to gate with options as given in standard EN 15804:2011, 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.

6.2.3 A4-A5 Construction process stage, information modules

The construction process stage shall include for EPD Cradle to gate with options as given in standard EN 15804:2011, 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 as given in standard EN 15804:2011, clause 6.2.3:

- B2, maintenance

- B3, repair

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

Not included, see figure 1.

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

Not included, see figure 1.

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

Not included, see figure 1.

6.3 Calculation rules for the LCA

6.3.1 Functional unit

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

1 m² of treated surface with a specified function properly maintained and repaired during reference service life¹.

Results shall be displayed both per declared unit (cradle to gate) and per functional unit based on scenarios for modules A4-A5 and B2-B3, see chapter 6.3.8.

6.3.2 Declared unit

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

1 kg of manufactured product

6.3.3 Reference service life (RSL)

Service life have to be define in compliance with EN 15804 or as minimum based on verified European statistic data for the considered chemical product.

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

- 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.

¹ See appendix A1, national requirement/practise

- 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

- A4 Transport from production gate to construction site.
- A5 Amount of product needed for covering 1 m² surface and waste generated from construction stage.

6.3.4.4 Use stage

B2-B3 Maintenance:

Number of maintenance and repair intervals and amount of the product during its expected reference service life [7]. Maintenance/repair is to be modelled according to manufacturers' guidelines.

Releases to ground and surface water during the use of the technical-chemical products for building and construction industry shall be declared in accordance with national standards and practice.

6.3.4.5 End of life stage

Not included, see figure 1.

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

Not included, see figure 1.

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

General cut-off criteria are given in standard EN 15804:2011, 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 15804:2011, clauses 6.3.6 and 6.3.7.

In addition the following rules should be applied:

- For manufacturing of product, specific annual data shall be applied
- Actual data age (when data was collected) shall be stated.
- For upstream processes EPDs are preferable, then specific data and generic if the two other categories are not available
- The electricity mixes used in calculations shall be according to relevant energy mix. 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	Product manufacturing	Installation processes	Use processes
Process type	Upstream processes	Processes the manufacturer has influence over	Downstream processes		
Data type	a) EPD-data b) Specific data c) Generic data ²	Manufacturer's average or specific data	Generic data		

Figure 2 — Application of generic and specific data, (ISO 15804:2011, table 1).

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 9 and ISO 14044:2006, clause 4.2.3.6). Specific requirements apply for construction products given in EN 15804:2011, 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 [5].
- Hazardous waste shall be specified according to relevant national regulations (specific and/or average background).

6.3.8 Scenarios on product level

Scenarios for construction, use, end of life and transport shall be described and documented in the LCA-report according to EN 15804:2011, clause 7.3, tables 7-10

A4 – A5 Construction

A4: Transport from production gate to construction site shall be calculated based on information requirements given in standard EN 15804:2011, clause 7.3.2.1, table 7 and reported in the LCA-report.

A5: Information to specify the product's installation scenarios shall be provided as given in standard EN 15804:2011, clause 7.3.2.2, table 8 and shall be reported in the LCA-report.

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

B2 – B3 Use stage, maintenance and repair

Information to specify the maintenance and repair scenarios shall be provided as given in standard EN 15804:2011, clause 7.3.3.1, table 9 and shall be reported in the LCA-report.

² See CEN/TR 15941:2009 "Sustainability of construction works — Environmental product declarations — Methodology for selection and use of generic data".

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

6.4 Inventory analysis

6.4.1 Allocation of input flows and output emissions

The allocation rules given in the standard EN 15804:2011 clause 6.4.3 shall be followed.

Resource use (material and energy) shall be reported in the LCA-report according to EN 15804:2011, clause 7.2.4, table 4.

6.5 Impact assessment

The characterisation factors in the European Reference Life Cycle Database (ELCD) [7] provided by the European Commission shall be used.

Parameters shall be declared and reported according to standard EN 15804:2011, clause 7.2.3.

Environmental impact shall be declared as stated in EN 15804:2011, clause 7.2.3:

- Global warming potential, GWP, in kg CO₂ - equivalents, 100 years
- Depletion potential of the stratospheric ozone layer, ODP, in kg CFC 11-equivalents, 20 years
- Acidification potential of land and water sources, AP, in kg SO₂ - equivalents
- Eutrophication potential, EP in kg PO₄³⁻-equivalents
- Formation potential of tropospheric ozone photochemical oxidants, POCP, in kg C₂H₄-equivalents).
- Abiotic depletion potential for non-fossil fuels in Sb equivalents
- Abiotic depletion potential for fossil resources in MJ, net calorific value.

Waste to disposal shall be declared according to EN 15804:2011, clause 7.2.5, table 5 as:

- Hazardous waste (kg) according to international or relevant national regulations.
- Non hazardous waste (kg)
- Radioactive waste

7 Additional environmental information

An EPD for technical - chemical products for the building- and construction industry shall include the following information related to environmental issues, in addition to the environmental information derived from LCA.

7.1 Chemicals

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” [8] when their content exceeds the limits for registration with the European Chemicals Agency.

7.2 Indoor environment impact

Technical-chemical products for building and construction industry exposed to the indoor environment shall be classified according to national guidelines.

8 Content of the EPD

The content of the EPD shall follow the instruction given in EN 15804:2011, clause 7.1.

9 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 EN 15804. 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 14044:2006 clause 5.2, EN15804:2011 clause 8.

10 Period of validity of the document

This document is valid until 20.01.2017 (5 years).

11 References

1. EN 15804:2011 Sustainability of construction works – Environmental Product Declarations – core rules for the product category of construction products.
2. ISO 2006 Environmental labels and declarations –Type III environmental declarations – Principles and procedures
3. ISO 14044:2006 Environmental management - life cycle assessment - requirements and guidelines
4. ISO 21930:2007 Sustainability in building construction -- Environmental declaration of building products.
5. PCR 2007: Product category rules for preparing an environmental declaration for Electricity, Steam, Hot and cold water, generation and distribution, PCR CPC 17, Version 1.1.
6. EN 15978:2010: Sustainability of construction works – Assessment of environmental performance of buildings – calculation method.
7. ELCD (European Reference Life Cycle Data System) <http://lct.jrc.ec.europa.eu/assessment/data>
8. Candidate List of Substances of Very High Concern for authorisation, http://echa.europa.eu/chem_data/authorisation_process/candidate_list_table_en.asp

Approved 20.01.2012, valid until 20.01.2017
Norwegian EPD Foundation, PCR Review Panel

Svein Fossdal
Panel chairman

APPENDIX A1

(informative)

Norwegian conditions and requirements

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

1 Communication format and content of the Norwegian EPD

The communication format of the EPD shall (recommended) be in accordance to EN 15942:2010 [1] and the presentation format shown in www.epd-norge.no.

2 Transport

Transport distances and type of transport in the different stages shall be documented in the project report.

3 Electricity mix

The electricity mix used shall be shown in the EPD as emissions of g CO₂-equivalents per kWh or g CO₂-equivalents per MJ.

4 Emission classification of building materials

Classification of emissions of building materials shall be carried out according EN 15251:2007 [2][3].

5 Key Environmental Parameters

On page one of the EPD the key Environmental parameters (max 5) shall be shown in a table surrounded by a red frame.

Parameter to be shown are;

Global warming potential, GWP, in kg CO₂ - equivalents

Total energy consumption in MJ

Chemicals type, justification and quantity in kg

5.1 Chemicals in BREEAM NOR checklist A 20

If the product contains substances given in BREEAM NOR checklist A 20, they shall be declared and justified. If no such substances occur the following statement shall be given in the EPD: "The product contain no substances given in BREEAM NOR checklist A20".

5.1.1 Checklist A 20

Bisphenol A

Phthalates

Oktyl. / nonylphenols

Chrome

Arsenic

Cadmium

Brominated flame retardants

Perfluorooctane sulfonate /perfluorooctanoic

Lead

Chlorinated paraffins

Siloxane

For more details see www.epd-norge.no or [KLIF](#)

6 References

- 1 EN 15942:2010: Communication format business-to-business.
- 2 EN 15251:2007: Indoor environmental input parameters for design and assessment of energy performance of buildings addressing indoor air quality, thermal environment, lighting and acoustics.
- 3 WHO (2000): Air Quality Guidelines for Europe.
http://www.euro.who.int/_data/assets/pdf_file/0005/74732/E71922.pdf