Protocol for the preparation of environmental declarations for construction products (Rakennustieto EPD)

November 12, 2024

Complies with standard SFS-EN 15804:2012 + A2:2019/AC:2021

PT 42 RTS EPD committee

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Preface

The purpose of this protocol (RTS PCR) is to assist in the preparation of declarations according to the standard SFS- EN 15804:2012+A2:2019+AC:2021 and to gradually replace declarations prepared according to the previous standard SFS-EN 15804:2014. This protocol includes all the information that was available during the preparation of the RTS PCR. A declaration template, Guideline and Guideline Appendix A have been prepared to complement the RTS PCR. Statements were requested for the RTS PCR in 2022, and all statements were processed during the autumn of 2022. In addition, the requirements of the Eco-Platform, published at the beginning of 2024, have been taken into account.

Members of the PT18 / PT42 RTS EPD Committee participated in the preparation of the protocol.

Helsinki, November 12, 2024

PT42 RTS EPD

This document replaces the "*RTS PCR Protocol for drawing up Environmental Product Declarations of building products*", published on August 26, 2020. The replaced document can be used until December 31, 2025, for the preparation of EPD declarations.

Introduction

Environmental declarations for construction materials and products, such as the Rakennustieto EPD, present the environmental impacts of raw material procurement, product manufacturing, use, and disposal. In a verified environmental declaration, which is third-party certified, impartial information about the environmental impacts of building products is provided. The declaration presents the product's data and calculated environmental impacts as simply as possible. Environmental declarations form the basis for assessing buildings at the construction level, considering the entire life cycle. The Rakennustiedon EPD can be created for raw materials, products, product groups, product combinations, building components, or technical equipment used in construction. EPDs can be developed for house building, HVAC, building automation, as well as infrastructure construction needs in the same manner. Rakennustieto EPD can be

- Product-specific (one product, one manufacturing location or one product, multiple manufacturing locations)
- Product group-specific (similar products, one/multiple manufacturing locations/manufacturers

This protocol (RTS PCR) is used in conjunction with the standard SFS-EN 15804:2012 + A2:2019 + AC:2021 ”*Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products*”, hereafter referred as SFS-EN 15804:2019. The protocol (RTS PCR) only presents the necessary additional requirements and clarifications.

The table of contents of the protocol follows the structure of the standard SFS-EN 15804:2019 up to section 10, after which there is a section on the Rakennustieto EPD program practices. Only those sections requiring clarifications are addressed in the protocol; otherwise, the preparation of EPDs follows the standard. According to the SFS-EN 15804:2019 standard, at a minimum, modules A1-A3, C, and D should be presented, except in cases mentioned as exceptions in the standard. The breakdown of A1-A3 modules is recommended. The rules for presenting other modules follow the standard's guidelines.

In a separate Rakennustieto EPD model declaration, the details that must be included in the final environmental declaration are mentioned. The protocol does not address the layout of the Rakennustieto EPD. A verified and published Rakennustieto EPD can be recognized by the Rakennustieto EPD logo (see section 11) and the EPD number.

The comparison of environmental impacts of building products should be done at the building or infrastructure construction level. Environmental declaration data is collected, calculated, and presented modularly. At the building level comparison, the entire life cycle is taken into account, ensuring that the technical and functional requirements for products in the specific application are known. Individual lifecycle stage data should not be used separately from other information presented in the environmental declaration. Emission offsetting is not considered in the environmental declaration.

1 Scope

EPDs are prepared according to SFS-EN 15804:2019 (SFS EN 15804:2012 + A2:2019) *"Sustainability of construction works. Environmental product declarations. Core rules for the product category of construction products"*. The protocol (RTS PCR) shall be used together with the aforementioned standard. Product group-specific c-PCRs approved by CEN are used as an aid if the information or requirements do not conflict with SFS-EN 15804:2019 and this RTS PCR.

The protocol (RTS PCR) contains the necessary requirements and additional information along with SFS-EN 15804:2019. A declaration template that meets the requirements of both the standard and this PCR is available at cer.rts.fi. Declarations made for other systems can be approved if they contain the information specified in this RTS PCR.

2 Normative requirements

To be drawn up in accordance with SFS-EN 15804:2019.

3 Terms and definitions

To be drawn up in accordance with SFS-EN 15804:2019.

4 Abbreviations

CO_2	Carbon dioxide
CO_2-eq.	Carbon dioxide equivalent, climate impact of greenhouse gases
c-PCR	Product group-specific standard (EN) supplementing EN 15804 general rules, product group rules
ECHA	European Chemicals Agency (https://echa.europa.eu/fi/home)
EPD	Environmental Product Declaration
GWP	Global Warming Potential, impact potential on global warming
LCA	Life cycle assessment
HVAC	Heating, ventilation, and air conditioning, also includes water and electricity
M1	Emission classification of building materials (M1)
ND	Not declared
PCR	Product Category Rules
PT42 RTS EPD	Main committee of Building Information Foundation RTS sr
BAS	Building automation system
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals-regulation
RTS	Building Information Foundation RTS sr
SVHC	Candidate list of Substances of Very High Concern (https://echa.europa.eu/fi/information-on-chemicals/candidate-list-substances-in-articles-table)

5 General

5.1 Objectives of general rules

To be drawn up in accordance with SFS-EN 15804:2019.

5.2 Types of EPD with respect to the lifecycle stages covered

INFORMATION ABOUT THE IMPACTS OF THE VARIOUS STAGES OF BUILDING ASSESSMENT	BUILDING LIFE CYCLE	Product phase	A1	☒	Acquisition of raw materials
			A2	☒	Transport to manufacturing site
			A3	☒	Manufacturing
		Construction process stage	A4	☒	Transport to construction site
			A5	☐	Construction site operations
		Operational life	B1	☐	Use
			B2	☐	Maintenance
			B3	☐	Repair
			B4	☐	Substitution of parts
			B5	☐	Large-scale repairs
			B6	☐	Energy use (only electrical and building technology)
			B7	☐	Water use (only electrical and building technology)
		End-of-life stage	C1	☒	Demolition
			C2	☒	Transport during demolition phase
			C3	☒	Demolition waste treatment
			C4	☒	Final disposal of demolition waste
		Impacts outside the life cycle	D	☒	Reuse
			D	☒	Recovery
			D	☒	Recycling

Mandatory modules
Mandatory in accordance with the provisions of section 5.2 of the RTS EPD protocol
Optional modules

FIGURE 5-1 STAGES OF A CONSTRUCTION PRODUCT'S LIFE CYCLE AND ASSOCIATED INFORMATION MODULES SFS EN 15804:2019.

Rakennustieto EPDs shall be drawn up in accordance with the modular structure and subdivision into life cycle phases referred to in SFS-EN 15804:2019 "*Sustainability of construction works. Environmental product declarations. Core rules for the product category of construction products*".

The Rakennustieto EPD must cover the manufacturing phase of the product, from the acquisition of raw materials to the factory gate, i.e. information modules A1–A3 and modules A4, C1–C4 and D. The exceptions allowed in the standard SFS-EN 15804:2019 from reporting C and D modules are also allowed in Rakennustieto EPD. For electrical and building technology products, modules B6 (Energy

use) and B7 (Water use) of the use phase can be declared if the product uses energy or water during use. According to the requirements of the ECO Platform, B6 (Energy Use) must be reported for products that consume energy; see section 6.2.5 for further details.

Rakennustieto EPD shall include modules A4 and A5 A5 in accordance with the following provisions:

- **Module A4** (Transport to construction site): Environmental impacts must be declared if the GWP is more than 20% of the corresponding GWP of modules A1–A3 or the transport distance is greater than 1000 km.
- **Module A5 (Construction site operations):** The GWP-biog impact category is mandatory information in module A5 if the binding of atmospheric carbon dioxide to the packaging material has been calculated in module A1 or A3.

5.3 Comparability of EPD for construction products

To be drawn up in accordance with SFS-EN 15804:2019.

5.4 Additional environmental information

To be drawn up in accordance with SFS-EN 15804:2019. Carbon offset, carbon storage and delayed emissions are not taken into account in the Rakennustieto EPD.

5.5 Ownership, responsibility and liability for the EPD

To be drawn up in accordance with SFS-EN 15804:2019. Responsibilities and obligations related to EPDs are detailed in the Guideline and Guideline Appendix A.

5.6 Communication formats esitysmuoto

To be drawn up in accordance with SFS-EN 15804:2019.

6 Product category rules for LCA

6.1 Product category

To be drawn up in accordance with SFS-EN 15804:2019.

6.2 Life cycle stages and their information modules to be included

6.2.1 General

To be drawn up in accordance with SFS-EN 15804:2019.

6.2.2 A1…A3, product stage, information modules

To be drawn up in accordance with SFS-EN 15804:2019.

6.2.3 A4…A5, construction process stage, information modules

Section A4 Environmental Impacts shall be reported if the environmental impacts, in terms of GWP data, exceed 20% of the total GWP data for modules A1-A3, or if the transportation distance is greater than 1000 km. The environmental impact data for module A4 shall be reported per average transportation distance.

Conversion guidelines for different transportation distances can be added to the environmental declaration if necessary.

If the sequestration of atmospheric carbon dioxide has been accounted for in the packaging material in module A1 or A3, the biogenic carbon transferring to the next product system, should be allocated to module A5 as a calculated biogenic carbon dioxide emission (GWP-biogenic).

6.2.4 B1…B5, use stage, information modules related to the building fabric

To be drawn up in accordance with SFS-EN 15804:2019.

6.2.5 B6…B7, use stage, information modules related to the operation of the building

To be drawn up in accordance with SFS-EN 15804:2019.

Operational energy use (B6) shall be presented in the Rakennustieto EPD for products that consume energy either directly or indirectly (for example, a cable consumes energy through losses). The scenario for B6 data shall be presented so that the user of the EPD can utilize them if desired.

Standard SFS-EN 50693:2019 provides detailed rules concerning electrical equipment. End-of-life modules (C1-4 ja D) as well as indicators missing from standard SFS-EN 50693:2019 shall be drawn together in accordance with SFS-EN 15804:2019.

6.2.6 C1…C4, End-of-life stage, information modules

The information in modules C1, C2, C3 and C4 is presented in the EPD. The environmental impact information in section C2 is declared for the transport distance and capacity utilization level according to the scenario.

Probable material/product group-specific scenarios for waste treatment and disposal methods should be developed for modules C and D. Based on these scenarios, the environmental impacts for modules C and D are calculated. The calculation is done for the most probable market area.

Additionally, the results of the environmental impact calculations can be presented separately as additional information for all possible waste treatment methods (reuse, recycling, energy recovery, disposal). It should be indicated that these are not the most probable method.

The wear and tear of the product during use is shown in the calculation as final disposal. Waste treatment can take place in the target country. Thus, the same EPD can be used in a different part of Europe with the probable waste utilisation scenario of the target country. In preparing the EPD, geographical and technological coverage must be taken into account and declared in accordance with the standard.

TABLE 6-1 EXAMPLES OF POSSIBLE END-OF-LIFE SCENARIOS. IN PLANNING OF SCENARIO IT IS NECESSARY TO TAKE INTO ACCOUNT THE CURRENT LEGISLATION.

Product	Components for reuse	Material recycling		Utilization as energy	Product or material to disposal, including losses
		Use after recycling	System boundary (module D)		
Mineral wool	Reused as insulation material, if fulfils requirements and replaces similar insulation material	Land construction or raw material for blowing wool	Replaces primary raw materials	Not feasible	Losses during lifetime to C4. Disposal in landfill
		Raw material for geo polymers or as a binder	Replaces primary raw materials	Not feasible	Losses during lifetime to C4.
Concrete	Concrete structures and elements can be reused if they fulfil requirements in the new use	Non-recyclable concrete structures and elements are crushed and used as stone material in land and road construction	Crushed concrete replaces natural stone material	Not feasible	Losses during lifetime to C4. Non-recyclable concrete to appropriate waste treatment
	The concrete frame of the existing building can be reused on the same site.	Non-reusable concrete structures and elements are crushed and used as stone material in land and road construction.	Crushed concrete replces natural stone material	Not feasible	Losses during lifetime to C4. Non-recyclable concrete to appropriate waste treatment.
		Reinforcement steel used in steel manufacturing	Recycled steel is compared to reinforcement steel from primary resources.	Not feasible	Losses during lifetime to C4.
Metal	Reused as metal product if it fulfills the demands for the use	Non-reusable material is used as raw material for new metal.	Recycled metal is compared to metal from primary materials, e.g. iron slab or aluminum ingot	Not feasible	Losses during lifetime to C4.

Wood products	Reused as product if it fulfills demands of the use.	Non-reusable wood product is recycled for chip board or wood pellet material.	Recycled material is compared to chipboard of wood pellet (refined secondary fuel) made of primary materials	Non-recyclable material is chipped used as energy.	Chemically treated or non-recyclable wood to appropriate waste treatment. Losses during lifetime to C4.
Plastic products	Plastic sewage pipe can be reused if it fulfills demands of the use.	Recycled mechanically or chemically to recycled plastic material.	Mechanically recycled plastic shred or chemically recycled polymer replace fossil raw material.	Non-recyclable material is utilized as energy.	Plastic material unsuitable for energy recovery is taken to appropriate waste treatment. Losses during lifetime to C4.
WEEE products	Reused as product if it fulfills demands of the use.	Dismantled into waste fractions and used as raw material for recycling according to the waste fraction.		Suitable fractions utilized as energy.	Disposal of WEEE products is not legal. To be taken to appropriate waste treatment.. Losses during lifetime to C4.
Plastic insulation	Reused as product if it fulfills demands of the use.	Recycled mechanically or chemically to recycled plastic material.	Mechanically recycled plastic shred or chemically recycled polymer replace fossil raw material.	Non-recyclable material is utilized as energy	Plastic material unsuitable for energy recovery is taken to appropriate waste treatment. Losses during lifetime to C4.
Asphalt	Not feasible	Recycled for raw material of recycled asphalt	Milled asphalt replaces stone material and bitumen in asphalt or other stone material in road works.	Not feasible	Contaminated asphalt is to be taken to appropriate (hazardous) waste treatment.

6.2.7 D, Benefits and loads beyond the system boundary, information module

To be drawn up in accordance with SFS-EN 15804:2019.

6.3 Calculation rules for the LCA

6.3.1 Functional or declared unit

To be drawn up in accordance with SFS-EN 15804:2019, but the result must be convertible and presented per product kilogram. For products with variable moisture content, like wood, the moisture content shall be reported as a percentage of the dry weight.

Additionally, if the chosen unit does not reflect the typical use or sales unit of the product, the results must be convertible to the corresponding unit, for example, using a conversion factor table. The conversion factor table should then be presented in the environmental declaration.

6.3.2 Functional unit

Shall be declared in units according SFS-EN 15804:2019. The Functional unit shall be clearly defined and measurable, and it shall define the use of the product or product groups' unit. Similarly, the functional unit must quantify the key performance characteristics or minimum performance as part of the building.

If the functional unit involves a different period than reference service life (RSL), the RSL shall be declared as technical information. When presenting the functional unit, it is recommended to use product category-specific product category rules if CEN TC c-PCR guidelines are not available.

6.3.3 Declared unit

To be drawn up in accordance with SFS-EN 15804:2019.

6.3.4 Reference service life (RSL)

To be drawn up in accordance with SFS-EN 15804:2019. RSL is mandatory when the EPD covers modules for the use stage (B1-B7).

Standard SFS-EN 50693:2019 provides more detailed rules for electrical equipment. The end-of-life modules (C1–4 and D) and the indicators missing from SFS-EN 50693:2019 are drawn up according to SFS-EN 15804:2019.

Information related to the reference service life of the product requires the determination of suitable scenarios for the product phase, the construction phase and the use phase. The reference service life must be verifiable" (SFS-EN 15804:2019). The reference service life is only valid with the reference use conditions defined in the EPD. The reference service life can be based on:

- field test;
- inspection of buildings and their components;
- experimental buildings;
- in-use exposure. (SFS-EN 15804:2019).

The reference service life is not the same as the planned or typical life. In the Rakennustieto EPD, only the reference service life is declared.

6.3.5 System boundaries

To be drawn up in accordance with SFS-EN 15804:2019 in compliance with the following clarifications under 6.3.5.6.

6.3.5.6 Benefits and loads beyond the product system boundary in module D

In order for a component or material removed from the building to have reached its "end-of-waste" state, it must meet the following conditions from the EU Waste Framework Directive:

- The substance or object is commonly used for certain purposes;
- There is a market or demand (typically monetary value) for the substance or object;
- The substance or object meets the technical requirements for specific purposes and complies with existing regulations and standards applicable to products; and
- The use of the substance or object does not cause harmful overall impacts on the environment or human health.

The building part or component removed from the building is at the end of its life cycle. This building part or component only leaves the life cycle of the site in question when it reaches its “end-of-waste” state. This rule is a consequence of the “polluter pays” principle. In order for a component or material removed from a building to reach its “end-of-waste” state, all environmental impacts resulting from handling processing are allocated to module B4 (exchanges) or C3 (waste treatment).

When the component or material removed from the building has already reached its “end-of-waste” state, according to this rule, the component or material is removed from the life cycle under review and moved to the life cycle of the next use (reuse, material and energy recovery). The aforementioned environmental impacts are allocated to module D and not to the life cycle modules under review (A5 (site), B4 (exchanges) or C3 (waste treatment) or C4 (disposal).

6.3.6 Criteria for the exclusion of inputs and outputs

To be drawn up in accordance with SFS-EN 15804:2019.

6.3.7 Selection of data

To be drawn up in accordance with SFS-EN 15804:2019.

Additionally, specific data from the key processes in the production shall be used for the analysis, or the omission of their use shall be justified.

Rakennustiedon EPDs are drawn up for

a) Single product (one product; one / several sites)
b) Product group (average or typical product; similar types of product; one / several sites / manufacturers)

The results for the average product or for the typical product in a product group shall be within ± 10 % of GWP-total of A1-A3 modules of the average of the products involved. The use of typical product shall be justified. In some cases it is justified to use the ”worst case scenario”, when the poorest results (A1-A3) are selected to be presented. In such cases the differences between GWP-total results between products can be greater than ± 10 %.

Environmental profiles of used energy in manufacturing

Contractual instruments can include energy attribute certificates, renewable energy certificates (RECs), guarantee of origin (GOs) or green energy certificates. For a producer of more than one product, it is not allowed to allocate contractual instruments to different products unless there is a separate energy supply and contract in place (virtual allocation is not allowed).

It is allowed to use guarantees of origin in the Rakennustieto EPDs for **electricity** used in the product manufacturing through the central register of AIB[1] and its members' systems. To avoid double counting, the residual mix values of the production country shall be used in the absence of the guarantees of origin.

The guarantees of origin used must be cancelled in the guarantees of origin system. If guarantees are used from countries where the registry is not connected to the central register of AIB, the origin of guarantees shall be verified, and they must comply with the Renewable Energy Directive (RED II or RED III).

For verification purposes, the documents of the guarantee of origin shall indicate the supplier of the electricity, the delivered energy mix and quantity as well as the issuance and validity of the guarantees of origin. The absence of the following information shall be justified: the place of production, tracking numbers, and whether the seller has produced the electricity covered by the guarantees of origin.

EPD can include the results calculated using the average electricity production values as additional information, either as an appendix or as additional result tables. Results presented as additional information must be clearly labelled as such.

In the B and C modules of the life cycle other than average data can be used if the manufacturer has control over the electricity procurement for these phases (e.g., in service functions).

For **biogas**, it is allowed to use guarantees of origin in the Rakennustieto EPDs. If the biogas is produced internally or by a directly connected producer and the guarantees of origin have not been sold to third parties, the life cycle analysis result for the used biogas can be applied. If the producer has purchased guarantees of origin, their use is allowed. If the guarantees of origin do not cover the entire biogas consumption, the remaining portion shall be calculated with residual mix values. If none of the above conditions are met, the biogas consumption shall be calculated with residual mix values.

For **district heating** used in module A3, it is recommended to primarily use the specific environmental profile of the supplier, if that is available and the guarantees of origin have not been sold to third parties. If the producer has purchased guarantees of origin, their use is allowed. If the guarantees of origin do not cover the entire district heating energy consumption, the remaining portion shall be calculated with residual mix values. If none of the above conditions are met, the district heating consumption shall be calculated with residual mix values.

The eco-profile of the energy consumed in production shall be reported and explained in the project report. Fuel acquisition (A3) is always part of the process. If the decommissioned product is used as energy, in section A3 the allocation takes place as recycled fuel or waste. The author of the declaration must explain the principle of allocation in the project report and declaration.

For the electricity and district heating used in module A3, the following additional information is to be included in the declaration: quality of electricity and district heating data and at least CO_2 emissions (kg CO_2-eq /kWh).

[1] https://energiavirasto.fi/en/guarantee-of-origin and https://www.aib-net.org/facts/eecs-registries

The reporting of emissions from cement production shall follow the European Cement Association (CEMBUREAU) EPD practice, which aligns with the reporting rules under the Emissions Trading Directive. When utilizing energy from recycled fuels (e.g., tire-derived fuel, plastic-based fractions) and waste incineration, the emissions are attributed to cement production. If the emissions from waste incineration are to be deducted from the total emissions, this information may be reported separately as additional information.

Eco-profile of the energy consumed (B6)

The eco-profile of energy during use is primarily calculated based on the target country's profile. If there are several target countries, the European average can be used. The scenario used for the energy consumption during use and the eco-profile must be declared. For energy consumed, the production profile used in the calculation of the aforementioned databases must correspond to the production profile of the energy consumed at the time of calculating the emissions (e.g. JRC Joint Research Center). The eco-profile of the energy consumed shall be reported and explained in the project report.

Eco-profile of the water consumed (B7)

The eco-profile of water consumption during use is primarily calculated based on the target country/application profile. The scenario used for the water consumption during use and the eco-profile must be declared.

6.3.8 Data quality

To be drawn up in accordance with SFS-EN 15804:2019.

6.3.9 Developing product level scenarios

To be drawn up in accordance with SFS-EN 15804:2019.

6.3.10 Units

To be drawn up in accordance with SFS-EN 15804:2019.

6.4 Inventory analysis

6.4.1 Collecting data

To be drawn up in accordance with SFS-EN 15804:2019.

6.4.2 Calculation procedures

To be drawn up in accordance with SFS-EN 15804:2019.

6.4.3 Allocation of input flows and output emissions

To be drawn up in accordance with SFS-EN 15804:2019.

The use of mass balance or other method of calculational allocation (so called ”Mass balance approach” or ”book and claim”[2]) shall not be used.

6.4.3.2 Co-product allocation

The project report must present the allocation of the data of the co-product and the allocation procedure used following the following clarifications under 6.4.3.2.

Follow the hierarchy according to ISO 21930:2017, EN ISO 14067:2018 and the PEF method guidelines (2019) for allocating co-products:

1. It is a co-product if the “main products” have a physical property relationship with the co-products. This means, for example, that the “main product” cannot be manufactured without the input material needed by the co-products in question.

2. Allocation between products is based on physical property relationships.

3. The manufacturing process is divided into subprocesses, after which their inputs and co-products are “differentiated” based on a selected relevant physical property (e.g. material mass, energy content or other technical property: carbon content, etc.) into their own “blocks”, as a result of which the environmental impacts of the different manufacturing subprocesses are allocated based on their physical properties. In other words, the input material can be divided based on the selected physical property into each of the main and co-products. Simple differentiation of inputs and main and various co-products is possible when, for example, the chemical compositions of the inputs compared to the main and co-products do not change during the subprocess.

4. If the allocation of the environmental impact of manufacturing based on physical properties according to point 1 is not possible, economic allocation is used for co-products based on relative market value, the variability/instability of which causes uncertainty in the allocation and makes it difficult to compare the results at the building level, (e.g. plywood vs. OSB or gypsum board vs. chipboard).

In the project report and the declaration, the data sets used and the allocation method chosen according to the hierarchy mentioned above are also indicated.

Note! According to the decision of the Eco-Platform[3], economic allocation must be used in processes where co-products are generated for use in cement and concrete, for example:

- steel production and granulated blast-furnace slag or crystallised basic oxygen furnace slag;

[2] Mass Balance Approaches refers to the “mass balance model: credit method” in ISO 22095
[3] Eco-Platform document ”LCA calculation rules”,
available at https://www.eco-platform.org/our-relevant-documents.html

- coal fired electricity generation, fly ash and artificial gypsum, and other processes producing artificial gypsum;
- silicon metal and ferro-silicon alloys and silica fume and
- aluminium-oxide-containing sources arising from aluminium and alumina production.

6.4.3.3 Allocation procedure of reuse, recycling and recovery

Waste flows are treated as recoverable material in accordance with SFS-EN 15804:2019. In the calculation, the direct emissions of waste processing are taken into account until waste processing has reached the “end-of-waste” state. When a building is demolished, all materials are, in principle, waste. When a material meets the criteria of the standard for the “end-of-waste” state, this material is the next application’s reusable product or raw material for a construction product. See section 6.3.5.5 of the standard.

Co-products that may arise during the production of the product must be allocated a share of the benefits and disadvantages, so they do not affect module D.

6.4.3.4 Information on biogenic carbon content

To be drawn up in accordance with SFS-EN 15804:2019.

6.5 Impact assessment

To be drawn up in accordance with SFS-EN 15804:2019.

This protocol can be used for different products. The characterization factors according to SFS-EN 15804:2019 can be found at http://eplca.jrc.ec.europa.eu/LCDN/developerEF.xhtml. It is recommended to use the latest version published.

6.5.1 General

To be drawn up in accordance with SFS-EN 15804:2019.

6.5.2 Core environmental impact indicators

To be drawn up in accordance with SFS-EN 15804:2019.

6.5.3 Additional environmental impact indicators

Additional indicators are not mandatory according to EN 15804:2019, nor are they mandatory information to be declared in the Rakennustieto EPD. However, the declaration template includes a table for presenting the information. If the information on the indicators is not presented in the declaration, ND (Not declared) is marked.

7 Content of the EPD

7.1 Declaration of general information

To be drawn up in accordance with SFS-EN 15804:2019.

If the product contains SVHC substances (599/2013, (EC) No 1272/2008, (EC) No 1907/2006), they are declared in the EPD. The list of SVHC substances can be found on the ECHA website http://echa.europa.eu/web/guest/candidate-list-table.

In order to increase the usability of the information in the EPD (environmental classifications and environmental programmes) and to promote the circular economy, the information related to the main composition of the product (product declaration) is declared by weight percentage in the product. If an averaged product or product group is declared, can the main composition be declared as ranges. In the same table shall be presented the proportion of recycled materials (see the table in the template or sample EPD).

7.2 Declaration of environmental indicators derived from EPD

7.2.1 General

To be drawn up in accordance with SFS-EN 15804:2019. The results for GWP-IOBC/GHG [4] can be presented as additional information, but these shall not be presented alongside core indicators.

7.2.2 Rules for declaring LCA information per module

To be drawn up in accordance with SFS-EN 15804:2019.

7.2.3 Indicators describing environmental impacts based on Life Cycle Impact Assessment (LCIA)

To be drawn up in accordance with SFS-EN 15804:2019.

Additional indicators can be declared voluntarily, the declaration template includes sections for them. If the information on the indicators is not presented in the declaration, ND (Not declared) is marked.

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[4] IOBC «Instantaneous oxidation of biogenic carbon»: Reference for its origin https://cbmjournal.biomedcentral.com/articles/10.1186/s13021-019-0129-5 Global warming potential except emissions and uptake of biogenic carbon (GWP-IOBC/GHG)
The GWP-IOBC/GHG indicator includes all contribution to GWP except that emissions and uptake of biogenic carbon, including temporary stored in products and packaging (as in Table 9 in EN 15804:2012+A2:2019), are set to zero (i.e. direct balanced out while other biogenic substances like methane etc has a characterisation factor and therefore accounted for as greenhouse gases). This indicator is often the default in LCA-software in the past and has in the EN 15804 standardisation process been known as "+/- 1 kg biogenic CO_2= 0 kg CO_2-eq, or just 0/0". In published standards, it is described as type 2 in EN 16760.

7.2.4 Indicators describing resource use and environmental information based on Life Cycle Inventory (LCI)

To be drawn up in accordance with SFS-EN 15804:2019.

7.2.5 Information on biogenic carbon content

To be drawn up in accordance with SFS-EN 15804:2019.[5]

7.3 Scenarios and additional technical information

7.3.1 General

To be drawn up in accordance with SFS-EN 15804:2019. Product level scenarios are drawn up for the use stage and the end-of-life stage, see section 5.2.

7.3.2 Construction process stage

7.3.2.1 A4, transport to the building site

The environmental profile of transport must be declared (table 7-1) for all transport methods used. Average transport distances and mode of transport are taken into account in transport.

TABLE 7-1 DECLARATION OF THE AVERAGE VALUES FOR TRANSPORT. THE INFORMATION IS PROVIDED IN THE PROJECT REPORT AND DECLARATION

Object	Value
Fuel type and consumption of vehicle or vehicle type used for transport e.g. long distance truck, boat etc. (l/km) Commission Directive 2007/37/EC (European Emission Standard)	
A4 average transport distance (km)	
Capacity utilisation (including empty returns) (%)	
Bulk density of transported products (kg/m3)	
Volume capacity utilisation factor (factor: =1 or <1or ≥ 1 for compressed or nested packaged products)	

If no exact information is available about transport, the typical transport method and average transport distance for the product are used. Alternatively, the journey from the place of manufacture to Helsinki or, for export products, to the port of export can be used as the transport distance. It is possible to declare scenarios for transportations to different areas.

[5] There have been errors in the reporting of the carbon bound to the wood product. It is reported as pure carbon (C) in section 22 of the table in the declaration template. See standard section “biogenic carbon content, table 9”

Technical specifications are provided in accordance with Table 10 of section 7.3.2.1 of the standard. The quality and source of the information used must also be specified.

7.3.2.2 A5, installation in the building

To be drawn up in accordance with SFS-EN 15804:2019. The packaging material scenario is drawn up if the information is relevant. The packaging material scenario is drawn up if the information is relevant.

7.3.3 B1-B7 use stage

7.3.3.1 B1-B5 use stage related to building fabric

To be drawn up in accordance with SFS-EN 15804:2019.

7.3.3.2 Reference service life

To be drawn up in accordance with SFS-EN 15804:2019.

7.3.3.3 B6, use of energy and B7, use of water

EPDs for construction products are prepared in accordance with SFS-EN 15804:2019. In principle, the environmental impacts of energy and water consumption during use (B6 and B7) are declared at the building level. If desired, the manufacturer can declare information on the water consumption at the product level.

B6 (energy consumption) shall be declared to products that consume energy directly or indirectly (ex. a cable is consuming energy through losses in the cable). B6 shall be presented separately so that the results can be used if desired. It is recommended to use c-PCR guidelines for energy and water consumption. Instead, the impact of the product on the building's energy balance is only dealt with in the building-level assessment (e.g. heat recovery and geothermal heat pump).

Standard SFS-EN 50693:2019 provides more detailed rules for electrical equipment. The end-of-life modules (C1–4 and D) and the indicators missing from SFS-EN 50693:2019 are drawn up according to SFS-EN 15804:2019.

7.3.4 End-of-life

To be drawn up in accordance with SFS-EN 15804:2019.

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

7.4.1 Indoor air

To be drawn up in accordance with SFS-EN 15804:2019.

In Rakennustieto EPDs, it is also possible to declare the product's emission class for construction materials (M1) (where applicable) or the emissions measurement results.

7.4.2 Soil and water

To be drawn up in accordance with SFS-EN 15804:2019.

7.5 Aggregation of information modules

To be drawn up in accordance with SFS-EN 15804:2019.

8 Project report

8.1 General

To be drawn up in accordance with SFS-EN 15804:2019.

8.2 LCA-related elements of the project report

To be drawn up in accordance with SFS-EN 15804:2019.

8.3 Dokumentation on additional information

To be drawn up in accordance with SFS-EN 15804:2019.

8.4 Data availability for verification

The environmental product declarations of building products to be published as Rakennustieto EPDs are drawn up in accordance with SFS-EN 15804:2019 "*Sustainability of construction works. Environmental product declarations. Core rules for the product category of construction products"* and with the additional instructions referred to in the protocol (RTS PCR) and the declaration template. The additional instructions supplement SFS-EN 15804:2019.

9 Verification and validity of an EPD

General additional instructions, RTS EPD guidance and RTS EPD Verification rules for EPD-tools, concerning the preparation of environmental declarations published as Rakennustieto EPDs and supplementing SFS-EN 15804:2019.

EPD and LCA tools are valid for 3 years. The EPDs produced with tools are valid for 5 years according the standard SFS-EN 15804:2019.

9.1 Verification

Verification is carried out according to ISO 14025 principles and RTS EPD Verification rules for EPD-tools. A list of approved verifiers is available at https://ymparisto.rakennustieto.fi/en.

10 LIITE C.2 Calculation rules for the climate change impact category

As a clarification to the requirements of standard EN 15804:2019 in section C.2, the following simplified rules are applied to the indicative formulas for module D, provided in section D.3.4 of EN 15804:2019, in accordance with the calculation rules specified in section 6.3.5.6 of EN 15804:2019.

NOTE: the presented calculation rules use GWP-total indicator, but the same calculation rules apply to all LCA-based indicators of EN 15804:2019 that can be used in the formulas presented in section D.3.4 of EN 15804:2019.

a) Reuse

$$GWP_{reuse} = (M_{reuse,\ out} - M_{reuse,\ in}) \times (GWP_{reuse} - GWP_{replaceable})$$

according to which the number of reused components in the construction product or packaging is subtracted from the number of reusable components. From the greenhouse gas emissions resulting from the renovation of the reusable construction part or packaging, the current greenhouse gas emissions resulting from the acquisition of raw materials and manufacture of the new equivalent construction product to be replaced are deducted.

b) **material recycling**

$$GWP_{material\ recycling} = (M_{recycling,\ out} - M_{recycling,\ in}) \times (GWP_{recycling} - GWP_{replaceable}) \times (Q_{recycling,\ out} / Q_{replaceable})$$

according to which the amount of recycled material used in the construction product or packaging is deducted from the amount of material going to material recycling. 100% of the greenhouse gas emissions from the base material produced from the recycled material are deducted from the current greenhouse gas emissions from the acquisition of raw materials and production for the new equivalent construction product to be replaced. In addition, the technical quality difference between the material to be replaced and the material going to material recycling can be taken into account with the quality difference factor. For example, in the case of metals, primarily the recycled material corresponds to the technical quality of the material to be replaced, in which case $Q_{recycling,\ out} / Q_{replaceable} = 1$.

c) **energy utilisation as refined recycled fuel**

$$GWP_{recycled\ fuel} = (M_{recycled\ fuel,\ out} - M_{recycled\ fuel,\ in}) \times (GWP_{recycled\ fuel} - GWP_{replaceable\ fuel})$$

according to which the amount of recycled fuel used in the manufacture of the construction product or packaging is deducted from the amount of material used to manufacture the recycled fuel. From the further processing of the end-of-life recycled fuel up to the point of substitution and from the greenhouse gas emissions ($kgCO_2$-eq/kg) resulting from the use of the fuel, the average current greenhouse gas emissions from the acquisition of raw materials for the new equivalent recycled fuel to be replaced and from the production and use of the fuel are deducted.

The GWP-biogenic emissions resulting from the use of wood-based recycled fuel are 0 $kgCO_2$-eq/kg when the wood material comes from all sources except native forests acording to the standard. Correspondingly, when the wood material comes from a native forest according to the standard, the emissions caused by the use of wood-based recycled fuel are marked as GWP-luluc impacts.

d) **energy utilisation in an incineration plant**

$$GWP_{incinerator} = (M_{incinerator,\ in} \times GWP_{incinerator,\ in}) - M_{incinerator,\ in} \times (LVH \times X_{efficiency,\ heat} \times GWP_{replaceable\ heat} + LVH \times X_{efficiency,\ electricity} \times GWP_{replaceable\ electricity})$$

according to which the utilisation of building material removed from the life cycle as energy in an incineration plant with an efficiency of more than 65% is calculated as net potentially avoided emissions. This means that from the emissions resulting from the energy utilisation of the building material brought to the incineration plant, the greenhouse gas emissions of the replaced heat and power production are deducted, taking into account the lower calorific value of the building material brought to the incineration plant and the efficiency of the heat and power production of the incineration plant. Of the greenhouse gas emissions from the heat and power generation to be replaced, current emissions in accordance with EN 15804:2019 and the estimated emissions at the time of recovery are taken into account in accordance with the Decree of the Ministry of the Environment on climate reports.

The GWP-biogenic emissions resulting from the use of wood-based material are 0 $kgCO_2$-eq/kg, when the wood material comes from all sources except native forests according to the standard. Correspondingly, when the wood material comes from a native forest according to the standard, the GWP-luluc emissions resulting from the use of wood-based material are +x $kgCO_2$-eq/kg.

C.2.4 Impact potential on global warming, biogenic (GWP-biogenic)

To be drawn up in accordance with SFS-EN 15804:2019 observing the following clarifications in section C.2.4, which deals with the binding of atmospheric carbon dioxide to wood-based construction products originating from sustainably managed commercial forests, and in 6.3.5.6, which deals with the end of the life cycle.

1. The atmospheric carbon dioxide binding effect of the wood-based construction product or packaging entering the system is allocated to the wood product or packaging in the relevant module A1, A3 or B4. This means:
    - Atmospheric carbon dioxide bound by the raw material of a wood product or packaging as it grows is inherited by the wood product or packaging when the material enters the production facility: GWP-biogenic: - x kg CO_2-eq/(declared unit), which corresponds to the bound atmospheric carbon dioxide in the raw material of the wood product. In addition, the energy content of the raw material is allocated to the module: +x MJ/declared unit.

- According to sections 6.4.9.5, 6.4.9.6 and E.2 of EN ISO 14067, wood material originating from Finnish commercial forests can be assumed to originate from sustainably managed forests according to the standard.

2. The environmental impacts caused by the wood-based construction product or packaging leaving the system are allocated to the wood product or packaging until it reaches its “end-of-waste” state in the waste treatment phase, module A5, B4 or C3. When the wood material has reached its “end-of-waste” state, no further environmental impacts are allocated to such material. This means:
    - The value CF=+1 is used as the characterisation coefficient of the amount of biogenic carbon bound to the wood product for the product leaving the system in the impact category GWP-biogenic.
    - Environmental impacts caused by the processing of the wood product or packaging, such as those caused by cleaning and chipping, are allocated to the wood product or packaging, including a calculated “carbon content reset”: GWP-biogenic: + x kg CO_2-eq/declared unit, which corresponds to the bound atmospheric carbon dioxide remaining in the material.
    - and “energy content reset” of the material (renewable primary energy resources used as raw materials): - x MJ/declared unit.
3. The environmental impacts caused by the final disposal of the wood product remaining inside the system are allocated to the wood product in module C4 or B4 or to the wood packaging in module A5 or B4, when it is “disposed of from the system” at a landfill or is disposed of in an incinerator with less than 65% efficiency or, for example, due to impregnating substances in a hazardous waste facility: GWP-biogenic: + x kg CO_2-eq/kg, which corresponds to the remaining bound atmospheric carbon dioxide in the product, as well as the “energy content reset” of the product (renewable primary energy resources used as raw materials): - x MJ/kg. The energy recovered from wood materials burned in an incineration plant or a hazardous waste plant with an efficiency of less than 65% and exported over the system boundary is declared based on the lower calorific value in module C4 and for packaging material in module A5 or B4 with the indicator “energy exported”: + x MJ/kg.

C.2.5 Impact potential on global warming, land use and land use change (GWP-luluc)

To be drawn up in accordance with SFS-EN 15804:2019 observing the following clarifications in section C.2.5, which deals with wood-based construction products coming from non-sustainably managed forests (e.g. old-growth virgin forests, primaeval forests, tropical rainforests), and in 6.3.5.6, which deals with the end of the life cycle.

1. The atmospheric carbon dioxide binding effect of the wood-based construction product or packaging entering the system is not allocated to the wood product or packaging in the relevant module A1, A3 or B4. This means:
    - GWP-biogenic: 0 kg CO_2-eq/kg, biogenic carbon bound to the wood material is not calculated in these modules in the impact category GWP-biogenic, because the carbon dioxide in the atmosphere bound by the wood material as it grows has a significantly smaller impact than the significant weakening of the carbon balance of the forest due to the change in land use. In addition, the energy content of the raw material is allocated to the module: + x MJ/kg.

2. The environmental impacts caused by the wood-based construction product or packaging leaving the system are allocated to the wood product or packaging until it reaches its “end-of-waste” state in the waste treatment phase, module A5, B4 or C3. When the wood material has reached its “end-of-waste” state, no further environmental impacts are allocated to such material. This means:
    - The environmental impacts caused by the processing of the wood product or packaging, such as cleaning and chipping, are allocated to the wood product or packaging, and the biogenic carbon bound to the wood is declared in the GWP-luluc impact category as an emission into the atmosphere (CF=+1): GWP luluc: + x kg CO_2-eq/kg, which corresponds to the carbon content remaining in the material.
    - and “energy content reset” of the material (renewable primary energy resources used as raw materials): - x MJ/kg.

The environmental impacts caused by the final disposal of the wood product or packaging remaining inside the system are allocated to the wood product in module C4 or B4 or to the wood packaging in module A5 or B4, when it is “disposed of from the system” at a landfill or is disposed of in an incinerator with less than 65% efficiency or, for example, due to impregnating substances in a hazardous waste facility: GWP luluc: + x kg CO_2-eq/kg, which corresponds to the remaining carbon content in the product, as well as the “energy content reset” of the product: - x MJ/kg. The energy recovered from wood materials burned in an incineration plant or a hazardous waste plant with an efficiency of less than 65% and exported over the system boundary is declared based on the lower calorific value in module C4 and for packaging material in module A5 or B4 with the indicator “energy exported”: + x MJ/kg.

Clarification on the calculation of wood-based biogenic carbon in the product lifecycle:

The biogenic carbon embedded in the raw material of a construction product is reported as a negative GWP-biogenic value in module A1 or, in the case of packaging materials, in module A3, provided the incoming raw material originates from all sources except native forests.

In module A3, the sequestration effects of biogenic carbon in bio-based raw materials (negative GWP-biogenic value) and emission effects of energy raw material (positive GWP-biogenic value) are always reported. This includes emissions resulting from the acquisition and processing of these energy raw materials. Additionally, any other biogenic carbon compounds generated during combustion are accounted for using specific characterization factors in module A3.

The indicator tables for modules A1–A3 shall exclude any raw material streams sold as co-products, along with their associated GWP-biogenic or other values.

If the material raw material of a wood-based construction product originates from native forests, no GWP-biogenic value is reported in modules A1 or A3 for the wood-based material. If this bio-based raw material is used for energy production during product manufacturing, the resulting CO_2 emissions are reported as a positive GWP-luluc value in module A3, including other biogenic carbon compounds produced during combustion, with their specific characterization factors reported in module A3.

For wood-based products originating from all sources except native forests, a calculated emission is reported in module C3 or allocated to module C4 based on the product's biogenic carbon content (x kg C).

This is calculated by multiplying the carbon content by 3.67 (=44/12), where:
GWP-biogenic = +3.67 × x kg CO_2e/kg.

If the raw material of the wood-based product is sourced from native forests, a calculated emission based on the physical biogenic carbon content (x kg C) is reported in module C3 or allocated to module C4. This is calculated:
GWP-luluc = +3.67 × x kg CO_2e/kg. (Refer to Appendix C.2 for details.)

The carbon content (kg C) of wood originating from all sources except native forests is transferred to module D under the GWP-biogenic impact category. If this carbon is used for energy production in module D, the CO_2 emissions equivalent to the sequestered carbon are released, resulting in a combustion GWP-biogenic value of 0 kg CO_2e.

If the raw material of the wood-based product is native forests, no carbon sequestration is accounted for in energy recovery. Instead, the CO_2 emissions are reported as a GWP-luluc value in module D, calculated as:
GWP-luluc = +3.67 × x kg CO_2e/kg.

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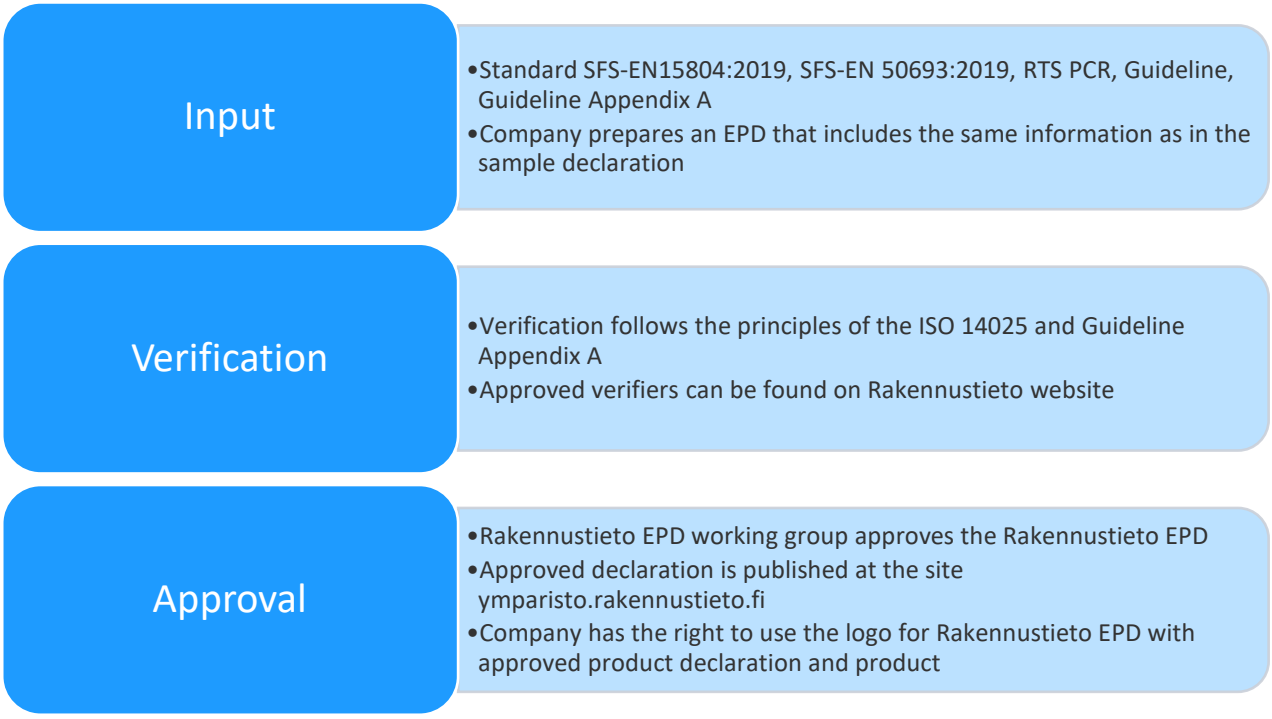
11 Practices of Rakennustieto EPD program

11.1 Verification

Verification follows ISO 14025 and *RTS EPD Verification rules for EPD-tools*. Approved verifiers are listed on the site http:/ymparisto.rakennustieto.fi.

11.2 Approval for Rakennustieto EPD

The approval is carried out by a working group at Rakennustieto Oy, whose composition has been confirmed by the Building Information Foundation sr. During the approval process, the verification data, the environmental declaration prepared by the company, the project report, product information, the verification report, the communication report between the verifier and the calculator, and the completed application are reviewed. The required information is presented in the sample declaration. The necessary details must be included in the declaration prepared by the company. The working group's review process is confidential.



The appearance of the declaration can either follow the company's/organization's own design or adhere to the RTS sample declaration format. Approved environmental declarations are published on the website http://ymparisto.rakennustieto.fi. A company whose declaration has been approved as a Rakennustieto EPD commits to complying with the general rules for environmental declarations established by the Building Information Foundation RTS, outlined in the document *"Rakennustieto EPD, General Rules."*

If a significant change occurs in the product's life cycle after the publication of the declaration, the declaration is no longer valid. However, the owner of the EPD has the option to keep the old EPD

published and collect data for one year to conduct a new LCA for updating the EPD or publishing a new one.

- Significant change is ±10 % of GWP total (A1-A4, B6-B7, C1-C4) or the weakening of over 10 % in any other indicator
- A significant change in the product information (e.g., manufacturing location, raw materials, composition, service life), the manufacturing process, or other relevant details.

Figure 11-1 illustrates the marks used on the cover of verified and published EPD declarations from the Rakennustieto EPD program. The mark on the left is the previous one that can be used during the validity period of the old PCR (Product Category Rules) protocol.

FIGURE 11-1 ON THE LEFT RTS EPD LOGO, THAT CAN BE USED UNTIL THE END OF THE YEAR 2025. ON THE RIGHT, THE VALID RAKENNUSTIETO EPD LOGOS IN FINNISH AND IN ENGLISH.

11.3 Handling of feedback and complaints

Any feedback or complaints of Rakennustieto EPDs, the activities or decisions of working groups, the conduct of verifiers or LCA practitioners, or other matters related to EPD operations shall be submitted to the secretary of the Building Information Foundation's EPD Main Committee (PT 42). To process the complaint, it must be submitted in writing and clearly specify the subject of the complaint (EPD, document, specific actor, or similar issue) and the reason for complaint (e.g., violation of standard or guideline, or similar issue).

An initial response to the complaint will be provided within one week of its receipt. Depending on the subject and nature of the complaint, it will be handled by the secretary either independently or in collaboration with the working group or the principal committee. During the handling of a complaint regarding an EPD, the EPD may be temporarily removed from publication listing. As part of complaint handing of an EPD, questions regarding the content of the EPD and the background report may be presented to the owner of the EPD, and re-verification of the declaration by a different verifier (appointed by the program) may be required.

The complaint is aimed to be resolved within a month of its receipt for handling. If the first decision is not satisfactory, the complaint can be reviewed again by the principal committee. If dissatisfaction persists

with this second decision, the matter can be referred to the Building Information Foundation’s Director General for resolution.