

# 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



[www.bau-epd.at](http://www.bau-epd.at)

## Part B: Requirements on the EPD for Wood cement – mineralbonded wood based products

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## Contents

1. Scope .....	5
Requirements on the layout of the EPD .....	5
Content of the EPD.....	5
1. General information .....	7
2. Product .....	9
2.1 General product description .....	9
2.2 Application field .....	9
2.3 Standards, guidelines and regulations relevant for the product .....	9
2.4 Technical data .....	9
2.5 Basic/auxiliary materials .....	10
2.6 Production .....	11
2.7 Packaging.....	11
2.8 Conditions of delivery.....	11
2.9 Transport.....	12
2.10 Processing/ installation .....	12
2.11 Use stage.....	12
2.12 Reference service life (RSL).....	12
2.13 Reuse and recycling .....	13
2.14 Disposal.....	13
2.15 Further information .....	13
3. LCA: Calculation rules.....	14
3.1 Declared unit/ Functional unit .....	14
3.2 System boundary.....	14
3.3 Flow chart of processes/stages in the life cycle.....	16
3.4 Estimations and assumptions.....	16
3.5 Cut-off criteria.....	16
3.6 Data sources .....	16
3.7 Data quality.....	16
3.8 Reporting period .....	16
3.9 Allocation.....	16
3.10 Comparability .....	17
4. LCA: Scenarios and additional technical information .....	17
4.1 A1-A3 product stage.....	17
4.2 A4-A5 Construction process stage.....	17
4.3 B1-B7 use stage.....	18
4.4 C1-C4 End-of-Life stage.....	20
4.5 D Potential of reuse and recycling.....	20
5. LCA: results.....	21

6. LCA: Interpretation .....	25
7. Literature .....	26
8. Directory and Glossary.....	26
8.1 List of figures.....	26
8.2 List of tables.....	26
8.3 Abbreviations.....	27

## 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 mineralbonded wood-based products, long known as "wood cement". Wood cement is a wood-based material (e.g. cement-bonded chipboard) made from wood with mineral binders (cement or magnesite).

The shape and type of the products (semi-finished goods, finished goods, etc.) and the surface finish must be declared.

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 16485- Round and sawn timber - Environmental Product Declarations - Product category rules for wood and wood-based products for use in construction
- Requirements from EN 16449-Wood and wood-based products - Calculation of the biogenic carbon content of wood and conversion to carbon dioxide
- 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](http://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 wood cement** and **specific LCA calculation rules for wood cement** 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



OWNER AND PUBLISHER	Bau EPD GmbH, A-1070 Wien, Seidengasse 13/3, <a href="http://www.bau-epd.at">www.bau-epd.at</a>
PROGRAMME OPERATOR	Bau EPD GmbH, A-1070 Wien, Seidengasse 13/3, <a href="http://www.bau-epd.at">www.bau-epd.at</a>
HOLDER OF THE DECLARATION	Name of declaration holder
DECLARATION NUMBER	To be accorded with Bau EPD GmbH
ISSUE DATE	Date
VALID TO	Date
NUMBER OF DATASETS	Number
ENERGY MIX APPROACH	MARKET BASED APPROACH

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

Contents:

<b>Content of the EPD .....</b>	<b>5</b>
1. General information .....	7
2. Product .....	9
2.1 General product description .....	9
2.2 Application field .....	9
2.3 Standards, guidelines and regulations relevant for the product .....	9
2.4 Technical data .....	9
2.5 Basic/auxiliary materials .....	10
2.6 Production .....	11
2.7 Packaging.....	11
2.8 Conditions of delivery.....	11
2.9 Transport .....	12
2.10 Processing/ installation .....	12
2.11 Use stage .....	12
2.12 Reference service life (RSL) .....	12
2.13 Reuse and recycling .....	13
2.14 Disposal.....	13
2.15 Further information .....	13
3. LCA: Calculation rules .....	14
3.1 Declared unit/ Functional unit .....	14
3.2 System boundary .....	14
3.3 Flow chart of processes/stages in the life cycle .....	16
3.4 Estimations and assumptions .....	16
3.5 Cut-off criteria.....	16
3.6 Data sources.....	16
3.7 Data quality .....	16
3.8 Reporting period .....	16
3.9 Allocation .....	16
3.10 Comparability .....	17
4. LCA: Scenarios and additional technical information .....	17
4.1 A1-A3 product stage.....	17
4.2 A4-A5 Construction process stage.....	17
4.3 B1-B7 use stage.....	18
4.4 C1-C4 End-of-Life stage .....	20
4.5 D Potential of reuse and recycling.....	20
5. LCA: results.....	21
6. LCA: Interpretation .....	25
7. Literature.....	26
8. Directory and Glossary .....	26
8.1 List of figures .....	26
8.2 List of tables .....	26
8.3 Abbreviations .....	27

**1. General information**

<p><b>Product name</b> Name and description of product</p>	<p><b>Declared Product / Declared Unit</b> Description of the declared product and declared unit/functional unit</p>
<p><b>Declaration number</b> To be accorded with Bau EPD GmbH</p>	<p><b>Number of datasets in EPD Document(s):</b> XX</p>
<p><b>Declaration data</b> <input type="checkbox"/> Specific data <input type="checkbox"/> Average data</p>	<p><b>Range of validity</b> The products considered in the data of the life cycle assessment and for which the declaration applies must be named.</p>
<p><b>Declaration based on:</b> 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>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><b>Type of Declaration as per EN 15804</b> From cradle to ... .. LCA-method: (i.e. Cut-off by classification)</p>	<p><b>Database, Software, Version</b> Declaration of background database, Software used and both its versions <b>Version Characterisation Factors:</b> Quelle, Version</p>
<p><b>Author of the Life Cycle Assessment</b> Name of the author Institution, Address website</p>	<p><b>The CEN standard EN 15804:2014+A1 serves as the core-PCR.</b> <b>Independent verification of the declaration according to ISO 14025:2010</b>  <input type="checkbox"/> internally      <input checked="" type="checkbox"/> externally  <b>Verifier 1:</b>      Name <b>Verifier 2:</b>      Name</p>
<p><b>Holder of the Declaration</b> Name of the manufacturer/owner Institution, Address website</p>	<p><b>Owner, Publisher and Programme Operator</b> Bau EPD GmbH Seidengasse 13/3 1070 Vienna Austria</p>

DI (FH) DI DI Sarah Richter  
Head of Conformity Assessment Body

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 wood cement:

- Explanation based on an example:
- The declared product is, for example, a panel with the following dimensions..., one m<sup>2</sup> of material with a layer thickness of...

### 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.

#### Specific notes for the creation of an EPD for wood cement:

None.

### 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 wood cement:

The standards regulating wood cement must be cited (i.e. standards, guidelines, other regulations)  
Examples for product standards for wood cement in Austria are illustrated in table 1.

Table 1: Product specific standards

Standard	Title
ÖN EN 13986:2015 06 01	Wood-based panels for use in construction - Characteristics, evaluation of conformity and marking
ÖN EN 13964:2014 09 15	Suspended Ceilings - <i>Requirements</i> and Test Methods

### 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 wood cement:

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 2: Technical data of the declared construction product (Table normative, only relevant data for the specific data must be declared)**

Characterization	Value	Unit
Moisture content upon delivery as per ÖNORM EN 322		%
Dimensional deviation		mm
length (min. - max.)		m
width (min. - max.)		m
Layer thickness (min. - max.)		m
Bulk density as per ÖNORM EN 323		kg/m <sup>3</sup>
grammage		kg/m <sup>2</sup>
Thermal conductivity as per ÖNORM EN ISO 10456		W/(mK)
water vapour diffusion resistance factor as per ÖNORM EN ISO 10456		-
Sound absorption coefficient (depending on the system)		-
Fire behaviour as per EN 13501-1		-

For specific EPD the technical data of the product must be declared as required in Table 2.

For average EPD (“Sector or Branch-EPD”, “Group EPD” or “EPD from Associations”) Table 2 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 m<sup>2</sup> used for calculating the LCA must be declared as an additional information in chapter 3.1.

## 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 REACH<sup>1</sup>. 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 (ECHA<sup>2</sup>). 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.

<sup>1</sup> 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

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

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 wood cement:**

The raw materials must be declared. Specification of all raw materials in mass-% (average amounts used), separated according to raw materials such as wood types (hardwood, softwood, used wood according to the recycling wood ordinance), binding agent type, composition and content. Indication of whether it is atro conditions or equilibrium moisture content when leaving the factory gate. Auxiliaries and additives that remain with the product must also be declared, in particular surface coatings and water repellents. For additives such as fire retardants or wood preservatives, plasticizers or biocides, at least the function and the substance class (e.g. borate-based fire retardants) must be specified.

**Table 3: base materials in mass-% (example)**

Components	Function	Mass fraction in percent
Fichtenholz <sup>1)</sup>	Structure material	
Caustic burnt magnesite (MgO) <sup>2)</sup>	Binder CAS 1309-48-4	
....	....	....

Optional: footnote with description for each component

**Auxiliaries / additives**

Specifications and proportions of excipients are to be stated (in text or tabular format)

**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 wood cement:**

Origin and proportion of the raw materials, manufacturer-specific and special process chains, special processing methods.

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

Description of chart

**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 wood cement:**

Example: As a rule, mineral-bound wood-based materials are delivered in boxes on pallets as a stacking aid.

**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).

## 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 wood cement:

The installation or installation of mineral-bound wood-based materials depends on the planned application and the respective product characteristics. References to detailed processing guidelines and information on safe processing from the manufacturer are possible.

## 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 wood cement:

If wood-cement 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 wood cement:

According to current scientific knowledge, the service life of load-bearing wood-based materials is unlimited and corresponds to the service life of the components or the building. The load-bearing function of the wood-based material remains unrestricted over the service life if it is installed properly and professionally and is used trouble-free.

Non-load-bearing wood-based materials can be removed at any time for economic, aesthetic, use-related, etc. reasons.

Table 4: Reference service life (RSL)

Characterization	value	unit
Product name		years
Differentiation indoor and outdoor etc. so relevant		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 PKR 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 wood cement:

The declared unit is 1 m<sup>3</sup>. Alternatively, 1 m<sup>2</sup> can be declared for flat materials or a meaningful functional unit must be specified for cradle-to-grave EPDs (1 m<sup>2</sup> is usually suitable). The moisture in the delivery condition must be specified. The reference to mass (density or weight per unit area) must be specified.

Table 5: Declared unit/Functional unit 1 m<sup>3</sup>

characterization	value	unit
declared unit	1	m <sup>3</sup>
Wood moisture or moisture content on delivery		%
gross density for conversion into kg		kg/m <sup>3</sup>

Table 6: Declared unit/Functional unit 1 m<sup>2</sup>

characterization	value	unit
Deklarierte Einheit/Funktionale Einheit	1	m <sup>2</sup>
Wood moisture or moisture content on delivery		%
Layer thickness		m
Grammage 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 7. Undeclared modules are to be marked with ND (= not declared).

Table 7: 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 wood cement:**

**A1-A3**

Accounting of secondary raw materials:

o Recycled wood from other production companies is subject to the allocation rules of the general guideline for life cycle assessment.

o Recycled wood that is obtained from recycling companies or directly from the place where it occurs must be accounted for as a pollution-free product (without allocation from the previous product life). The carbon content (balancing the bound CO<sub>2</sub>) and energy content (based on net calorific value) of the recycled wood is included in the new product system. The transport from the point of origin to the production site and any reprocessing steps must be accounted for.

Co-product allocation:

Co-products (saw by-products such as wood chips, bark, sawdust) and their material flows, which cannot be calculated from the production data, are subject to the allocation rules of the general guideline for the life cycle assessment according to EN16485, -i.e. if the difference in the revenues of the main product and the co-product is less than 25%, an allocation based on physical variables must be carried out. The correct assignment of the loads of the product system to the co-products with regard to the respective functional unit (equivalent co-products) is thus guaranteed. If the difference in the revenues of the main product and the co-product is more than 25%, an economic allocation must be made. The correct assignment of the loads of the product system to the co-products with regard to the respective declared unit (co-products have different values in terms of their benefit) is thus guaranteed. Material flows that contain specific material-inherent properties such as energy content, elementary composition (e.g. biogenic carbon content) should always be allocated in such a way that the physical flows are mapped independently of the allocation method selected for the process.

Note: According to EN 16485, contributions to the total revenue of the product system of the order of 1% or less are classified as very small and can therefore be neglected (cut-off). The correct representation of the physical properties of the product (e.g. carbon content, primary energy content) must be ensured in any case and adjusted accordingly if necessary.

Example 1: A product system generates a main product and a co-product. The main product has a revenue of 100 €/t and the by-product 76 €/t, so this results in a difference in revenue related to the main product of 24 €/t, which corresponds to 24%. This is classified as a high influence of the co-product on the overall system and the allocation is therefore based on physical variables.

Example 2: A product system generates a main product and a co-product. The main product has a revenue of 100 €/t and the by-product 25 €/t, so this results in a difference in revenue related to the main product of 75 €/t, which corresponds to 75%. This is classified as a minor influence of the co-product on the overall system and the allocation is therefore based on economic variables.

#### A4-A5

Minimum requirements for material losses Transport: Material losses are negligible. Installation: A realistic material loss must be specified for the specific product and application.

#### B1-B7

B1 to B3 are not relevant for the product. The stage B4 replacement is equivalent to the product end of life.

#### C1 - C4 und D

The possible disposal scenarios must be described. In any case, one scenario must represent landfilling. Note for all relevant modules on carbonation: Subject of carbonation: According to EN 15804:2019+A2, the manufacturer is free to decide whether he wants to map the environmental impact of carbonation processes. If a representation is desired, proceed in accordance with EN 16575 (Annex BB).

### 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.

#### **Specific LCA calculation rules for wood cement:**

According to ÖNORM EN 16485, all environmental impacts are assigned to the different types of wood, taking into account the yield. Further measures can then be assigned to the assortments that go through the processes

### **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 in the same version, 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.

#### **Specific LCA calculation rules for wood cement:**

The forest with its diverse functions is outside the product system. The system boundary must be set in such a way that those processes that provide material and energy flows into the system are within (ÖNORM EN 16485, 6.3.4.2). No or a positive change in the C content in the pool is assumed for sustainably managed forests.

All forestry processes associated with timber harvesting, such as thinning, afforestation, etc. are considered to be within the product system. The extraction of biomass for energy purposes is seen as independent of the wood harvest for material use and outside of the product system.

For the balancing of the wood system, the carbon content of the wood taken from the forest at the system entry is calculated negatively (given as CO<sub>2</sub>, which was removed from the atmosphere by the wood during the course of growth), but the energy content (net calorific value) as a material property is calculated positively. Energy content and biogenic carbon are considered as material properties (ÖNORM EN 16485, 6.3.4.2). The flows leaving the system are calculated accordingly at the system boundary - the biogenic carbon is calculated positively as the release of carbon dioxide (in the case of thermal use as an emission in Module C, otherwise as a material release), the energy content used is calculated as the output of renewable final energy (can be calculated in Module D be taken into account (ÖNORM EN 16485, Fig. 1.)).

### **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 8: 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 <sup>3</sup>
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 9: 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 <sup>3</sup>
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 10: 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 <sup>a</sup>
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 <sup>3</sup>
Energy input during maintenance, e.g. vacuum cleaning, energy carrier type, e.g. electricity, and amount, if applicable and relevant		kWh

**Table 11: 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 <sup>3</sup>
Energy input during repair, e.g. crane activity, energy carrier type, e.g. electricity, and amount		kWh

Table 12: 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 13: 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 14: 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 <sup>3</sup>
Type of energy carrier, e.g. electricity, natural gas, district heating		kWh or m <sup>3</sup>
Power output of equipment		kW
Characteristic performance, e.g. energy efficiency, emissions, variation of		units as appropriate

performance with capacity utilisation etc.		
Further assumptions for scenario development, e.g. frequency and period of use, number of occupants		units as appropriate

**Specific LCA calculation rules for wood cement:**

Specification of the use (B1) according to chap. 3.6.3 Use Phase. The carbon stored in the usage phase, calculated according to ÖNORM EN 16449, can be specified as storage of CO<sub>2</sub>eq for the duration of the reference usage period as technical information. For built-in products, any effects of the life cycle phases B1-B7 on the life cycle assessment of the product must be specified. Maintenance, cleaning and other surface treatment, etc. should be mentioned here. Modules B6 and B7 are not relevant to the product.

**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 wood cement:**

Brief description of the disposal process and the assumed scenarios (e.g. for transport). If the disposal phase is accounted for, at least one scenario must include landfill if this corresponds to standard waste management practice or legislation. Further scenarios for recycling can be created.

The flows leaving the system are accordingly offset at the system boundary – the biogenic carbon is counted positively as carbon dioxide emissions (if the material is landfilled, the whereabouts of the biogenically bound carbon in the landfill must be treated as an emission from the technosphere into the natural environment. )

If waste wood is used, the CO<sub>2</sub> bound in the waste wood must be taken into account on the input side with the corresponding negative GWP; the energy content (net calorific value) is accounted for as consumption of "energy from secondary materials".

However, if the waste end is reached through processing processes (secondary raw materials or fuels), the processing processes required for this are to be calculated in C3, but the actual recycling processes and their loads lie outside the product system. In both cases, credits for the provided energy or secondary raw materials are possible in Germany.

The charging of disposal methods is shown in Table 1 of ÖNORM EN 16485 for comparison.

**Table 15: 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 <sup>3</sup> 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 wood cement:**

none

**Table 16: 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.

Table 17: 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 <sub>2</sub> eq.													
GWP fossil fuels	kg CO <sub>2</sub> eq.													
GWP biogenic	kg CO <sub>2</sub> eq.													
GWP luluc	kg CO <sub>2</sub> eq.													
ODP	kg CFC-11 eq.													
AP	mol H <sup>+</sup> eq.													
EP freshwater	kg PO <sub>4</sub> <sup>3-</sup> eq.													
EP marine	kg N eq.													
EP terrestrial	mol N eq.													
POCP	kg NMVOC eq.													
ADPE	kg Sb eq.													
ADPF	MJ H <sub>u</sub>													
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 18: 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	dimensionless													
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 19: 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 <sup>3</sup>													
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 20 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 20: 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 21: 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 22: 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 <sub>2</sub>	

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 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 EN 16485- Round and sawn timber - Environmental Product Declarations - Product category rules for wood and wood-based products for use in construction
- ÖNORM EN 16449-Wood and wood-based products - Calculation of the biogenic carbon content of wood and conversion to carbon dioxide
- Management system handbook including applicable documents from Bau EPD GmbH

## 8. Directory and Glossary

### 8.1 List of figures

Figure 1: Example of a flow chart/graphic production stage..... 11

### 8.2 List of tables

Table 1: Product specific standards .....	9
Table 2: Technical data of the declared construction product (Table normative, only relevant data for the specific data must be declared).....	10
Table 3: base materials in mass-% (example) .....	11
Table 4: Reference service life (RSL).....	12
Table 5: Declared unit/Functional unit 1 m <sup>3</sup> .....	14
Table 6: Declared unit/Functional unit 1 m <sup>2</sup> .....	14
Table 7: Declared life cycle stages.....	15
Table 8: Description of the scenario „Transport to building site (A4)“ .....	18
Table 9: Description of the scenario „Installation of the product in the building (A5)“ as per table 8 in ÖNORM EN 15804 ...	18
Table 10: Description of the scenario „maintenance (B2)“ based on table 9 in EN 15804 .....	18
Table 11: Description of the scenario „repair (B3)“ .....	18
Table 12: Description of scenario „replacement (B4)“ .....	19
Table 13: Description of scenario „refurbishment (B5)“ .....	19
Table 14: Description of scenarios „energy (B6)“ resp. „Water (B7)“ .....	19
Table 15: Description of the scenario „Disposal of the product (C1 to C4)“ according to table 12 in EN 15804 .....	20
Table 16: Description of the scenario „re-use, recovery and recycling potential (module D)“ .....	20
Table 17: Parameters to describe the environmental impact of mineral insulating products per declared/functional unit .....	21
Table 18: Additional environmental indicators.....	22
Table 19: Parameters to describe the use of resources of mineral insulating products per declared/functional unit .....	23
Table 20: Classification of disclaimers to the declaration of core and additional environmental impact indicators .....	24

Table 21: Parameters describing LCA-output flows and waste categories of mineral insulating products per declared/functional unit..... 25  
 Table 22: Information for description biogenic carbon content at factory gate ..... 25



### 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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