

PRODUCT-CATEGORY RULES (PCR)

For preparing an environmental
declaration (EPD) for Product Group

Precast Concrete Products

NPCR 20
March 2012

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Introduction

These product category rules (PCR) are intended for companies preparing an Environmental Product Declaration (EPD) for Concrete products, e.g. mortar, smoothing compound and surface treatment, glue, binder, sealant and additives. 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 two perspectives:

1. EPD – cradle to gate
2. EPD – cradle to grave

The two 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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Program operator:

The Norwegian EPD Foundation
PB 5250 Majorstuen 0303 Oslo

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

Members of the PCR WG:

The Norwegian Precast Concrete Federation,
ASAK Miljøstein AS
Spenncon AS
Contiga AS
Vikaune Fabrikker AS
Ostfold Research

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 Precast Concrete Products executive summary

Chapter	Topic	PCR – Concrete products	Cross references			
			ISO 14044: 2006	ISO 14025 :2006	ISO 21930: 2007	EN 15804: 2012
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) Cradle to grave for slabs and elements (A1-C4)				5.2
6.1	Definition of product category	Precast Concrete Products		6.7.1 6.7.2	6.2.2	6.1
	Calculation Rules					
6.3.1	Functional unit; Only valid for building and infrastructure elements	EPD Cradle to grave: 1 tonne of all products, and 1 m2 Insulated wall elements, massive wall elements and slabs, with proper maintenance in an expected specified national average service life.	4.2.3.1 4.2.3.2		6.2.4	6.3.1
6.3.2	Declared unit	EPD Cradle to gate: 1 tonne of all products			6.2.3	6.3.2
6.3.3	Reference service life	EPD Cradle to gate grave: to be specified. Not relevant for EPD-Cradle to gate				6.3.3
6.3.4	System Boundaries	EPD Cradle to gate: A1-A3 EPD Cradle to grave	4.2.3.1 4.2.3.3 4.3.3.4		6.2.5	6.3.4
6.3.7	Data quality		4.2.3.1 4.2.3.6		6.2.6 6.2.8	6.3.7
6.4.3	Allocation rules	Allocation according to mass [kg]	4.2.3.1 4.3.4		6.2.7.1	6.4.3
7	Content of the EPD	The content of harmful substances/chemicals, as well as impacts on indoor environment must be included in the EPD		7.2	8.1	7
	Scenarios					
7.3.2	Construction stage A4-A5	EPD Cradle to grave				7.3.2
7.3.3	Use B1-B7	EPD Cradle to grave				7.3.3
7.3.4	End of life C1-C4	EPD Cradle to grave				7.3.4

1 Scope

The intended application of this Product Category Rules (PCR) is to give guidelines for development of Environmental Product Declarations (EPD) for *concrete products* and to further specify the underlying requirements of the LCA. The core rules valid for all construction products are given in standard EN15804: 2012, and are expected known by those preparing the EPD.

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 EN15804: 2012, chapter 3.

3.1

environmental product declaration (EPD)

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

[EN15804: 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

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.

[EN15804: 2012]

3.4

functional unit

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

[EN15804: 2012]

3.5 Precast concrete products

3.5.1

concrete paving

- Paving stones and slabs.
- Retaining wall.
- Edging stones.
- Building blocks or construction blocks.

3.5.2

concrete building products

- Columns Beams
- Insulated wall elements
- Massive wall elements
- Floor and roofing elements
- Staircases

3.5.3

concrete infrastructure products

- Culverts
- Sleepers
- Beams
- Safety barriers
- Tunnel Linings

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 products (A1 – A3), Figure 1a
- EPD 2: Cradle to gate with options is not covered in this PCR
- EPD 3: Cradle to grave for building and infrastructure products (A1-A5, B1-B6 and C1-C4), Figure 1b

Figure 1b

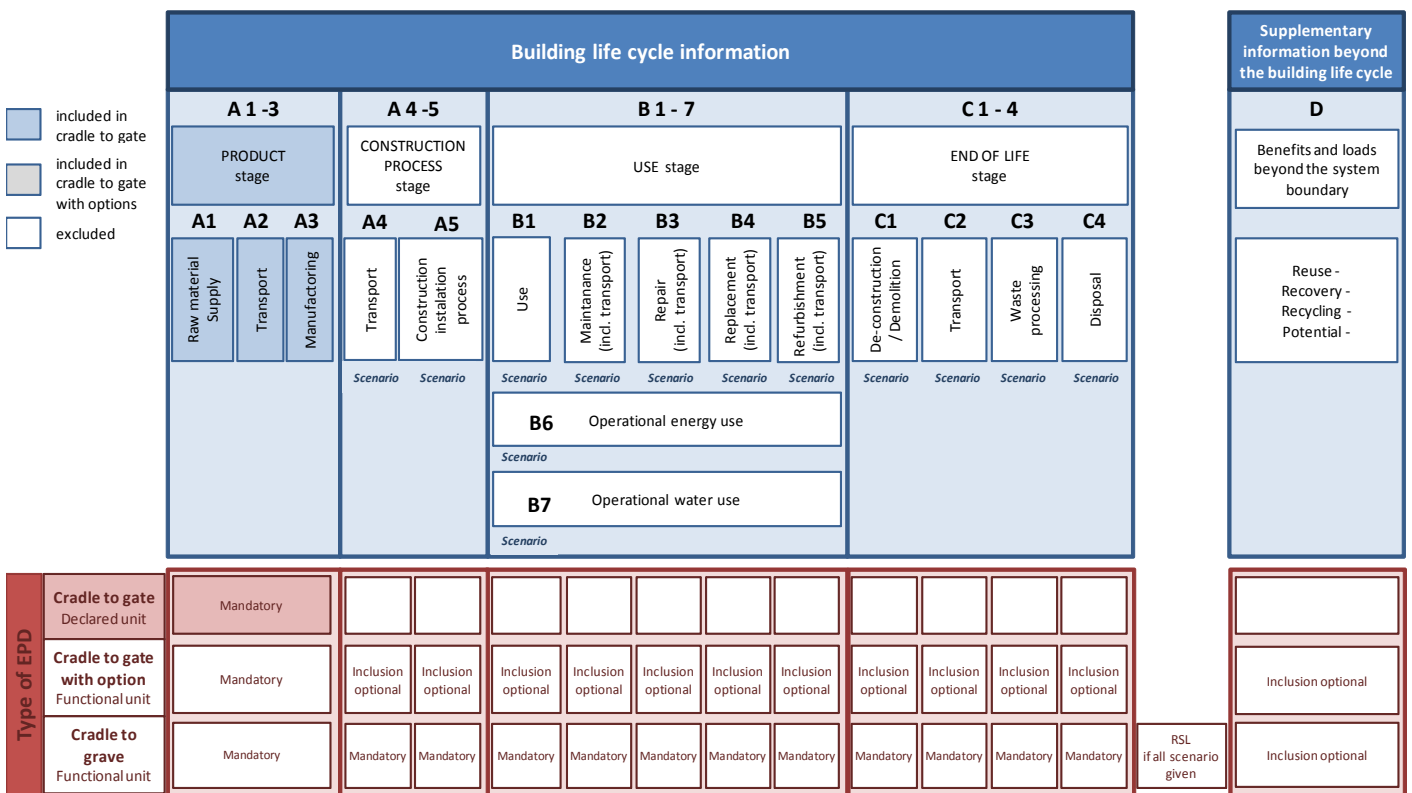


Figure 1a: Types of EPDs with respect to life cycle stages and modules included in the building assessment (EPD 1)

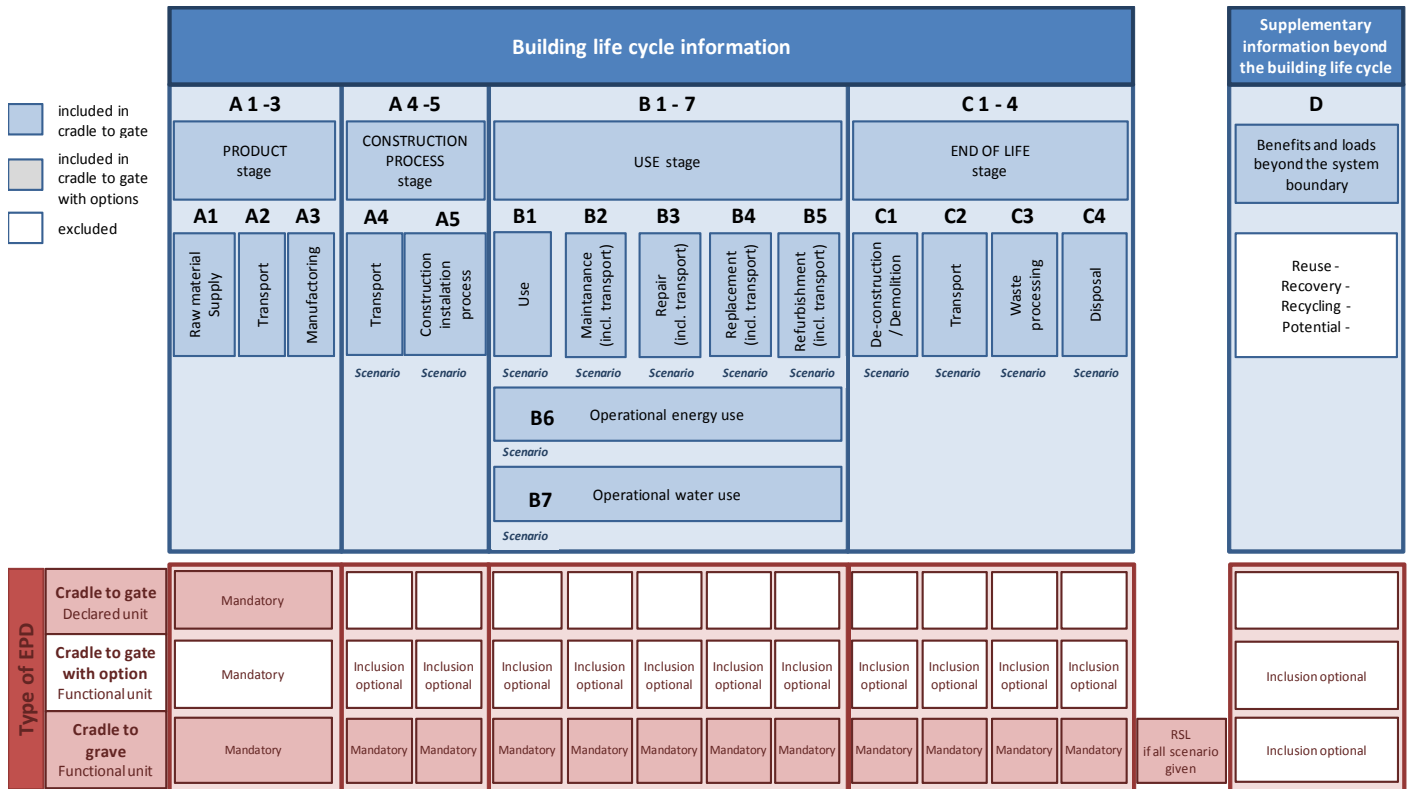


Figure 1b: Types of EPDs with respect to life cycle stages and modules included in the building assessment

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. For a comparison however always identical technical and functional performances are conditional. See the standard EN15804: 2012, 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.

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 covered in this PCR is *Precast Concrete products*:

- Concrete paving
- Building products
- Infrastructure products

6.2 Life cycle stages and their information modules to be declared

6.2.1 General

Which modules or life cycle stages to include are depending on defined type of EPD given in chapter 5.2. EPDs based on this PCR include the following life cycle stages or modules as given in Table 2 (shaded) in Figure 2:

Table 2 Types of EPDs for the different product groups covered in this PCR

	Products included in the group	Product groups
<i>EPD 1</i>	Concrete paving	All products
<i>EPD 2</i>	None	None
<i>EPD 3</i>	Building and infrastructure products	Cradle to grave

In EPD 1 (the cradle to gate), a manufacturer may choose to declare additional technical information without calculating optional life cycle stages to ensure proper understanding of a product's function in a building and thus support proper scenario development at the building level.

All additional technical information is declared in the module, to which it refers (e.g. technical information about the use of a product in the appropriate use stage modules B.)

For the report any additional technical information shall be documented separately from the LCA derived parameters.

If additional technical information is not complete at the product level as specified in 7.3, this shall be stated.

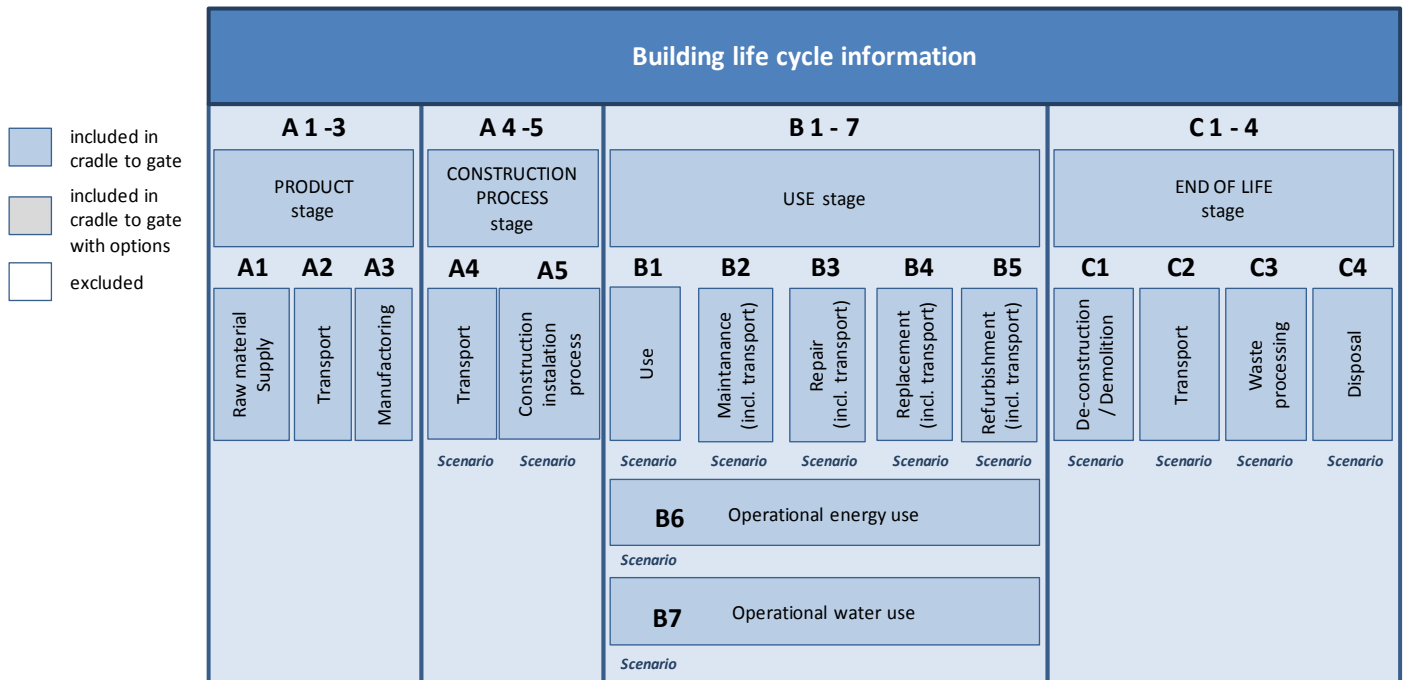


Figure 2: Types of EPDs with respect to life cycle stages and modules included in the building assessment. Modules A1-A3 are mandatory cradle to gate, A1-C4 are mandatory for cradle to grave.

6.2.2 A1-A3, Product stage, Information modules

The product stage shall be included in both for EPD Cradle to gate and cradle to grave as given in 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 or separate.

6.2.3 A4-A5, Construction process stage, information modules

The construction process stage shall be included for EPD Cradle to grave as given in standard EN15804: 2012, clause 6.2.3:

- A4, transport to the building site
- A5, installation into the building 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.

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

The use stage shall include for EPD Cradle to grave as given in standard EN15804: 2012, clause 6.2.3:

- B1, Use of the installed product, in terms of any emissions to the environment (not covered by B2 – B7)
- B2, maintenance
- B3, repair (incl transport)

- B4, replacement (incl transport)
B5, refurbishment (incl transport)

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

- B6, Energy use to operate building integrated technical systems – *not relevant*
B7, Operational water use by building integrated technical systems – *not relevant*

	Only declared unit
Columns, beams, culvert, railway sleepers	1 tonne
Insulated and massive elements and slabs (standard quantitative units are m ²)	1 tonne and m ²

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

The end-of-life stage, related to the building fabric shall include for EPD Cradle to grave as given in standard EN15804: 2012, clause 6.2.6:

- C1, de-construction/demolition
C2, transport to waste collection
C3, waste processing
C4, disposal

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

- D, reuse, recovery, recycling potentials. *Not included.*

6.3 Calculation rules for the LCA 6.3.4.1 General

6.3.1 Functional unit

The functional unit for EPD 3, Cradle to grave, is defined as:

1 tonne or m² of installed product with a specified reference service life

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 tonne of manufactured product

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 Precast Concrete Products.

6.3.4 System boundaries

6.3.4.1 General

Life cycle stages and information modules, which are included, are shaded in figure 2.

6.3.4.2 Product stage

All flows are proportionally allocated to the specified product. The justification of this allocation is to be reported (see 6.4.1)

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, (NOTE: excluding 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, (NOTE: excluding those processes that are part of the waste processing in the previous product system); that are part of waste processing in the previous product system;
- A2, Transportation of goods and resources up to the factory gate and any 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

- A4, Transport from production gate to construction site.
- A5, Amount of product needed for fulfilling the functional unit.

6.3.4.4 Use stage

- B1, Radiation and Release of substances from the products in this PCR to indoor air, soil or water has to be stated. 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.
- B2-B5, Radiation and Release of substances from the products in this PCR to indoor air, soil or water has to be stated. 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.
- B6-B7, The boundary of the modules “Energy use to operate building integrated technical systems” and “Operational water use” shall include energy and water use during the operation of the product (the integrated building technical system), together with its associated environmental aspects and impacts including processing and transportation of any waste arising on site from the use of energy.

6.3.4.5 End of life stage

- C1-C2, Demolition and transport into waste management and transport of secondary products up to end-of-waste stage are to be included. (see Annex B in EN15804: 2012)
- C3-C4, Radiation and Release of substances from the product waste in this PCR to soil or water has to be stated. 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.

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

Not included, see figure 2.

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

General cut-off criteria are given in standard EN15804: 2012, clause 6.3.5.

The declaration of material content of the product shall list the 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.

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 EN15804: 2012, clauses 6.3.6 and 6.3.7.

In addition the following rules should be applied (see also Table 3):

- 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
- If site-specific data for electricity not is available, the mix of electricity used shall be the grid mix in the country where main energy consuming processes take place. The mix of electricity (calculation procedure) shall be documented
- When PCRs are available for other background data, the procedures in the respective PCRs shall be followed.

Table 3 Application of generic and specific data, EN15804: 2012.

Modules	Module A1-A3		A4-A5	B1-B7	C1-C4
		Production of commodities, raw materials	Product manufacture	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 ¹	Manufacturer's average or specific data	Generic data		

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 ISO14044: 2006, 4.2.3.6). Specific requirements apply for construction products given in EN15804: 2012, clause 6.3.7. In addition the following requirements shall be applied:

- For manufacturing of product, specific annual data shall be applied
- Actual data age (when data was collected) shall be stated.
- If site-specific data cannot be obtained, the mix of electricity used shall be the grid mix in the country where main energy consuming processes take place. The mix of electricity (calculation procedure) shall be documented.
- 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.
- Hazardous waste shall be specified according to relevant national regulations.

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 EN15804: 2012, clause 7.3, tables 5-10

6.3.8.1 A4 – A5 Construction

A4, Transport from production gate to construction site shall be calculated based on information requirements given in standard EN15804: 2012, clause 7.3.1 Table 5 and reported in the LCA-report.

A5, Information to specify the product's installation scenarios shall be provided as given in standard EN15804: 2012, clause 7.3.1 Table 6 and shall be reported in the LCA-report.

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

6.3.8.2 B1 Use

Environmental aspects and impacts connected to the normal (i.e. anticipated) use of products are reported as additional information for EPD products in the following categories;

- Concrete paving: e.g. release of substances under the specified exposure
- Concrete building products: e.g. release of substances from the facade, roof, floor covering, walls and other surfaces (interior or exterior)

6.3.8.3 B2 – B7 Maintenance, repair and replacement, energy and water use

Information to specify the maintenance and repair scenarios shall be provided as given in standard EN15804: 2012, clause 7.3.1 Table 7 and shall be reported in the LCA-report.

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

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, clause 4.3.3 shall apply.

6.4.3 Allocation of input flows and output emissions

General allocation rules including closed-loop and open-loop allocation procedures are given in the standard EN 15804:2012 clause 6.4.3.

Allocation should be performed in the following order

- 1 Physical properties (e.g. mass)
- 2 Economic value

Resource use (material and energy) shall be reported according to EN 15084:2012, table 1.

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 EN15804: 2012, clause 7.2.2.

Environmental impact shall be declared as stated in EN15804: 2012, clause 7.2.2:

- Global warming potential, GWP, in kg CO₂ equivalents, 100 years
- Ozone depletion, ODP, in kg CFC 11 equivalents, 20 years
- Acidification potential of soil and water sources, AP, in kg SO₂ equivalents
- Eutrophication potential, EP in kg (PO₄)³⁻ equivalents
- Photochemical Ozone creation, POCP, in kg C₂H₄ equivalents.
- Depletion of abiotic resources-elements kg Sb equivalents.
- Depletion of abiotic resources-fossil fuels 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

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 clause 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

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.

7.3.2 Construction process stage

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

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

7.3.2.2 A5, Installation

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 Use stage

- B1 *not relevant*

- B2- B5 information required for maintenance, repair, replacement and refurbishment shall be given according to EN15804: 2012, Table 9 (use stage reference to the building fabric) and Table 10 (reference service life). Maintenance/replacements are to be modelled according to manufacturers' guidelines. Maintenance of Precast Concrete Products that will be required to reach the expected reference service life shall be described.

- B6 – B7 *not relevant*

The reference service life of Precast Concrete Products is depending on materials used and location. The number of replacements of Precast Concrete Products shall be declared accordingly to the building's reference service life.

7.3.4 End of life

End of life shall be specified accord to EN15804: 2012, Table 12.

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 EN14025: 2007. The project report is not part of the public communication.

The project report shall follow the instructions given in EN 14044:2006 clause 5.2, 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 28.03.2012, valid until 28.03.2017

Norwegian EPD Foundation, Verification committee



Panel chairman

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APPENDIX A1

(informative)

Norwegian requirements

This appendix describes Norwegian recommendations 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 be in accordance to EN15942: 2010 and the presentation template shown in www.epd-norge.no

2 Treatment of electricity

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

3 Reference service life

Reference Service Life is defined to be 100 years and for buildings 60 years.

4 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(100 years), in kg CO₂ equivalents

Total energy consumption in MJ

Chemicals type, justification and quantity in kg

4.1 Chemicals in the Candidate list and the Norwegian Priority list

If the product contains substances given in the Candidate list or the Norwegian Priority list, 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 the Candidate list or the Norwegian Priority list".

4.1.1 Candidate list and the Norwegian Priority list

Substances on the Candidate list and the Norwegian Priority list will be found on,

<http://www.echa.europa.eu/web/guest/candidate-list-table> and

<http://www.miljostatus.no/no/Tema/Kjemikalier/Kjemikalielister/Prioritetslisten/>

See also the requirement in the [BREEAM-NOR A-20 list](#) .

5 Emission classification of building materials

Various chemicals are emitted from building and interior decoration materials into indoor air. The classification presents emission requirements for the materials used in ordinary work spaces and residences with respect to good indoor air quality. M1 stands for low emissions, for further information see www.rts.fi.

Table A1: Assessment requirements for M-classification in emission classification of building materials

Examined qualities	M1 [mg/m²h]	M2 [mg/m²h]
The emission of total volatile organic compounds (TVOC). A minimum of 70% of the compounds shall be identified.	< 0,2	< 0,4
The emission of formaldehyde(HCOH)	< 0,05	< 0,125
The emission of ammonia (NH ₃)	< 0,03	< 0,06
The emission of carcinogenic compounds belonging to category 1 of the IARC monographs (IARC 1987) ^{1*}	< 0,005	< 0,005
Odour (dissatisfaction with odour shall be below 15 %) ^{2*}	Is not odours	Is not significantly odorous

1* IARC 1987, does not apply to formaldehyde (IARC 2004)

2* The result of sensory evaluation shall be > + 0,1.

Plasters and tiling products, leveling agents, putty, mastics, fillers, screeds and renders shall not contain casein. Emission class M3 includes materials whose emissions exceed the values specified for materials in category M2.