

B-EPD .BE

B-EPD – CONSTRUCTION PRODUCT CATEGORY RULES

Complementary to NBN EN
15804+A2
Version 18.10.2022

TABLE OF CONTENTS

table of contents	3
1 Scope.....	7
2 Normative references.....	7
3 Terms and definitions	7
4 Abbreviations	10
5 General aspects.....	10
6 Product Category Rules for LCA.....	12
6.1 Product Category.....	12
6.2 Life cycle stages and their information modules to be included.....	12
6.3 Calculation rules for the LCA.....	12
6.4 Inventory analysis.....	21
6.5 Impact assessment.....	23
7 Content of the EPD.....	23
7.1 Declaration of general information.....	23
7.2 Declaration of environmental parameters derived from LCA	25
7.3 Scenarios and additional technical information	26
7.4 Additional information on release of dangerous substances to indoor air, soil and water during the use stage.....	36
7.5 Aggregation of information modules.....	37
8 Project report	37
9 Verification and validity of an EPD	37
Bibliography.....	38
Annex A Waste (informative)	39
Annex B Characterisation factors for GWP, ODP, AP, EP, POCP and ADP (normative)	40
C.1 Core environmental impact categories and indicators.....	40
C.2 Calculation rules for the climate change impact category	40
Annex C End-of-life formulae	41
Annex D Schemes to be applied for data quality assessment of generic and specific data	42
Annex E Rules for the development of C-B-EPD PCR.....	43
Annex F Application unit	45
Annex GB-EPD template.....	48

PREFACE

The current technical document contains complementary rules to EN 15804:2012+A2:2019, for the creation of environmental product declarations of construction products in compliance with the Belgian EPD program, B-EPD.

The document follows the structure of the EN 15804:2012+A2:2019 and adds:

- Clarification and examples to facilitate the use of the standard EN 15804+A2:2019
- Additional requirements concerning scenarios, declared modules and indicators
- Additional requirements to allow the integration of B-EPD's in the TOTEM tool and clarifications concerning the integration itself. Those additions are indicated in *Italic bleu*
- A template for B-EPD's

The list below gives an overview of additions compared to the EN 15804:2012+A2:2019.

A 1 Relation horizontal and vertical PCR documents	7
A 2 Clarification concerning the definition of average data.....	7
A 3 Added definitions	8
A 4 Added abbreviations.....	10
A 5 Mandatory life cycle stages	10
A 7 B-EPD template	12
A 8 Clarification concerning the output flows from the production stage and other life cycle stages, in relation to information module D.....	12
A 10 Clarification concerning the functional unit.....	13
A 11 Declaration of indicator results in relation to RSL.....	13
A 12 On-site (renewable) energy generation	13
A 13 Packaging in the production phase (A1-A3).....	14
A 14 Module A5 (Construction stage) for EPD's representing products "as installed" or "as produced".....	14
A 15 Clarification concerning the allocation of impacts and benefits from incineration of waste and secondary fuels	14
A 16 Incineration of waste	17
A 17 Exclusion of inputs and outputs	17
A 18 Electricity use from the grid (including renewable energy purchases)	17
A 19 Selection of data with regard to EPD's covering more than one product, or more than one site	18
A 20 Addition concerning the geographical representativeness of B-EPD's	18
A 22 Time period for collection of inputs and outputs	20
A 23 Trading green properties within the system (temporary addition until further guidance is provided by EC)	20

A 24 Waste treatment scenarios	21
A 25 Allocation of biogenic carbon and GHG emissions from land use change.....	21
A 26 Clarification concerning the principle and calculation of benefits and loads beyond the product system boundary	21
A 27 Addition to information on biogenic carbon content.....	23
A 28 Additional requirement concerning the content of the EPD.....	23
A 29 Content of the EPD for multi-layer materials.....	23
A 30 Coherent product description	23
A 31 Addition concerning the declaration of material content	24
A 32 Additional requirements regarding the declaration of information for EPD's covering more than one product, or more than one site.....	24
A 33 Addition regarding the declaration of data quality information.....	24
A 34 Additional requirement regarding the declaration of thermal characteristics.....	25
A 36 Significant figures.....	25
A 37 Declaration of additional environmental impact indicators	25
A 38 Net fresh water use.....	25
A 39 Addition related to carbonation	26
A 40 Addition related to reversibility.....	26
A 41 Declaration of scenario information for module A5	32
A 42 Default end-of-life scenario.....	32
A 43 Additional requirement concerning the declaration of scenario information for module D.....	36
A 44 Quantification of Module D for waste incinerated at end-of-life.....	36
A 45 Emissions into indoor air.....	36
A 46 Average EPD.....	37
A 47 Calculation of biogenic global warming potential (GWP-biogenic).....	40
A 48 Greenhouse gas emissions from land use change (GWP-luluc).....	40
A 49 Toxicity indicators: aggregation of contribution from metals, organic and inorganic substances	40
A 51 B-EPD template.....	48

[*Additions specific for TOTEM*](#)

<i>A 6 Treatment of (un) declared module information in TOTEM</i>	<i>10</i>
<i>A 9 Reference unit(s) for TOTEM</i>	<i>12</i>
<i>A 21 Use of generic data for integration in TOTEM</i>	<i>20</i>
<i>A 35 General information to be translated in view of the integration in TOTEM</i>	<i>25</i>
<i>A 50 Application unit</i>	<i>45</i>

The following terminology is used to indicate the requirements, the recommendations and options that companies may choose:
The term “shall” is used to indicate what is required in order for an EPD to be in conformance with this B-EPD PCR.
The term “should” is used to indicate a recommendation rather than a requirement. Any deviation from a “should” requirement has to be justified by the conductor of the study and made transparent.
The term “may” is used to indicate an option that is permissible.

1 SCOPE

This document, B-EPD PCR, provides complementary horizontal product category rules for Type III environmental declaration for construction products and construction services in accordance with the Belgian EPD program, B-EPD.

This complementary horizontal PCR document includes additional rules and requirements as well as clarifications of the European standard EN 15804:2012+A2:2019.

A 1 Relation horizontal and vertical PCR documents

It is possible to develop and to verify a Type III EPD directly to the present horizontal PCR. If more detailed specifications and descriptions for a product group are needed, complementary vertical PCR (c-B-EPD PCR) in compliance with this B-EPD PCR may be developed. The development of c-B-EPD PCR shall respect the requirements from Annex E .

NOTE 1 The homepage of the B-EPD program contains a list of European C-PCR documents which have been validated by the B-EPD program.

2 NORMATIVE REFERENCES

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 15804+A2:2019, Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products

CEN/TR 16970:2016, Sustainability of construction works – Guidance for the implementation of EN 15804.

ISO 21930:2017, Sustainability in buildings and civil engineering works – Core rules for environmental declaration of construction products and services

EN 15941 Sustainability of construction works – Data quality for environmental assessment of products and construction works – Selection and use of data

EN 15942 Sustainability of construction works - Environmental product declarations - Communication format business-to-business

3 TERMS AND DEFINITIONS

As in EN 15804:2012+A2:2019, in addition:

A 2 Clarification concerning the definition of average data

Calculated mean of data based on a fully representative sample for a construction product or construction service, provided by one or more manufacturers, either from their multiple plants or based on multiple similar construction products of the manufacturer(s)

NOTE 1 The product category or construction service can contain similar construction products or construction services. [SOURCE: prEN 15941:2022]

A.3 Added definitions

For the purposes of this document, the terms and definitions included in EN 15804+A2:209 as well as the following terms and definitions apply:

3.37

average EPD

EPD based on average data

[SOURCE: ISO 21930:2015]

NOTE 1 An average EPD can represent: a specific product from various manufacturing plants of one company; similar products from one manufacturing plant; similar products from several manufacturing plants of one or more companies.

3.38

biogenic carbon

Carbon derived from/contained in biomass

[SOURCE: EN 16485:2014]

3.39

biomass

material of biological origin, excluding material embedded in geological formations and material transformed to fossilised materials

[SOURCE: EN 16485:2014]

3.40

collective EPD

average EPD representing similar products from various economic operators (e.g. EPD from trade associations)

NOTE 1 'economic operator' means the manufacturer, importer, distributor or authorised representative ¹

3.41

freshwater

water having a low concentration of dissolved solids

NOTE 1 Freshwater typically contains less than 1000 milligrams per litre of dissolved solids and is generally accepted as suitable for withdrawal and conventional treatment to produce potable water.

NOTE 2 The concentration of total dissolved solids can vary considerably over space and/or time.

[ISO 14046:2014, 3.1.1]

¹ As in: Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC (Text with EEA relevance)

3.42 intermediate products

products that are already processed but require further processing into a final product (e.g. cement)

3.43 water use

use of water by human activity

NOTE 1 Use includes, but is not limited to, any water withdrawal, water release or other human activities within the drainage basin impacting water flows and/or quality, including in-stream uses such as fishing, recreation, transportation.

NOTE 2 The term “water consumption” or “NET water use” is often used to describe water removed from, but not returned to, the same drainage basin. Water consumption can be because of evaporation, transpiration, integration into a product, or release into a different drainage basin or the sea. Change in evaporation caused by land-use change is considered water consumption (e.g. reservoir). The temporal and geographical coverage of the water footprint assessment are defined in the goal and scope.

[SOURCE ISO 14046:2014, 3.2.1, modified as in Guidance document [1] and term “NET water use” has been added for clarity]

4 ABBREVIATIONS

A 4 Added abbreviations

B-EPD PCR	Belgian horizontal product category rules, complementary to EN 15804:2012+A2:2019
CF	Characterisation factor
c-PCR	Complementary product category rules
c-B-EPD PCR	Belgian product group specific PCR, complementary to B-EPD PCR
GHG	Greenhouse gas
EOW	End-of-waste status
TOTEM	Tool to Optimise the Total Environmental impact of Materials (https://www.TOTEM-building.be/)

5 GENERAL ASPECTS

As in EN 15804:2012+A2:2019, in addition

A 5 Mandatory life cycle stages

All construction products and materials shall declare modules A1-A3, **A4**, C1-C4 and D². The declaration of module A5 is mandatory for in situ products, e.g. insulation products to be blown in a cavity wall. Only construction products and materials that fulfil the three conditions for exemption stated in EN 15804+A2: 2019, § 5.2 may omit the declaration of modules C1-C4 and module D. Figure 1 represents the different types of EPD that can be declared in the context of this B-EPD PCR, with indication of the mandatory and optional life cycle stages.

[A 6 Treatment of \(un\) declared module information in TOTEM](#)

The modules declared in the B-EPD will be used as input for the life cycle modules included in TOTEM. Slight processing of the B-EPD data may occur, this is documented in the TOTEM FAQ (see www.totem-building.be).

In addition to the compulsory modules, TOTEM also considers the optional modules A5, B2 and B4. For EPDs not using ecoinvent data as background data (e.g. EPDs using data from gabi or ILCD+), the declaration of modules A5, B2 and B4 is mandatory for use in TOTEM. For EPDs using ecoinvent generic data, TOTEM will complete missing modules as documented in the TOTEM FAQ (see www.totem-building.be) based on generic data and often worst case assumptions. Therefore it is recommended to declare also the optional modules A5, B2 and B4. *Concerning the impact of operational energy use, module B6 is calculated in TOTEM at element and building level based on the lambda values provided in the B-EPD (see A 34).*

² A4 is required by the Royal Decree on environmental messages of 22 May 2014

Life cycle stages		PRODUCT stage			CONSTRUCTION PROCESS stage		USE stage						END OF LIFE stage				Benefits and loads beyond the system boundary	
		A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules		Raw material supply	Transport	Manufacturing	Transport	Construction	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse / Recovery / Recycling potential
		Definition of SCENARIOS required for each declared module																
Type of EPD	Cradle to gate with options, modules C1-C4 and module D ^{1, 2, 3}	M	M	M	M	O/M	O	O	O	O	O	O	O	M	M	M	M	M
	Cradle to grave, and module D ³	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
	Cradle to gate with options ²	M	M	M	M	O/M												

NOTES

- 1 A4 and A5 are additions to EN 15804+A2 requirements.
- 2 A5 is only mandatory for products formed in-situ (e.g. on-site blown insulation)
- 3 Reference Service Life has to be included according to at least one scenario (being the most representative)
- 4 Only possible for construction products that are exempt from declaring modules C and D according to EN 15804+A2: 2019, §5.2.

KEY

M : Mandatory / O : Optional

Figure 1 Representation of the different types of B-EPD's with indication of mandatory life cycle stages

A 7 B-EPD template

The template provided in Annex G shall be used.

6 PRODUCT CATEGORY RULES FOR LCA

6.1 Product Category

As in EN 15804+A2:2019

6.2 Life cycle stages and their information modules to be included

As in EN 15804+A2:2019, in addition

A 8 Clarification concerning the output flows from the production stage and other life cycle stages, in relation to information module D

During the life cycle of the product or building it is possible that secondary material and energy flows leave the system boundary and have a new role to play in another product or building life cycle. In other words: a product can have a positive or negative environmental contribution beyond the product life cycle (or product system) under study. Reuse or recycling therefore can bridge two life cycles.

However the output flows from the production stage and from the other life cycle stages, i.e. construction, use and end-of life stage, are treated differently.³

- The information given for output flows from the construction stage to the end-of-life stage (A4-C4) of the life cycle under study and thus for potential input flows into a next life cycle is provided as potential benefits and loads connected to a product's life cycle beyond its system boundary. This information of potential benefits and loads is provided in information module D. Contributions to module D can only come from modules A4-C4
- Output flows coming from the production stage (A1-A3), are principally considered as co-products (when they are not waste), which themselves carry benefits or loads from their previous production history. This information is not provided in information module D. Co-products leaving one product system are treated like any other commodity when they become input into another product system (EN 15804:2012+A2:2019, §6.3.5.2). Exported energy from the incineration of production waste (A3) is also treated as a co-product leaving the production phase.

6.3 Calculation rules for the LCA

As in EN 15804+A2: 2019, in addition

A 9 Reference unit(s) for TOTEM

To guarantee compatibility with TOTEM, the B-EPD program operator shall be contacted for the definition of the functional or declared unit. Besides the functional or declared unit, an application unit shall be defined (see Annex F), which allows to link the product to a specific application in TOTEM. The definition of multiple application units allows one B-EPD to be used for various applications.

³ CEN/TR 16970:2016.Sustainability of construction works - Guidance for the implementation of EN 15804, §5.2.2

For the time being EPDs for raw materials and intermediate products will not be integrated in TOTEM (e.g. sand, cement). Some exceptions may exist.

A 10 Clarification concerning the functional unit

The functional unit usually includes following aspects⁴:

- The function(s)/service(s) provided: "what";
- The extent of the function or service: "how much";
- The expected level of quality: "how well";
- The duration/life time of the product: "how long";

EXAMPLE The functional unit of a thermal insulation material might be described as follows:

(WHAT) Thermal insulation material (i.e. reduction of heat transfer through the building elements against which it is installed), composed of a rigid thermoset modified resin insulated faced on both sides with a glass tissue based facing;

(HOW MUCH) A surface of 1m² installed in a cavity wall, with a representative thickness of 100mm;

(HOW WELL) Providing an R-value of 5.0m².K/W.

(HOW LONG) Providing thermal insulation for a period of x years.

A 11 Declaration of indicator results in relation to RSL

Except for cradle to gate EPD's with options (Figure 1), all EPD's shall declare a RSL according to at least one scenario, being the most representative.⁵

NOTE Cradle to gate EPD's (with options) are only allowed for products fulfilling all conditions to be exempt from the declaration of modules C1-C4 and module D(EN 15804:2012+A2:2019, §5.2).

Indicator results shall be provided per information module for the full RSL.

Indicator values shall never be declared as annual values in the impact category table, nor as additional information.

A 12 On-site (renewable) energy generation

Within the assessed system boundary, (renewable) energy may be produced on-site. If part of it is consumed on-site and part of it is exported outside the system boundaries (e.g. provided to the electricity grid), both energy flows should be treated as co-products and the impact from energy production should be allocated accordingly. This means that part of the impact from the energy generation (e.g. PV-panels) can be allocated to the energy leaving the system boundaries. However, benefits associated with net exports from onsite energy generation (e.g. avoided electricity production from national energy mix) shall NOT be attributed to products covered by the EPD.

For the part that is consumed on-site, the life cycle data for that electricity shall be used if no contractual instruments have been sold to a third part. Otherwise the residual mix shall be used. [4]

⁴ Based on annex 1, § 3.2.1 from Commission recommendation of 16.12.2021 on the use of the Environmental Footprint methods to measure and communication the life cycle environmental performance of products and organisations

⁵ Requirement from KB, Annexe1/Bijlage1. According to EN 15804:2012+A2:2019, §6.3.4.1 only EPD's covering the use stage shall declare RSL information

A 13 Packaging in the production phase (A1-A3)

Modules A1, A2, A3 may be reported as one aggregated module (A1-A3). However, if they are reported separately, the impact related to the production of the product packaging and any wastage of this packaging during the production phase should be reported in module A3.

Packaging waste from the production process shall be tracked to the end-of-waste state or final disposal. Where the fate is not known, national or European databases can be used as a source of typical percentages of packaging sent to different fates.⁶

NOTE This link provides information: <http://ec.europa.eu/eurostat>.

For packaging waste from production processes that take place in Belgium the default scenarios provided in A 42 shall be used when specific data is not available.

EN 15804:2012+A2:2019 requires allocation for all net flows crossing the product system boundary from modules A1-A3 and becoming secondary materials and/or exported energy after they have reached the end of waste state. A conservative approach would be to omit such an allocation and leave benefits and loads to the system under study, as the effort of allocation may be disproportionate to any improvement in accuracy.⁶

A 14 Module A5 (Construction stage) for EPD's representing products "as installed" or "as produced"

The scope of an EPD can be a product "as installed" or "as produced".

For products "as installed" A5 shall include the impact of all processes, fixations, jointing materials or treatments necessary for installing/mounting the product according to a specified scenario. Detailed information on this scenario shall be provided in the EPD. EPD's of in-situ products shall always represent the product including installation.

For EPD's representing products "as produced", A5 includes only processes that are directly related to the product itself, e.g.. material losses, packaging EOL. To enable a correct building evaluation, additional information on the materials and processes needed for installation should be provided in the scenario information section of the EPD.

NOTE Fixation materials are materials necessary to attach a product to another layer or to the primary structure of the building. Jointing materials are materials used during or shortly after installation to connect products within the same layer.

The program operator has the final word on which parts of the installation shall be declared in an EPD.

For kits (as defined in the Construction Product Regulation), the impact of the ancillary materials (which are part of the kit) shall be declared in A1-A3.

A 15 Clarification concerning the allocation of impacts and benefits from incineration of waste and secondary fuels

Table 1 provides guidance on the assignment of impacts and benefits from incineration of waste and secondary fuels. Specifications concerning the end-of-life scenarios and assumptions concerning the energy efficiency of incinerations plants are included in A 16 and A 42, A 44.

⁶ From TR 16970:2016, §6.3.4.2.2

TABLE 1 – APPLICATION OF THE “POLLUTER PAYS” PRINCIPLE TO THE USE OF WASTE AS SUBSTITUTE FOR PRIMARY FUELS OR MATERIALS ⁷

Reached end-of-waste state?*	Energy recovery Efficiency rate	Use of waste considered as	System that generates waste	System that uses waste/ <i>secondary fuel or material</i>
Yes – the substance or object is commonly used for specific purposes; – a market or demand, exists for such a substance or object; – the substance or object fulfils the technical requirements for the specific purposes and meets the existing legislation and standards applicable to products; – the use of the substance or object will not lead to overall adverse environmental or human health impacts. (EN 15804:2012+A2:2019, 6.3.5.5)	> = 60% ⁸ (<i>or > 65%**</i>)	Use of secondary fuel, e.g. use of wood chips recovered from untreated wood.	Declare the – materials for recycling or <i>materials for energy recovery</i> in module where the waste is generated, or if at end-of-life in C3 (EN 15804:2012+A2:2019, 7.2.4.4, Table 8); and – impacts of recycling processes to achieve end of waste in C3; – impacts to achieve substitution*** and benefits**** in module D (EN 15804:2012+A2:2019, 6.3.5.6 and 6.4.3.3).	Declare the – use of secondary material or secondary fuel; and – environmental impact from the use of secondary material or fuel in the module where it is used (usually in A1-A3; EN 15804:2012+A2:2019, 6.3.5.2).
	N/A	Use of secondary material		

⁷ Modified version from table 2 from TR16970:2016[1] *Modifications are shown in italic.*

⁸ EN 15804:2012+A2:2019, section 6.3.5.5, bullet C3 waste processing “Materials from which energy is recovered with an efficiency rate below 60% are not considered materials for energy recovery”

No, <i>not all criteria from above (from EN 15804: +A2:2019, 6.3.5.5) are met⁹</i>	> = 60% (<i>or > 65%**</i>)	Waste <i>disposal</i> ⁰ . Sometimes referred to as use of alternative or waste fuel, e.g. use of tyres as substitute for fossil fuels in the cement industry.	Declare the <ul style="list-style-type: none"> – environmental impact from waste processing (e.g. incineration) in the module where the waste is generated, or if end-of life in module C4;¹¹ – exported energy in the module where the waste is generated (EN 15804:2012+A2:2019, 7.2.5, Table 8 – Exported energy in MJ per energy carrier); – substitution benefits in module D (EN 15804:2012+A2:2019, 6.3.5.6 and 6.4.3.3). 	Do not declare the <ul style="list-style-type: none"> – impacts from waste processing e.g. co-incineration of waste. Declare the <ul style="list-style-type: none"> – use of exported energy from the waste within “use of secondary fuel”, as a more appropriate indicator does not currently exist. <i>This shall be noted</i> below the table.
	< 60% (<i>or < 65%**</i>)	Waste disposal	<ul style="list-style-type: none"> – Declare the environmental impact from waste disposal (e.g. incineration) in the module where the waste is generated, or if end-of life in module C4; – exported energy in the module where the energy is generated (EN 15804:2012+A2:2019, 7.2.5, Table 8 – Exported energy in MJ per energy carrier) – substitution benefits^{*****} in module D (EN 15804:2012+A2:2019, 6.3.5.6 and 6.4.3.3). 	
<p>* In case of incineration, the question should be interpreted as “reached the EOW state before incineration”</p> <p>** For installations after 31st of December 2008¹²</p> <p>*** e.g. impact from transport, processing after EOW (including combustion))</p> <p>**** e.g. avoided impact from electricity or heat production</p> <p>***** e.g. avoided impact from exported energy</p>				

⁹ EN 15804:2012+A2:2019, §6.3.5.5. + EN 15804:2012+A2:2019, § 6.3.5.2: “Regardless of the geographical coverage of a product system the rules for defining the end-of-waste state of this European standard apply” + TR 16970 :2016, §6.3.4.5.2: “A material or part thereof is considered a secondary material or fuel when all four specified EOW criteria are fulfilled. If it does not reach the status of secondary material or fuel, then it stays as waste”

¹⁰ EN 15804:2012+A2:2019, § 6.3.5.5, NOTE 2: “only when materials have reached the EOW state can they be considered as materials for energy recovery, provided the energy recovery process has an energy efficiency rate higher than 60% + EN 15804+A2:2019, § 7.2.4.4, NOTE 4: “ The parameter “materials for energy recovery” does not include materials for waste incineration.

¹¹ EN 15804:2012+A2:2019, § 6.3.5.5, C3 :waste processing of material flows intended for reuse, recycling and energy recovery⇒as only materials that have reached EOW state can be considered for energy recovery, the impacts from waste processing (incl. incineration) do not belong in C3 but in C4 (C4= waste disposal including physical pre-treatment and management of the disposal site)

¹² EN 15804+A2:2019, §7.2.5, NOTE 4

A 16 Incineration of waste

If the efficiency of energy recovery is unknown, it shall be assumed that $R1 < 0,6$. Hence loads and MJ exported energy (EN 15804:2012+A2:2019, 7.2.5, Table 8 – Exported Energy in MJ per energy carrier) are declared where the waste is disposed of (e.g. module A3 for production waste, module C4 if End-of-life). For waste incinerated in modules A4 to C4, the potential substitution benefits from exported energy are reported in module D¹³ (see Table 1).

A 17 Exclusion of inputs and outputs

In addition to the requirements from § 6.3.6 from EN 15804+A2: 2019, the following requirements apply:

- When proxy data is used to fill data gaps, its influence on the overall results shall be mentioned in the EPD, if this contribution is assumed to be significant (e.g. more than 10% to any of the required impact-categories of this standard).
- Materials and energy flows known to have the potential to significantly contribute to any of the environmental indicators of this standard (e.g. substances with hazardous and toxic properties, or from which the extraction, use or disposal causes significant effects or energy use) shall be included even when the given unit process is under the cut-off criteria of 1% of total mass or energy usage.
- The procedure for inclusion and exclusion of inputs and outputs from § 6.3.6 from EN 15804+A2: 2019 also applies to the impact of infrastructures (e.g. production facility, machinery used in production processes, transport infrastructure) and consumables necessary for the functioning of the process (e.g. lubricating oil).
- When data concerning infrastructure is available in the generic datasets (e.g. ecoinvent) used for upstream and downstream processes, they shall be included.

Following processes can systematically be excluded from the inventory:

- Employee transport and business travel
- Energy use, infrastructure and consumables from administrative departments (e.g. head offices and sales offices)

A 18 Electricity use from the grid (including renewable energy purchases)

When electricity from the grid is used for the production phase, the electricity mix shall be selected following the guidelines from EN 15941, i.e.

Production facility in Belgium (i.e. country with a reliable tracking system in place for electricity):

- Supplier specific data shall be used if all of following conditions are met:
 - GoO (guarantee of origin certificate) have been valid and cancelled on behalf of the reporting entity for the period of production used for raw data collection of the EPD, or for the period from data collection to the publication of the EPD.
 - GoO will continue to be cancelled for the period of validity of the EPD (5 years).
- Otherwise, the Belgian **residual** mix shall be used.

Production facility outside of Belgium: select the electricity mix following the guidelines from EN 15941 (i.e., a supplier specific mix can only be used if all conditions set by EN 15941 are met).

For electricity consumed during installation (module A5), use (modules B1-B7) and end-of-life (modules C1-C4 and D), the Belgian **consumption** mix should be used. Any deviations hereof shall be clearly motivated in the project report and declared as scenario information in the EPD (e.g. end-of-life scenario assuming that the waste is treated outside of Belgium because no treatment facility is available in Belgium).

¹³ TR 16970 :2016, §6.3.4.2.2

NOTE 1 The consumption mix is national production plus imports and excluding exports.

NOTE 2 The residual mix reflects the relevant energy consumption mix (e.g. for electricity) for the related region, excluding any previously claimed attributed energy (e.g. electricity covered by tracked contractual instruments). Details of the methodology to assess the residual mix for electricity and calculations for European member states are available at <https://www.aib-net.org/facts/european-residual-mix>. The 2020 AIB method is not comparable to prior versions, but it is recommended to model using latest research results.

[SOURCE: EN 15941: 29/03/2022]

A 19 Selection of data with regard to EPD's covering more than one product, or more than one site

Ideally, an EPD covering more than one product or more than one site will provide the impact of an average product, for example by weighting impacts by production volume of all or a representative sample of the products it covers.

NOTE A representative sample can be established e.g. based on representation in terms of production method and/or market share. One product could also be chosen as representative for the product group covered by the EPD. Annex 1, § 4.4.6 from Commission recommendation of 16.12.2021 on the use of the Environmental Footprint methods to measure and communicate the life cycle environmental performance of products and organisations provides a sampling procedure to establish a representative sample. The selection of products to be covered in an EPD should be done in such a way that the resulting EPD is reasonably descriptive of the product group represented by the EPD in view of the use of the EPD in a construction works assessment.

The homogeneity (in terms of environmental impact) of the product group covered by the EPD should be evaluated based on a sensitivity analysis. The latter should identify the main contributors to the environmental impact of the considered product, how those vary amongst the different products/manufacturers represented by the EPD (or amongst the representative samples of the product group) and based hereupon what is the expected range of LCIA results (for all declared modules). If the variability between the products within the group is too high for the main environmental indicators (selection of at least 3 indicators from section 7.2.3 of EN 15804+A2: 2019 based on relevance for the considered product (e.g. based on normalised results) and including at least GWP_{total})), it may be necessary to adjust the product group. This sensitivity analysis should be documented in the project report provided to the verifier.

To decide on the acceptability of the estimated variability, the LCA expert and the verifier shall use expert judgment and the guidance provided by ISO 21930 and EN 15941¹⁴.

A 20 Addition concerning the geographical representativeness of B-EPD's

B-EPD's shall be representative for products available on the Belgian market and used in Belgian buildings. This implies that B-EPD's shall comply with the requirements from

¹⁴ According to prEN 15941:2022, §7.3.3 EPD's covering more than one product or more than one site should not differ in their core environmental impact indicators by more than +-10%. Where larger impact differences are found for the sites and/or products evaluated, a description of the range/variability of the LCIA results shall be provided in the EPD.

Table 2.

TABLE 2 REQUIREMENTS CONCERNING THE REPRESENTATIVENESS OF B-EPD'S

	Representativeness of A123 for Belgium	Representativeness of A4 to D for Belgium
Manufacturer with all production sites in Belgium	The EPD/data shall use average data derived from these specific production sites, which is representative for the market share of products placed on the Belgian market.	The scenarios shall be representative for the products on the Belgian market A4: transport to BE (see 0) A5: installation in BE (see A 18) B: use phase in BE C: EOL in BE (see A 42) D: benefits from recycling/energy recovery in BE (see A 15, A 16, A 26, A 42, A 44)
Collective EPD – all production sites in Belgium (e.g. EPD established by a Belgian federation with only Belgian members)		
Manufacturer with production sites spread over Europe	Modules A1-A3 shall be representative for the products on the Belgian market. The representativity of Modules A1-A3 for the Belgian market shall be investigated and motivation shall be given. This is also part of the verification. Important aspects may be technological representativeness, energy mix, origin of resources, etcetera.	
Collective EPD –production sites are spread over Europe (e.g. EPD established by a European federation)		

NOTE 1 The table above implies that for existing EPDs which are representative for Europe, it is not a mandatory rule to limit the specific data to those production sites in Belgium, nor is there an obligation that Belgian production sites have contributed specific data. It is however mandatory that the representativeness is thoroughly researched and verified. E.g. if a technology is used which is common practice in Europe but not for products sold in Belgium, this will not be accepted for a B-EPD.

NOTE 2 A European collective EPD may be used as basis for the declaration of a collective B-EPD on the condition that all requirements from the B-EPD PCR are met.

[A 21 Use of generic data for integration in TOTEM](#)

TOTEM was developed using ecoinvent data adapted to the Belgian context. Until further notice TOTEM also accepts B-EPDs based on other background data. In this case, see also A 6.

A 22 Time period for collection of inputs and outputs

On unit process level the time period over which inputs to and outputs from the system shall be accounted for is 100 years. The years are counted from the time when the material, pre-product or product enters the relevant process, e.g. landfill. If relevant (e.g. landfill of hazardous waste), long-term emissions (i.e. that occur beyond 100 years) should be inventoried in a separate dataset as “long-term” elementary flows. Corresponding LCIA results should be declared separately from the 100 years results in the EPD and the project report. The results entered in the B-EPD database should exclude the effect of long-term emissions.

A 23 Trading green properties within the system

The inventory of raw material inputs considered for the quantification of the indicator values should represent the physical flows of raw materials and the average composition of the product covered by the B-EPD, e.g. the amount of secondary material or biobased material considered for the quantification of the indicator values shall be representative of the average composition of the

product covered by the B-EPD. The Credit Method implementation of the Mass Balance Method, and the Book and Claim Model shall **not** be used as they allow claims for outputs with specified inherent properties which do not reflect the physical flows.

NOTE Mass balance is for the time being not compliant with the Construction Products Regulation. A horizontal policy framework similar to renewable energy is necessary with rules e.g. to avoid trade offs with product groups outside the construction sector or with products not covered by an EPD. The framework should not only contain rules but also contain the necessary policy targets, checks and balances (e.g. to check annually that the sale and production actually corresponds) to guarantee increase in investments and share of mass balanced materials for the whole sector. A similar system as for green electricity where producers not generating their own green electricity are subject to a number of legal obligations such as buying a minimum amount of certificates proportional to their production without (e.g.) biomass/biobased materials and providing fines in case of not respecting this. Until such an overall framework is in place and operational, mass balance is not allowed.

A 24 Waste treatment scenarios

Indicator results presented in the EPD shall be representative of the average waste flows. However, when different scenarios are developed for information modules C1-C4 the most relevant scenarios (and corresponding results) may be provided as 100 % version in the additional technical information. For example, when 20% of a product is recycled, 50% is incinerated and 30% is deposited, declared values on aspects and impacts for modules C1-C4 and module D may be declared as additional technical information for 100% of incineration, 100% of recycling and 100% of deposition. This allows the building assessor to choose and calculate the correct scenario on building level.

For each 100% scenario, not only the values for modules C1-C4 have to be provided but also the values for all other modules where waste is disposed of according to those EOL scenarios (A5 production waste, B4 replacements).

NOTE 1 EN 15942: 2021 provides guidance on the presentation of results in case various scenarios are declared.

6.4 Inventory analysis

As in EN 15804:2012+A2:2019, in addition

A 25 Allocation of biogenic carbon and GHG emissions from land use change

As material inherent property, biogenic carbon content are allocated reflecting the physical flows, irrespective of the allocation chosen for the process.

As GHG emissions associated with land use change are not a material inherent property, in case of co-product allocation they shall be allocated according to the allocation chosen for the process (e.g. economic or physical allocation).

A 26 Clarification concerning the principle and calculation of benefits and loads beyond the product system boundary

Figure 2 provides graphical guidance on the principles related to the calculation of net impacts in module D.

Net output flows are calculated by adding all output flows of a secondary material and then subtracting all input flows of THIS secondary material¹⁵. In case of open loop recycling, there is no input flow corresponding to the secondary material exiting the system, so the net output flow corresponds to the amount of secondary material leaving the system.

When the quantity of a secondary materials leaving the system boundaries is lower than the quantity entering the system there is no net output flow of secondary materials, and therefore no contribution to module D.

¹⁵ EN 15804+A2 :2019, §6.4.3.3

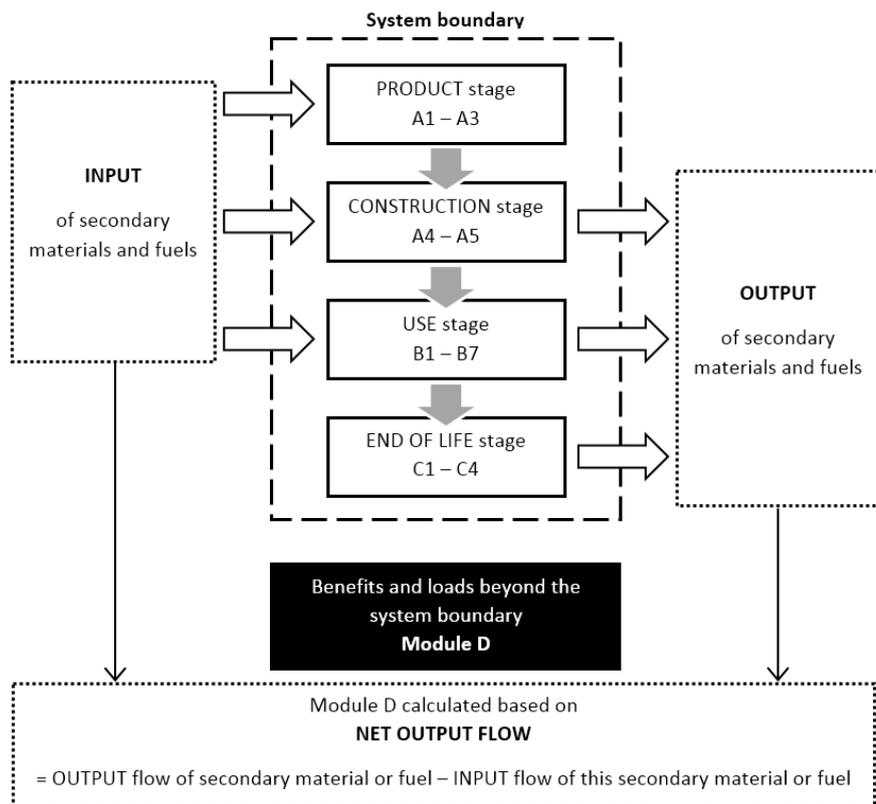


Figure 2: Graphical representation of module D principle

EXAMPLE The method for calculating the net impacts is detailed in EN 15804+A2:2019, § 6.4.3.3. An example of net output flow calculation for a secondary material is included below.

A product, e.g. metal, has an output at the end-of-life (C1) of 0.8kg material. If the recycling rate is 90%, then 0.72kg of scrap metal can be used in another system with the impacts from disposing of 0.08kg to be reported in C4.

1. If the initial product has no scrap input per kg in its module A, the output flow of 0.72kg shall be considered for calculation of the associated loads and benefits.
 - Any further processing of the 0.72kg before being used in the new system shall be taken into consideration as a load in module D.
 - In this example a recycling yield of 95% is assumed which enables the replacement of virgin input in a new system with 0.68 kg (= 0.72kg * 0.95) of scrap metal. The (avoided) production of 0.68kg of virgin material shall therefore be taken into consideration as a benefit in module D.
2. If the initial product has a scrap input of 0.5kg per kg in its module A, then only a net output flow of $0.72 - 0.5 = 0.22$ kg shall be considered for calculation of the associated loads and benefits.
 - Any further processing of the 0.22kg before being used in the new system shall be taken into consideration as a load in module D.
 - Using the same recycling yield of 95% in the new system, enables the replacement of virgin input in a new system with 0.209 kg (= 0.22kg * 0.95) of scrap metal. The (avoided) production of 0.209kg of virgin material shall be taken into consideration as a benefit in module D.
3. If the initial product has a scrap input of 0.9kg per kg in its module A, then no benefits, nor impacts can be reported in module D as there is no net output of secondary material ($0.72 - 0.9 < 0$)

A 27 Addition to information on biogenic carbon content

The carbon content shall reflect the specific characteristics (e.g. moisture content, density) of the product and the packaging. The carbon content provided by the generic databases may not always be representative and may not be based on physical allocation (see A 25) . Therefore, the carbon content of the product and the packaging may have to be determined separately.

NOTE EN 16449:2004 *Wood and wood-based products - Calculation of the biogenic carbon content of wood and conversion to carbon dioxide* provides guidance on how to calculate the biogenic carbon content of wood and wood based products. The Phyllis database (<https://phyllis.nl/>) provides information on the carbon content of various biobased materials (e.g. hemp, straw,...), with the possibility to adapt the moisture content.

6.5 Impact assessment

As in EN 15804:2012+A2:2019

7 CONTENT OF THE EPD

As in EN 15804:2012+A2:2019, in addition

A 28 Additional requirement concerning the content of the EPD

The B-EPD shall only contain verifiable information and shall be in line with ISO 14021. A B-EPD shall e.g. not contain vague information or vague statements, nor marketing talk. In case of doubt, the program operator will decide on the legitimacy of the content.

A 29 Content of the EPD for multi-layer materials

Some products are composed of several layers from which some layers have a fixed and others a variable thickness, e.g. insulation panels with a core and a facer.

If the impact of the variable layer varies linearly with its thickness, it is possible to declare the indicator values for the different layers separately in the B-EPD database. So, the declared values can be used to calculate the impact of the product for different thicknesses.

The person entering the EPD in the B-EPD database shall contact the program operator for guidance on how to enter data for such multi-layer materials.

7.1 Declaration of general information

As in EN 15804:2012+A2:2019, in addition

A 30 Coherent product description

The product description shall well represent the content of the EPD, i.e. an EPD of a product system cannot cover only part of that system.

EXAMPLE: An EPD of an acoustic ceiling, which is composed of a structure and insulation cannot declare indicator values only for the structural part.

EXAMPLE: an EPD for a two-component glue cannot declare indicator values for only one of both components when the installation requires that both components are mixed.

A 31 Addition concerning the declaration of material content

The declaration of material content of the product shall not only list substances contained in the product that are listed in the "Candidate List of Substances of Very High Concern for authorisation", but all materials and chemical substances contained in the product as purchased. The gross weight of each material/substance per unit of product can be indicated as a range. Proprietary materials and substances covered by exclusive legal rights including patent and trademarks do not have to be mentioned by their specific name.

NOTE The declaration of content should be looked at having following in mind: content relevant for (future) recycling and remanufacturing; content relevant regarding potential health effects for workers, users, builders, recyclers, etc; content relevant for life cycle environmental impacts of the product; content relevant for the use of the product.

A 32 Additional requirements regarding the declaration of information for EPD's covering more than one product, or more than one site

In the case of EPD's covering more than one product or more than one site, the following information shall at least be provided in the EPD for transparency and to give the user the necessary information to use the EPD correctly:

- The range of products for which the EPD is relevant, even if data from some products have not been used directly in producing the EPD, including the technical description of the product group covered by the EPD (such as density or a property as a U-value)

EXAMPLE For an average EPD for a declared unit of R-Value of a specific type of insulation material, the representation of the EPD could be described by the relevant technical properties such as the range of density, thermal conductivity and thickness for which the EPD is representative

- Sites, manufacturer, or group of manufacturers or those representing them for whom the EPD is representative
- In case of collective EPD, identification of the market players that can use the collective EPD.
- When there is a selection of sites or products assessed, description on how the selection of the sites/products was done
- How the declared value has been determined (e.g. representative product, worst case value or weighted average of results from the various products based on production volume)
- Information on the most influencing parameters in the LCA
- If the products covered by the EPD differ by more than +10% in their core environmental indicators, description of the range of variability of the LCIA results¹⁶
- Qualitative description of the main differences between the products / production sites covered by the EPD (e.g. similar composition but different production process, or same composition except for the coloring agent or finishing layer);
- Information on restrictions to the use of the EPD;
- Geographical coverage;

A 33 Addition regarding the declaration of data quality information

Data quality including any information on deficiencies in data quality shall be described and reported in the EPD following the requirements from EN 15941. If any datasets are used that do not conform to the methodological requirements of EN 15804 (e.g. regarding allocation rules, system boundaries) this shall be mentioned in the EPD, together with an indication of the relative importance of this dataset in terms of contribution to the environmental profile of the EPD.

¹⁶ TR 16970:2016

A 34 Additional requirement regarding the declaration of thermal characteristics

EPD's of products contributing to the thermal performance of the building envelope shall declare the Lambda-value and/or U-value of the product in the technical property table of the B-EPD (see Annex G).

A 35 General information to be translated in view of the integration in TOTEM

TOTEM accepts B-EPDs established in one of the four following languages: Dutch, French, German, English.

For following parts of the B-EPD, a translation shall be entered in the B-EPD database in Dutch, French, German and English:

- *Product name*
- *Product description (short description of the product to make the product recognizable for an architect or consumer in case the product name is vague.)*
- *Intended use (more detailed description of the application for which the product is made available on the market.)*
- *Product composition (EN 15804 §7.1 d): description of the materials and processes included in the product, including information on the inclusion (or not) of fixing materials and packaging .*
- *Application unit (see Annex F)*

7.2 Declaration of environmental parameters derived from LCA

As in EN 15804:2012+A2:2019, in addition:

A 36 Significant figures

All results shall be reported to 3 significant figures using a scientific notation

A 37 Declaration of additional environmental impact indicators

The additional environmental impact indicator values shall be included in the project report and in the EPD for each module declared in the EPD.

A 38 Net fresh water use¹⁷

This indicator is calculated in compliance with ISO 14046.

EN 15804:2012+A2:2019 uses the term "net" as opposed to "gross" in relation to freshwater use, to show both: the intention that use of water, which is not consumed (e.g. water used for river transport, used to power hydroelectric turbines or used as coolant and returned to the original source), is not considered within the indicator. That water which would have been lost from the original, natural system, e.g. from evaporation of rainwater or from a body of water, is not considered within the losses from the studied technical system.

Evaporated fresh water is considered consumption unless it is demonstrated otherwise. For each process, the water flows are identified, in terms of volume extracted, volumes discharged and the source or the destination, e.g. surface water, ground water, sea water.

¹⁷ TR 16970 :2016

Where tap water (water from the public grid) is used, the water treatment and distribution systems are considered as an upstream process, which will have its own resource use and discharges.

Similarly, where water is discharged to the sewer, then the sewer and water treatment system are considered as a downstream process with its own resource use and discharges.

Other water flows, for example water which evaporates or water which is incorporated into the product, are ideally be itemized in the process inventory so that a full water balance can be made.

For each process, the water consumed is the sum of the water which is lost from a drainage basin. This can be more easily calculated as the sum of water which evaporates, transpires from biomass, is incorporated into products or is discharged to a different drainage basin. This also, as mentioned, does not need to account for water which would have been lost from the drainage basin in the natural system before the technical system was implemented.

EXAMPLE 1 Rainwater would normally be expected to drain to surface or ground water. If a factory or building is placed on the site, then water could instead be directed to the sewer and could be discharged, after treatment, to the sea, surface or ground water. Water which is diverted through the water treatment system from its original drainage basin is consumed. If rainwater is used in the building before discharging it into the sewer then this will be considered no differently than if the water was discharged directly to the sewer. However, if rainwater is used for cleaning and evaporates, then this water is consumed.

EXAMPLE 2 For an agricultural process, water that evaporates or transpires from the plants as a result of human activity (irrigation) is considered as consumption. Water, such as rainwater, which evaporates or goes to the drainage basin in the same way as if it would, were there no agricultural process, is not consumption. The assumption is that natural vegetation would have the same effect.

EXAMPLE 3 Additional water evaporation from reservoirs and as a result of the hydro-generation process downstream occurring in addition to that from the original natural system is considered water consumption.

EXAMPLE 4 For a quarry, where de-watering takes place, if this water is returned to the same drainage basin it would naturally have drained to, then it is not consumption. If however, it is used in a process and evaporates, then it is consumption.

7.3 Scenarios and additional technical information

As in EN 15804:2012+A2:2019, in addition:

A 39 Addition related to carbonation

Carbonation may be considered following the specifications of European or Belgian c-PCR relevant for the considered product group (e.g. concrete and concrete products, lime based mortars). The underlying methodology and scenarios, and the contribution of carbonation to the declared values for the indicator GWP_{fossil} shall be described in the “scenarios and technical information” part of the EPD.

A 40 Addition related to reversibility

At least for all different applications in the application unit, a qualitative description of the reversibility shall be given per type of fixation and/or installation using **Fout! Verwijzingsbron niet gevonden.** The declared level of reversibility shall be assessed using the criteria from Table 4.

TABLE 3 REVERSIBILITY CRITERIA

Description	Type of fixing	Level of reversibility	Simplicity of disassembly	Speed of disassembly	Ease of handling (size and weight)	Robustness of material (material resistance to disassembly)
<p><i>Describe to what element or other product the product is installed to</i></p>	<p><i>Description of ancillary material and way of fixation. See table below for options.</i></p>	<p><i>Indicate the level of reversibility based on Table 4 per type of connections.</i></p>	<p><i>per type of fixation, choose from</i></p> <ul style="list-style-type: none"> <i>-Simple, no specific tools required</i> <i>-Simple, use of specific though common tools</i> <i>-Simple, but collecting the material is a bit more intensive (e.g. bulk material)</i> <i>-Complex, requires specific tools and/or skills</i> <i>-n/a: the element is not reversible</i> 	<p><i>Per type of fixation choose from</i></p> <ul style="list-style-type: none"> <i>-Speedy disassembly</i> <i>-Speedy, lightweight material</i> <i>-Speedy, material loosely laid / in bulk</i> <i>-Rather speedy disassembly</i> <i>-Speed of disassembly varies from quick to slow depending on element dimensions</i> <i>-Speed of disassembly varies from quick to slow depending on element dimensions and number of fixations per distance unit</i> <i>-Disassembly is slow (due to dimensions, weight and/or fixation method)</i> <i>-n/a: the element is not reversible</i> 	<p><i>Per type of fixation choose from</i></p> <ul style="list-style-type: none"> <i>-Easy to manipulate by hand (small size and limited weight): one worker should be sufficient</i> <i>-Material easy to manipulate by hand, one to two workers required depending on dimensions</i> <i>-Can be handled manually, but due to size, weight and/or tools two or more workers are required</i> <i>-At least two workers and additional specific equipment are needed</i> <i>-Comes in a manipulable size, but the whole is rather heavy to manipulate.</i> <i>-n/a: the element is not reversible</i> 	<p><i>Per type of fixation choose from</i></p> <ul style="list-style-type: none"> <i>-The material resists well during disassembly</i> <i>-Disassembly is possible but should be done carefully in order not to generate any damage</i> <i>-Material with a long lifespan, disassembly is possible, but the material should be handled with care in order to prevent damaging it</i> <i>-Disassembly is possible but can cause damage to the material due to the type of assembly or fixing used.</i> <i>-Disassembly is possible but will likely cause damage to the material due to the type of assembly or fixing used</i> <i>-Disassembly is possible but will likely cause damage to the material due to the type of assembly or and tools used and the</i>

						<i>presence of additional layers. -n/a: the element is not reversible</i>
e.g. Bricks joint together to form an external wall	cement mortar for masonry joints (R joint \geq Rmat)	Non reversible connections				
e.g. Insulation attached to concrete flat roof structure	Loose laid with ballast	Reversible connections				
e.g. Insulation attached to concrete flat roof structure	screws	Reversible connections with light repairable damage	<i>Simple, use of specific though common dismantling tools required</i>	<i>Speedy disassembly</i>	<i>Easy to manipulate by hand (small size and limited weight): one worker should be sufficient</i>	<i>Material with a long lifespan, disassembly is possible but the material should be handled with care in order to prevent damaging it</i>
...				

TABLE 4 QUALITATIVE CRITERIA FOR THE ASSESSMENT OF THE LEVEL OF REVERSIBILITY

Type of assembly	Level of reversibility
Buried, reversible but not easy accessible for reuse	Non-reversible connections
Cast in situ (chemically bonded)	
Cast/fixed in mass (chemically bonded)	
Coating (chemically bonded)	
Fixed with cement mortar (Resistance of joint \geq Resistance of material)	
Glued	
Glued and fixed with plugs	
Glued and joints with cement mortar	
Glued and nailed	
Loose laid but covered by/integrated in concrete	
Loose laid but with cement mortar joints	
Masonry with adhesive mortar (Resistance of joint \geq Resistance of material)	
Masonry with bastard mortar joints (Resistance of joint \geq Resistance of material)	
Masonry with cement mortar joints (Resistance of joint \geq Resistance of material)	
Mechanically fixed but covered by concrete	
Plaster (chemically bonded)	
Screwed but covered by joint filler	
Sprayed (chemically bonded)	
Welded	
Fixed with cavity ties and clips	Reversible connections with non-repairable damage
Fixed with lime mortar (Resistance of joint = Resistance of material)	
Lime mortar for masonry joints (Resistance of joint < Resistance of material)	
Nailed	
Nailed with specific nails	
Screwed or fixed with hammer-in plugs	
Stapled	
Taped	
Anchored	Reversible connections with light repairable damage
Anchored with hinged subcomponents	
Bolted	
Bolted/screwed	
Loose laid with sand cement mortar (Resistance of joint = Resistance of material)	
Screwed	
Screwed with loose subcomponents	
Clamped and sealed	Reversible connections
Fixed with clips	
Hinged	
Loose laid	
Loose laid and ballasted	
Unknown, depends on the construction method	Unknown connections, depends on the construction method

Default transport to the building site

Transport scenarios from the factory to the building site shall be representative for the Belgian market share of the production (see A 20).

In case specific data on transport (e.g. statistical data from logistic department or data provided by c-PCR) is lacking, following default transport scenarios shall be used:

Organization of transport:

Unless the goods are produced in an overseas location, fractions of products that go directly from the factory to the building site or to a retailer first are determined based on product group according to Table 6. For products produced overseas, it is assumed that no products are transported directly to the building site (so 100% go from factory to retailer first).

Transport mode and route:

Default transportation modes are available for each product group in Table 6. Default transport distances are available in Table 5.

TABLE 5 – DEFAULT TRANSPORT DISTANCES (MODULE A4)

		TRANSPORT DISTANCE		
		Factory to construction site	Factory to supplier	Supplier to construction site
ORIGIN	Production in Belgium	100 km	100 km	35 km
	Production outside Belgium (NOT overseas)	Distance from production site to Brussels with a minimum distance of 100 km	Distance from production site to Brussels with a minimum distance of 100 km	35 km
	Production outside Belgium (overseas)	X	Distance (by road) from production site to closest harbour in the country of origin + Distance (by boat) to port of Antwerp + 60 km by road (Antwerp to retailer)	35 km

Loading rates

Default lorries identified in Table 6 are based on Ecoinvent v3.1 data records¹⁸. Those implicitly suppose default loading rates representing average European journeys. Unless more specific data is available, those average loading rates can be used for the above specified trips. In case those average loading rates are used, return trips can be omitted (as the loading factors used to create those records already take into account a certain amount of empty returns).¹⁹

Any deviations from the default scenarios shall be clearly motivated in the project report and transport scenarios shall be reported transparently in the EPD.

¹⁸ When available, more recent versions of the database should be used.

¹⁹ Ecoinvent records based on Tremove model v2.7b (2009) and EcoTransIT (2011) report

TABLE 6 – DEFAULT TRANSPORT SCENARIO (MODULE A4)

		ORGANISATION OF TRANSPORT		TRANSPORTATION MODE						
		% directly from factory to construction site	% via intermediary supplier	Factory to construction site			Factory to supplier	Supplier to construction site		
ORIGIN	Transport from overseas location	0%	100%	X			By road: See scenarios for each product group			
	Transport by road from Belgium or Europe	See scenarios for each product group		See scenarios for each product group						
		% directly from factory to construction site	% via intermediary supplier	Factory to construction site			Factory to supplier	Supplier to construction site		
				Lorry 16-32 ton (EURO 5)	Lorry 7.5-16 ton (EURO 5)	Lorry 3,5-7.5 ton (EURO 5)	Lorry >32ton (EURO 5)	Lorry 16-32 ton (EURO 5)	Lorry 7.5-16 ton (EURO 5)	Lorry 3,5-7.5 ton (EURO 5)
PRODUCT GROUPS	Bulk materials for structural work (e.g. cement, sand, gravel, ...)	75%	25%	100%	0%	0%	100%	90%	10%	0%
	Poured concrete	100%	0%	100%	0%	0%	nvt	nvt	nvt	nvt
	Prefabricated products for structural works (e.g. beams, columns,...)	100%	0%	100%	0%	0%	100%	100%	0%	0%
	Loose products (e.g. blocks, bricks, roof tiles, plasterboard,...)	40%	60%	100%	0%	0%	100%	85%	15%	0%
	Insulation	40%	60%	100%	0%	0%	100%	85%	15%	0%
	Finishing products: floor coverings (e.g. carpet, linoleum, ceramic tiles,...)	10%	90%	90%	10%	0%	100%	90%	10%	0%
	Finishing products: plasters (e.g. gypsum plaster, external plaster,...)	40%	60%	50%	50%	0%	100%	50%	50%	0%
	Finishing products: cabinet work (e.g. window frames, stairs)	90%	10%	50%	45%	5%	100%	40%	50%	10%
	Finishing products: paints and varnishes	10%	90%	0%	100%	0%	100%	0%	80%	20%
Installations (e.g. heating boiler, radiators, ventilation)	0%	100%	na	na	na	100%	0%	80%	20%	

A 41 Declaration of scenario information for module A5

In addition, the scenario information for A5 shall clearly indicate which ancillary materials are included in the indicator values declared for this module.

A 42 Default end-of-life scenario

End-of-life scenarios shall be representative of the Belgian situation. In case specific data on end-of-life is lacking, following default scenarios shall be used. Any deviations from the default scenarios shall be clearly motivated in the project report. Scenarios shall be reported transparently in the EPD for the main product and all other materials included in the EPD (e.g. fixations).

Default End-of-life scenario depending on product group: see Table 7.

NOTE 1 The scenarios in Table 6 represent the average Belgian practice in 2016 (averaged over the different regions and different types of construction works). As a result, they do not necessarily represent the technical end-of-life potential or best practice and in some cases might deviate from regulation.

NOTE 2 For recycling, no distinction is made between "open loop" and "closed loop" recycling. This information might be specified for a specific product group in the complementary vertical PCR (c-B-EPD PCR).

Default transport of waste:

- With the exception of soil, all construction and demolition waste, whether or not sorted on site, is transported from the construction/demolition site to a sorting facility/collection point (e.g. metal dealer) or crusher first and from there it is eventually further dispatched to recycling, incineration, energy recovery or landfill.
- Transport distance:
 - From construction/demolition site to sorting plant/crusher/collection point: 30 km
 - From sorting plant to landfill: 50 km
 - From sorting facility to incineration plant/energy recovery: 100 km
- Transport mode: 100% with Lorry 16-32 ton (EURO 5)
- Average load factor: if default load factors from ecoinvent are used, no empty return has to be taken into account. Otherwise, calculations shall consider empty returns.

Default impact of the sorting plant:

- Electricity use (Belgian electricity mix):
 - Sorting plant without crusher (=energy demand of conveyor belt etc.) 0.0022 kWh/kg waste (for materials sorted out prior to the crusher (e.g. mineral wool, boards,...) or causing no resistance in crushing (e.g. paints)
 - Sorting plant with crusher (e.g. for concrete materials): 0.0037 kWh/kg waste
 - Use Belgian electricity mix (low voltage)
- Diesel consumption for charging and discharging waste: 5.9 MJ diesel burned in building machine/m³ bulk volume of waste
- Infrastructure from sorting plant: 1x10⁻¹⁰ plant/kg waste

NOTE 1 as an approximation, the bulk density of waste can be calculated as 0.9 x material density.

TABLE 7 – DEFAULT END-OF-LIFE SCENARIOS

Flux de déchet	Produits / Description	Traitement en fin de vie (scénario 2016)			
		Décharge	Incinération et/ou valorisation énergétique	Recyclage (a)	Réemploi
		%	%	%	%
Pierreux & verre (inertes)	Béton	5	0	95	0
	Briques, tuiles	5	0	95	0
	Autres déchets pierreux inertes (p.ex. carrelage, pierre naturelle, ardoise, blocs silico-calcaires)	5	0	95	0
	Porcelaine & céramique (p.ex. WC, bain, lavabo)	15	0	85	0
	Matériaux en vrac (p.ex. sable, graviers, argile expansé)	5	0	0	95
	Verre plat	5	0	95 (b)	0
Bois	Bois non-traité, non-contaminé (p.ex. charpente et structure, coffrage, petits bois)	0	25	75	0
	Bois massif traité et non-imprégné (p.ex. bois peint ou vernis (chassis, parquet massif))	0	85	15	0
	Produits en bois composé (p.ex. panneaux de fibres (stratifiés/laminés, agglomérés (MDF, OSB), multiplex, ...))	0	95	5	0
	Bois imprégné et traité chimiquement (p.ex. billes de chemin de fer, bois pour abri-garage, jouets extérieurs, écrans de jardin, ...)	0	100	0	0
Métaux	Fer, acier, métaux non-ferreux (cuivre, bronze laiton, aluminium, plomb, zinc, étain)	5	0	95	0
Emballages (chantier)	Papier et carton	0	5	95	0
	Films en plastique (emballages)	5	60	35	0
	Emballages EPS	10	30	60	0
	Palettes	0	40	40	20
Isolants	Isolants minéraux (p.ex. laine de roche, laine de verre)	50	50 (h)	0	0
	Isolants synthétiques (p.ex. polyuréthane (PUR), polyisocyanurate (PIR), polystyrène extrudé (XPS), mousse phénolique, polystyrène expansé (EPS))	5	95	0	0
	Isolants organiques (p.ex. fibres de plantes (bois, cocos, chanvre, lin), cellulose (en vrac ou en matelas), laine de mouton, liège (en vrac ou en matelas))	5	95	0	0
Produits fibro-ciment	p.ex. Plaque /Ardoise fibro-ciment	100	0	0	0
Éléments en plâtre	p.ex. Blocs de plâtre, plaques de plâtre	80	0	20	0
Béton cellulaire	p.ex. Éléments, blocs	70	0	30	0
Bitume	p.ex. Roofing bitumineux, pare/frein vapeur, pare eau, ...	85	5	10	0
Polyléfinés (PP, PE)	p.ex. Pare/frein vapeur en papier kraft ou polyéthylène (PE), conduits. <u>Hors emballages.</u>	10	85	5	0
Elastomères	p.ex. Roofing résineux réticulé EPDM	90	0	10	0
PVC	Films PVC, p.ex. roofing résineux thermoplastique PVC, membranes étanches (ex. pour les piscines)	20	65	15	0
	Profils en PVC, p.ex. châssis	10	45	45	0
	Cablage, p.ex. câbles électriques et isolation de fil	10	40	50	0
	Conduits, p.ex. pour les canalisations (c)	10	30	50	0
Revêtements de sol	p.ex. linoléum, tapis-plain, vinyle	0	95	5	0
Finitions (d)	Couche de finition collée à du bois, à de la matière synthétique ou à du métal, p.ex. peinture, revêtement, colle	0	100 (e)	0	0
	Couche de finition collée à des débris (inertes), p.ex. plâtre (p.ex. de gypse, de calcaire et d'argile), peinture, revêtement, colle	5	0	95 (f)	0
Déchets résiduels	Déchet résiduel non-combustible	100	0	0	0
	Déchet résiduel combustible (p.ex. lamelles, textile de pare soleil)	0	100	0	0
Autres déchets dangereux	Bombes et kits (mousse PU, silicones)	0	100 (g)	0	0
	Amiante liée ou non-liée	100	0	0	0
	Tubes fluorescents	30	0	70	0
	Déchets fluides de chantier, p.ex. restes de peintures, colles, résines, huiles de décoffrage, white spirit	0	75	25	0

- (a) La valorisation énergétique ne tombe pas sous la catégorie "recyclage" mais sous la catégorie "incinération et/ou valorisation énergétique".
Le recyclage peut être 'open loop' (recyclage dans une autre application) ou 'closed loop' (recyclage dans la même application).
- (b) Principalement recyclage "open loop" (Si le verre n'est pas démonté avant démolition, celui-ci est recyclé avec la fraction inerte. Applications courantes pour le verre collecté séparément sont: production de laine de verre, verre cellulaire, billes de verre,...). Pour la fraction mélangée avec la fraction inerte aucun bénéfice ne peut être déclaré dans le module D car la présence du verre est tolérée mais non souhaitée.
- (c) 10% restent généralement dans le sol. La somme des scénarios n'est donc pas égale à 100%.
- (d) Il s'agit de relativement petites quantités de matériaux qui sont collées aux autres matériaux.
- (e) La finition suit le même chemin que son support. Lors du broyage du bois (pour recyclage), la couche de finition se retrouve dans les fines qui sont ensuite incinérées. Le recyclage des métaux est réalisé à haute température, donc en pratique la couche de finition est aussi incinérée.
- (f) La finition suit le même chemin que son support (p.ex. béton, brique). Lors du broyage, la couche de finition est recyclée avec le débris. Toutefois si la finition (ex. le plâtre de gypse) est seulement tolérée mais non souhaitée dans la fraction inerte, aucun bénéfice ne peut être déclaré dans le module D pour ce scénario.
- (g) La bombe elle-même sera recyclée (métal), le contenu sera incinéré pendant ce processus.
- (h) Il peut paraître illogique d'incinérer des isolants minéraux mais ce scénario reflète la pratique dont la vérification a été obtenue auprès de plusieurs entreprises de traitement des déchets en Belgique.

Afvalstroom	Product / Beschrijving	Afvalbehandeling (scenario 2016)			
		Stort	Verbranding en/of energetische valorisatie	Recyclage (a)	Hergebruik
		%	%	%	%
Steenachtig & glas	Beton	5	0	95	0
	Baksteen, dakpannen	5	0	95	0
	Ander steenachtig (o.a. tegels, natuursteen, leisteen, kalkzandsteenblokken)	5	0	95	0
	Porcelein & keramiek (o.a. wc, bad, lavabo)	15	0	85	0
	Bulkmaterialen (o.a. zand, grind, geëxpandeerde kleikorrels)	5	0	0	95
	Vlakglas	5	0	95 (b)	0
Hout	Onbehandeld, niet-verontreinigd hout, bv. daken en structuur, bekisting & hulphout, ...	0	25	75	0
	Massief hout met oppervlaktebehandeling, bv. geverfd of gevernist hout (raamkaders, massief parket)	0	85	15	0
	Composiet hout producten, bv. vezelplaten (multiplex, spaanplaten, OSB, MDF), fineerhout, laminaat, ...	0	95	5	0
	Chemisch behandeld geïmpregneerd hout, bv. treinbilzen, hout voor carports, buitenspeeltuigen, tuinschermen, ...	0	100	0	0
Metalen	Ijzer, staal, non-ferro metalen (koper, messing, aluminium, lood, zink, tin)	5	0	95	0
Verpakkingen (Werf)	Papier en karton	0	5	95	0
	Plastiekfolies (verpakkingen)	5	60	35	0
	EPS-verpakkingen	10	30	60	0
	Paletten	0	40	40	20
Isolatiematerialen	Minerale isolatiematerialen (o.a. rotswol, glaswol)	50	50 (h)	0	0
	Synthetische isolatiematerialen (o.a. polyurethaan (PUR), polyisocyanurate (PIR), geëxtrudeerd polystyreen (XPS), fenolschuim, EPS)	5	95	0	0
	Organische isolatiematerialen (o.a. plantaardige vezels (hout, kokos, hennep, vlas), cellulose (in bulk of maten), schapenwol, kurk (in bulk of platen))	5	95	0	0
Vezelcementproducten	o.a. Vezelcementplaten/leien	100	0	0	0
Gipselementen	o.a. Gipsblokken, gips(karton)platen	80	0	20	0
Cellenbeton	o.a. Elementen, blokken	70	0	30	0
Bitumen	o.a. Bitumineuze dakbedekking, dampschermen, vochtkering, ...	85	5	10	0
Polyolefinen (PP, PE)	o.a. Dampscherm in kraftpapier of polyethyleen (PE), buizen. <u>Uitgezonderd verpakkingen</u>	10	85	5	0
Elastomeren	o.a. EPDM dakbedekking	90	0	10	0
PVC	Folies, o.a. PVC dakbedekking, waterdichte membranen (bv. voor zwembaden)	20	65	15	0
	Profielen (o.a. raamkozijnen)	10	45	45	0
	Bekabeling (o.a. elektrische kabels en draadisolatie)	10	40	50	0
	Buizen (o.a. voor riolering) (c)	10	30	50	0
Soepele vloerbekledingen	o.a. linoleum, vast tapijt, vinyl	0	95	5	0
Afwerkingslagen (d)	Verkleefd aan hout, kunststof of metaal: bv. verven, coatings, lijmen	0	100 (e)	0	0
	Verkleefd aan steenachtig afval: bv. pleisters (o.a. gips-, kalk-, en leempleisters), verven, coatings, lijmen	5	0	95 (f)	0
Restafval	Niet brandbaar restafval	100	0	0	0
	Brandbaar restafval (o.a. lamellen, textiel van zonwering)	0	100	0	0
Ander gevaarlijk afval	Spuitbussen en kits (PU-schuim, siliconen)	0	100 (g)	0	0
	Asbest (gebonden, ongebonden)	100	0	0	0
	TL-Lampen, ...	30	0	70	0
	Vloeibaar werfafval van o.a. verven, lijmen, harsen, bekistingsoliën, white spirit, ...	0	75	25	0

(a) Energetische valorisatie valt NIET onder de categorie "recyclage" maar onder de categorie "verbranding en/of energetische valorisatie".
Recyclage kan "open loop" (recyclage in een andere toepassing) of "closed loop" zijn (recyclage in dezelfde toepassing).

(b) Grotendeels "open loop" recycling (Indien het glas niet gedemonteerd wordt voor het slopen, wordt het samen met de inerte fractie gerecycleerd. Courante toepassingen voor glas dat wel afzonderlijk ingezameld wordt: productie van glaswol, cellenglas, glasparsels,...). Voor het aandeel glas dat samen met de inerte fractie wordt gerecycleerd mag geen voordeel gedeclareerd worden in module D aangezien het glas enkel getolereerd wordt in deze fractie maar niet gewenst is.

(c) 10% blijft typisch in de grond zitten, waardoor de som van het scenario geen 100% is.

(d) Het betreft relatief kleine hoeveelheden materiaal die verkleefd zijn aan andere materialen.

(e) De afwerkingslaag volgt dezelfde weg als zijn drager. Bij het verbrijzelen van hout (voor recyclage) komt de afwerkingslaag in de poederfractie terecht die dan verbrand wordt. Recyclage van metalen gebeurt bij hoge temperaturen zodat de afwerkingslaag in de praktijk ook verbrand wordt.

(f) De afwerkingslaag volgt dezelfde weg als zijn drager (bv. beton, baksteen). Bij het breken wordt de afwerkingslaag dus samen met het puin gerecycleerd tot puingranulaat (open loop recycling).
Hierbij dient te worden opgemerkt dat gipspleister een storende stof is die de kwaliteit van de inerte fractie kan verminderen. Voor afwerkingslagen die niet

(g) De spuitbus zelf(metaal) zal worden gerecycleerd, de inhoud ervan zal tijdens dit proces worden verbrand.

(h) Ook al lijkt het onlogisch, volgens verschillende afvalverwerkingcentra in België reflecteert dit scenario de Belgische praktijk.

A 43 Additional requirement concerning the declaration of scenario information for module D

The following information shall be provided to specify the scenarios supporting the calculation of the impacts and benefits reported in Module D.

TABLE 8 MODULE D (SCENARIO INFORMATION BASED ON PREN 15942, V 2021-04)

Parameter	Units/comments	Scenario information
Net output flow specified per material	units as appropriate	
Avoided production	units as appropriate	
Location of end-of-waste point	Not applicable	
Point of functional equivalence	Not applicable	
Other assumptions (e.g. description of impacts reported in module D)	units as appropriate	

A 44 Quantification of Module D for waste incinerated at end-of-life

Unless more specific data is available, following default scenarios shall be used for the quantification of the benefits from waste incineration in Module D:

- net energy efficiency of 20% for thermal energy and 10% for electric energy (using the Lower Heating Value of waste (LHV))

EXAMPLE If 1kg of waste with a LHV of 10MJ/kg is incinerated, benefits declared in module D are quantified based on the avoided production of 20% \times 10MJ=2MJ heat and 10% \times 10MJ=1MJ electricity

- substituting process for heat production: "Thermal energy from natural gas" (e.g. Heat, natural gas, at industrial furnace >100kW)
- substituting process for electricity production: Belgian high voltage consumption mix, excluding the impact from the transmission network.

NOTE 1 As the default energy efficiency of the energy recovery process is below 65%, impacts from incineration are reported in module C (see Table 1).

NOTE 2 The default scenario considers that the waste is incinerated in a municipal incineration plant. Therefore, the substituted processes are the same regardless of the nature of the waste (i.e.. fossil based or biobased waste).

NOTE 3 If the specific scenario for the EPD assumes that the biobased waste is incinerated in a biomass energy plant, then the benefit reported in module D shall represent the avoided impact from energy (heat and/or electricity) produced by a biomass energy plant using (virgin) wood pellets.

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

As in EN 15804:2012+A2:2019, in addition

A 45 Emissions into indoor air

For building products in direct contact with and with possible emissions into the indoor air, information concerning possible emission into indoor air should be declared. In case of declaration the characteristics shall be determined according to EN 16516 "Construction Products – Assessment of release of dangerous substances – Determination of emissions into indoor air".

TABLE 9 DECLARATION OF EMISSIONS INTO INDOOR AIR

Characteristic	
R value	2 significant figures
TVOC content	µg/m ³ with 2 significant figures
TSVOC content	µg/m ³ with 2 significant figures
Carcinogenic substances	mg/m ³ with 1 significant figures or "below the detection limit"
Formaldehyde	µg/m ³ with 2 significant figures or "below the detection limit"

In case of declaration, the EPD shall also list the test method reference.

For floor coverings, glues for floor coverings and finishing products for wooden floor coverings the legal obligations specified in the *Royal Decree of 8 May 2014 concerning emissions of building products to the indoor environment* are valid (Koninklijk besluit van 8 mei 2014 tot vaststelling van de drempelniveaus voor de emissies naar het binnenmilieu van bouwproducten voor bepaalde beoogde gebruiken).

7.5 Aggregation of information modules

As in EN 15804:2012+A2:2019

8 PROJECT REPORT

As in EN 15804:2012+A2:2019, in addition

A 46 Average EPD

For an average EPD, the project report should also describe and present the results from the analysis of variability of LCIA results within the product group (see *A 19 Selection of data with regard to average EPD's*)

9 VERIFICATION AND VALIDITY OF AN EPD

As in EN 15804:2012+A2:2019, in addition extra verification requirements from the B-EPD program are applicable such as requirements for compliant verifiers, checklist for verification, requirements for attestation of verification, etc. These are laid down in separate reference documents on the B-EPD website (<https://www.health.belgium.be/en/belgian-epd-programme-b-epd>).

BIBLIOGRAPHY

As in EN 15804:2012+A2:2019, in addition:

1. CEN/ TR 16970 : 2016 Sustainability of construction works – Guidance for the implementation of EN 15804.
2. ISO 21930:2017 Sustainability in buildings and civil engineering works – Core rules for environmental product declarations of construction products and services
3. Commission recommendation of 16.12.2021 on the use of the Environmental Footprint methods to measure and communicate the life cycle environmental performance of products and organisations
Requirements and guidance on the reference service life
(normative)
4. prEN 15941: 2022 Sustainability of construction works – Data quality for environmental assessment of products and construction work – Selection and use of data

Annex A Waste (informative)

As in EN 15804:2012+A2:2019

Annex B Characterisation factors for GWP, ODP, AP, EP, POCP and ADP (normative)

C.1 Core environmental impact categories and indicators

As in EN 15804:2012+A2:2019

C.2 Calculation rules for the climate change impact category

As in EN 15804:2012+A2:2019, in addition

A 47 Calculation of biogenic global warming potential (GWP-biogenic)

Since there is not yet sufficiently robust LCI data available to enable a coherent automatic calculation of the biogenic carbon emissions and removals, emissions and removals of biogenic carbon may have to be calculated manually. Therefore, the calculation of GWP_{biogenic} may be limited to the amounts of biogenic carbon present in the biobased part of the finished construction product and in its packaging, and exclude the amounts of biomaterial input required to make the product (e.g. packaging of raw materials used in A1-A3, biogenic carbon emissions and removals from grid electricity production).

However, for all processes where biogenic carbon removals are reported, biogenic carbon emissions shall also be calculated and reported in the EPD. Also, a mass and carbon balance shall be carried out to ensure that the biogenic carbon dioxide removals and emissions are coherently computed for the considered processes.

NOTE EN 16449:2004 *Wood and wood-based products - Calculation of the biogenic carbon content of wood and conversion to carbon dioxide* provides guidance on how to calculate the biogenic carbon content of wood and wood based products.

A 48 Greenhouse gas emissions from land use change (GWP-luluc)

When significant based on expert judgement, GHG emissions occurring as a result of direct land use change should be included in the quantification of the GWP. These GHG emissions are included in the LCI and LCIA and documented separately in the project report. The project report shall include a dated reference to the underlying methodology (latest available version of PEF guidance document), and an interpretation of the results reflecting the influence of data availability.

GHG emissions that occur as a result of direct land use change shall be allocated to products for (i) 20 years after the land use change occurs or (ii) a single harvest period from the extraction of the evaluated product (even if longer than 20 years) and the longest period shall be chosen.

NOTE 1 This aspect is not restricted to bio-based materials, e.g. in the context of deforestation or conversion of grassland to energy crops, but applies also to other materials and processes, e.g. related to the conversion of land to quarries, infrastructure, production plants etc.

NOTE According to EN 16485 wood from sustainably managed forestry's is accounted for zero emission concerning land use change. The concept of sustainably managed forests is linked but not limited to respective certification schemes. Other evidence such as national reporting under the United Nations Framework Convention on Climate Change (UNFCCC) can be used to identify forests for which stable or increasing forest carbon stocks and thus zero emissions from land use change can be assumed.

A 49 Toxicity indicators: aggregation of contribution from metals, organic and inorganic substances

For the toxicity indicators (i.e. human toxicity cancer, human toxicity non-cancer, and ecotoxicity freshwater), contributions from metals, organic and inorganic substances may be reported separately in the project report (e.g. as Human toxicity, cancer - organic; Human toxicity, cancer - inorganic; Human toxicity, cancer - metals) to improve the interpretation of results. However, only the total contributions (i.e. Human toxicity, cancer; Human toxicity non-cancer; ecotoxicity freshwater) shall be reported in the B-EPD.

Annex C End-of-life formulae

As is EN 15804:2012+A2:2019.

Annex D Schemes to be applied for data quality assessment of generic and specific data

As in EN 15804:2012+A2: 2019.

Annex E

Rules for the development of C-B-EPD PCR

(This annex is not part of EN 15804:2012+A2:2019)

The development of c-B-EPD PCR shall respect following principles

1. The grouping of products shall follow the grouping of the European Product TC's.
2. Any c-B-EPD PCR using the B-EPD PCR as a reference needs to be compliant with specifications of this PCR (and therefore also with specifications of EN 15804:2012+A2:2019). If there is no c-B-EPD PCR available, EPD for construction products are developed only according to the present PCR. The EPD always states according to which PCR it was made (EN ISO 14025:2011, 7.2.1, e).
3. Any c-B-EPD PCR using the present PCR as reference shall also be compliant with the applicable European c-PCR for the concerned product group which is considered compliant with EN 15804:2019+A2 by CEN/TC350 and which has been validated by the B-EPD program operator.
4. In order to develop a consistent set of principles and rules for the construction sector, the c-B-EPD PCR provided by national mirror committees of Product TC's shall²⁰:
 - a) use the following common title structure:

"[title of Product TC] – Environmental product declarations – Product category rules complementary to B-EPD PCR [product group, depending on name]"
 - b) use the same structure as the present document.
5. In the development of c-B-EPD PCR the following aspects are considered:
 - a) Complementary specifications to the core rules provided by B-EPD PCR, particularly related to:
 - 1) the scope of the c-B-EPD PCR, related to the product group, product type, intended application and use of the product, type of EPD;
 - 2) the scope with respect to any required information modules A1-C4 and D;
 - 3) specification of the declared or functional unit;
 - 4) allocation rules;
 - 5) system boundary setting;
 - 6) application of the rules for the exclusion of inputs and outputs;
 - 7) possible data sources.

²⁰ May be adapted depending on the structure defined by the program operator (business plan)

NOTE 2 A c-B-EPD PCR should focus on aspects that are specific to its product group. Specifications that are common to other product groups are preferably considered for further revisions of the B-EPD PCR.

- b) Guidance for the life cycle inventory specifically related to the product group and/or product type for the information modules covered by the type of EPD.
- c) Selection of information modules for which more specific requirements and guidance are given.
- d) Inclusion of default scenarios related to a specific application of the product including guidance on:
 - 1) the specific content of all information modules of the life cycle and information module D, for default scenarios (e.g. use, typical waste processing, for energy recovery, recycling and reuse and disposal);
 - 2) the definition of the end-of-waste status;
 - 3) the technical scenario information for all information modules of the product system and information module D;
 - 4) the determination of the RSL and related in-use conditions for a specific application of the product.
- e) Selection of additional technical information to be declared (e.g. pertinent product characteristics and respective testing methods).
- f) Guidance on provision of additional information on release of dangerous substances to indoor air, soil and water during the use stage.

The following aspects are not part of c-B-EPD PCR:

- a) classes, benchmarks or threshold values for the indicators;
- b) new indicators or exclusion of indicators required by the B-EPD PCR, as part of the c-B-EPD PCR implementation.

Annex F Application unit

(This annex is not part of EN 15804:2012+A2:2019)

A.50 Application unit

The manufacturer shall enter an application unit in the database for each application of the product. The application unit allows to link the EPD to a specific application in TOTEM. Compared to the functional or declared unit, which is often chosen to be valid for different applications, the application unit is selected based on the compatibility with TOTEM. The link between the functional or declared unit and the application unit is defined by means of a ratio (see below). At least one application unit shall be entered for each EPD that will be integrated in TOTEM. Multiple application units can be entered if relevant. Please always contact the program operator to ensure that a proper application unit is selected which is compatible with TOTEM.

EXAMPLE An EPD of ready-mixed concrete has a declared unit of 1 m³. Several application units are entered, each representing 1 m³ of concrete in a specific element application (foundation, floors, walls, etc.).

EXAMPLE An EPD of fibre cement corrugated sheets has a declared unit of 1 m² of corrugated sheets without overlap. Several application units are entered, each representing 1 m² of corrugated sheets with specific sheet dimensions and overlap.

EXAMPLE An EPD of EPS insulation has a declared unit of 1 m³ of insulation material. Several application units are entered, each representing 1 m² of EPS board with a specific thickness (e.g. 100 mm) in a specific element application (floor finish, wall finish, roof finish, etc).

Name

In addition to the EPD product name, the name of the application unit will appear in TOTEM. To ensure a consistent database please follow a similar naming structure to the examples below. The name of the application unit should include information on the type of element and function, form of the product, material, dimensions and type of fixations (if relevant). Additional characteristics such as the density or specific properties (fire resistance, acoustic performance, compressive strength...) may also be added to distinguish the different variants.

EXAMPLES

- Floor bed | Cast in situ | Concrete (per m³)
- Roof finish | Cladding - inclined surfaces | Corrugated sheet | Fibre cement (2135x1090 mm - overlap 200 mm) | Screwed.
- Wall - external finish | Thermal insulation | Board | EPS (100 mm) | For cavity wall | Compressive strength 60 kPa

Make sure that you provide a unique and meaningful name for each application, which helps the TOTEM user to select the most relevant product.

A translation of the application unit name shall be entered in the B-EPD database in Dutch, French, German and English.

Element & Detail

Here you can select the relevant building element where the product is used. If multiple elements are possible, multiple application units shall be created.

Quantity and unit

This is the quantity and unit of the application that will be integrated in TOTEM. For many products the quantity and unit is 1 m², but there are exceptions.

EXAMPLE An EPD of ready-mixed concrete has a quantity and unit of 1 m³.

EXAMPLE An EPD of fibre cement corrugated sheets has a quantity and unit of 1 m² (for specific sheet dimensions and overlap)

EXAMPLE An EPD of EPS insulation has a quantity and unit of 1 m² (for a board with a specific thickness).

Thickness

For planar products (e.g. insulation board, floor slab, etc.) the definition of the thickness is straightforward (e.g. 100 mm). For non-planar products (e.g. pipes, beams, window profiles, etc.), the thickness might not be relevant. Please contact the program operator in case of doubt.

EXAMPLE An EPD of ready-mixed concrete has an application unit of 1 m³, therefore the thickness is not relevant.

EXAMPLE An EPD of fibre cement corrugated sheets has an application unit of 1 m² (planar product). The thickness of the corrugated sheets is 6.5 mm.

EXAMPLE An EPD of EPS insulation has an application unit of 1 m² (planar product). The EPS boards are produced in various thicknesses. A thickness of 100 mm is selected as a default value to be shown in the TOTEM database. The availability of other thicknesses can be specified in the thickness description (see below)

Thickness description

This field allows to specify the thickness property you have entered.

If the thickness is filled in for a non-planar product, make sure the description clearly defines what type of property is considered (e.g. pipe internal diameter vs. pipe external diameter).

If the product is available in various thicknesses (e.g. insulation boards), specify if the product is available for a range of values (e.g. the product can be custom made to any size in between a minimum and a maximum thickness) or finite thicknesses (e.g. the product is only produced for certain standard sizes).

EXAMPLE A blown-in insulation material is produced for any thickness between 20 and 200 mm. The description will be: "The product is produced in any thickness between 20 and 200 mm."

EXAMPLE An insulation material is produced for some specific thicknesses only. The description will be: "The product is produced in 60, 80, 100, 120 and 140 mm. The product is not produced in other thicknesses."

Proportional to the environmental impact

Only answer 'Yes' to this question if there is a linear correlation between the thickness property of your product and its environmental impact.

EXAMPLE A homogenous insulation board (consisting of only one material) is produced in 60, 80, 100, 120 and 140 mm. The environmental impact of the boards is linearly proportional to the selected thickness.

EXAMPLE A heterogenous insulation board (consisting of a core and one or more facers) is produced in 60, 80, 100, 120 and 140 mm. The environmental impact of the core is proportional to the selected thickness, but the environmental impact of the facers is not proportional to the selected product thickness, since their thickness remain constant for all the boards. So in this case, the total environmental impact is not linearly proportional to the product thickness.

Ratio application / reference quantity

The ratio allows TOTEM to calculate the environmental impacts of the application unit based on the environmental impacts of the reference quantity (declared or functional unit). In practice it represents the amount of product needed for the application unit divided by the amount of product needed for the reference quantity. If the application unit do not differ from the declared or functional unit, the ratio is 1.

EXAMPLE An EPD of ready-mixed concrete has a declared unit of 1 m³. The application unit is also 1 m³, so the following ratio is calculated: Ratio = 1 m³ / 1 m³ = 1

EXAMPLE An EPD of fibre cement corrugated sheets has a declared unit of 1 m² of corrugated sheets without overlap. Several application units are defined, each representing 1 m² for specific sheet dimensions and overlap. For a corrugated sheet of 2135 by 1090 mm with an overlap of 200 mm, the following ratio is calculated: Ratio = ((2.135+0.2)*1.09) m² / (2.135*1.09) m² = 1.09

EXAMPLE An EPD of EPS insulation has a declared unit of 1 m³ of insulation material. The application unit represent 1 m² of EPS board with a default thickness of 100 mm. The following ratio should be filled: Ratio = 100 mm / 1000 mm = 0.1

Description

This field includes a detailed description of the application unit. Please note that this description will appear directly in TOTEM and will be the main information of your product that the TOTEM user sees. Make sure that the description describes the application of the product in a clear way, and that it informs the TOTEM user of what is included/excluded in the EPD.

TOTEM will combine the description of the product (entered for the EPD) with the description of the application unit (entered for each application unit). Therefore, the description of the application unit should not repeat the general product description, but mention clearly what is the unique characteristic of each application unit, so that the TOTEM user can easily select the most relevant application unit.

EXAMPLE An EPD of fibre cement corrugated sheets has the following general EPD product description: "The EPD represents fibre cement corrugated sheets with a thickness of 6,5 mm that can be used in a roof or a façade. The corrugated sheets are manufactured on the basis of a homogeneous mixture of Portland cement, organic fibres, selected mineral additives and water. The corrugated sheets are extremely strong, watertight, rust free and incombustible. They do not rot and they are resistant to vermin and most weather circumstances. They are coated on the upper side with a water-based acrylic paint. The corrugated sheets are available in various lengths".

For the application as roof finish with dimensions (2135 x 1090 mm) and an overlap of 200 mm, the description of the application unit is: "The corrugated sheets are used as roof finish (pitched roof). The sheets are 2135 by 1090 mm and installed with an overlap of 200 mm. The sheets are fixed on a support structure with screws. The impact of the fixations is included in the EPD."

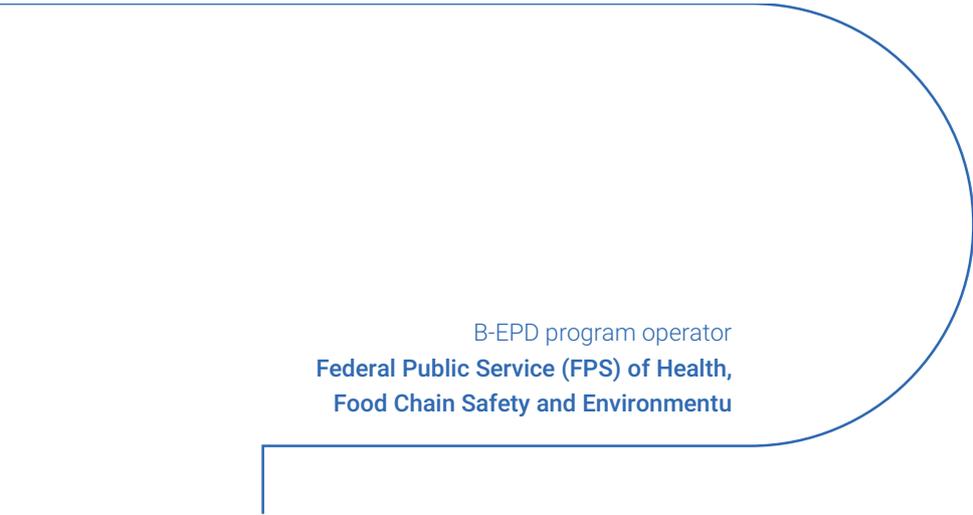
A translation of the product and application unit description shall be entered in the B-EPD database in Dutch, French, German and English.

Annex G B-EPD template

(This annex is not part of EN 15804+A2)

A 51 B-EPD template

B-EPD's shall use the following template.

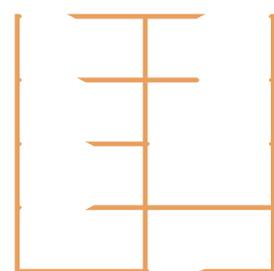


B-EPD program operator
**Federal Public Service (FPS) of Health,
Food Chain Safety and Environmentu**



Avenue Galilée / Galileelaan 5
box 2, 1210 Brussels

www.b-epd.be
epd@health.fgov.be



B-EPD .BE