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

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Part B: Requirements on the EPD for

Cement

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Tracking of versions

Version	Comments	Date of changes
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0.1	Editorial changes Sarah Richter due to adaptations for all PCR-B (here was worked in parallel, all PCR will be reissued at the beginning of March, addition of accreditation mark, indication of CF factors, editorial changes, title page EPD labelling energy mix approach).	2023-02-10
0.2	Revision based on input from PCR panel and close interested parties related to members of the PGF.	2023-04-03
0.3	Editorial revision for public release to solicit comments from broader interested parties.	2023-04-06
1.0	No comments received, approved for EPD Creation	2023-05-22
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3.0	**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**

Contents

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.

The document applies to cements according to the following standards:
- ÖNORM EN 197-1 Cement - Part 1: Composition, requirements and conformity criteria for ordinary cement
- ÖNORM B 3327-1 Cements according to ÖNORM EN 197-1 for special uses - Part 1: Additional requirements
- ÖNORM EN 14216 Cement - Composition, requirements and conformity criteria for special cements with very low heat of hydration
- ÖNORM EN 197-5 Cement - Part 5: Portland composite cement CEM II/C-M and composite cement CEM VI
- ÖNORM EN 197-6 Cement - Part 6: Cement with recycled constituents
- Cements with national technical approval

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
- C-PCR: Requirements from ÖNORM EN 16908 cement and building lime — environmental product declarations — product category rules in addition to EN 15804
- Complementary requirements on EPD of Bau EPD GmbH

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).

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 for Cement** and **specific LCA calculation rules for 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, www.bau-epd.at
PROGRAMME OPERATOR	Bau EPD GmbH, A-1070 Wien, Seidengasse 13/3, www.bau-epd.at
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 holder

picture
To be accorded with declaration holder and Bau EPD GmbH
(Note: photographic rights must be clarified and cited)

Company logo of declaration holder

Contents:

1. General information

Product name Name and description of product	**Declared Product / Declared Unit** Description of the declared product and declared unit/functional unit **Number of datasets in EPD Document(s):** XX **Range of validity** The products, sites and locations/countries considered in the data of the life cycle assessment and for which the declaration applies must be named. In the case of an average EPD, this type of EPD must be pointed out. The representativeness of the declaration must be shown with regard to the production volume covered by the life cycle assessment and the technology used. Likewise, the range of fluctuation of the product group considered, must be specified in the interpretation.
Declaration number To be accorded with Bau EPD GmbH	
Declaration data ☐ Specific data ☐ Average data	
Declaration based on: MS-HB version dated YYYY-MM-DD: Name of PCR PCR Code Version XX of YYYY-MM-DD Version XX of content and format template (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.	
Type of Declaration as per EN 15804 From cradle to ... . LCA-method: (i.e. Cut-off by classification)	**Database, Software, Version** Declaration of backround database, Software used and both its versions **Version Characterisation Factors:** Source, Version
Author of the Life Cycle Assessment Name of the author Institution Address, Postal Code, city Country	**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 ☒ externally **Verifier 1:** Name **Verifier 2:** Name
Holder of the Declaration Name of the manufacturer Address, Postal Code, city Country	**Owner, Publisher and Programme Operator** Bau EPD GmbH Seidengasse 13/3 1070 Vienna Austria

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 and in the 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 Cement:

Separate description of the cements per applicable product standard.

Example:
Cement is a hydraulic binder, i.e. a finely ground inorganic substance which, when mixed with water, produces cement paste, which sets and hardens by hydration and, after hardening, remains solid and stable in space even under water.

Cement according to ÖNORM EN 197-1:2018, ÖNORM EN 197-5:2022, ÖNORM B 3327-1:2005 or ÖNORM EN 14216:2015 consists of

- Main cement constituents (Portland cement clinker, granulated blast furnace slag, pozzolana, fly ash, burnt shale, limestone or silica fume),
- Cement constituents (after appropriate preparation, improve the physical properties of cement due to their particle size distribution),
- calcium sulphate (added to the other constituents of cement during its production to regulate the setting behaviour), and
- (cement) additives (the total quantity of additives must not exceed a mass proportion of 1.0 % in relation to the cement (excluding pigments)).

Portland cement clinker is produced from a mixture of raw materials that is heated in a kiln at a temperature of over 1400 °C until it sintered. Portland cement clinker consists mainly of calcium silicates and calcium aluminates.

The declared cement belongs to the main cement type (CEM I, CEM II, CEM III....) according to ÖNORM EN 197-1:2018.

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 Cement:

For the declared cements, the main areas of application shall be shown accordingly.

Example:
The main application of cement is the production of concrete according to ÖNORM EN 206:2021 or according to ÖNORM B 4710-1:2018, cement screed according to ÖNORM EN 13813:2003 or ÖNORM B 3732:2016 and cement mortar according to ÖNORM EN 998-1:2017 and ÖNORM EN 998-2:2017.

2.3 Standards, guidelines and regulations relevant for the product

The respective standard and/or general technical approval or comparable national regulation must 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 Cement:

The rules of application applicable to cements shall be mentioned (e.g. standards, guidelines, other regulations).

Example:
Regulation (EU) No 305/2011(CPR) applies to the placing on the market of the product in the EU/EFTA (except Switzerland). The product requires a declaration of performance taking into account EN 197-1:2018 or EN 14216:2015 and CE marking. The cements CEM II/C and CEM VI require an application approval according to ÖNORM EN 197-5:2022. Product-relevant standards for cements in Austria are shown in Table 1.

Table 1: Product specific standards

Standard	Title
ÖNORM EN 197-1:2018	Cement - Part 1: Composition, requirements and conformity criteria for ordinary cement
ÖNORM B 3327-1:2005	Cements according to ÖNORM EN 197-1 for special uses - Part 1: Additional requirements
ÖNORM EN 14216:2015	Cement - Composition, requirements and conformity criteria for special cements with very low heat of hydration
ÖNORM EN 197-5:2022	Cement - Part 5: Portland composite cement CEM II/C-M and composite cement CEM VI
ÖNORM EN 197-6:2022	Cement - Part 6: Cement with recycled building materials
National technical building approval	Cements with national technical building approval

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 Cement:

For declared cements, at least the following technical data shall be provided:

Table 2: Technical data of the declared cement product

Characterization	Value	Unit
Mean raw density or raw density range		kg/m3
Class of standard compressive strength according to ÖNORM EN 197-1:2018		N/mm²

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.

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.

Specific notes for the creation of an EPD for Cement:

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

Components	Function	Mass fraction in percent
Portland cement clinker (K)	Primary raw material	
Pozzolana natural (P)	Primary raw material	
Pozzolana/tempered clay (Q)	Primary raw material	
burnt slate (T)	Primary raw material	
Limestone (L)	Primary raw material	
limestone (LL)	Primary raw material	
natural gypsum	Primary raw material	
Anhydrite	Primary raw material	
Stone powder	Primary raw material	
AMZ marl	Primary raw material	
Gravel-clay mixture	Primary raw material	
Marble sand	Primary raw material	
granulated blastfurnace slag (S)	Secondary raw material	
Fly ash rich in silica (V)	Secondary raw material	
Fly ash rich in lime (W)	Secondary raw material	
Silica fume (D)	Secondary raw material	
FGD gypsum	Secondary raw material	
Filter dusts	Secondary raw material	
Bypass dusts	Secondary raw material	
Slags	Secondary raw material	
Moulding gypsum, broken gypsum planks	Secondary raw material	
Coarse ash	Secondary raw material	
Gypsum from microbial applications	Secondary raw material	
Ferrous sulphate	Chromate reducer	
Ethylene glycol	Grinding aid	

[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

2.6 Product stage

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 Cement:

Example:

The most important cement raw materials limestone, clay and their natural mixture, limestone marl, are extracted in quarries mainly by blasting. Clay can be removed directly from the quarry face with bucket chain, bucket wheel or dragline excavators. Vehicles transport the coarse raw material to hammer crushers where it is broken into crushed stone. The crushed stone can then be transported from the quarry to the cement plant, e.g. on conveyor belts. The raw material components are fed in predetermined mixing ratios via dosing equipment in a mill and finely ground into raw meal.

In Austria, cement clinker is produced exclusively by the dry process in rotary kilns with cyclone preheaters. In the preheater, the raw meal is heated to over 800 °C by the exhaust gases from the rotary kiln. The material exiting the lower cyclone stage of the preheater enters the rotary kiln, which is inclined at an angle of 3 - 4°. In the rotary kiln, the material is moved from the kiln inlet towards the burner installed at the kiln outlet. In the so-called sintering zone, the firing material reaches temperatures of about 1450 °C. A clinker cooler is connected to the kiln outlet. After burning and cooling, the clinker is stored in silos or closed halls to avoid clinker dust emissions as much as possible.

For the production of cement, the clinker is finely ground separately or together with other main constituents. A sulphate carrier is added to the ground material to control solidification. Gypsum or anhydrite from natural sources or from flue gas desulphurisation plants is used for this purpose. The finished cement is usually stored in silos, from which the cement is shipped as sacks or silos.

Relevant for Austria (text can be adapted or omitted for other countries):

To ensure cement quality, quality assurance systems are installed in all Austrian cement plants today, which are based on the requirements for factory production control according to ÖNORM EN 197-2:2020 [15] or the standard for quality management systems ÖNORM EN ISO 9001:2015 [16]. In addition to the concrete specifications for process control and monitoring of intermediate and final products, QM systems according to ÖNORM EN ISO 9001:2015 [16] also include measures to improve the organisational structure and the production processes as a whole.

Figure 1 shows the schematic representation of the cement production process from quarry to dispatch.

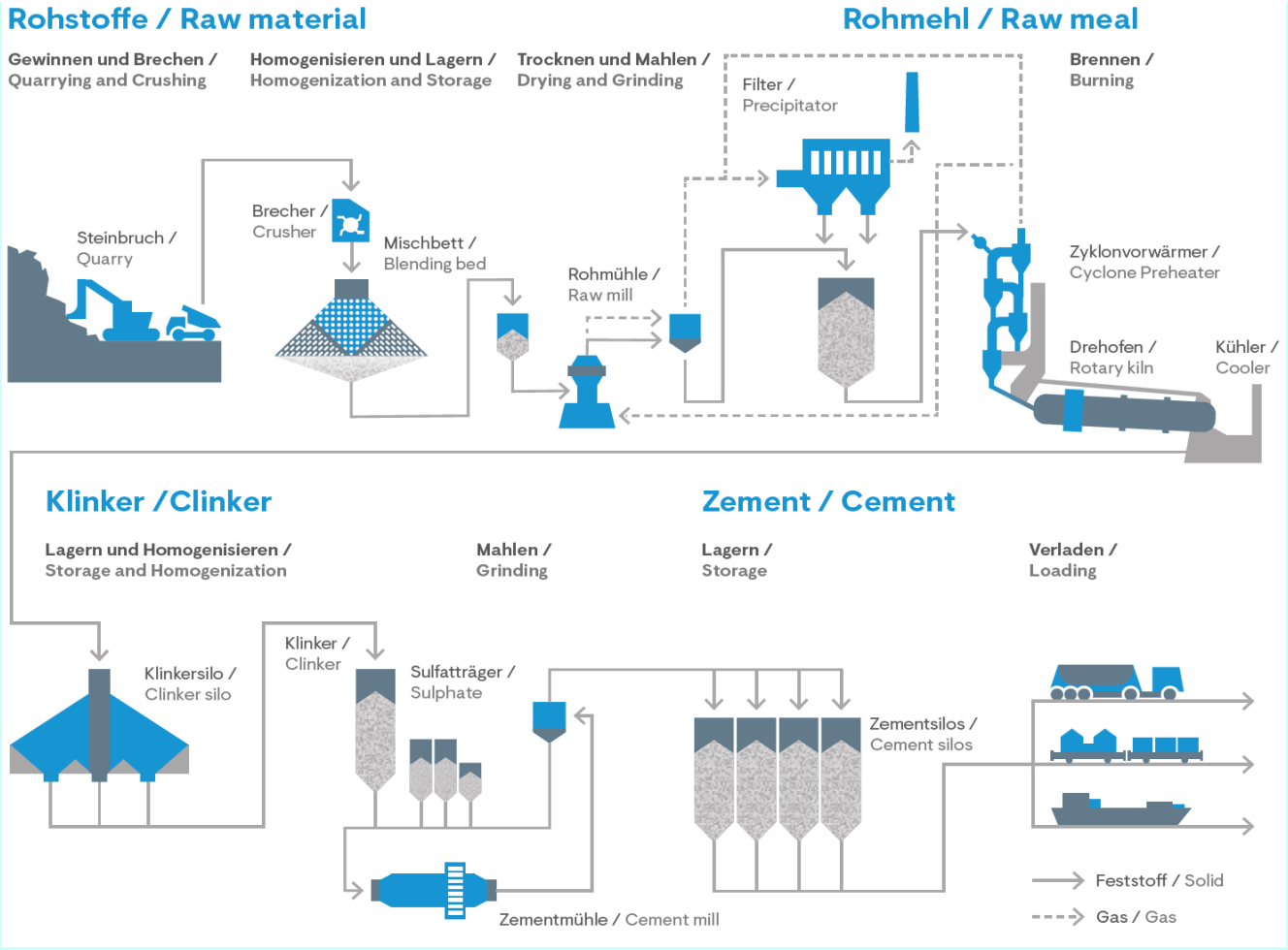

Figure 1: Example of a flow chart/graphic production stage

2.7 Packaging

Information concerning each component of packages:

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

Specific notes for the creation of an EPD for Cement:
A very small proportion of the cement reaches the customer as bagged goods in paper bags. PE shrink films (EWC 150102), wooden pallets (EWC 150103) and steel strapping (EWC 150104) are used as packaging materials. Under the Interseroh system, these packaging materials are returned to the cement manufacturers.
This EPD only considers silo goods and does not take into account packaging material for the very small market share of bagged goods.

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).

Specific notes for the creation of an EPD for Cement:
Cement is a powdery bulk material and is predominantly delivered in bulk and loaded onto road or rail vehicles. A very small proportion of the cement reaches the customer as bagged goods.

2.9 Transport to site

Description of delivery (Route and means of transport incl. capacity utilisation (including empty runs) in percent, bulk density of the transported products in kg/m³ and volume utilisation factor.)

Specific notes for the creation of an EPD for Cement:

Example:

Cement is a homogeneous bulk good that is transported either by truck or by rail. The declared cement is mainly delivered to local sales markets.

2.10 Construction product stage

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 Cement:

Example:

The main application of cement is the production of concrete, screed or mortar. Mixing cement and water produces cement paste, which coats the individual grains of aggregate in the corresponding building material and firmly bonds them together by hardening. In the process, the cement paste, which is liquid after the addition of water, passes into the solid cement stone.

Today, fresh concrete is produced almost exclusively in ready-mixed concrete plants, on large construction sites or in precast factories in medium to large mixing plants. Cement screed and cement mortar are mixed directly on the construction site or transported from mixing plants.

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 Cement:

Example:

Since cement is used as an intermediate product in the production of various cement-bound building materials (ready-mixed concrete, precast concrete, cement screed, etc.), it is usually not possible to provide information on the environmental impacts from the product during the construction phase, the use phase and the disposal phase, as these depend significantly on the use of the cement. The EPD therefore considers the life cycle modules A1-A3 (raw material extraction and processing, transport to the manufacturer, production). The construction phase, the use phase and the disposal phase are not considered in the life cycle assessment for cement. This is permissible according to ÖNORM EN 15804, as cement fulfils the conditions for this specified in the standard (see 3.2 System boundary).

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 Cement:

Example:

Not relevant for cement (see 2.11 Use phase and 3.2 System boundary).

2.13 End of life stage

The different ways of end of life treatment must be described.
The EAK-waste disposal code (Disposal code following the European list of waste) must be declared.
Specific notes for the creation of an EPD for Cement:

Example:
If cement needs to be disposed of, it should be cured with water and disposed of in accordance with local authority regulations. The hardened product is then disposed of as for concrete waste and concrete slurries.

Waste code according to the Austrian Waste Catalogue Ordinance or the European Waste Catalogue (EWC) depending on the origin: 17 01 01 [18] (concrete) or 10 13 14 [18] (concrete waste and concrete slurry).

The EPD does not consider the disposal phase due to the arguments given in 2.11 Use phase and 3.2 System boundary.

2.14 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.
If an average EPD is prepared, the average values used in the LCA and their range must be stated. Please refer to the explanations on averaging in section 5.3.

Specific LCA calculation rules for Cement:

The declared unit is 1 ton of the assessed cement.

Table 1: **Declared unit 1 t**

characterization	value	unit
declared unit	1	t
gross density for conversion into kg		kg/ m³
Mass-related volume		m³/kg
Weight for conversion into kg		kg

[1)] If the gross density corresponds to the conversion factor to 1 kg, the last line is omitted. In the last line, instead of 'weight', the usual term for the weight in question can be stated (e.g. weight per unit area, weight per piece, etc.).

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 Table 4. Undeclared modules are to be marked with ND (= not declared).

Table 4: 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 = included in LCA; ND = 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 Cement:

Type of LCA or EPD: from the cradle to the factory gate

The selected system boundaries cover the production of cement, including raw material extraction, up to the finished product at the factory gate.

Since cement is used as an intermediate product in the production of various cement-bound building materials (ready-mixed concrete, prefabricated concrete, cement screed, etc.), it is usually not possible to provide information on the environmental impacts from the product during the construction phase, the use phase, and the disposal phase, since these are largely dependent on the use of the cement. The EPD therefore considers the life cycle modules A1-A3 (raw material extraction and processing, transport to the manufacturer, production). The construction phase, the use phase and the disposal phase are therefore not considered. This is permissible according to ÖNORM EN 15804 as cement fulfils the following conditions specified in the standard:

- The product or material is physically integrated with other products during installation so that it cannot be physically separated from them at the end of life.

- The product or material is no longer identifiable at the end of its life as a result of a physical or chemical transformation process.

- The product or material does not contain biogenic carbon.

The key input material for cement is the cement clinker. The production of the clinker, as far as it comes from the same producer as the cement or as far as knowledge about its production is available, is to be modelled with primary data (in modules A1-A3). Since clinker and cement production can also take place separately or in the case that the clinker is purchased and no detailed information on clinker production is available, clinker production can also be taken into account purely under A3 (as an intermediate product according to EN 15804) and, if necessary, mapped using life cycle inventories from corresponding databases.

Module A1: Raw material extraction and processing:

- Raw material extraction for cement and clinker production

- this includes, for example, the extraction of calcareous materials such as limestone or marl, and clayey materials such as clay or clay slate

- Extraction of primary fuels

- Important primary energy sources used in cement or clinker production are hard coal, petroleum coke, lignite and natural gas

- Processing of raw materials, fuels and co-products from other industries (e.g. blast furnace slag, fly ash)

Module A2: Transport to the cement plant and internal transports

- Transport of raw materials, fuels and co-products from other industries to the cement or grinding plant

- Internal transports in the cement or grinding plant

- if applicable, transport of Portland cement clinker and other cement constituents to the grinding plant

Module A3: Cement production

- Clinker production: heating of the raw material mixture in a kiln plant until sintering (at a temperature of over 1400 °C)

- If necessary, the entire clinker production, if the clinker is supplied accordingly

- Grinding of the raw materials

- Grinding and mixing of the main and secondary cement constituents

- Storage of the cement, preparation for dispatch

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.

Specific notes for the creation of an EPD for Cement:

Example:

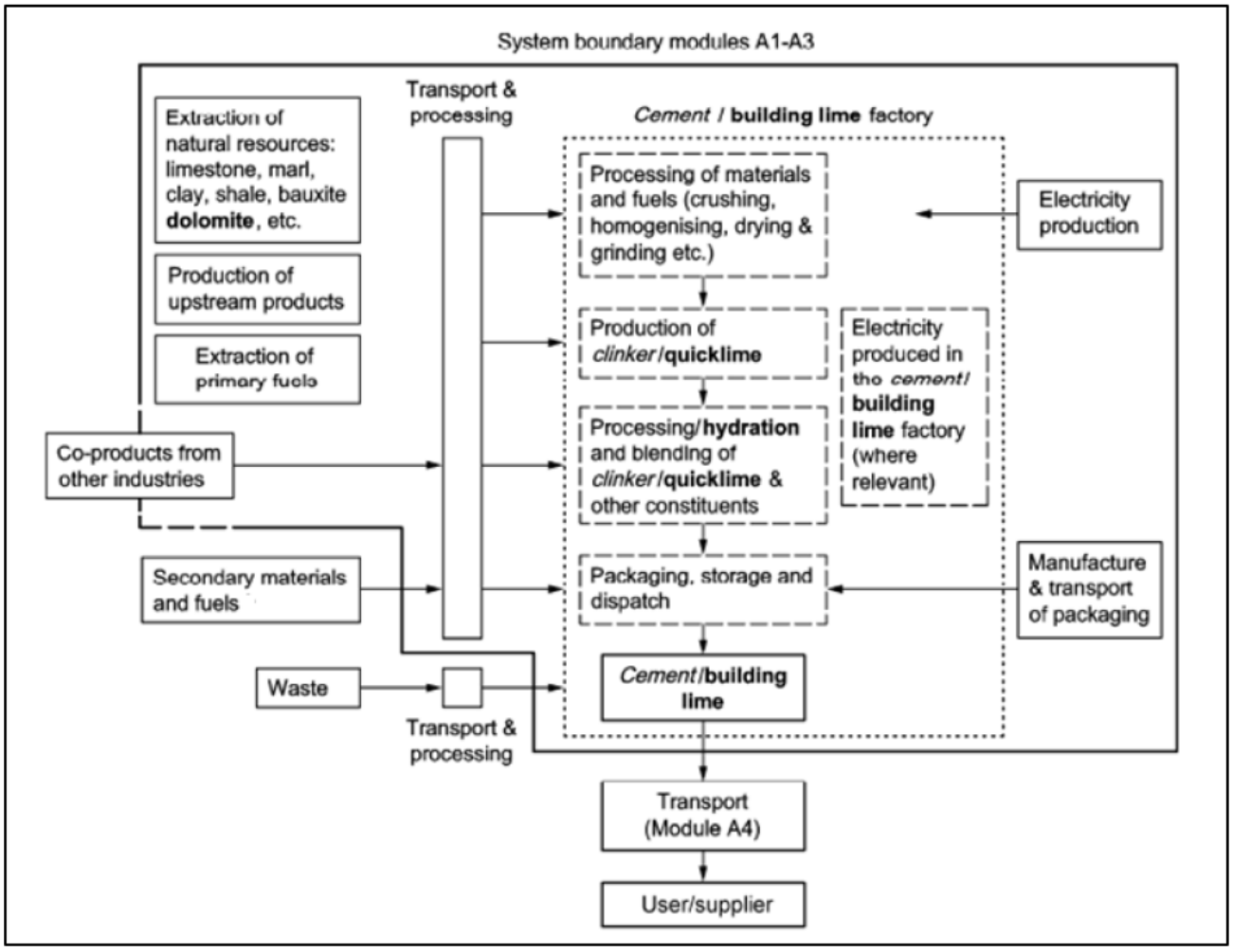

Figure 2: System boundaries in cement production as per EN 16908

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 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.

Specific LCA rules for cement:

When allocating the materials "blast furnace slag" and "fly ash" required for the production of cement, an economic allocation must be applied according to EN 15804. The loads from granulation, dewatering and transport of the blast furnace slag are to be allocated 100% to the granulated blast furnace slag. Deviations from this rule shall be justified with regard to their compliance with EN 15804.

In accordance with the polluter pays principle according to EN 15804 or CEN/TR 16970 - Table 2, the following applies to the incineration of waste in the cement product system:
- The waste status shall be substantiated in the project report by e.g. stating the waste code(s) (or comparable evidence).
- CO2 emissions from the incineration of verified wastes are not attributed to the cement production system. They shall nevertheless be calculated. In the case of emissions from biogenic wastes, the sum of the emissions in A1-A3 shall normally always be indicated as 0 (see normative annex EN15804). If biogenic waste was taken into account, this must also be indicated as a note under the LCA table.
- The following note is inserted directly below the results table: "For all GWP indicators in A1 - A3, the net values are declared. The waste status of the (waste-based) fuels has been demonstrated. Gross emissions (i.e., including CO2 from waste incineration) are x1 kg CO2 eq./t (GWP-total), x2 kg CO2 eq./t (GWP-fossil), x3 kg CO2 eq./t (GWP-biogenic).", where x1, x2 and x3 are the respective sums of net values and emissions from incineration of verified waste.
- All corresponding calculations shall be documented in the project report.
- All non-CO2 emissions are basically attributed to the cement production system

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 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.

In the project report and the EPD the following information must be declared:
The emission factors of the carbon footprint of the electricity mix used in XX kg CO2e/kWh.
The energy data sets used must be specified. Minimum: Indication of whether residual mix or self-modelled data sets were used. Information on whether Guarantees of Origin are used must be provided. The mix of energy sources should be specified/displayed.

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 5: 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/m³

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

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	m³
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]
Statements to B1 optional as long as no horizontal testing standards do exist. Else: 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 7: 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 [a]
Ancillary materials for maintenance, e.g. cleaning agent, specify materials		Kg/cycle
Waste material resulting from maintenance (specify materials)		kg
Net fresh water consumption during maintenance		m³
Energy input during maintenance, e.g. vacuum cleaning, energy carrier type, e.g. electricity, and amount, if applicable and relevant		kWh

Table 8: 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		m³

Energy input during repair, e.g. crane activity, energy carrier type, e.g. electricity, and amount		kWh

Table 9: 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 10: 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 11: 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 Cement:

As cement is used as an intermediate product in the production of various cement-bound building materials (ready-mixed concrete, precast concrete, cement screed, etc.), it is usually not possible to provide information on the environmental impacts from the product during the construction phase, the use phase and the disposal phase, as these are largely dependent on the use of the cement. Therefore, the life cycle modules A1-A3 (raw material extraction and processing, transport to the manufacturer, production) are to be considered. The construction phase, the use phase and the disposal phase are not considered. This is permissible according to EN 15804, as cement fulfils the conditions for this specified in the standard.

4.4 C1-C4 End-of-Life stage

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

Table 12: Description of the scenario „Disposal of the product (C1 to C4)“

Parameters for End-of-Life stage (C1-C4)	value	Quantity per m^3 insulation material
Collection process specified by type		kg collected separately
		kg collected with mixed construction waste
Recovery system specified by type		kg for re-use
		kg for recycling
		kg for energy recovery
Disposal specified by type		kg product or material for final deposition
Assumptions for scenario development, e.g. transportation		Appropriate units

Specific LCA calculation rules for Cement:

As cement is used as an intermediate product in the production of various cement-bound building materials (ready-mixed concrete, precast concrete, cement screed, etc.), it is usually not possible to provide information on the environmental impacts from the product during the construction phase, the use phase and the disposal phase, as these are largely dependent on the use of the cement. Therefore, the life cycle modules A1-A3 (raw material extraction and processing, transport to the manufacturer, production) are to be considered. The construction phase, the use phase and the disposal phase are not considered. This is permissible according to EN 15804, as cement fulfils the conditions for this specified in the standard.

4.5 D Potential of reuse and recycling

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

Table 13: 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

Specific LCA calculation rules for Cement:
As cement is used as an intermediate product in the production of various cement-bound building materials (ready-mixed concrete, precast concrete, cement screed, etc.), it is usually not possible to provide information on the environmental impacts from the product during the construction phase, the use phase and the disposal phase, as these are largely dependent on the use of the cement. Therefore, the life cycle modules A1-A3 (raw material extraction and processing, transport to the manufacturer, production) are to be considered. The construction phase, the use phase and the disposal phase are not considered. This is permissible according to EN 15804, as cement fulfils the conditions for this specified in the standard.

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

5.1 Principles 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 modelled 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 an industry:
- Percentage of total consumption or production of the construction product or service represented by the EPD in the specified market or region in which the EPD is modelled;
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 Explanation of the averaging process

For EPDs that cover an average environmental quality for several products or several sites, the averaging process must be explained. Chapter 7 LCA: Interpretation must describe the range of values and the variation of the impact assessment. The results in the core indicators for the environmental impacts of the individual products or sites should not differ significantly. If major differences in 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

5.4.1 Summarised 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 modelling 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 the relevant 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 life cycle inventory 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 authoritative 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 4 - Life cycle inventory, input-output tables, LCA model, Table 21 shows 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.

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 Verification of 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 assessment 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 14: Parameters to describe the environmental impact

Para-meter	unit	A1-A3	A4	A5	B1	B2	B5	B6	B7	B1-B7	C1	C2	C3	C4	C1-C4	A-C	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.																
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 = 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 15: Additional environmental indicators

Parameter	Einheit	A1-A3	A4	A5	B1	B2	B5	B6	B7	B1-B7	C1	C2	C3	C4	C1-C4	A-C	D
PM	Auftreten von Krankheiten																
IRP	kBq U235 äquiv																
ETP-fw	CTUe																
HTP-c	CTUh																
HTP-nc	CTUh																
SQP	dimensions-los																
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															

Table 16 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 16: 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 17: Parameters to describe the use of resources

Parameter	Einheit	A1-A3	A4	A5	B1	B2	B5	B6	B7	B1-B7	C1	C2	C3	C4	C1-C4	A-C	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 18: Parameters describing LCA-output flows and waste categories

Para-meter	Einheit	A1-A3	A4	A5	B1	B2	B5	B6	B7	B1-B7	C1	C2	C3	C4	C1-C4	A-C	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 19: Information for description biogenic carbon content at factory gate

Biogenic carbon content	unit
Biogenic carbon content in the product	kg C
Biogenic carbon content of packing	kg C
Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO_2	

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

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 sites and/or products assessed, an additional explanation must be provided.

Regarding Module D, the interpretation in the EPD shall indicate that the benefits and loads are outside the product system boundaries. Graphs for the interpretation of life cycle results shall 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 be interpreted without graphs, it is recommended to include graphs only 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. Description of representativity of average EPD

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

a) The market(s) for which the average EPD are representative;

b) 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.

EN ISO 14025:2006-07 Environmental labels 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 guidelines

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

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

General Principles and Guidelines = MS-HB and applicable M-Docs of Bau-EPD GmbH, in the current version

10. Directory and Glossary

10.1 List of figures

10.2 List of tables

10.3 Abbreviations

10.3.1 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

10.3.2 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

Annex 1 - Documentation of data collection and calculation procedure

Table, text

Annex 2 – Table of basic/auxiliary material in detail

Table, text

Annex 3 – Description of the data quality of authoritative data according to ILCD data format

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	

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	

Technological coverage

Field name	Field name	Requirement Compliance	Compliance requirement type
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	

Aspect of Precision

Field name	Requirement Compliance	Compliance requirement type	Value
Mean amount	optional	optional	
Uncertainty distribution type	optional	optional	
Relative StdDev in %	optional	optional	
Comment	optional	optional	

Aspect of Completeness

Field name	Requirement Compliance	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	

Aspect of Consistency

Field name	Requirement Compliance	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	

Sources of data

Field name	Requirement Compliance	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	

Annex 4 – Inventory Analysis, 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.

Table 21 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.

Table 20: 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**		**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								

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Logo	**Author of the Life Cycle Assessment** Name of creator in person Name of Institution (if rel.) Address Postcode, Location Mail Person creator Tel Mail Web
Logo	**Holder of the declaration** Name of creator in person Name of Institution (if rel.) Address Postcode, Location Tel Mail Web