PCR Guidance-Texts for Building-Related Products and Services

From the range of Environmental Product Declarations of Institute Construction and Environment e.V. (IBU)

Part B: Requirements on the EPD for Ceramic tiles and panels

Institut Bauen und Umwelt e.V.

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Template	01.08.2024	v11	*Amar Salcinovic*	"Other declared units are allowed if the conversion is shown transparently." is now editable. "Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO2" is now not editable.

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Scope

This document contains the Requirements for an Environmental Product Declaration (EPD) for the range of environmental product declarations published by the Institut Bauen und Umwelt e.V. (IBU) based on the *EN 15804* standard. The document applies for:

- Ceramic tiles and panels to DIN EN 14411 which are manufactured using conventional extrusion and drying processes for use in interior and exterior applications.
- Earthenware, stoneware and porcelain stoneware as floor coverings and for walls, including mosaics, decorative and moulded elements.

The requirements for the EPD include:

- Requirements for the *EN 15804* standard as a European core EPD
- Complementary requirements for IBU EPD

The calculation rules for the life cycle assessment and requirements for the project report are specified in a separate document as Part A of the Product Category Rules.

The general principles for the EPD range of Institut Bauen und Umwelt e.V. (IBU) also apply.

Hints for using the database system

Insert text: Requirements for the content are shown in blue colour under the respective titles. These coloured texts can be edited by clicking. In the appearing text editor, the requirements for the content are outlined above for further assistance. The relevant text can be entered below. After confirming the input, texts are incorporated into the document and displayed.

Inserting images: Using the text editor, "broad" and "small" pictures can be added. If you click on the respective button in the editor, you can select the image file and upload it. After uploading, the figure is shown in the text editor and can be changed in size by clicking and pulling the edges.

Technical tables: Click on the table, to open the table editor. Insert your values (= numbers) in the respective field in the column "Value". For each row, you can choose between 3 value types: value (= number), range (= consisting of two numbers separated with a hyphen) and a free text (e.g. “test passed after 3 days”). On the far left, you can hide rows that are not relevant by clicking on the check. Click the “add new property” button to generate a new row with free text space. It is not allowed to insert a picture instead of a table!

Chapter 5, "Results of the LCA": Click on the first table "system boundaries" and select all life stages you want to declare in the following dialogue. Then the following three tables are adjusted according to your entries. Now you can insert numerical values by clicking on the tables. The numerical values are to be indicated with three significant digits. The "exponential view" can be selected for each impact indicator to achieve an optimal representation.

Storing/saving is done fully automatically.

The first three pages of the document will be deleted automatically after the creation of the EPD.

Labelled sample texts are proposals to facilitate the creation of an EPD. If they are accepted into an EPD, they should be checked for their accuracy and if necessary adapted for the specific product.

Requirements for content and format:

The chapters of the EPDs must be described in a compact form and in a factually and technically correct way. Judgmental, comparative, or promotional texts are not permitted unless specifically requested in the PCR or if necessary in the context of the EPD. Each document is carefully checked before publication.

The extent of an EPD: For technical reasons, an EPD may contain one data set only. This means that the tables for the LCA results are available only once per EPD. All four tables of the LCA results (Chapter 5) must be located entirely on one side.

Quotations should be indicated in italic (formatting), for example: EN 15804. The literature cited is to be shown completely in the references (Chapter 8).

Product-group-specific LCA calculation rules from PCR part A

On A4, transport to construction site:

Ceramic tiles are sold: (1) nationally, (2) in Europe and (3) in the rest of the world. If no other data are available, average default transportation scenarios can be used as displayed in Table 1.

Table 1 – Default scenarios for the A4 module

Destination	Type of transport	Average distance (km)
National	Truck with a capacity of 27 tons	300
Europe	Truck with a capacity of 27 tons	1390
International (Outside Europe)	Transoceanic freight ship	6520

The LCA practitioner should justify the transportation scenario used (if different from the default scenario).

For transport distances of less than 300 km, trucks shall be assumed to make the return trip empty, *whereas* for distances exceeding 300 km, they will return full with other goods, so that the return trip is not included in the inventory of the system analysed. This assumption is made for every type of transport in the system analysed.

On A5, Installation in the building:

Table 2 provides average data of different materials that are frequently used for the in-stallation of 1 m2 ceramic tiles on walls, floor or façade. In case of lack of data for the module A5, the LCA practitioner can select the most adequate option for the installation of 1 m2 of ceramic tile.

Table 2 – Scenarios for A5 installation module

		Parameter	Parameter unit expressed per functional / declared unit (1 m^2)
Input	Option 1	Mortar	3.3 kg
		Water	0.8 dm^3
	Option 2	Mortar for the joint or grouts	0.5 kg
		Dispersion adhesive (water based)	2.5 kg
		Polysulfide	0.07 kg
	Option 3	Cementitious adhesive – Small format tile (15x15)	2-3 kg
		Cementitious adhesive – Medium for-mat tile (20x20, 33x33)	3-4 kg
		Cementitious adhesive – Large format tiles	4.5-6 kg

The scenario assumptions for module A5 are based on average data from different manufacturers of ceramic tiles in Europe. If specific data or more adequate scenarios are available, they should be considered for the LCA study.

For the treatment of packaging waste, European average scenarios can be used if no specific data or different treatment scenarios are available. These European average scenarios for the end-of-life of the packing waste are illustrated in Table 3.

Table 3 – Packaging waste scenarios (EU27) (Eurostat, 2011)

	Recycling (%)	Energy recovery (%)	Landfill (%)
Plastic	34.3	29.1	36.6
Paper and board	83	8.5	8.5
Wood	37.7	29.9	32.4
Metals	72.3	0.6	27.1
TOTAL	63.6	13.7	22.7

It is considered that the packaging waste is transported and managed at a disposal site located 50 km away from the building site, therefore the return trip shall be included in the system. The LCA practitioner shall use different transport data for packaging waste if available.

On B1, use or application of the installed product :

The environmental impacts generated during the B1 phase are very low and therefore can be neglected.

On B2, Maintenance:

Throughout its service life, the ceramic coverings product shall be cleaned regularly, to a greater or lesser degree, depending on the type of building: residential, commercial, healthcare, etc., in which it is installed. If the surface is dirty or greasy, cleaning agents, such as detergents or bleach may be added. Thus, the consumption of water and disinfectant can be considered.

Scenario for maintaining ceramic floor tiles:

· Residential use: 0.2 ml detergent and 0.1 l water are used to wash 1 m2 of ceramic floor tiles once a week.

Scenario for maintaining ceramic wall tiles:

· Residential use: 0.2 ml detergent and 0.1 l water are used to wash 1 m2 of ceramic floor tiles once every three months.

· The B2 stage scenarios are based on average data from different manufacturers of ceramic tiles in Europe. When an EPD cradle-to-grave is developed, it will include at least this scenario. If specific data or more adequate scenarios are available, they can also be considered for the LCA study.

On B3, Repair:

Ceramic tiles require no repairing during the use phase and therefore no impacts should be de-clared in module B3.

On B5, Refurbishment:
Ceramic tiles require no refurbishment during the use phase and therefore no impacts should be declared in module B5.

On B6-B7, operational energy use and operational water use:

Generally, the environmental impacts generated during the B6 and B7 phases are not applicable and thus neglected

On C1, de-construction, demolition :

The environmental impacts generated during the C1 phase are very low and therefore can be neglected.

On C2, transport to waste processing :

The ceramic tile demolition waste is transported from the building site to a container or treatment plant by truck and it is considered an average distance of 20 km. The return trip shall be included in the system. It can be considered an average distance of 30 km from the container or treatment plant to final destination. The LCA practitioner shall use different transport data for packaging waste if available.

On C3, waste processing for reuse, recovery and/or recycling:

A certain percentage of the waste shall be considered to be reused/recycled. This percentage shall be appropriately justified as a function of the most recent available data whose sources can be verified.

If no other data is available, default end-of-life scenarios can be used as displayed in Table 4. The LCA practitioner should justify the end-of-life scenario used (if different than the default scenario).

Table 4 – Default EOL scenarios for ceramic tiles

EOL scenario	Proportion (%)
Recycling	70
Landfilling	30

On C4, disposal:
The disposal scenario of the waste that is neither recycled nor reused shall be justified.

Benefits and loads beyond the product system boundary in module D

Information module D aims at transparency for the environmental benefits or loads resulting from reusable products and recyclable materials leaving a product system e.g. as secondary materials.

Any declared net benefits and loads from net flows leaving the product system that have not been allocated as co-products and that have passed the end-of-waste state shall be included in module D.
Avoided impacts from allocated co-products shall not be included in Module D.

The information in module D may contain technical information as well as the quantified predetermined LCA derived parameters. The quantified predetermined parameters shall be those described.

After the demolition/deconstruction stage, ceramic tiles can be crushed
and then used in a range of different applications:

· road construction in filled embankment;

· concrete aggregates (Kin et al. 2012);

· when ceramic tiles is crushed, it forms recycled
ceramic aggregates which can be integrated as a partial substitute of natural
aggregate in hot-mix asphalt (Silvestre et al., 2013);

· recycled ceramic aggregates can be used in the construction of landfills (Silvestre et al., 2013);

· recycled ceramic aggregates can be utilized in the construction of sub-based courses on secondary roads (Silvestre et al., 2013).

Below a generic definition is given of module C and module D. This default scenario can be used to assess impacts, loads and benefit for ceramic tiles.

Module C:

· Demolition/deconstruction of ceramic tiles;
· Collection of the construction waste at the building site;
· Transport from the building site to a sorting plant (if any, sometimes at the building site) including any packaging when necessary;

· Sorting process (in sorting plant or at the building site);

· Transport of ceramic tile demolition waste to waste processing;

· Primary crushing of ceramic tile demolition waste up to the end-of waste state is reached (according the criteria of EN 15804 – paragraph 6.3.4.5)

Module D:
· Secondary crushing and size selection (if necessary, according to the new function of the material);

· Other processing steps in order to have a secondary raw material;

· Avoided extraction and processing of virgin materials used as granulates (e.g. gravel and sand).

Additional information on release of dangerous substances to indoor air, soil and water during the use stage Indoor air

Ceramic tile materials are inert without any release into soil and water without testing the products. LEED v4 does not require any test.

Soil and water

Ceramic tile materials are inert without any release into soil and water without testing the products.
LEED v4 does not require any test.

ENVIRONMENTAL PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A2*

Owner of the Declaration	
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	
Issue date	
Valid to	

Name of declared product

Name of manufacturer/association

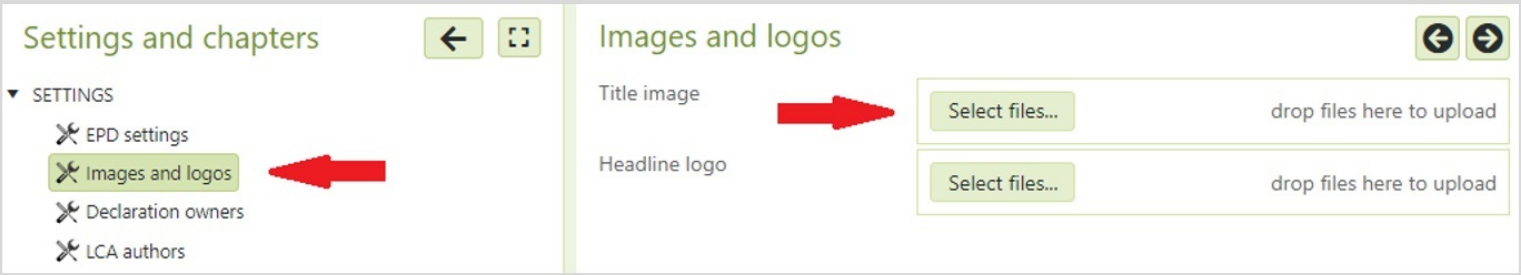
www.ibu-epd.com | https://epd-online.com

Large picture of the product

Maximum file size: 4 MB

Recommended picture size: width 1500 pixel, height 1000 pixel

Insert the picture: Click on "Images and Logos" in the tree view and specify the location of the image on your PC in the dialog on the right.



LOGO

1. General Information

Name of the manufacturer

Programme holder

IBU – Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

Declaration number

This declaration is based on the product category rules:

Name of PCR, 08.2021
(PCR checked and approved by the SVR)

Issue date

Valid to

[Unterschrift]

Name of Chairman
(Chairman of Institut Bauen und Umwelt e.V.)

[Unterschrift]

Name of Managing Director
(Managing Director Institut Bauen und Umwelt e.V.)

Name of the product

Owner of the declaration

Name of the manufacturer
Street
ZipCode/City
Country

Declared product / declared unit

Name of declared product / declared unit

Scope:

The products, plants and their locations must be outlined, on which data the Life Cycle Assessment is based and for which the declaration applies.

For average EPDs, e.g. association EPDs, the plants/companies under review on whose data the LCA is based must be named; as an alternative, the representatively of the declaration can be depicted, e.g. for the association, by declaring the production volume covered by the LCA as a percentage of the entire volume of the declared product manufactured by all association members in the year of reference. In both cases, the companies that have contributed data have to be named in the project report. This clause shall clearly mention if the EPD represents an average EPD, e.g. as an association EPD.

The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

The EPD was created according to the specifications of EN 15804+A2. In the following, the standard will be simplified as *EN 15804*.

Verification

The standard EN 15804 serves as the core PCR
Independent verification of the declaration and data according to ISO 14025:2011
☐ internally ☒ externally

[Unterschrift]

Name of verifier,
(Independent verifier)

2. Product

2.1 Product description/Product definition

The declared products must be described.

In addition to a general product description, the trade names of the products/product groups (including any product codes) must be mentioned to which the EPD applies.

If the declaration of trade names is not meaningfully possible (e.g. in the context of association EPDs), the product description must clearly demarcate the products product groups to which the EPD applies.

Please select one of the following options and delete the header of the selected [alternative]:

[Alternative 1a: Product according to the CPR based on a hEN]:

For the placing on the market of the product in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland) Regulation (EU) No. 305/2011 (CPR) applies. The product needs a declaration of performance taking into consideration EN xyz:date, title and the CE-marking.

For the application and use the respective national provisions apply.

[Alternative 1b: Products according to the CPR based on an ETA]:

For the placing of the product on the market in the European Union/European Free Trade Association /EU/EFTA) (with the exception of Switzerland) the Regulation (EU) No. 305/2011 (CPR) applies. The product needs a declaration of performance taking into consideration ETA no. xyz:date, title and the CE-marking.

For the application and use the respective national provisions apply.

[Alternative 2a: Product not harmonised in accordance with the CPR but in accordance with other provisions for harmonisation of the EU]:

For the placing on the market in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland) the following legal provisions apply:

- *Directive no. xyz: date, title*
- *Regulation no. xyz: date, title*
- and the harmonised standards based on these provisions:
- *EN xyz: date, title*

The CE-marking takes into account the proof of conformity with the respective harmonized standards based on the legal provisions above.

For the application and use the respective national provisions apply.

[Alternative 2b: Product harmonized as well in accordance with the CPR as with other provisions for harmonisation of the EU]:

For the placing of the product on the market in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland) the Regulation (EU) No. 305/2011/ (CPR) and the following other provisions for harmonisation apply:

- *Directive (EU) xyz: date, title*
- *Regulation (EU) no. xyz: date, title*

The product needs a declaration of performance in accordance with the CPR taking into consideration /EN xyz: date/, title or /ETA no. xyz/:date, title respectively and the CE-marking.

The CE-marking for the product takes into account the Declaration of Performance in accordance with the CPR and the proof of conformity with the following harmonised standards or based on the other provisions for harmonisation:

- *EN xyz: date, title*
- *Source, date, title*

For the application and use the respective national provisions apply.

[Alternative 3: Product for which no legal provisions for harmonisation of the EU exist]:

For the use and application of the product the respective national provisions at the place of use apply, in Germany for example the building codes of the federal states and the corresponding national specifications.

2.2 Application

The designated application must be specified for the products covered in the EPD.

2.3 Technical Data

The technical specifications of the products within the scope of the EPD shall be listed, including the reference to the test methods/test standards for each specification.

For products with CE marking, the technical specifications must be specified in accordance with information in the declaration of performance. The properties relevant to the product should be specified in the table below. If no information is given for properties, an explanation must be given in the background report to the EPD as to why the property is not relevant to the product.

Constructional data

Name	Value	Unit
Water absorption acc. to EN ISO 10545-3		mg
Break load acc. to DIN EN ISO 10545-4		N
Flexural strength acc. to DIN EN ISO 10545-4		N/mm^2
Resistance to chemicals and staining acc. to DIN EN ISO 10545-13 (optional)		-
Non-slip propertie (class A, B oder C) acc. to DIN 51130 (only floor coverings)		-
Resistance to deep abrasion acc. to DIN EN ISO 10545-6 (unglazed floor coverings)		-
Resistance to surface wear (class) acc. to DIN EN ISO 10545-7 (only floor coverings)		-
Impact resistance acc. to DIN EN ISO 10545-5 (only floor coverings)		N/cm

Please select one of the following options and delete the header of the selected [alternative]:

[Alternative 1a: Product according to the CPR, based on a hEN]:

- Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to *EN xyz:date, title*.
- Voluntary data: *source, date, title* (not part of CE-marking).

[Alternative 1b: Product according to the CPR, based on an ETA]:

- Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to *ETA no. xyz, date, title*.
- Voluntary data: *source, date, title* (not part of CE-marking).

[Alternative 2a: Product not harmonised in accordance with the CPR but in accordance with other provisions for harmonisation of the EU]:

Performance data of the product according to the harmonised standards, based on provisions for harmonization.

Voluntary data: *source, date, title* (not part of CE-marking).

[Alternative 2b: Product harmonized as well in accordance with the CPR as with other legal provisions of the EU]:

- Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to *EN xyz: date, title* or *ETA no. xyz, date, title* respectively.
- Performance data of the product, based on the harmonised standards, in accordance with the other provisions for harmonization.
- Voluntary data: *source, date, title* (not part of CE-marking)

[Alternative 3: Product for which no legal provisions for harmonisation of the EU exist]:

Performance data of the product with respect to its characteristics in accordance with the relevant technical provision (no CE-marking).

2.4 Delivery status

The dimensions/quantities must be declared for the products covered in this EPD in their delivery status.

2.5 Base materials/Ancillary materials

The main constituents of the product or its components shall be indicated as mass percentages to enable the user of the EPD to understand the composition of the product in delivery status. This information should support safety and efficiency during installation, use, and disposal of the product.

When substances from the “Candidate List of Substances of Very High Concern for Authorisation” (SVHC) are part of the formulation with a mass percentage of > 0,1 of the mass of the construction product, i.e. when they were added to the formulation on purpose, then the substances shall be declared including CAS-number.

If the construction product is a substance or mixture under the chemical law (*REACH*), the concentration limit value refers to the entire product; if it is an article, the partial product or component applies as a unit of reference.

The Candidate list can be found on the ECHA website address: echa.europa.eu/de/home

This declaration is mandatory for all EPDs and must be formulated as follows:

1) “This product/article/at least one partial article contains substances listed in the candidate list (date: dd.mm.yyyy) exceeding 0.1 percentage by mass: yes/no”.

[if yes: List of respective SVHC and their CAS-number]

[If yes:] - Information on the concentration and/or concentration range (comparable information on hazardous properties and if relevant, information on the partial article in the case of articles)

If the construction product is a substance or mixture under the chemical law (REACH), the safety data sheet shall be made available in the EPD, e.g. by a link. In addition, the concentrations of the hazardous substance as well as its hazardous properties have to be stated in the EPD.

Carcinogenic, mutagenic, reprotoxic (CMR) substances in categories 1A and 1B must also be declared including CAS-number if a European harmonised classification is available as well as information on treatment with biocides. For IBU-EPDs statements 2) and 3) are mandatory.
This statement on other CMR substances which are not listed as SVHC and on biocides must be formulated as follows:

2) “This product/article/at least one partial article contains other CMR substances in categories 1A or 1B which are not on the candidate list, exceeding 0.1 percentage by mass: yes/no”

[If yes:] – List the concentration and/or concentration ranges (comparable to the information on a safety data sheet), provide information on hazardous properties and if relevant information on the partial article in the case of articles.

3) “Biocide products were added to this construction product or it has been treated with biocide products (this then concerns a treated product as defined by the (EU) Ordinance on Biocide Products No. 528/2012): yes/no”

[If yes:] - List the biocides referred to above.
The active substance and the product type (in-can preservative, film preservative, wood protection, etc. according to the Ordinance on Biocide Products (see also 1.4) must be indicated.

Ancillary materials and additives remaining on the product must also be declared.
If additives such as fire retardants, softeners or biocides are used, their functional chemical group must be indicated.

Statements like “…free of ….” and/or “…does not contain…” may not be used.

2.6 Manufacture

The manufacturing process must be described and can be illustrated using a simple graphic. If the EPD applies to several locations, the production processes must be described for all sites in case they differ.

Quality management systems can be referred to.

2.7 Environment and health during manufacturing

Presentation of measures relating to health protection during the manufacturing process extending beyond national guidelines (of the production country).

Presentation of measures relating to environmental protection during the manufacturing process extending beyond national guidelines or plant-specific requirements, e.g. description of special environmentally-friendly dealings with waste air, waste water, and waste as well as noise emissions.

Information on the Environment Management System or similar (if available)

2.8 Product processing/Installation

Description of the type of processing, machinery and tools used, dust extraction etc., auxiliary materials needed for installation as well as measures for noise reduction.
Information on the rules of technology as well as on workers safety and environmental protection is possible.

2.9 Packaging

Information on product-specific packaging:
type, composition, and possible reuse, recycling, energy recovery, and disposal of packaging materials (paper, pallets, foils, etc.).

2.10 Condition of use

Information should be provided here regarding changes in material composition over the service life of the product and/or regarding environmentally relevant material inherent properties over the service life of the product.

2.11 Environment and health during use

Information on the relationships between the product, the environment and health.

Information on the possible content of harmful substances or emissions.

Note: recommendations concerning cleaning, maintenance, etc. for the declared product should be listed in the corresponding section in 4 “Technical information on scenarios”.

2.12 Reference service life

The declaration of the reference service life (RSL) is imperative for EPDs covering the complete use stage (modules B1-B7), or if a use stage scenario is described, which refers to the lifetime of the product. If not all modules of the use stage are declared and no use stage scenario covering the full lifetime of the product is described, then the indication of the RSL (according to *ISO 15686:1, -2, -7 and -8*) is voluntary.

Information on the product’s RSL requires specification of compatible scenarios for the product stage, construction process stage and use stage. The RSL is dependent on the properties of the prod¬uct and reference in-use conditions. These conditions shall be declared together with the RSL in clause 4 and it shall be stated that the RSL applies for the reference conditions only.

If a reference service life (RSL) cannot be declared according to ISO 15686 (or it is not relevant for consideration of the LCA), this has to be stated clearly in the EPD.

In such cases, a service life can be declared in accordance with the BBSR table "Service lives of components for life cycle assessment according to
BNB" (www.nachhaltigesbauen.de/baustoff-und-gebaeudedaten/nutzungsdauern-von-bauteilen.html).

It shall be unambiguously stated that a service life (not: a reference service life) in accordance with the BBSR table (or based on a manufacturer’s declaration (see below)) is not a RSL according to ISO 15686.

A service life provided by the manufacturer can be declared as an alternative to the value from the BBSR table. This information shall be accompanied by explanations on the origin of the declared service life, e.g. referring to simulations, tests, an assessment of the manufacturer or statistical data, etc. and shall contain the specification of the application for which the stated service life is valid (to be provided in clause 4).

The requisite information for technical building installations should be taken from *VDI 20673*.

Description of the influences on the ageing of the product when applied in accordance with the rules of technology.

2.13 Extraordinary effects

Fire

Information on the fire performance according to *EN 13501:1* or established national standards. According to *EN 13501:1*:

- The classes of building products regarding their fire performance are predefined as: A1, A2, B, C, D, E, and F;
- The classes of flaming droplets/particles are pre-defined as: d0, d1, or d2;
- The classes for smoke density are pre-defined as: s1, s2, or s3

Fire protection

Name	Value
Building material class	
Burning droplets	
Smoke gas development	

Water

Information on the product performance including possible impacts on the environment following the unforeseeable influence of water, e.g. flooding.

Mechanical destruction

If relevant: information on the product performance including possible impacts on the environment following unforeseeable mechanical destruction.

2.14 Re-use phase

The possibilities of re-use, recycling, and energy recovery must be described.

2.15 Disposal

The possible disposal channels must be indicated.
The waste code in accordance with the European Waste Index must be described.

2.16 Further information

Possible sources of additional information, e.g. website, a reference source for safety data sheet.

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3. LCA: Calculation rules

3.1 Declared Unit

The declared unit and the mass reference must be indicated in the appropriate table as declared. If there are several units to choose from, a suitable one must be selected. If averages are declared across various products, the average breakdown must be explained.

The declared unit is 1 m² plus indication of the average surface weight of the tiles and panels. Alternatively, presentation can be with reference to 1 tonne. It must be possible to convert to the declared unit (1 m²).

Declared unit and mass reference

Name	Value	Unit
Declared unit		m^2
Declared unit		t
Grammage		kg/m^2
Layer thickness		m
Gross density		kg/m^3

Other declared units are allowed if the conversion is shown transparently.

For IBU core EPDs (where clause 3.6 is part of the EPD): for average EPDs, an estimate of the robustness of the LCA values must be made, e.g. concerning the variability of the production process, geographical representativeness and the influence of background data and preliminary products compared to the environmental impacts caused by the actual production.

3.2 System boundary

Type of the EPD: choose as appropriate: cradle to gate, cradle to gate - with options, cradle to grave.

The modules considered in the life cycle assessment as per “system boundaries” outlined in section 5.5. of the PCR, Part A: “Calculation Rules for the Life Cycle Assessment and Requirements for the Project Report” must be described in brief. The description should be product specific; it should be apparent (as to) what processes are considered in what modules.
If green electricity has been calculated, the following sentence must be declared in the IBU EPD under the assumptions:
For the environmental impact, the use of green electricity was calculated taking into account the residual electricity mix for the remaining electricity. The proportion of the electricity demand covered by green electricity in the total electricity demand is x %.

3.3 Estimates and assumptions

Key assumptions and estimates for interpretation of the life cycle assessment should be listed here, provided that they are not dealt with in other sections of the main clause 3 “LCA: Calculation rules”.

3.4 Cut-off criteria

The use of cut-off criteria as per the PCR, Part A: “Calculation Rules for the Life Cycle Assessment and Requirements for the project report” must be documented here.

3.5 Background data

The sources for background data in the LCA used must be provided.

3.6 Data quality

An estimate should be made as regards data quality (addressing both foreground and background data), whereby the age of background data used must be indicated.

For average EPDs, an estimate of the robustness of the LCA values must be made, e.g. concerning the variability of the production process, geographical representatively and the influence of background data and preliminary products compared to the environmental impacts caused by the actual production.

3.7 Period under review

The period under review for the collection of production data and the resulting averages (if applicable) shall be documented.

3.8 Geographic Representativeness

Land or region, in which the declared product system is manufactured, used or handled at the end of the product´s lifespan:

3.9 Allocation

The allocations of relevance for calculation (appropriation of expenses across various products) must be indicated, at least:

- Allocation of energy, auxiliary and operating materials used for individual products in a factory;
- Allocation of co-production processes;
- Allocation in the use of recycled and/or secondary raw materials;
- Loads and benefits beyond the system boundary from recycling or energy recovery of packaging materials and production waste;
- Loads and benefits beyond the system boundary from recycling or energy recovery from the end of life of the product.

whereby reference must be made to the modules in which the allocations are performed.

3.10 Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account.
The used background database has to be mentioned.

4. LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

The biogenic carbon content quantifies the amount of biogenic carbon in a construction product leaving the factory gate, and it shall be separately declared for the product and for any

accompanying packaging.
If the total mass of biogenic carbon containing materials is less than 5 % of the total mass of the product and accompanying packaging, the declaration of biogenic carbon content may be omitted. The mass of packaging containing biogenic carbon shall always be declared.

Information on describing the biogenic carbon content at factory gate

Name	Value	Unit
Biogenic carbon content in product		kg C
Biogenic carbon content in accompanying packaging		kg C

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO_2.

The following technical scenario information is required for the declared modules and optional for non-declared modules. Modules for which no information is declared can be deleted; additional information can also be listed if necessary.

The following technical information is a basis for the declared modules or can be used for developing specific scenarios in the context of a building assessment if modules are not declared (MND).

A5 is not declared including the disposal of the packaging material on the construction site, the amounts of packaging materials included in the LCA calculations must be declared as technical scenario information for Module A5.

Transport to the building site (A4)

Name	Value	Unit
Litres of fuel		l/100km
Transport distance		km
Capacity utilisation (including empty runs)		%
Gross density of products transported		kg/m^3
Capacity utilisation volume factor		-

Installation into the building (A5)

Name	Value	Unit
Auxiliary		kg
Water consumption		m^3
Other resources		kg
Electricity consumption		kWh
Other energy carriers		MJ
Material loss		kg
Output substances following waste treatment on site		kg
Dust in the air		kg
VOC in the air		kg

Use or application of the installed product (B1) see section 2.12 "Use"

Name	Value	Unit

Maintenance (B2)

Name	Value	Unit
Information on maintenance		-
Maintenance cycle		Number/RSL
Water consumption		m^3
Auxiliary		kg
Other resources		kg
Electricity consumption		kWh
Other energy carriers		MJ
Material loss		kg

Repair (B3)

Name	Value	Unit
Information on the repair process		-
Information on the inspection process		-
Repair cycle		Number/RSL
Water consumption		m^3
Auxiliary		kg
Other resources		kg
Electricity consumption		kWh
Other energy carriers		MJ
Material loss		kg

Replacement (B4) / Refurbishment (B5)

Name	Value	Unit
Replacement cycle		Number/RSL
Electricity consumption		kWh
Litres of fuel		l/100km
Replacement of worn parts		kg

In case a **reference service life** according to applicable ISO standards is declared then the assumptions and in-use conditions underlying the determined RSL shall be declared. In addition, it shall be stated that the RSL applies to the reference conditions only.

The same holds for a service life declared by the manufacturer. Corresponding information related to in-use conditions needs not be provided if a service life taken from the list of service life by *BNB* is declared.

Reference service life

Name	Value	Unit
Reference service life (according to ISO 15686-1, -2, -7 and -8)		a
Life Span (according to BBSR)		a
Life Span according to the manufacturer		a
Declared product properties (at the gate) and finishes		-
Design application parameters (if instructed by the manufacturer), including the references to the appropriate practices and application codes		-
An assumed quality of work, when installed in accordance with the manufacturer's instructions		-
Outdoor environment, (for outdoor applications), e.g. weathering, pollutants, UV and wind exposure, building orientation, shading, temperature		-
Indoor environment (for indoor applications), e.g. temperature, moisture, chemical exposure		-
Usage conditions, e.g. frequency of use, mechanical exposure		-
Maintenance e.g. required frequency, type and quality and replacement of components		-

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Operational energy use (B6) and Operational water use (B7)

Name	Value	Unit
Water consumption		m^3
Electricity consumption		kWh
Other energy carriers		MJ
Equipment output		kW

End of life (C1-C4)

Name	Value	Unit
Collected separately waste type waste type		kg
Collected as mixed construction waste		kg
Reuse		kg
Recycling		kg
Energy recovery		kg
Landfilling		kg

Reuse, recovery and/or recycling potentials (D), relevant scenario information

Name	Value	Unit

5. LCA: Results

In Table 1 "Description of the system boundary", all declared modules shall be indicated with an "X"; all modules that are not declared shall be indicated with "MND" (As default the modules B3, B4, B5 are marked as MNR – module not relevant). In the following tables, columns can be deleted for modules that are not declared. Indicator values should be declared with three valid digits (eventually using the exponential form (e.g. 1,23E-5 = 0,0000123). A uniform format should be used for all values of one indicator.
If several modules are not declared and therefore have been deleted from the table, the abbreviations for the indicators can be replaced by the complete names, while the readability and clear arrangement should be maintained; the legends can then be deleted.
If due to relevant data gaps, an indicator cannot be declared in a robust way, then the abbreviation “IND” (indicator not declared) should be used for this indicator.

- 0 - calculated value is 0
- 0 - value falls under the cut-off
- 0 - assumption which exclude any flows (e.g. exported electricity A1-A3)
- IND – in cases where the inventory does not support the methodological approach or the calculation of the specific indicator IND shall be used.

If no reference service life is declared (see chapter 2.13 "Reference Service Life"), the LCA results of the modules B1-B2 and B6-B7 shall refer to a period of one year. This shall then be indicated as an explanatory text below the tables. In addition, the formula for the quantification of such B-modules over the total life cycle shall be provided.

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)

Product stage			Construction process stage		Use stage							End of life stage				Benefits and loads beyond the system boundaries
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: [declared unit and product]

GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential)

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: [declared unit and product]

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: [declared unit and product]

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional: [declared unit and product]

PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic); SQP = Potential soil quality index

Disclaimer 1 – for the indicator “Potential Human exposure efficiency relative to U235”. This impact category deals mainly with the eventual impact of low-dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure or radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – for the indicators “abiotic depletion potential for non-fossil resources”, “abiotic depletion potential for fossil resources”, “water (user) deprivation potential, deprivation-weighted water consumption”, “potential comparative toxic unit for ecosystems”, “potential comparative toxic unit for humans – cancerogenic”, “Potential comparative toxic unit for humans - not cancerogenic”, “potential soil quality index”. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high as there is limited experience with the indicator.

6. LCA: Interpretation

To facilitate comprehension of the life cycle assessment, both the relevant indicators of the life cycle inventory and the indicators of the impact assessment declared in section 5 “LCA results” have to be interpreted in a dominance analysis. An illustration of the results with figures is recommended, e.g. for the dominance analysis, the distribution of impacts across the modules, the CO2-balance, etc. as appropriate for a reader to understand the environmental profile of the declared product. The interpretation shall also include a description of the time frame and/or variability of the LCIA results (in qualitative or quantitative terms) if the EPD is valid for several products or producers.

7. Requisite evidence

As a general rule, all statements must be documented with measured data (presented by the corresponding test certificates). The methods of evidence and the test conditions have to be described together with the results.

If substances are not detected, the limit of detection must be included in the declaration.

Interpreting statements such as “… free of …” or “… are entirely harmless …” are not allowed.

If evidence required by the specific PCR part B is not provided, this has to be justified under the respective title for the required evidence.

If relevant for the scope of application of the declared product, or if derivable from its material composition, it is recommended to provide additional adequate evidence.

Information and explanation on the representativeness of requisite evidence have to be given in the project report for all members of the association.

8. References

Standards

EN 15804

EN 15804:2012+A1 2013, Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products.

EN 15804

EN 15804:2012+A2:2019+AC:2021, Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products.

ISO 14025

EN ISO 14025:2011, Environmental labels and declarations — Type III environmental declarations — Principles and procedures.

Further References

Title of the software/database

Title of the software/database. Addition to the title, version. Place: Publisher, Date of publication [Access on access date].

IBU 2021

Institut Bauen und Umwelt e.V.: General Instructions for the EPD programme of Institut Bauen und Umwelt e.V., Version 2.0, Berlin: Institut Bauen und Umwelt e.V., 2021
www.ibu-epd.com

The literature referred to in the Environmental Product Declaration must be listed in full.Standards already fully quoted in the EPD do not need to be listed here again.
The current version of PCR Part A and PCR Part B of the PCR document on which they are based must be referenced.

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