

PRODUCT CATEGORY RULES FOR BUILDING RELATED PRODUCTS AND SERVICES

as per ISO 14025 and EN 15804+A2

for preparation of EPDs (Environmental Product Declarations)
according to the EPD programme of the BAU EPD GmbH

Bau-EPD
Baustoffe mit Transparenz



www.bau-epd.at

Part B: Requirements on the EPD for Insulating products made from mineral wool

PCR-Code: 2.22.2.1

Date 2021-11-27



Imprint

Publisher:

Bau EPD GmbH

Seidengasse 13/3

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Tracking of versions

| Version | Comments | Date of changes |
|---------|--|-------------------|
| 8.0 | New structure following decisions of TAC from 2017-05-11, adaptations following resolutions from TAC in autumn 2016 and 2017. | 2017-08-17 |
| 9.0 | Changes due to issue of EN 16783 - Thermal insulation products. Product category rules (PCR) for factory made and in-situ formed products for preparing environmental product declarations | 2018-07-02 |
| 10.0 | Changes following decisions of TAC since last publication. Changes on occasion of verification of PCR for concrete and concrete elements as well as resulting from working out the PCR for steel reinforcement. Changes to be made in all PCR B parts as well as some editorial changes. Index now included. | 2019-07-06 |
| 11.0 | Adaptation as per EN 15804:2019+A2:2019; adaptation of rules for declaration of geographical representativity | 2020-11-05 |
| 12.0 | Public version for interested parties after approval of PCR review panel. | 2021-01-12 |
| 13.0 | Consideration of comments, approval for EPD creation | 2021-04-07 |
| 14.0 | Adaptation tables module B and C, minor editorial changes | 2021-08-27 |
| 15.0 | Change ECO Platform logo, note to photographic rights, minor editorial changes (created by SR, checked and approved by FG | 2021-11-27 |

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1. Scope

This document contains the **Requirements on an Environmental Product Declaration (EPD)** as per EN 15804 and ISO 14025 and requirements of Bau EPD GmbH for mineral insulating products according to the following Austrian standards (ÖNORMen):

- ÖNORM EN 13162 "Thermal insulation products for buildings - Factory made mineral wool (MW) products - Specification "
- ÖNORM EN 14303 Thermal insulation products for building equipment and industrial installations - Factory made mineral wool (MW) products – Specification
- ÖNORM EN 14064-1 Thermal insulation products for buildings - In-situ formed loose-fill mineral wool (MW) products - Part 1: Specification for the loose-fill products before installation

The requirements on the EPD include:

- Requirements from EN ISO 14025
- Requirements on the EN 15804 standard as a European core EPD
- Requirements from EN 16783 as complementary product PCR for insulating materials
- Complementary requirements on EPD of Bau EPD GmbH

The calculation rules for the Life Cycle Assessment and Requirements on the project report are specified in a separate document – "Management System Handbook chapter 5" of Bau EPD GmbH.

Requirements on the layout of the EPD

Bau-EPD GmbH determines the following features with regard to the layout of the EPD:

- The document on hand defines the format template for EPD-document that is to fill in (Word file „Format template EPD Bau EPD GmbH“, download at www.bau-epd.at).
- The content of an EPD is not limited in length of text.
- The layout of the front page of the EPD is defined and picture material must be accorded with Bau EPD GmbH (not more than 4 MB).
- On the last page of the EPD the publishing institution as well as the programme operator (Bau EPD GmbH in both cases), the LCA practitioner and owner of the declaration must be indicated with a logo and full address (including telephone number, fax number, email and website).
- Generally the font „Calibri“ must be used.
- In addition to the EPD as Microsoft Word format an Excel-document (BAU EPD M-DOCUMENT 8- excel-file for electronic data transfer Editor baubook ECO Platform) must be created including the result tables for electronic transfer and complying to EN 15942 (ITM Matrix). The templates of Bau EPD GmbH must be used, for these tables also serve to forward data to database owners (ECO Platform/ECO Portal, OEKOBAUDAT and BAUBOOK).

Content of the EPD

The following format template respective guidance describes the required structure of the EPD document including the **required content for each individual chapter**.

In addition to that, this document is giving **specific notes for the creation of an EPD of mineral insulating materials** and **specific LCA calculation rules for mineral insulating materials** that must be considered when creating the EPD and underlying LCA study.

Parts of the content that are considered as additional information of optional character (=not required as per international standard and/or guidelines from ECO Platform) are marked in lilac colour. This information is free to choose whether to declare or not and indications can be delivered by the owner of the declaration on optional basis.

Legend:

- Blue: required content for each chapter
- Turquoise: specific requirements for EPD of materials from the scope of the PCR
- Green: specific LCA rules for EPD of material from the scope of the PCR
- Violet: additional information of optional character

EPD - ENVIRONMENTAL PRODUCT DECLARATION

As per ISO 14025 and EN 15804



| | |
|--------------------------|---|
| PUBLISHER | Bau EPD GmbH, A-1070 Wien, Seidengasse 13/3, www.bau-epd.at |
| PROGRAMME OPERATOR | Bau EPD GmbH, A-1070 Wien, Seidengasse 13/3, www.bau-epd.at |
| OWNER OF THE DECLARATION | Name of declaration owner |
| DECLARATION NUMBER | To be accorded with Bau EPD GmbH |
| ISSUE DATE | Date |
| VALID TO | Date |
| NUMBER OF DATASETS | Number |

Name and description of product

Name of declaration owner

picture

To be accorded with declaration owner
and Bau EPD GmbH

(Note: photographic rights must be
clarified and cited)

Company logo of
declaration owner

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1. General information

| | |
|--|--|
| <p>Product name Name and description of product</p> | <p>Declared Product / Declared Unit Description of the declared product and declared unit/functional unit</p> |
| <p>Declaration number To be accorded with Bau EPD GmbH</p> | <p>Number of datasets in EPD Document(s): XX</p> |
| <p>Declaration data <input type="checkbox"/> Specific data <input type="checkbox"/> Average data</p> | <p>Range of validity The products considered in the data of the life cycle assessment and for which the declaration applies must be named. In the case of an average EPD, this type of EPD must be pointed out. The representativeness of the declaration must be shown with regard to the production volume covered by the life cycle assessment and the technology used. Likewise, the range of fluctuation of the product group considered, must be specified in the interpretation.</p> |
| <p>Declaration based on: MS-HB version dated dd.mm.yyyy: Name of PCR PCR Code Version (PCR tested and approved by the independent expert committee = PKR-Gremium) The owner of the declaration is liable for the underlying information and evidence; Bau EPD GmbH is not liable with respect to manufacturer information, life cycle assessment data and evidence.</p> | |
| <p>Type of Declaration as per EN 15804 From cradle to LCA-method (i.e. cut-off by classification)</p> | <p>Database, Software, Version Declaration of background database, Software used and both its versions</p> |
| <p>Author of the Life Cycle Assessment Name of the author Institution, Address website</p> | <p>The CEN standard EN 15804:2014+A1 serves as the core-PCR. Independent verification of the declaration according to ISO 14025:2010 <input type="checkbox"/> internally <input checked="" type="checkbox"/> externally Verifier 1: Name Verifier 2: Name</p> |
| <p>Owner of the Declaration Name of the manufacturer/owner Institution, Address website</p> | <p>Publisher and Programme Operator Bau EPD GmbH Seidengasse 13/3 1070 Vienna Austria</p> |

DI (FH) DI DI Sarah Richter
 Managing director Bau EPD GmbH

DI Dr. sc ETHZ Florian Gschösser/ N.N.
 chairperson/vice chairperson of expert committee (PCR-Gremium)

Academic Title Name
 Verifier

Academic Title Name,
 Verifier

Note: EPDs from similar product groups from different programmes might not be comparable.

2. Product

2.1 General product description

For the product description the characteristics of the declared product must be described. In case of average EPD (“sector or branch” EPD) all declared products must be described separately.

Indications for the general product description:

- Separate description of products/materials for each product standard applicable, citing the product types and names.
- Description of characteristic components.
- All factory locations for the respective product categories must be declared, alternatively a reference can be made to an overview in an appendix (mandatory information in the project report, voluntary information in the EPD document)

Specific notes for the creation of an EPD for mineral insulating materials:

- Separate description of mineral insulating materials for each product standard applicable
- The declared product is...

2.2 Application field

The use and application purpose of the named products are to specify. The individual applications (including functions) must be declared as a text or table format.

Example as a table format:

For products regulated in the standard ÖNORM EN 13162 the application fields covered must be marked in the following table:

Table 1: Scope of application as per ÖNORM B 6000

| Wall – Pillars – Columns – Floor slabs | | | | | | Ceiling – Roof – Terrace | | | | | | | | | | |
|--|--|--|--------------------------|-------------------------|-------------------------|---|-----------|----------------------------|---|--|--|--|--|---|--------------------|----------------------------------|
| Exterior insulation | | | Core insulation | | Interior insulation | Exterior insulation | | | | | | Interior insulation | | | | |
| With ventilation | External thermal insulation compound systems (ETICS) | Laid into formwork, e.g. thermal bridges | With plaster or cladding | In cavity constructions | In lightweight elements | Masonry or concrete walls with or without rendering (coating) | Warm roof | Cold roof, loft conversion | attics, walkable or non-walkable insulation | In case of increased compressive loads, e.g. parking decks | Ceiling soffit (undersides) with plaster | Ceiling soffit (undersides) with ETICS | Under screed without requirements on impact noise protection | Under screed with requirements on impact noise protection | Suspended ceilings | Ceiling soffit, sound absorption |
| X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |

For products regulated in the standard ÖNORM EN 14303 the appropriate application fields must be stated (e.g. Lamella-Mats for insulation of industrial installations, like containers with hot media, ventilating systems with hot media or pipes with hot media).

For products regulated in the standard ÖNORM EN 14064-1 the appropriate application fields must be stated (e.g. thermal insulation in loft conversion - open blowing on the top storey ceiling, cavity insulation of double wall masonry or cavity insulation between rafters or wooden frames).

2.3 Standards, guidelines and regulations relevant for the product

The respective standard and/or general technical approval or comparable national regulation can be indicated.

Optional: Documentation under the frame of CE -certification such as certificates of constancy of performance, certificates of conformity of the internal production control on the manufacturer’s site, Declarations of performance, Official certificates of registration, European Technical Assessments or Technical permissions of construction industry can be cited.

Specific notes for the creation of an EPD for mineral insulating materials:

The standards regulating mineral insulating materials must be cited (i.e. standards, guidelines, other regulations)
Examples for product standards for mineral insulating materials in Austria are illustrated in table 2.

Table 2: Product specific standards

| Standard | Title |
|---------------------------|---|
| ÖNORM EN 13162:2013-01-15 | Thermal insulation products for buildings - Factory made mineral wool (MW) products - Specification |

Additional European requirements:

Documentation that the products are not classified under the European Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures with reference to bio-persistent fibres (e.g.: EUCEB-Trademark, RAL-quality label) can be given (see also chapter 5.3).

National requirements:

Austria: documentation requirements on formaldehyde class E1 in compliance with ÖNORM EN 13986

2.4 Technical data

For products carrying a CE marking as per Construction Products Regulation (CPR) the EPD must declare at least the same technical data as required and indicated in the declaration of performance of the manufacturer. What kind of data is required in each individual case is to learn from the document underlying the CE marking: any Harmonized European Standard or European Technical Assessment (ETA). Additional technical data must be listed if relevant for product distinction or specification.

Specific notes for the creation of an EPD for mineral insulating materials:

Product designation codes of the declared products must be given.

If relevant for the declared product, the following technical construction data in the delivery status must be provided with reference to the testing standard.

Table 3: Technical data of the declared construction product

| Characterization | Value | Unit |
|--|-------|-------------------|
| Thermal conductivity ¹⁾ : For products as per ÖNORM EN 13162 and ÖNORM EN 14064-1: Declared thermal conductivity λ_D resp. λ_D -range For products as per ÖNORM EN 14303: Measured value λ_{dry} at selected average temperatures | | W/(mK) |
| Nominal density ²⁾ resp. range of nominal density | | kg/m ³ |
| Classification of fire behaviour as per ÖNORM EN 13501-1 ³⁾ | | |

- 1) For mineral wool no correction factors for humidity are designed.
- 2) Average nominal density
- 3) The classification must be documented with the EC-certificate

For specific EPD the technical data of the product must be declared as required in **Fehler! Verweisquelle konnte nicht gefunden werden.** For average EPD ("Sector or Branch-EPD", "Group EPD" or "EPD from Associations") **Fehler! Verweisquelle konnte nicht gefunden werden.** must be filled, average values or ranges are accepted, in addition a note stating „see product sheets“ pointing to single technical product sheets can be cited. Technical data must be provided by the manufacturers. The manufacturers are to ensure that the relevant data are accessible, and the LCA-practitioner must indicate the sources where the technical data can be downloaded.

In this case the average value of nominal density/ weight per m² used for calculating the LCA must be declared as an additional information in chapter 3.1.

In case of declaring average values ÖNORM EN 16783 chapter 6.3.6 must be considered:

Grouping of products and declaring average values is allowed without reporting differences, if the differences in each impact category are lower than 25 %. In other cases, the differences in the impact categories shall be reported together with average values.

2.5 Basic/auxiliary materials

The product components and/or contents and ingredients must be declared in mass-% to enable the user of the EPD to understand the composition and structure of the product in delivery status. These indications shall also support security and efficiency in installation, use and disposal of the product.

The declaration of mass-% can be accurate numbers or a range by analogy with REACH¹. The mass of components that make up less than 1 mass-% of the total product mass can be declared with < 1 mass-%.

The declaration of material product content must list at least those substances contained in the product which are included in the “Candidate List of Substances of Very High Concern for Authorization” where their contents exceed the limit values (0.1 mass-% on product level) for registration by the European Chemicals Agency (ECHA²). If substances and preparations lose their hazardous features during manufacturing (e.g. after a complete chemical reaction) they are exempted from the obligation of declaration.

If the content of the material is below the limit of ECHA the following note must be stated in the EPD:

„The content of XXXX is below the limit values of the registration by the European Chemicals Agency (ECHA). Interpreting statements such as “... free of ...” or “... are entirely harmless ...” are not permissible.

The product components must be described in detail, so that their sort of product is clear, but the protection of sensitive data is assured, and company secrets are not revealed.

For additives, the function and substance class respective chemical group (i.e. hydraulic binders) must be stated. In addition to that all auxiliary materials and additives that stay within the product must be declared.

Specific notes for the creation of an EPD for mineral insulating materials:

Table 4: base materials in mass-% (example)

| Components | Function | Mass fraction in percent |
|------------------------------------|---|--------------------------|
| Recycled glass ¹⁾ | Glass raw material | ca. 60 % |
| Borax pentahydrate ²⁾ | Glass raw material | ca. 6 % |
| Quartz sand ³⁾ | Glass raw material | ca. 2 % |
| Soda ash ⁴⁾ | Glass raw material | ca. 4 % |
| Colemanite ⁵⁾ | Glass raw material | ca. 2 % |
| | | |
| Auxiliary materials ¹¹⁾ | - Hydrophobing agents - Adhesion agents - Auxiliary materials for colouring | Total < 1 % |

Optional: footnote with description for each component

Examples:

¹ Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC

² European Chemicals Agency: <http://echa.europa.eu/de>

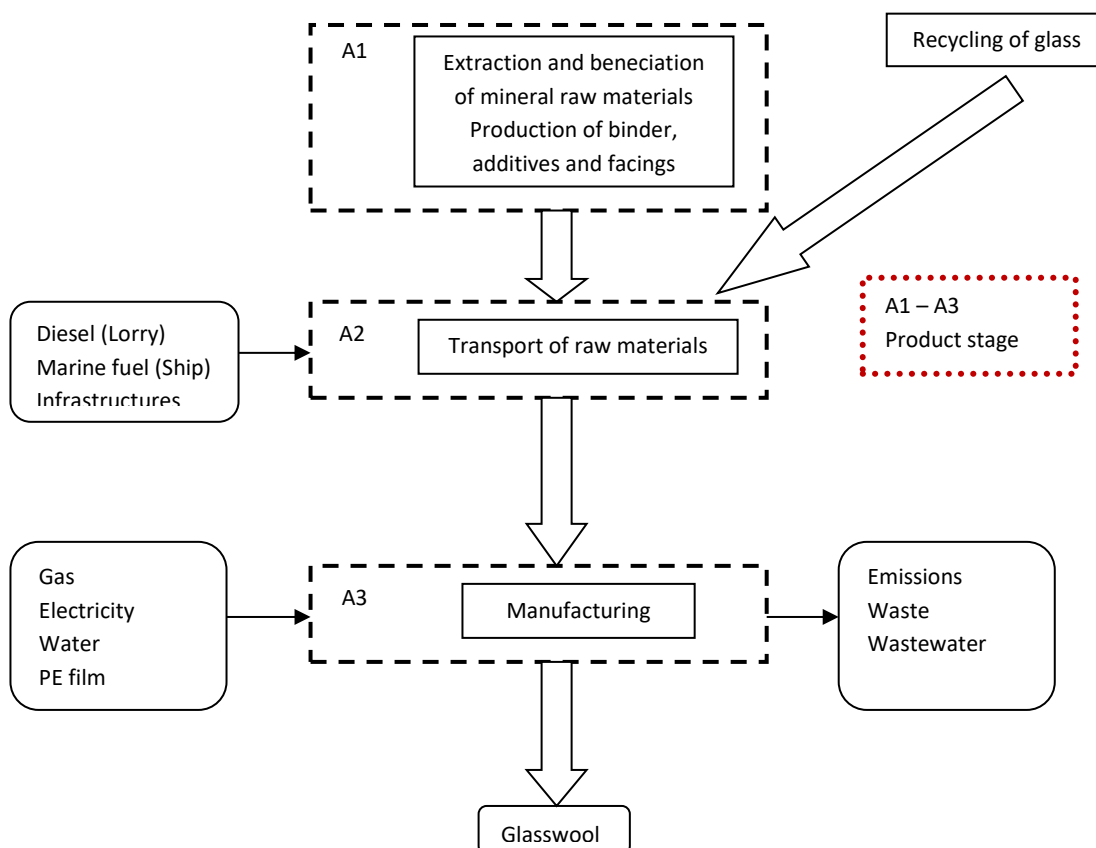
- 1) Processed broken glass from flat glass production or processed laminated glass from motor vehicles and bottle glass from bottlers. The glass comes exclusively from Austria.
- 2) The boron deposits for the production of borax pentahydrate are located in California, Argentina and Turkey. Depending on their origin, the mined raw borates are contaminated with different accompanying substances and have to be processed into borax.
- 3) Quartz is widespread in nature and one of the most important rock-forming minerals of plutonic and volcanic rocks. At the same time, quartz is one of the most weather-resistant minerals. Sands are end products of various weathering processes and have been formed in almost every formation in the history of the earth. The quartz sand is extracted in opencast mines (at depths down to the groundwater level) using large front shovel excavators. The silica sand is attrited, washed, hydroclassified and screened. Feldspar is the second important mineral raw material in glass wool production. Among other things, it occurs as a by-product of the quartz sand obtained in opencast mining. Both the quartz sand used in the product and the feldspar come from the Melk part of the Bohemian Massif.
- 4) Soda is sourced from Germany and, due to the great distance to natural sources, is extracted there from common salt and limestone using the "Solvay process".
- 5) In addition to phenol-formaldehyde resin, the binder contains two other organic components in small amounts. These are all sourced from Austria and Germany. The binder content is max. 9% for heavy, resilient panels, with an average raw density of 16.5 kg/m³ approx. 5%.
- 6) The additives include other glass raw materials, which are only added in small amounts, as well as oils to bind the dust and make it hydrophobic. They are all delivered from the European market.

2.6 Production

The process of production must be described and illustrated with a simple figure (i.e. flow chart). In case of average EPD the production processes of all sites must be described respective a useful summary must be included and a list of all production sites must be provided in an annex. Quality management systems, eco management systems etc. can be referred to.

Specific notes for the creation of an EPD for mineral insulating materials:

Description of raw material extraction, processing and geographical origin of raw materials, special processing chains....



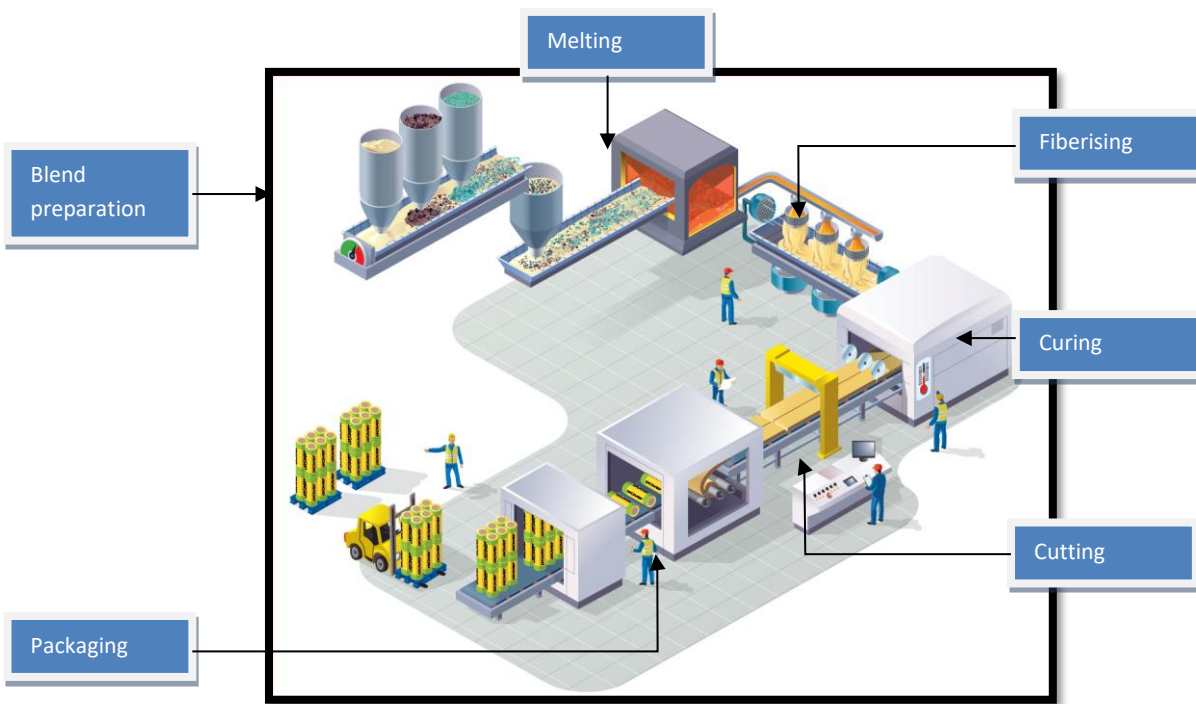


Figure 1: Example of a flow chart/graphic production stage

2.7 Packaging

Information concerning each component of packages:

Type (Foil, pallets, etc.),
Material (Paper, Polyethylene; including origin, e.g. recycled paper) and
Possibilities of reuse (e.g. multi way pallets).

Specific notes for the creation of an EPD for mineral insulating materials:

Example: Products are wrapped in polyethylene film (PE film) and loaded into metal containers.

2.8 Conditions of delivery

Written description of conditions of delivery, units of delivery, size and dimension as well as requirements on storage important for the declared product(s). Example: rolls, slabs or mats.

2.9 Transport

Description of delivery (Route and means of transport).

2.10 Processing/ installation

Description of way of treatment, used machines, tools, dust collection etc., auxiliary materials as well as measures of noise reduction. Notes regarding recognized rules of engineering, work safety or protection of the environment can be included. References to detailed processing directives and referrals to user safety (safe use instruction sheets) of the manufacturer are required.

Specific notes for the creation of an EPD for mineral insulating materials:

Installation scenarios for use in EIFS must be described in detail (components of system).

Specific LCA calculation rules for mineral insulating materials:

Installation scenarios for use in EIFS – allocation of material flows to be calculated in A1-A3 and those flows to be declared in A5 as per CEN TR 16970 = Guidance Document to EN 15804) must be described.

2.11 Use stage

Notes describing specific features of the material composition relevant for the use stage.

Specific notes for the creation of an EPD for mineral insulating materials:

If mineral insulating products are installed professionally and if the phase of utilization is not disturbed, no modifications of the material composition occur.

2.12 Reference service life (RSL)

The indication 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 (“from cradle to grave”).

The RSL must refer to the declared technical and functional quality of the product. It must be established in line with all of the specific rules in the European product standards and must also take consideration of the ISO 15686-1, -2, -7 and -8 standards.

Where information is available for deriving the RSL from harmonized European product standards, such data has priority.

The assumption underlying the calculation of the RSL and for those only the RSL can be declared must be stated. Influence on aging as per recognized rules of engineering.

Specific notes for the creation of an EPD for mineral insulating materials:

Table 5: Reference service life (RSL)

| Characterization | value | unit |
|--|-------|------------------|
| Mineral insulating slabs in EIFS | | years |
| Other applications of mineral insulating products | | years |
| Reference conditions on which the RSL is based (if relevant) | | Individual units |

See EN 15804+A2 clause 6.3.4 and Annex A requirements and guidelines for reference service life

If no reference service life can be determined according to the rules of EN 15804+A2 (Annex A), a default value from a complementary PCR of the CEN/TC product committees, if available, must be used. If no complementary PCR is available, the service life can be declared from service life catalogues, depending on the area of application, stating the source, e.g. according to BAU EPD-M-DOKUMENT-20-Reference-usage-times-20150810 (Austria) or the BBSR table "Useful lives of components on life cycle analysis according to BNB" (Germany). If no information can be found there, the RSL can be derived from other sets of regulations (Eurocodes, other basis).

2.13 Reuse and recycling

Possibilities and scenarios of reuse and recycling must be described.

2.14 Disposal

The different ways of disposal must be described.

The EAK-waste disposal code (Disposal code following the European list of waste) must be declared.

2.15 Further information

Optional details, indication of reference source for additional information, e.g. websites...

3. LCA: Calculation rules

3.1 Declared unit/ Functional unit

The declared resp. functional unit, the mass reference and the conversion factor to 1 kg must be declared in a table.

Specific LCA calculation rules for mineral insulating materials:

The declared unit is 1 m³ insulation material. Option: In addition, the data can be declared referring to a functional unit (e.g. 1 m² insulation material for a specific thermal resistance; R_D -value).

In „Cradle-to-Grave-EPD“, the R-value per unit (= thermal insulation resistance) as per ÖNORM EN 16783 must be indicated as one functional unit.

Table 6: Declared unit

| characterization | value | unit |
|--------------------------------------|-------|-------------------|
| declared unit | 1 | m ³ |
| gross density for conversion into kg | | kg/m ³ |

Table 7: Functional unit

| characterization | value | unit |
|--|-------|----------------|
| functional unit i.e. for R _D = 1 m ² K/W | 1 | m ² |
| Calculation factor for conversion into kg | | - |

If average results of different products are declared, the methods of calculating the average values must be explained.

In this case the average value of nominal density/ weight per unit used for calculating the LCA must be declared as an additional information.

3.2 System boundary

The type of EPD with regard to the applied system boundaries must be specified in the EPD. All building products and materials must declare modules A1-A3, modules C1-C4 and module D. The following EPD types may be specified:

- from the cradle to the factory gate with modules C1-C4 and module D (A1-A3 + C + D);
- from the cradle to the factory gate with options, modules A1-A3, C1-C4 and D (A1-A3 + C + D and additional modules. The additional modules may be one or more modules selected from A4 to B7);
- from cradle to grave and module D (A + B + C + D)

Exceptions to this rule are specified in EN 15804+A2, chapter 5.2.

Note: The specifications for the modules that must be declared no longer correspond to ÖNORM EN 16783:2017 - the specifications from EN 15804:2019+A2 apply primarily.

All declared life cycle stages (modules) are to be marked with an "X" in Table 8. Undeclared modules are to be marked with ND (= not declared).

Table 8: Declared life cycle stages

| PRODUCT STAGE | | | CON-STRUCTION PROCESS STAGE | | USE STAGE | | | | | | | END-OF-LIFE STAGE | | | | BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES |
|---------------------|-----------|---------------|-------------------------------------|----------------------------|-----------|-------------|--------|-------------|---------------|------------------------|-----------------------|-----------------------------|-----------|------------------|----------|---|
| A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| Raw material supply | Transport | Manufacturing | Transport from the gate to the site | Construction, installation | Use | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | De-construction, demolition | Transport | Waste processing | Disposal | Reuse-Recovery-Recycling-potential |
| x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |

X = included in LCA; MND = Module not declared

The modules assessed in the LCA study must be described shortly. It should be made apparent, which processes are calculated in which module and how the system boundaries to nature resp. to other product systems are set (if relevant for the declared product).

If not all modules are declared in an EPD, a clear justification must be given.

Specific LCA calculation rules for mineral insulating materials:

A1-A3

- Calculation of secondary raw materials (used glass, ashes, slag, etc.)
 - Secondary materials /raw materials and fuels from external sources that do not evoke costs for the producer (transport costs not considered) must be declared as value neutral products without loads from the previous product system (e.g. ashes for rock wool production).
 - The collection and sorting of used glass must be allocated to the system of waste disposal of the previous product system. The preparation of recycling glass to be used for the production of glass fibres must be allocated to the product system assessed.
 - Expenses for transport from the location of treatment and possible recycling steps must be calculated without allocation, meaning that they must be allocated to the secondary materials/recycling materials in question.
- Co-product-allocation:
 - Production of rock wool fibres: iron or that can be recycled is produced during the melting process of raw materials and preliminary products in the smelting furnace. In this case an economical allocation must be carried out.
 - Co-products that have been excluded from the declaration (e.g. granulated wool, insulation of building services plants) and whose material flows cannot be subtracted from the production data underlie the rules of allocation from the general rules for LCA calculation.

A4-A5

- Minimum requirements on loss of material
 - min. 10 % of the quantity delivered for slabs used for insulation of exterior walls
 - min. 5 % of the quantity delivered for slabs used for insulation of ceilings
 - min. 3 % of the quantity delivered for loose laid or clamped insulation rolls
 - min. 5 % of the quantity delivered mix of rolls and slabs
 - irrelevant for granulated wool or loose fill products
 - if lower percentages shall be considered, the manufacturer has to provide corresponding evidence

Note: The Product Group Forum of Bau EPD GmbH has determined the above quoted minimal quantities on the basis of facts collected in Austria. These values are higher as the default values in ÖNORM EN 16783 and shall be considered for EPD distributed on or calculated for the Austrian market.

B1-B7

- During the use stage, no material or energy flows relevant for the LCA occur. The stages B1 use and B2 maintenance as well as B3 repair are not relevant for the product group. The stage B4 replacement is equivalent to an end-of-life scenario. No material or energy flows occur during removal of the product. The stages B5 conversion/refurbishment, B6 operational energy use and B7 operational water use are not applicable on insulation products. Therefore: no product group specific rules

C1 - C4 und D

- If the end of life stage is calculated, at least one scenario must consider the disposal of the insulation material in a landfill. For recycling or other ways of treatment other scenarios can be described.

3.3 Flow chart of processes/stages in the life cycle

A meaningful flow chart describing the manufacturing process shall give further aid to comprehension. The flow chart must be subdivided at least into the phases of life cycle declared (production, use, end-of-life). The phases can be partitioned into appropriate process stages.

3.4 Estimations and assumptions

The assumptions and assessments that are important for the interpretation of the life cycle assessment are to be listed here.

3.5 Cut-off criteria

The application of the cut-off criteria according to MS-HB Chapter 5.5.3 must be documented here.

3.6 Data sources

The quality of the collected data must be described.

3.7 Data quality

The sources of the background data sets must be declared. If necessary, additional information on the quality of the used data sets shall be made (estimations). The issuing year of the used data material must be indicated.

3.8 Reporting period

The period under review must be documented (in case of average EPD this would be the basis of the calculated average).

3.9 Allocation

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

- System boundary settings/allocation in the use of recycled and/or secondary raw materials
- Allocation concerning co-products
- Allocation of energy, auxiliary and operating materials used for individual products in a factory
- Loads and credits from recycling or energy recovery of packaging materials and production waste
- Loads and credits 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.

Detailed regulations concerning calculation of secondary materials and allocation MS-HB chapter "LCA rules" apply in all studies.

3.10 Comparability

With reference to comparability of EPD data the following facts must be mentioned:

Comparison or benchmarking of EPD data is only possible, if all compared data sets are calculating following EN 15804, the same programme specific PCR-rules or other additional rules. The same background data sources and software versions must be applied. Moreover, the context of the function in the building or product specific features of performance must be considered.

4. LCA: Scenarios and additional technical information

The following information is mandatory to give for all declared modules, for modules not declared it is optional. If need, additional information can be declared.

4.1 A1-A3 product stage

Following EN 15804 no scenario documentation is required for A1-A3 for the declaration and calculation of these modules lies within the responsibility of the manufacturer and must not be altered by the LCA practitioner.

Note: the masses of packaging per declared unit must be indicated, this is especially important if A5 is not declared.

4.2 A4-A5 Construction process stage

Table 9 and the units listed must be used for calculation the environmental impact of the transport phase.

Table 10 and the units listed must be used for calculation the environmental impact of the installation into the building.

Table 9: Description of the scenario „Transport to building site (A4)“

| Parameters to describe the transport to the building site (A4) | Quantity per unit |
|---|-------------------|
| Average transport distance | km |
| vehicle type, Commission Directive 2007/37/EC (European Emission Standard) | - |
| Fuel type and average consumption of vehicle | l/100 km |
| Maximum transport mass | tons |
| Capacity utilisation (including empty returns) | % |
| Bulk density of transported products | kg/m ³ |
| Volume capacity utilisation factor (factor: =1 or <1 or ≥ 1 for compressed or nested packaged products) | - |

x) The table must be filled with reference to the information available from the datasets used (i.e. in case of transport by ship). The datasets used must be noted in a footnote.

Table 10: Description of the scenario „Installation of the product in the building (A5)“ as per table 8 in ÖNORM EN 15804

| Parameters to describe the installation of the product in the building (A5) | Quantity per unit |
|--|---------------------------------|
| Ancillary materials for installation (specified by material); | Meaningful unit |
| Water use | m ³ |
| Other resource use | kg |
| Electricity demand | kWh or MJ |
| Other energy carrier(s): | kWh or other unit (e.g. litres) |
| Wastage of materials on the building site before waste processing, generated by the product's installation (specified by type) | kg |
| Output materials (specified by type) as result of waste processing at the building site e.g. of collection for recycling, for energy recovery, disposal (specified by route) | kg |
| Direct emissions to ambient air, soil and water | kg |

4.3 B1-B7 use stage

Reference Service life: [a]

The parameters and the units listed in the following tables must be used for calculation the environmental impact of the use stage (B2-B7). The tables can be excluded if no input or output happens. In this case a note of explanation would be sufficient: "In module BX-BY no material resp. mass flows occur, input +/- output = 0

Table 11: Description of the scenario „maintenance (B2)“ based on table 9 in EN 15804

| Parameters maintenance (B2) | value | unit |
|--|-------|--|
| Maintenance process | | Description or source where description can be found |
| Maintenance cycle | | Number per RSL or year ^a |
| Ancillary materials for maintenance, e.g. cleaning agent, specify materials | | Kg/cycle |
| Waste material resulting from maintenance (specify materials) | | kg |
| Net fresh water consumption during maintenance | | m ³ |
| Energy input during maintenance, e.g. vacuum cleaning, energy carrier type, e.g. electricity, and amount, if applicable and relevant | | kWh |

Table 12: Description of the scenario „repair (B3)“

| Parameters repair (B3) | value | unit |
|--|-------|--|
| Repair process | | Description or source where description can be found |
| Inspection process | | Description or source where description can be found |
| Repair cycle | | Number per RSL or year |
| Ancillary materials, e.g. lubricant, specify materials | | Kg or kg/cycle |
| Waste material resulting from repair, (specify materials) | | kg |
| Net fresh water consumption during repair | | m ³ |
| Energy input during repair, e.g. crane activity, energy carrier type, e.g. electricity, and amount | | kWh |

Table 13: Description of scenario „replacement (B4)“

| Parameters replacement (B4) | value | unit |
|--|-------|------------------------|
| Replacement cycle | | Number per RSL or year |
| Energy input during replacement e.g. crane activity, energy carrier type, e.g. electricity and amount if applicable and relevant | | kWh |
| Exchange of worn parts during the product’s life cycle, e.g. zinc galvanised steel sheet, specify materials | | kg |
| | | |

Table 14: Description of scenario „refurbishment (B5)“

| Parameters refurbishment (B5) | value | unit |
|--|-------|--|
| Refurbishment process | | Description or source where description can be found |
| Refurbishment cycle | | Number per RSL or year |
| Energy input during refurbishment e.g. crane activity, energy carrier type, e.g. electricity, and amount if applicable and relevant | | kWh |
| Material input for refurbishment, e.g. bricks, including ancillary materials for the refurbishment process e.g. lubricant, (specify materials) | | kg or kg / cycle |
| Waste material resulting from refurbishment (specify materials) | | kg |
| Further assumptions for scenario development, e.g. frequency and time period of use, number of occupants | | Units as appropriate |

Table 15: Description of scenarios „energy (B6)“ resp. „Water (B7)“

| Parameters energy (B6) and water (B7) | value | unit |
|--|-------|-----------------------|
| Ancillary materials, e.g. lubricant, specify materials | | Kg or kg/cycle |
| Net fresh water consumption | | m ³ |
| Type of energy carrier, e.g. electricity, natural gas, district heating | | kWh or m ³ |
| Power output of equipment | | kW |
| Characteristic performance, e.g. energy efficiency, emissions, variation of performance with capacity utilisation etc. | | units as appropriate |
| Further assumptions for scenario development, e.g. frequency and period of use, number of occupants | | units as appropriate |

Specific LCA calculation rules for mineral insulating materials:

For mineral insulating materials no LCA-relevant material- and energy flows occur in use stage (B1). Therefore results in B1 must be declared with “0”.

During use stage no processes with regard to maintenance, repair or replacement and refurbishment occur, therefore no environmental impact is to calculate in modules B2-B5 (the results must be declared with “0”). Modules B6 and B7 are not relevant for insulating materials, with that no impact is to calculate (B6 and B7 must be declared with “0”).

4.4 C1-C4 End-of-Life stage

Short description of processes concerning disposal and scenarios going with that (i.e. for transport).

Specific LCA calculation rules for mineral insulating materials:

Existing processes of treatment should be described, even if technical or economic framework conditions make treatment not sensible at the time of publication of the EPD.

Table 16: Description of the scenario „Disposal of the product (C1 to C4)“ according to table 12 in EN 15804

| Parameters for End-of-Life stage (C1-C4) | value | Quantity per m ³ insulation material |
|--|-------|---|
| Collection process specified by type | | kg collected separately |

| | | |
|---|--|---|
| | | kg collected with mixed construction waste |
| Recovery system specified by type | | kg for re-use |
| | | kg for recycling |
| | | kg for energy recovery |
| Disposal specified by type | | kg product or material for final deposition |
| Assumptions for scenario development, e.g. transportation | | Appropriate units |

4.5 D Potential of reuse and recycling

Short description of assumptions for reuse-, recover- and recycling processes.

Specific LCA calculation rules for mineral insulating materials:

Any substitutions of primary materials with regards to any considered share of secondary materials from insulating materials removed in C1 must be declared in module D (net flows).

Table 17: Description of the scenario „re-use, recovery and recycling potential (module D)“

(Substituted primary materials resp. technologies must be declared in a separate footnote (including technical information).

| Parameters for module D | value | unit |
|---|-------|-----------------|
| Materials for reuse, recovery or recycling from A4-A5 | | % |
| Energy recovery or secondary fuels from A4-A5 | | MJ/t resp. kg/t |
| Materials for reuse, recovery or recycling from B2-B5 | | % |
| Energy recovery or secondary fuels from B2-B5 | | MJ/t resp. kg/t |
| Materials for reuse, recovery or recycling from C1-C4 | | % |
| Energy recovery or secondary fuels from C1-C4 | | MJ/t resp. kg/t |

5. LCA: results

The declaration of environmental indicators must be listed in the following tables with reference only to the declared life cycle stages. Indicator values should be declared with three valid digits (eventually exponential form (e.g. $1.23E-5 = 0.0000123$). A uniform format should be used for all values of one indicator. It is preferred that the definitions of the environmental indicators are spelled out completely to ensure the best possible readability. If space is needed in case of too many columns the defined abbreviations are accepted.

Note: ÖNORM EN 16783 Section 6.3.6 applies when specifying averages:

Groupings of substances and declaration of mean values are acceptable without stating differences if the differences in each impact category are less than 25%. In other cases, the differences in the impact categories must be given together with mean values.

Table 18: Parameters to describe the environmental impact of mineral insulating products per declared/functional unit

| Parameter | unit | A1-A3 | A4 | A5 | B1 | B2 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|------------------|--|-------|----|----|----|----|----|----|----|----|----|----|----|---|
| GWP total | kg CO ₂ eq. | | | | | | | | | | | | | |
| GWP fossil fuels | kg CO ₂ eq. | | | | | | | | | | | | | |
| GWP biogenic | kg CO ₂ eq. | | | | | | | | | | | | | |
| GWP luluc | kg CO ₂ eq. | | | | | | | | | | | | | |
| ODP | kg CFC-11 eq. | | | | | | | | | | | | | |
| AP | mol H ⁺ eq. | | | | | | | | | | | | | |
| EP freshwater | kg PO ₄ ³⁻ eq. | | | | | | | | | | | | | |
| EP marine | kg N eq. | | | | | | | | | | | | | |
| EP terrestrial | mol N eq. | | | | | | | | | | | | | |
| POCP | kg NMVOC eq. | | | | | | | | | | | | | |
| ADPE | kg Sb eq. | | | | | | | | | | | | | |
| ADPF | MJ H _u | | | | | | | | | | | | | |
| WDP | m3 Welt eq. entz. | | | | | | | | | | | | | |
| Legende | GWP = Global warming potential; luluc = land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP = Eutrophierungspotenzial; 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, deprivation-weighted water consumption | | | | | | | | | | | | | |

Table 19: Additional environmental indicators

| Parameter | Unit | A1-A3 | A4 | A5 | B1 | B2 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|-----------|--|-------|----|----|----|----|----|----|----|----|----|----|----|---|
| PM | disease incidence | | | | | | | | | | | | | |
| IRP | kBq U235 eq. | | | | | | | | | | | | | |
| ETP-fw | CTUe | | | | | | | | | | | | | |
| HTP-c | CTUh | | | | | | | | | | | | | |
| HTP-nc | CTUh | | | | | | | | | | | | | |
| SQP | dimension-less | | | | | | | | | | | | | |
| Legende | PM = Potential incidence of disease due to Particulate Matter emissions; IRP = Potential Human exposure efficiency relative to U235; ETP-fw = Potential Comparative Toxic Unit for ecosystems; HTP-c = Potential Comparative Toxic Unit for humans – cancer effect; HTP-nc = Potential Comparative Toxic Unit for humans – non-cancer effect; SQP = Potential soil quality index | | | | | | | | | | | | | |

Table 20: Parameters to describe the use of resources of mineral insulating products per declared/functional unit

| Parameter | unit | A1-A3 | A4 | A5 | B1 | B2 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|-----------|---|-------|----|----|----|----|----|----|----|----|----|----|----|---|
| PERE | MJ, net calorific value | | | | | | | | | | | | | |
| PERM | MJ, net calorific value | | | | | | | | | | | | | |
| PERT | MJ, net calorific value | | | | | | | | | | | | | |
| PENRE | MJ, net calorific value | | | | | | | | | | | | | |
| PENRM | MJ, net calorific value | | | | | | | | | | | | | |
| PENRT | MJ, net calorific value | | | | | | | | | | | | | |
| SM | kg | | | | | | | | | | | | | |
| RSF | MJ, net calorific value | | | | | | | | | | | | | |
| NRSF | MJ, net calorific value | | | | | | | | | | | | | |
| FW | m ³ | | | | | | | | | | | | | |
| Legend | PERE = Renewable primary energy as energy carrier; PERM = Renewable primary energy resources as material utilization; PERT = Total use of renewable primary energy resources; PENRE = Non-renewable primary energy as energy carrier; PENRM = Non-renewable primary energy as material utilization; 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 fresh water | | | | | | | | | | | | | |

contains restrictions that must be declared according to the following classification in the project report and in the EPD with regard to the declaration of relevant core and additional environmental impact indicators.

Table 21 contains restrictions that must be declared according to the following classification in the project report and in the EPD with regard to the declaration of relevant core and additional environmental impact indicators.

Table 21: Classification of disclaimers to the declaration of core and additional environmental impact indicators

| ILCD-classification | Indicator | Disclaimer |
|--|---|------------|
| ILCD-Type 1 | GWP Global Warming Potential | none |
| | ODP Ozone Depletion Potential | none |
| | PM Particulate Matter | none |
| ILCD-Type 2 | Acidification potential, Accumulated Exceedance (AP) | none |
| | Eutrophication potential, Fraction of nutrients reaching freshwater end compartment (EP-freshwater) | none |
| | Eutrophication potential, Fraction of nutrients reaching marine end compartment (EP-marine) | none |
| | Eutrophication potential, Accumulated Exceedance (EP-terrestrial) | none |
| | Formation potential of tropospheric ozone (POCP) | none |
| | Potential Human exposure efficiency relative to U235 (IRP) | 1 |
| ILCD-Type 3 | Abiotic depletion potential for non-fossil resources (ADP-minerals&metals) | 2 |
| | Abiotic depletion potential for fossil resources (ADP-fossil) | 2 |
| | Water (user) deprivation potential, deprivation-weighted water consumption (WDP) | 2 |
| | Potential Comparative Toxic Unit for ecosystems (ETP-fw) | 2 |
| | Potential Comparative Toxic Unit for humans (HTP-c) | 2 |
| | Potential Comparative Toxic Unit for humans (HTP-nc) | 2 |
| | Potential Soil quality index (SQP) | 2 |
| Disclaimer 1 – 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 nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator. | | |
| Disclaimer 2 – The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. | | |

Table 22: Parameters describing LCA-output flows and waste categories of mineral insulating products per declared/functional unit

| Parameter | unit | A1-A3 | A4 | A5 | B1 | B2 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|-----------|---|-------|----|----|----|----|----|----|----|----|----|----|----|---|
| HWD | kg | | | | | | | | | | | | | |
| NHWD | kg | | | | | | | | | | | | | |
| RWD | kg | | | | | | | | | | | | | |
| CRU | kg | | | | | | | | | | | | | |
| MFR | kg | | | | | | | | | | | | | |
| MER | kg | | | | | | | | | | | | | |
| EEE | MJ | | | | | | | | | | | | | |
| EET | MJ | | | | | | | | | | | | | |
| Legend | 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 electric energy; EET = Exported thermal energy | | | | | | | | | | | | | |

Table 23: Information for description biogenic carbon content at factory gate

| Biogenic carbon content | unit |
|--|------|
| Biogenic carbon content in the product | kg C |
| Biogenic carbon content of packing | kg C |
| Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO ₂ | |

If the mass of biogenic carbon containing materials in the product is less than 5 % of the mass of the product, the declaration of biogenic carbon content may be omitted.

If the mass of biogenic carbon containing materials in the packaging is less than 5 % of the total mass of the packaging, the declaration of the biogenic carbon content of the packaging may be omitted.

6. LCA: Interpretation

For better understanding of the LCA, the aggregated indicators of the inventory analysis as well as those of the impact assessment (LCIA) from chapter 5 must be interpreted in a dominance analysis. The interpretation must describe a range resp. variance of LCIA results, if the EPD is valid for more than one product.

It is recommended to illustrate the results with graphic elements (i.e. the dominance analysis showing distribution of environmental impacts over several modules...)

When declaring average products, the range of possible results for the individual products for the main impact categories that are relevant to the materials used must be specified.

As for module D, the interpretation must declare, that the benefits and loads lie beyond the system boundary. Any graphic elements showing result interpretation of the life cycle must be created in a way, that modules A1-C4 and module D are displayed separate picture elements. Alternatively, the results can be interpreted without graphic elements.

Extension of an EPD:

It is mandatory to declare in a separate block in the project report:

Reasons for deviations of results of single indicators of more than 15% compared to the results before. This serves as an information for verifiers and enhances legal compliance. Users of the data can be informed of such facts.

Claims that can be published (i.e. same framework conditions, different electricity mix) can be declared in the EPD, if desired.

7. Literature

Relevant standards and sources for the preparation of the EPD resp. for the definition of the product must be listed here. The full documentation of references is to be done as follows:

Author, First name. and Author, First name. (year). Title of article. subtitle. location: publishing company.
 Author, First name. (year). Title of article. In: Surname, First name. and Surname, First name. (Publishing company): Name of paper. Bd. 2 or year number, 207-210.
 Organisation (Year): Full name of standard or rule. Date of Issue. Location. Legal institution.

Always to be quoted:

ÖNORM EN 13162: Thermal insulation products for buildings - Factory made mineral wool (MW) products - Specification

ÖNORM EN ISO 14040 Environmental management - Life cycle assessment -- Principles and framework

ÖNORM EN ISO 14044 Environmental management - Life cycle assessment -- Requirements and guidelines

ÖNORM EN ISO 14025 Environmental labels and declarations -Type III environmental declarations -- Principles and procedures

ÖNORM EN 15804 Sustainability of construction works - environmental product declarations. Core rules for the product category of construction products

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

Management system handbook including applicable documents from Bau EPD GmbH

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8.3 Abbreviations

8.3.1 Abbreviations as per ÖNORM EN 15804

| | |
|------|--|
| 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 |
| EPBD | Energy Performance of Buildings Directive |
| GWP | global warming potential |
| ODP | depletion potential of the stratospheric ozone layer |
| AP | acidification potential of soil and water |
| EP | eutrophication potential |
| POCP | formation potential of tropospheric ozone |
| ADP | abiotic depletion potential |

8.3.2 Abbreviations as per PCR on hand

| | |
|---------|---|
| CE-mark | french: Communauté Européenne or Conformité Européenne = EC certificate of conformity |
| REACH | Registration, Evaluation, Authorisation and Restriction of Chemicals |



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Name of Institution (if rel.)
Address
Postcode, Location

Mail Person creator
Tel
Fax
Mail
Web

Logo

Owner of the declaration

Name of creator in person
Name of Institution (if rel.)
Address
Postcode, Location

Tel
Fax
Mail
Web