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

Akkreditierung Austria
0966
ISO/IEC 17065

www.bau-epd.at

Part B: Requirements on the EPD for

EPS-XPS-insulating materials

PCR-Code: 2.22.1 Version 18.0 Date Feb. 25, 2025

Table of contents

Imprint 4
Tracking of versions, changes 5
Scope 6
Requirements on the layout of the EPD 6
Content of the EPD 7
1 General information 7
2 Product 8
2.1 General product description 8
2.2 Application field 9
2.3 Standards, guidelines and regulations relevant for the product 11
2.4 Technical data 11
2.5 Basic/auxiliary materials 14
2.6 Production process 15
2.7 Packaging 16
2.8 Conditions of delivery 16
2.9 Transport to the construction site 16
2.10 Processing / installation 16
2.11 Use stage 16
2.12 Reference Service Life (RSL) 16
2.13 End of life stage 17
2.14 Further information 17
3 LCA Calculation Rules 17
3.1 Declared Unit / Functional Unit 17
3.2 System Boundary 18
3.3 Flow chart of processes / stages in the life cycle 20
3.4 Estimations and assumptions 20
3.5 Cut-off criteria 20
3.6 Allocation 20
3.7 Comparability 20
4 LCA: Scenarios and further technical information 20
4.1 A1-A3 product stage 20
4.2 A4-A5 construction process stage 20
4.3 B1-B7 Use stage 22
4.4 C1-C4 End-of-life-stage 24
4.5 D Potential for reuse and recycling 24
5 Information on data quality and data selection in accordance with EN 15941 25
5.1 Basics for the description of data quality 25
5.2 Description of the temporal, geographical and technological representativeness of the product data 25
5.3 Explanations on averaging 26
5.4 Assessment of the data quality of the life cycle inventory data 26
5.4.1 Summarized assessment in the EPD 26
5.4.2 Documentation and evaluation of the raw data and the inventory analysis in the project report 27
5.4.3 Documentation of the generic and specific data used in the project report 27
5.4.4 Assessment of the data quality of the relevant data in the project report 27
5.4.5 Checking the mass balance in the project report 28
5.4.6 Proof of avoidance of double counting in the valuation of electricity and all other relevant energy 28
5.4.7 Documentation to support any statement contained in the EPD in the project report 28
5.4.8 General note 28
6 LCA-results 28

7 LCA: Interpretation 32
8 Presentation of the representativeness of average EPD 32
9 Literature 33
10 Directory and Glossary 33
10.1 Abbreviations 33
10.1.1 Abbreviations as per EN 15804 33
10.1.2 Abbreviations as per PCR on hand 33
I. Documentation of the data collection and calculation procedure 34
II. Detailed table of basic substances 34
III. Life cycle inventory, input-output tables, LCA model 34
IV. Description of the data quality of authoritative data according to the ILCD data format 35

list of illustrations 39
table directory 39

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Tracking of versions, changes

Table 1: Version history

Version	Comments	Date of changes
10.0	Adaptation as per EN 15804:2019+A2:2019; adaptation of rules for declaration of geographical representativity	2020-11-05
11.0	Public version for interested parties after approval of PCR review panel.	2021-01-12
12.0	Consideration of comments, approval for EPD creation	2021-04-07
13.0	Adaptation tables module B and C, minor editorial changes	2021-08-27
14.0	Change ECO Platform logo, note to photographic rights, minor editorial changes (created by SR, checked by FG and approved by SR)	2021-11-27
15.0	Addition of accreditation mark, change owner, publisher, holder of declaration, specification of CF factors, editorial changes, title page EPD declaration of Energy Mix Approach, (created by SR, checked by FG and approved by SR)	2023-01-27
16.0	Various minor changes: EP Freshwater Corrigendum table: unit P instead of PO4, editorial changes, rules for the application of c-PCR, adaptation of rules for new issue (correct term instead of extension, see MS-HB supplement) in interpretation, graphics now only required in project report, deletion of reference to subchapters of valid CEN standards (created by SR, checked by FG and approved by SR)	2023-09-20
17.0	Incorporation of new features in accordance with EN 15941, incorporation of resolution Adaptation to French totals columns in results tables, minor editorial changes (created SR, checked FG and approved SR)	2024-10-10
18.0	**Redundancy in Chapter 2.9 removed, Annexes 3 and 4 have been exchanged; Annex 3 mandatory, Annex 4 only informative, minor editorial changes** **(created SR, checked FG and released SR)**	**2025-02-25**

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.

The document applies to factory-made insulating materials made of expanded polystyrene foam (EPS) and extruded polystyrene foam (XPS) in accordance with the following standards:

- ÖNORM EN 13163 Thermal insulation products for buildings - Factory made expanded polystyrene (EPS) products - Specification
- ÖNORM EN 13164 Thermal insulation products for buildings - Factory made products made of extruded polystyrene (XPS) - Specification
- ÖNORM EN 14307 Thermal insulation materials for technical building equipment and for operational systems in industry - Factory-made products made of extruded polystyrene foam (XPS) - Specification ÖNORM EN 14309 Thermal insulation materials for building technology and for operational systems - Factory-made products made of expanded polystyrene (EPS) – specification
- ÖNORM EN 16025-1 Thermal insulation products for thermal and/or acoustic insulation in buildings - Bonded EPS fillers - Part 1 - Requirements for factory premixed EPS dry mortar

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 15941 for data quality information for recording the environmental quality of products - Selection and application of data
- Complementary requirements on EPD of Bau EPD GmbH

- C-PCR: Requirements from EN 16783 as complementary product PCR for insulating materials

Complementary PCR (c-PCR) from CEN, if available, must always be applied at the same time as the PCR-B from Bau EPD GmbH. The documents complement each other.

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).

There are 4 categories of content parts/requirements in the structure für EPDs:

1. category: generally required content for the individual chapters

2. category: specific notes for the creation of an EPD for the construction material in the scope

3. category: specific LCA-rules for the construction material in scope that must be considered when creating the EPD and underlying LCA study.

4. category: 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). This information is free to choose whether to declare or not and indications can be delivered by the holder of the declaration on an optional basis.

Content of the EPD

In this section you will find all the required content elements of the EPD.

1 General information

Product name

Name and description of product

Declaration number

To be accorded with Bau EPD GmbH

Declaration data

Specific data or average data

Declaration based on:

MS-HB version dated dd.mm.yyyy:

Name of PCR:

PCR Code:

Version: *XX, dated dd.mm.yyyy*

(PCR tested and approved by the independent expert committee = "PKR-Gremium")

Version M-14A2 Content and format template:

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.

Type of Declaration as per EN 15804

From cradle to ...

LCA-method: Cut-off by classification

Database, Software, Version

Declaration of backround database, Software used and both its versions

Version Characterisation Factors: Quelle, Version

Declared Product / Declared Unit

Description of the declared product and declared unit/functional unit

Number of datasets in EPD Document: XX

Range of validity

The products, plants and their countries of location on whose data the LCA is based and for which the declaration applies must be named.

In the case of average EPDs, reference must be made to this type of EPD.

The representativeness of the declaration with regard to the production volume covered by the LCA and the technology used must be shown.

The CEN standard EN 15804:2019+A2+corr2021 serves as the core-PCR. The c-PKR of CEN EN XXXXXX was applied.

Independent verification of the declaration according to ISO 14025:2010

internally or externally

Verifier 1: Name

Verifier 2: Name

Author of the Life Cycle Assessment

Name of the author/Institution

Address

Postal Code

Country

Holder of the Declaration

Name of the manufacturer/holder of declaration

Address

Postal Code

Country

Owner, Publisher and Programme Operator

Bau EPD GmbH

Seidengasse 13/3

1070 Vienna

Austria

Signature Head of conformity assessment body

Signature(s) verifier(s)

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

2 Product

Product information must be provided in this section.

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 plant locations for the respective product categories must be specified; alternatively, reference can be made to an overview in the appendix (mandatory information in the project report and EPD document)
- All manufacturers who have provided data for the life cycle inventory of the EPD must be listed (mandatory information in the project report and in the EPD document)

Specific notes for the creation of an EPD for EPS and XPS insulating materials:

- Separate description of EPS and XPS 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.

Specific notes for the creation of an EPD for EPS and XPS insulating materials:

Example as a table format:

For products, the areas of application according to EN 16783 must be ticked in the following table:

Table 2: Applications for thermal insulation in buildings according to EN 16783

Area of application	Designation	Application description	Application specific product(s)
Ceiling, Roof, floor	DAD	External insulation of warm pitched roof or ceiling insulation, protected against weathering, insulation under cover	X
	DAA	External insulation of flat roof or ceiling, protected against weathering, insulation under water proofing	X
	DUK	External insulation of the roof, exposed to the weather (inverted roof)	X
	DZ	Insulation between the rafters, two-shell roof, top floor ceiling not readily walkable but accessible	X
	DI	Interior insulation of the ceiling (underside) or the roof, insulation under the rafters / supporting structure, false ceiling etc.	X
	DEO	Interior insulation of the ceiling or floor plate (top side) below floor screed without acoustic dampening requirements	X
	DES	Interior insulation of the ceiling or floor plate (top side) below screed with acoustic dampening requirements	X
	VR	Thermal insulation between rafters, ventilated space directly above thermal insulation	X
Wall	WAB	External wall insulation behind covers (incl. ventilated façades)	X
	WAA	External wall insulation behind seal	X
	WAP	External Thermal Insulation Composite System with render	X
	WZ	Insulation of double-leaf walls, cavity wall insulation	X
	WH	Insulation of wood frame and wood panel construction	X
	WI	Interior wall insulation (insulation of walls from inside)	X
	WTH	Insulation between the house partition walls with sound insulation requirements (between adjacent houses)	X
	WTR	Insulation of partitioning walls (within one house)	X
Perimeter	PW	External thermal insulation of walls in contact with soil (outside of the water proofing)	X
	PB FI	External thermal insulation under the floor panel in contact with soil outside of water proofing)	X

Table 3: Applications for thermal insulation in building equipment, industry and civil engineering as per EN 16783

Area of application	Designation	Application description	Application specific product(s)
Building equipment	BEF	Flat application	X
	BEL	Linear (e.g. pipe insulation)	X
Industry	IF	Flat application	X
	IL	Linear (e.g. pipe insulation)	X
Civil engineering	CI	Civil Engineering	X
	LWF	Light-weight fill	X
	ILB	Insulation under load-bearing structure	X

2.3 Standards, guidelines and regulations relevant for the product

The applicable standard(s) or a comparable national regulation must be named.

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 EPS and XPS insulating materials:

The standards regulating EPS and XPS insulating materials must be cited (i.e. standards, guidelines, other regulations)

Examples for product standards for EPS and XPS insulating materials in Austria are illustrated in table 4.

Table 4: Product specific standards

Standard	Title
ÖNORM EN 13163:2013-03-01	Thermal insulation products for buildings - Factory made expanded polystyrene (EPS) products - Specification
ÖNORM EN 14309:2016 02 15	Thermal insulation products for building equipment and industrial installations - Factory made expanded polystyrene (EPS) products - Specification

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 EPS and XPS 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.

For declared products according to ÖNORM EN 13163, if applicable, the following technical data with reference to the test standard must be given:

Table 5: Technical characterizations for products as per ÖNORM EN 13163

Characterization	Value	Unit
thermal resistance thermal conductivity Design value of thermal conductivity		$m^2 \cdot K/W$ W/m·K W/m·K
Raw density1) or raw density range		kg/m^3
Euro class of fire behavior according to ÖNORM EN 13501-1	E	
Dimensional stability in normal climate	level	
Dimensional stability under defined temperature and humidity conditions	class	
Compressive stress at 10% compression	level	
flexural strength	level	
Tensile strength perpendicular to the plane of the plate	level	
Deformation under defined pressure and temperature stress	level	
Long-term creep behavior under compressive stress	level	
shear strength and/or shear modulus	level	
Relative deformation under cyclic loading	level	
Water absorption during long-term immersion	level	
Long-term water absorption by diffusion	level	
Resistance to freeze-thaw cycling after water absorption after long-term total immersion	level	
Resistance to freeze-thaw cycling after long-term water absorption by diffusion	level	
Water vapor diffusion resistance factor μ or water vapor diffusion resistance Z	level	- $m^2 \cdot s \cdot Pa/kg$
Dynamic Stiffness	level	
compressibility	level	
Long-term thickness reduction	level	

1) Mean bulk density

For declared products according to ÖNORM EN 14309, the following technical data must be stated with reference to the test standard, if applicable:

Table 6: Technical data for products as per ÖNORM EN 14309

Characterization	Value	Unit
thermal resistance thermal conductivity Design value of thermal conductivity		$m^2 \cdot K/W$ W/m·K W/m·K
Raw density1) or raw density range		kg/m^3
Euro class of fire behavior according to ÖNORM EN 13501-1	E	
Dimensional stability in normal climate	level	
Dimensional stability under defined temperature and humidity conditions	class	
Upper application limit temperature	level	
Lower application limit temperature	level	
Compressive stress at 10% compression	level	
flexural strength	level	
Tensile strength perpendicular to the plane of the plate	level	
Long-term creep behaviour under compressive stress	level	
Water absorption during long-term immersion	level	
Long-term water absorption by diffusion	level	
Freeze-thaw cycling	passed	
Water vapor diffusion resistance factor μ or water vapor diffusion resistance Z		- $m^2 \cdot s \cdot Pa/kg$
Dynamic Stiffness	level	
Long-term thickness reduction	level	
Small amounts of water-soluble ions: chloride, fluoride, silicate and sodium ions	levels	
pH value	Permissible Deviations	

1) Mean bulk density

For individual EPDs, the technical data of the product must be listed as in the required tables.

For average EPD (“Sector or Branch-EPD“, “Group EPD” or “EPD from Associations”) the technical tables 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.

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[1] . 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[2]). 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.

[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

Specific notes for the creation of an EPD for EPS and XPS insulating materials:

Table 7: base materials in mass-% (example)

Components	CAS	Function	Mass fraction in percent
PS granules x)			
Designation of other components, e.g. EPS recyclate x)			
e.g. silicate coating x)		e.g. protection against solar radiation	

Description of the manufacturing process of the PS granules

List of the ingredients in the PS granules including function and quantity in % by mass in Table 7.

Table 8: Basic materials in PS granules (example)

Components	CAS	Function	Mass fraction in percent
Polystyrole x)		main ingredient	
z.B. PolyFR x)		e.g. flame retardants	
z.B. Pentane x)		e.g. propellant	
z.B. Graphite x)		e.g. infrared absorbers	

x) Optional: footnote with description for each component

1) ...

Auxiliaries / additives

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

2.6 Production process

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 EPS and XPS insulating materials:

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

Example of flow chart/graphic

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

Insulation materials made from expanded polystyrene rigid foam are manufactured in a three-stage process:

In the pre-expansion plant, the EPS beads are exposed to steam at around 100 to 110 °C. The polystyrene softens, the pentane vapor pressure increases and the EPS beads expand into foam balls. The contained nucleating agents are responsible for the foam structure.

The most commonly used process for the production of insulating panels is block foaming with subsequent cutting. After foaming, the foam particles are cooled and temporarily stored in silos. Cooling reduces the vapor pressure of the pentane and the water involved. A negative pressure is created in the beads. Air diffuses into the particles while water vapor and pentane escape from the particles. The interim storage lasts about a day. In the third process step, the foam particles are filled into molds (usually cuboid block molds) and foamed with steam at 100 to 120 °C. This leads to further expansion and welding of the particles to form the molded part. The molds are cooled with water and, after a stabilization period, the EPS blocks are removed from the mold. Finally, the blocks are cut into slabs. Edge profiles such as tongue and groove or shiplap can be created by milling.

Panels as molded parts (automatic panels) are produced in molding machines. The finished panels are immediately available in the desired final shape, e.g. folded.

2.7 Packaging

Information concerning each component of packages:

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

Specific notes for the creation of an EPD for EPS and XPS insulating materials:

Example: The products are packed in a polyethylene film (PE-LD, 50-70 µm) and delivered on reusable pallets.

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 to the construction site

Description of the delivery:

Routes and means of transport need to be described.

2.10 Processing / installation

Description of way of treatment, used machines, tools, dust collection etc., auxiliary materials as well as measures of noise reduction.

References to rules of technology and occupational health and safety and environmental protection are possible.

References to detailed processing guidelines and information on safe processing (safe use instruction sheet) from the manufacturer are desirable.

If waste from packaging, for example, is present, this should also be indicated.

Specific notes for the creation of an EPD for EPS and XPS insulating materials:

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

Specific LCA calculation rules for EPS and XPS 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 EPS and XPS insulating materials:

If 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 EPS and XPS insulating materials:

Table 9: Reference service life (RSL)

Characterization	value	unit
EPS or XPS slabs		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 End of life stage

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

2.14 Further information

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

3 LCA Calculation Rules

This section lists LCA calculation rules that apply in addition to or supplement existing international and national standards and regulations.

3.1 Declared Unit / Functional Unit

The declared or functional unit, the mass reference and the conversion factor to 1 kg must be stated in the table provided as declared.

If an average EPD is prepared, the average values used in the LCA and their range must be stated. Reference should be made to the explanations on averaging in section 5.3.

Specific LCA calculation rules for EPS and XPS insulating materials:

The declared unit or functional unit must be selected in accordance with EN 16783, which differentiates between product types (1. mats, boards and similar products, 2. pipe sections and 3. structural applications), focussing on the insulating properties. This standard must be followed.

Table 10: Declared unit/Functional unit depending on the type of application of the insulation material

characterization	value	unit
Declared unit/functional unit	1	m, m^2 oder m^3
RD value, R value, lambda value		$(m^2K)/W$, W/(m*K)
Insulation thickness, if relevant		mm
Diameter, if relevant		mm
Bulk density for conversion to kg		kg/m^3
Conversion factor of the LCA results to 1 m^3 of insulation material, if relevant		

It is mandatory to state the declared/functional unit in m, m^2 or m^3 and the associated RD value, R value or lambda value.

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.

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

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

Image 1: Table: Life cycle modules

X = included in LCA; ND = 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 EPS and XPS insulating materials:

A1-A3

- The minimum requirement for the creation of a product specific EPD is the life cycle inventory data from the preparation of the PS granulate to the EPS or XPS insulating material ready for delivery
- The use of generic data is permitted for balancing the raw materials (PS granulate, coating, etc.) if no process-specific data is available. The generic data set for the PS granules should be based on current industry data [1]
- It must be ensured that the data records are complete. In this context, special attention should be paid to process-specific VOC emissions.
- All pentane emissions are classified as A1-A3.

A4-A5

- Guidelines for material losses
  - 10% of the delivery quantity for insulation panels for insulation of external walls
  - 5% of the delivery quantity for insulating boards for insulating ceilings and roofs
  - If lower values are to be used, the manufacturer must provide evidence of this.

B1-B7

- B1 use: any emissions of propellant residues are already assigned to A1-3.
- B2 maintenance and B3 repairs: Thermal insulation materials do not require any maintenance or repair work under normal conditions and if they have been installed correctly. The environmental impacts are therefore “0” in the default scenario.
- The stage B4 replacement is equivalent to the end of product life. The environmental impacts are therefore “0” in the default scenario.
- Stages B5 conversion/renewal, B6 energy use and B7 water use are not applicable at insulation level. The environmental impacts are therefore “0” in the “Default Scenario”.

C1 - C4 and D

- When balancing the disposal phase, at least one scenario must contain thermal waste recycling or treatment of the insulating material. Further scenarios for recycling such as bound EPS fills can be described.
- Waste collection and treatment processes for thermal utilization within the product system are considered in C3 or C4 if the end of the waste has not been reached. If the energy efficiency rate of the incineration plant is > 60%, the treatment and recovery plant is to be calculated in C3, with rates < 60% in C4. In both cases, credits for the electricity and heat quantities received in Germany are possible.
- Specifications for offsetting reuse, recovery and recycling potential:
  - For the provision of secondary raw materials, the credit is based on the effort required to provide the substituted raw material.

For the production of the substituted raw material, the effort must be used according to the existing market mix of primary and secondary material.

The alternative provision of gas should be used for thermal energy generated, and the national energy mix for electricity generated (see General Life Cycle Assessment Rules of Bau EPD GmbH).

[1] Current life cycle assessment data for EPS granulate http://www.plasticseurope.org/plasticssustainability/eco-profiles.aspx

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 estimates that are important for the interpretation of the LCA must be listed here.

3.5 Cut-off criteria

The application of the cut-off criteria according to MS-HB Chapter 5 must be documented here.

3.6 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.

3.7 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 backround 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 further 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

According to EN 15804, no technical scenario information is required for modules A1-A3 because the balancing of these modules is the responsibility of the manufacturer and may not be changed by the user of the LCA.

In the EPD, the emission factors of the carbon footprint of the electricity mix used must be stated in XX kg CO2e/kWh.

Indication of the energy data sets used is mandatory. Minimum: Indication of whether residual mix or self-modeled data sets were used. The mix of energy sources should be specified/displayed. Information on whether certificates of origin (Guarantees of Origin) are used must be provided.

4.2 A4-A5 construction process stage

The following table and the units listed must be used for calculation the environmental impact of the transport phase.

Table 11: Description of the scenario „Transport to building site (A4)“

Parameters to describe the transport to the building site (A4)[x)]	value	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.

The following table and the units listed must be used for calculation the environmental impact of the installation into the building.

Table 12: Description of the scenario „Installation of the product in the building (A5)“

Parameters to describe the installation of the product in the building (A5)	value	Quantity per unit
Ancillary materials for installation (specified by material);		kg/t t/t l/t
Installation aids (specified by type)		-
Water use		m^3/t l/t
Other resource use		kg/t t/t l/t
Electricity demand		kWh or MJ/t
Other energy carrier(s): ...		kWh or MJ/t
Wastage of materials on the building site before waste processing, generated by the product's installation (specified by type)		kg/t
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/t
Direct emissions to ambient air, soil and water		kg/t

4.3 B1-B7 Use stage

Reference Service life: [a]

Information on B1 optional as long as no horizontal test standards are available. Otherwise 0.

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 13: Description of the scenario „maintenance (B2)"

Parameters maintenance (B2)	value	unit
Maintenance process		description or source where description can be found
Maintenance cycle		number per RSL or year
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 14: 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, specified by materials		kg or kg/cycle
Waste material resulting from repair, (specified by materials)		kg
Net fresh water consumption during repair		m^3
Energy use during the repair, e.g. crane use, type and quantity of energy source, e.g. electricity, where appropriate and relevant		kWh/RSL, kWh/cycle

Table 15: 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 16: 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 17: 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 EPS and XPS insulating materials:

For EPS and XPS 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).

(Collective procedures and return procedures must be defined separately (including technical details) in a footer).

Table 18: Description of the scenario „Disposal of the product (C1 to C4)“

Parameters for End-of-Life stage (C1-C4)	**value**	**unit**
Collection process specified by type		kg $_{\text{collected separately}}$ kg $_{\text{collected with mixed construction waste}}$
Recovery system specified by type		kg $_{\text{for re-use}}$ kg $_{\text{for recycling}}$ kg $_{\text{for energy recovery}}$
Disposal specified by type		kg $_{\text{product or material for final deposition}}$
Assumptions for scenario development, e.g. transportation		appropriate units

Specific LCA calculation rules for EPS and XPS 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.

4.5 D Potential for reuse and recycling

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

(Substituted primary products or technologies must be defined separately (including technical details) in a footer).

Table 19: Description of the scenario „re-use, recovery and recycling potential (module D)“

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

Specific LCA calculation rules for EPS and XPS 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).

5 Information on data quality and data selection in accordance with EN 15941

This section provides information on data quality and selection in accordance with EN 15941.

5.1 Basics for the description of data quality

The information on data quality in the EPD must be consistent with the information on data quality provided in the project report and represent an appropriate summary of this data (EN 15941, point 7.3.3).

The project report must take into account the reporting requirements according to EN 15804:2012+A2:2019, 8.2, for example regarding the provision of information on averaging (see chapter 5.3 below) or on LCA rules such as the definition of system boundaries, cut-off rules, etc. (see chapter 3 LCA: Calculation rules).

The text describing the temporal, geographical and technological representativeness must use the terminology provided for the quality level in EN 15804:2012+A2:2019, Table E.1 and Table E.2 (EN 15941, point 7.3.3).

The EPD must contain the following statement (EN 15941, point 7.3.4):

The following data quality information shall be provided in accordance with the requirements of EN 15941 (EN 15941, point 7.3.4).

5.2 Description of the temporal, geographical and technological representativeness of the product data

With regard to the temporal, geographical and technological representativeness of the product data, at least the following information must be described in the project report and in the EPD:

Temporal representativeness:

- Data collection period for the raw data
- Indication and justification for the deviation from data collection within one year

Geographical representativeness:

- the geographical area where the product is manufactured and where the construction, use and end of use phases of the product are modeled must be detailed.

Technological representativeness:

- Brief description of the technology and/or relevant inputs for the product or service covered by the EPD

Geographical and technological representativeness for EPDs covering a sector:

- Percentage of total consumption or production of the building product or service represented by the EPD in the specified market or region in which the EPD is modeled;

Note: Total consumption includes the mix of products consumed in a region, total production includes the mix of products produced in a region.

- Number of products and/or sites included in the EPD;
- All sampling methods used to select sites must be described;
- The relative production volume covered by the data collection must be described in comparison to the production represented by the EPD;
- An explanation of the averaging procedure must be provided;

5.3 Explanations on averaging

For EPDs that cover an average environmental quality for several products or several locations, the averaging process must be explained.

In Chapter 7 LCA: Interpretation, the range of values and the variation of the impact assessment must be described. The results in the core indicators for the environmental impacts of the individual products or sites should not differ significantly. If major differences in the impacts are identified for the assessed sites and/or products, a reference must be made here to additional explanations in Chapter 7, e.g:

Information on the range of values and the variation of the impact assessment for the individual products can be found in Chapter 7 LCA: Interpretation.

5.4 Assessment of the data quality of the life cycle inventory data

The following sections describe the assessments of the data quality of the life cycle inventories.

5.4.1 Summarized assessment in the EPD

The source of the Life Cycle Inventory datasets must be indicated together with their age (e.g. name and dated version of the Life Cycle Inventory/LCA database). Specific EPDs used in the modeling should also be indicated.

It must be stated which table from EN 15804:2012+A2:2019, Annex E was used to assess the data quality of authoritative data.

Any use of authoritative data rated as poor or very poor in terms of time, geography or technology according to EN 15941, 7.1 and EN 15804:2012+A2:2019, 6.3.8.3

- have been assessed as poor or very poor
- have been assessed as medium and whose assessment has resulted in a contribution to any core indicators of more than 30 %

must be described, including the justification (the justification must only be given in the project report) for the quality level of the data and for the selection of the data set.

5.4.2 Documentation and evaluation of the raw data and the inventory analysis in the project report

The source of the raw data used in the EPD must be specified in the project report together with all sampling methods and calculations used for averaging.

An assessment of the data quality of the raw data and the life cycle inventory determined for the EPD must be provided in the project report based on one of the two systems described in EN 15804:2012+A2:2019, Annex E (Table E.2 is preferable).

5.4.3 Documentation of the generic and specific data used in the project report

The generic and specific data used in the modelling of the EPD, in particular all data sets of the life cycle inventory or of an upstream or downstream EPD, must be documented in the project report.

For the relevant data, the documentation must include the following:

- temporal coverage, e.g. year or years of collection of raw data and statistics, reference year of the life cycle inventory, validity of the EPD, etc.
- geographical scope;
- Technological coverage;
- Source including the year of publication.

In addition, the precision, consistency, completeness of the authoritative data used should be stated; any deviations from the requirements of EN 15804 must be stated and justified in the report, e.g. the use of upstream data that does not respect the allocation principles of EN 15804 must be clearly stated and justified in the project report, see EN 15804:2012+A2:2019, 6.4.3.1.

5.4.4 Assessment of the data quality of the relevant data in the project report

According to EN 15804, point 6.3.8.3, the term 'significant data' refers to data with a major contribution that together account for at least 80% of the absolute impact of each core indicator included in the EPD, considered over the entire life cycle with the exception of Module D, or over those modules of the life cycle that are included in the EPD. The data quality of Module D must also be considered.

The assessment of the data quality of the relevant data in accordance with 7.1 and EN 15804:2012+A2:2019, 6.3.8.3 must be stated in the project report.

It must be stated which table from EN 15804:2012+A2:2019, Annex E was used to assess the data quality of the relevant data.

In Annex 3 - Life cycle inventory, input-output tables, LCA model, tables 3 and 4 show a possible documentation of the data sets used, including a description of the representativeness according to EN 15941 and assessment according to EN 15804, Annex E for relevant process data.

If a more detailed assessment of the data quality is carried out than with Annex 3 (this is voluntary), it is recommended to use the ILCD format as described in Annex 4 analogue to EN 15941.

Any use of relevant data that has been assessed as poor or very poor in terms of time, geography or technology according to EN 15804 Annex E

- rated as poor or very poor,
- has been assessed as medium and whose assessment has resulted in a contribution to any core indicators of more than 30%,

must be described, including the justification for the level of quality of the data and for the selection of the data set.

Any data adjustments to improve the representativeness of the data or compliance with the requirements of EN 15804 must also be described.

The relevance of these datasets in terms of contribution to the results of the core indicators must also be described.

5.4.5 Checking the mass balance in the project report

The verification of the mass balance must be shown in the project report. The mass balances must demonstrate that the inputs are sufficient to produce all outputs, including waste generated, process emissions and biogenic carbon emissions. Water and moisture should also be considered as part of the mass balance or a separate water balance should be provided. (Further information can be found in EN 15941, Annex B Mass balance at product level.

In any case, the mass balance should include

- Documentation of the complete mass balance for the relevant modules and processes.
- Documentation of all input and output flows
- Description of uncertainties if mass balance is not balanced
- Documentation of water balance (as part of the mass balance or separate water balance)
- Documentation of the truncated input and output flows
- Documentation of the correction calculations in the case of allocations, including consideration of inherent material properties (biogenic carbon, energy content, etc.)

5.4.6 Proof of avoidance of double counting in the valuation of electricity and all other relevant energy

The project report must demonstrate that double counting has been avoided in the assessment of electricity and all other relevant energy, see Annex E.

5.4.7 Documentation to support any statement contained in the EPD in the project report

Statements contained in the EPD may include certification to environmental standards such as EN ISO 14001 or certification to technical standards. EN ISO 14021 must be taken into account with regard to environmental statements made in the EPD such as ‘recyclate content’ and ‘recyclable’.

Evidence, e.g. certification, must support any claim made in the EPD.

5.4.8 General note

The data quality of the relevant data for Module D must also be specified.

6 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 20: 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 P 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.													

Legend:

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 21: 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													

Legend:

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

The following figure 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.

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.		

Image 2: Table: Classification of disclaimers to the declaration of core and additional enviromental impact indicators

Table 22: Parameters to describe the use of resources

Para-meter	unit	A1-A3	A4	A5	B1	B2	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ H_u													
PERM	MJ H_u													
PERT	MJ H_u													
PENRE	MJ H_u													
PENRM	MJ H_u													
PENRT	MJ H_u													
SM	kg													
RSF	MJ H_u													
NRSF	MJ H_u													
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

Table 23: Parameters describing LCA-output flows and waste categories

Para-meter	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 24: 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

7 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 interpretation of the results in the project report with graphs (e.g. the dominance analysis regarding the distribution of environmental impacts across the modules, etc.). In the EPD, graphs should only be inserted at the express request of the declaration holder (this involves a high level of effort in the course of translation services into other languages).

When declaring average products, the range of values and the variation of the key impact categories for the individual products or individual locations must be explained. The results should not differ significantly in the core indicators for the environmental impacts. If major differences in the impacts are identified for the assessed sites and/or products, an additional explanation must be provided.

With regard to Module D, it must be pointed out in the interpretation in the EPD that the benefits and burdens lie outside the product system boundaries. Graphs for interpreting the results of the life cycle must be designed in such a way that modules A1-C4 are shown in one graph and module D in separate graphs. Alternatively, the results can also be interpreted without graphs; it is recommended that graphs are only included in the project report, see above.

Re-issuance 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.

8 Presentation of the representativeness of average EPD

In case of average EPD the following information must be given:

1. The market(s) for which the average EPD are representative;
2. A list of all production sites and products considered in the calculation

9 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:

EN ISO 14025:2006-07 Environmental labeling and declarations - Type III environmental declarations - Principles and procedures

EN ISO 14040:2006+A1:2020 Environmental management - Life cycle assessment - Principles and framework

EN ISO 14044:2006+A1:2017+A2:2020 Environmental management - Life cycle assessment - Requirements and guidance

EN 15804:2012+A2:2019+AC:2021 Sustainability of construction works - Environmental product declarations - Basic rules for the product category construction products

EN 15941:2024 Sustainability of construction works - Data quality for the assessment of the environmental quality of products and construction works - Selection and application of data

Management system handbook including applicable documents from Bau EPD GmbH

10 Directory and Glossary

At this point, lists of figures, tables and other necessary lists should be included.

10.1 Abbreviations

Abbreviations not used in the EPD document should be deleted:

10.1.1 Abbreviations as per EN 15804

Table 25: Abbreviations as per 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

10.1.2 Abbreviations as per PCR on hand

Table 26: 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

I. Documentation of the data collection and calculation procedure

Table, text

II. Detailed table of basic substances

Table, text

III. Life cycle inventory, input-output tables, LCA model

Screenshots of the life cycle inventory or the model

Specification of the baseline database, justification if additional or alternative data sets were used

Documentation of the process data, the assigned generic or specific data sets, the data source, the temporal, geographical and technological representativeness and the assessment of the data quality in accordance with EN 15805, Annex E.

The following table shows possible documentation of the data sets used, including a description of representativeness in accordance with EN 15941 and assessment in accordance with EN 15804, Annex E for relevant process data. The processes are to be assigned to the respective modules in which they occur. The heading of the table shall indicate whether the assessment is carried out in accordance with Table E.1 or E.2 of EN 15804, Annex E.

Process	**Used data**		**Time-related representativity**		**Geographical representativity**		**Technological representativity**	
Example	**Name of dataset**	**Data set source**	Description	Quality level	Description	Quality level	Description	Quality level
Transport	Transport, freight, lorry >32 metric ton, EURO6 {RER}| transport, freight, lorry >32 metric ton, EURO6 | Cut-off, S	ecoinvent v3.9.1	Reverence year 2009–2022	2	Europe	2	Euro 6	1
Valid for all life cycle stages								
A1–A3								
A4								
A5								
B1–B7								
C1								
C2								
C3								
C4								
Module D from A5								
Module D from C1-C4								

Image 3: Table: Relevant process data with documentation of the data sets used, including description of representativeness in accordance with EN 15941 and assessment in accordance with EN 15804, Annex E, Table E.1

Process	Used data		Aspect of precision	Aspect of completeness	Aspect of consistency
Example	**Name of dataset**	**Data set source**	Description	Description	Description
Transport	Transport, freight, lorry >32 metric ton, EURO6 {RER}| transport, freight, lorry >32 metric ton, EURO6 | Cut-off, S	ecoinvent v3.9.1			
Valid for all life cycle stages					
A1–A3					
A4					
A5					
B1–B7					
C1					
C2					
C3					
C4					
Module D from A5					
Module D from C1-C4					

Image 4: Table: Relevant process data with documentation of the data sets used, including description of precision, consistency and completeness in accordance with EN 15941

IV. Description of the data quality of authoritative data according to the ILCD data format

If a more in-depth assessment of data quality than Annex 3 is performed (this is optional), it is recommended to use the ILCD format as described below:

The International Reference Life Cycle Data (ILCD) data format uses a standardized nomenclature and classification of data to provide metadata and environmental information for generic and specific life cycle inventory and life cycle assessment for both process module and system datasets used in product life cycle assessment. The ILCD format is composed of fields that are required, recommended or optional within the ILCD. Details of special data quality criteria from the ILCD are shown for information purposes (source: EN 15941).

Table 27: Time related coverage

Field name	Requirement Compliance	Compliance requirement type	Value
Data collection period (text)	optional	optional	
Reference year (Year)	recommended	ILCD documentation-compliant	
Data set valid until: (Year)	recommended	ILCD documentation-compliant	
Time representativeness description	recommended	ILCD documentation-compliant	
Data treatment and extrapolations principles	recommended	ILCD documentation-compliant	
Deviation from data treatment and extrapolations principles / explanations	recommended	ILCD documentation-compliant	

Table 28: Geographical coverage

Field name	Requirement Compliance	Compliance requirement type	Value
Location	recommended	ILCD format schema valid data set	
Latitude and Longitude	optional	optional	
Geographical representativeness description	optional	ILCD documentation-compliant	
Mix and location types	recommended	ILCD documentation-compliant	
Data treatment and extrapolations principles	recommended	ILCD documentation-compliant	
Deviation from data treatment and extrapolations principles / explanations	recommended	ILCD documentation-compliant	

Table 29: Technological coverage

Field name	Compliance requirement	Compliance requirement type	Value
Technology description including background system	recommended	ILCD documentation-compliant	
Mix and location types	recommended	ILCD documentation-compliant	
Included data sets	recommended	ILCD documentation-compliant	
Technical purpose of product or process	recommended	ILCD documentation-compliant	
Pictogram of technology	optional	ILCD documentation-compliant	
Flow diagram(s) or picture(s)	optional	ILCD documentation-compliant	
Data treatment and extrapolations principles	recommended	ILCD documentation-compliant	
Deviation from data treatment and extrapolations principles / explanations	recommended	ILCD documentation-compliant	
Percentage supply or production covered	recommended	ILCD documentation-compliant	
Annual supply or production volume	optional	optional	

Table 30: Aspect of Precision

Field name	Compliance requirement	Compliance requirement type	Value
Mean amount	optional	optional	
Uncertainty distribution type	optional	optional	
Relative Standard deviation in %	optional	optional	
Comment	optional	optional	

Table 31: Aspect of Completeness

Field name	Compliance requirement	Compliance requirement type	Value
Data cut-off and completeness principles	recommended	ILCD documentation-compliant	
Deviation from data cut-off and completeness principles / explanations	recommended	ILCD documentation-compliant	

Table 32: Aspect of Consistency

Field name	Compliance requirement	Compliance requirement type	Value
Type of data set	recommended	ILCD documentation-compliant	
LCI method principle	recommended	ILCD documentation-compliant	
Deviation from LCI method principle / explanations	recommended	ILCD documentation-compliant	
LCI method approaches	recommended	ILCD documentation-compliant	
Deviations from LCI method approaches / explanations	recommended	ILCD documentation-compliant	
Modelling constants	recommended	ILCD documentation-compliant	
Deviation from modelling constants / explanations	recommended	ILCD documentation-compliant	

Table 33: Sources of data

Field name	Compliance requirement	Compliance requirement type	Value
Data source(s) used for this data set	recommended	ILCD documentation-compliant	
Data selection and combination principles	recommended	ILCD documentation-compliant	
Deviation from data selection and combination principles / explanations	recommended	ILCD documentation-compliant	
Sampling procedure	optional	optional	

List of illustrations

Image 1: Table: Life cycle modules 18
Image 2: Table: Classification of disclaimers to the declaration of core and additional enviromental impact indicators 30
Image 3: Table: Relevant process data with documentation of the data sets used, including description of representativeness in accordance with EN 15941 and assessment in accordance with EN 15804, Annex E, Table E.1 34
Image 4: Table: Relevant process data with documentation of the data sets used, including description of precision, consistency and completeness in accordance with EN 15941 35

Table directory

Table 1: Version history 5
Table 2: Applications for thermal insulation in buildings according to EN 16783 10
Table 3: Applications for thermal insulation in building equipment, industry and civil engineering as per EN 16783 11
Table 4: Product specific standards 11
Table 5: Technical characterizations for products as per ÖNORM EN 13163 12
Table 6: Technical data for products as per ÖNORM EN 14309 13
Table 7: base materials in mass-% (example) 14
Table 8: Basic materials in PS granules (example) 15
Table 9: Reference service life (RSL) 17
Table 10: Declared unit/Functional unit depending on the type of application of the insulation material 18
Table 11: Description of the scenario „Transport to building site (A4)“ 21
Table 12: Description of the scenario „Installation of the product in the building (A5)“ 21
Table 13: Description of the scenario „maintenance (B2)“ 22
Table 14: Description of the scenario „repair (B3)“ 22
Table 15: Description of scenario „replacement (B4)“ 23
Table 16: Description of scenario „refurbishment (B5)“ 23
Table 17: Description of scenarios „energy (B6)“ resp. „Water (B7)“ 23
Table 18: Description of the scenario „Disposal of the product (C1 to C4)“ 24
Table 19: Description of the scenario „re-use, recovery and recycling potential (module D)“ 25
Table 20: Parameters to describe the environmental impact of mineral insulating products per declared/functional unit 29
Table 21: Additional environmental indicators 29
Table 22: Parameters to describe the use of resources 31
Table 23: Parameters describing LCA-output flows and waste categories 31
Table 24: Information for description biogenic carbon content at factory gate 32
Table 25: Abbreviations as per EN 15804 33
Table 26: Abbreviations as per PCR on hand 34
Table 27: Time related coverage 35
Table 28: Geographical coverage 36
Table 29: Technological coverage 36
Table 30: Aspect of Precision 37
Table 31: Aspect of Completeness 37
Table 32: Aspect of Consistency 37
Table 33: Sources of data 38