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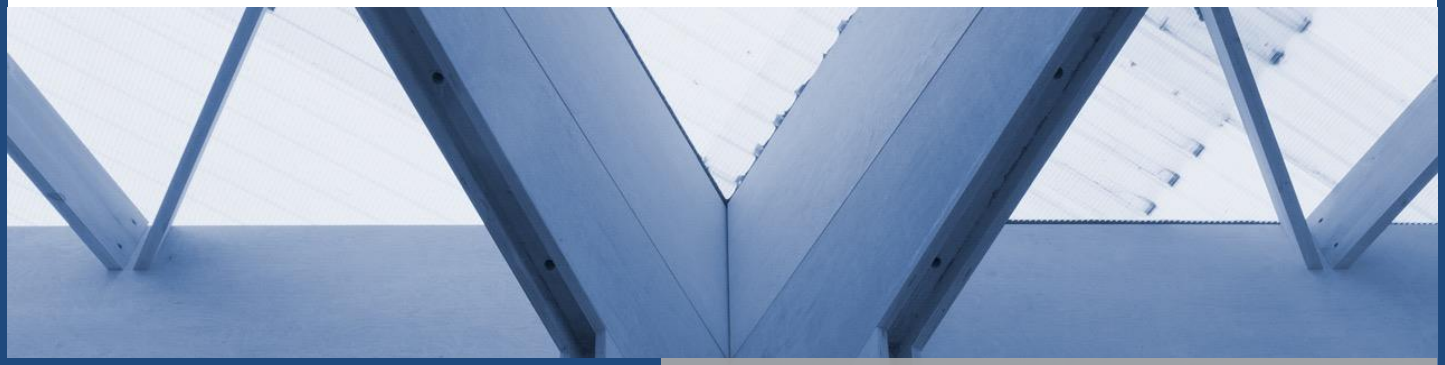
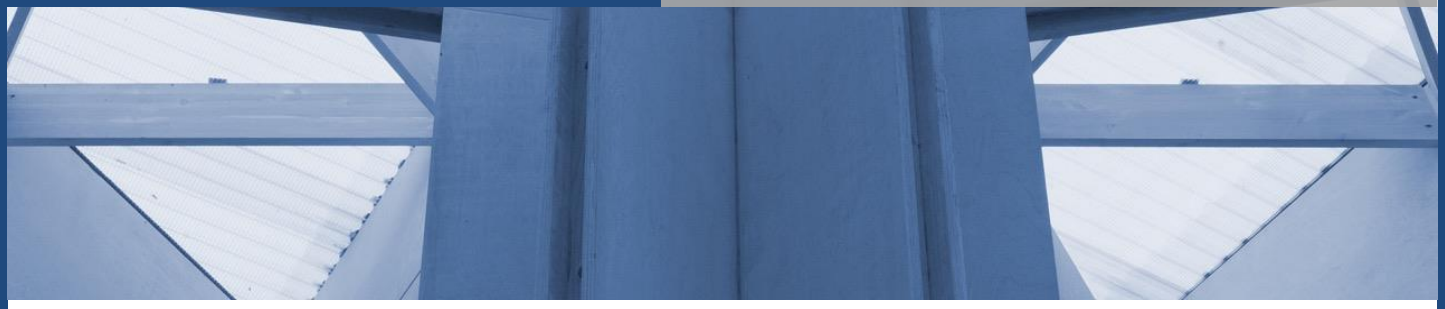


RAKENNUSTIETOSÄÄTIÖ RTS
BUILDING INFORMATION
FOUNDATION RTS SR

RTS PCR



RTS PCR protocol:
EPDs published by the Building Information Foundation RTS sr

PT 18 RT EPD Committee

Building Information Foundation RTS sr, Malminkatu 16 A, FI-00100 Helsinki, Finland

http://epd.rts.fi

Contents

INTRODUCTION

EPDs for construction materials and products, such as RTS EPDs, present the environmental impacts caused by products during their manufacturing, use and final disposal, as well as during the acquisition of raw materials. EPDs verified by a third party contain impartial and transparent information about the environmental impacts of construction products. Product information and environmental impact calculations shall be presented in EPDs according to the European standard EN 15804:2012 + A1:2013. EPDs constitute the basis for the building assessment to be carried out at the building level taking into account the entire life cycle. RTS EPDs can be drawn up for the raw materials, preparations, products, product groups, product combinations, building parts or technical equipment to be used in the construction works. Furthermore, they can be drawn up as needed for the assessment of both buildings and infrastructure. RTS EPDs can be

- product-specific (one product, one manufacturing site or one product, several manufacturing sites)
- product type-specific (similar products, one/several manufacturing site(s) /manufacturer(s))

This protocol (RTS PCR) shall be used together with EN 15804:2012 + A1:2013 “Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products ". The protocol (RTS PCR) only contains the necessary additional requirements and information.

The table of contents of the protocol is built in accordance with EN 15804:2012 + A1:2013. The protocol only deals with the parts that required additional information. Otherwise, EPDs shall be drawn up according to the standard. For example, all 24 environmental indicators shall be reported as referred to in the standard as the protocol provides no additional information on the matter. Modules A1–A3 (Acquisition of raw materials, Transport to manufacturing site, Manufacturing) are mandatory under EN 15804:2012 + A1:2013. Other modules shall be reported in accordance with the standard.

Section 6.2.1 of the protocol (RTS PCR) establishes when the following modules, which are otherwise optional, must be contained in EPDs:

- Construction process stage: Transport to construction site module A4
- End-of-life stage: Potentially mandatory modules C1, C2, C3 and C4 (De-construction, transport, waste processing, Disposal)
- Benefits and loads beyond the system boundary, module D (Reuse, recovery and recycling)
- Product description

The separate RTS EPD declaration template specifies the information to be included in the final EPD. The protocol provides no indications regarding the RTS EPD layout. Verified RTS EPDs can be recognised from the RTS EPD sign. See section 9.

The environmental impacts of construction products can be only compared at the building or infrastructure level. EPD information shall be collected, calculated and reported in a modular manner to enable comparison at the building level. The comparison shall take into account the entire life cycle. Therefore, the required technical and functional properties of the products and the related requirement levels must be known for the application in question. Single pieces of information related to life cycle stages must not be used separately from other EPD information.

1 Scope

EPDs shall be drawn up in accordance with EN 15804:2012 + A1:2013 “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 PCRs can be used if the information or requirements are not in conflict with the standard or the RTS PCR.

The protocol (RTS PCR) contains the necessary requirements and additional information along EN 15804:2012 + A1:2013. The declaration template that meets the requirements of both the standard and this PCR is available at epd.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 EN 15804:2012 + A1:2013.

3 Terms and definitions

To be drawn up in accordance with EN 15804:2012 + A1:2013.

4 Abbreviations

To be drawn up in accordance with EN 15804:2012 + A1:2013.

5 Overview

5.1 Objectives of general rules

To be drawn up in accordance with EN 15804:2012 + A1:2013.

5.2 Types of EPDs in relation to the lifecycle stages covered by them

To be drawn up in accordance with EN 15804:2012 + A1:2013.

5.3 Comparability of EPDs for construction products

To be drawn up in accordance with EN 15804:2012 + A1:2013.

5.4 Additional information

EPD holder and responsibilities and obligations related to EPDs

5.5 Format of the information to be displayed

To be drawn up in accordance with EN 15804:2012 + A1:2013.

6 General rules for life cycle assessment (LCA)

To be drawn up in accordance with EN 15804:2012 + A1:2013.

6.1 Scope of general rules

To be drawn up in accordance with EN 15804:2012 + A1:2013.

6.2 Life cycle stages and associated information modules

6.2.1 General

Modules A1–A3 (Acquisition of raw materials, Transport to manufacturing site, Manufacturing) are mandatory under EN 15804:2012 + A1:2013. Furthermore, as per the protocol (RTS PCR), EPDs (RTS EPDs) must include modules A4, C1, C2, C3, C4 and D in accordance with the following provisions:

- **Module C3** (Waste processing): Mandatory if carbon dioxide uptake has been taken into account in section A1. Section A1 shall also specify whether carbon dioxide uptake has been taken into account.
- **Module A4** (Transport to construction site): The environmental impacts must be declared if their GWP (global warming potential) is over 20% of the GWP of modules A1–A3.
- **Module D** (Reuse, recovery, recycling): If module D shows the benefits, the declaration must specify the scenarios that meet the requirements of the standard (see section 7.3.4). If no scenario is specified, the value in module D shall be declared as (0).
- **Modules C** (Deconstruction, transport during end-of-life stage, waste processing and final disposal): If module D shows the benefits of material recycling or other recovery (net substitution effects from using the material for the next application), the essential parts of modules C1–C4 that cause environmental impacts must be included:
  - Module C1 (Deconstruction) related technical implementation (scenario)
  - Module C2 (Transport during end of life stage)
  - Module C3 (waste processing) environmental impacts
  - Module C4 (Final disposal of demolition waste) environmental impacts

The requirements of sections 6.3.4.5 "End-of-life stage" and 6.3.4.6 "Impacts beyond the building life cycle, module D" of EN 15804:2012 + A1:2013 must be taken into account when defining modules C and D.

6.2.2 A1…A3 product stage, information modules

To be drawn up in accordance with EN 15804:2012 + A1:2013.

6.2.3 A4…A5 construction process stage, information modules

The information of module A4 is presented in the EPD

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

To be drawn up in accordance with EN 15804:2012 + A1:2013.

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

To be drawn up in accordance with EN 15804:2012 + A1:2013.

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

The information of modules C1, C3 and C4 is presented in the EPD.

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

The information of module D is presented in the EPD.

6.3 Calculation rules for life cycle assessment (LCA)

To be drawn up in accordance with EN 15804:2012 + A1:2013.

6.3.1 Functional unit

To be drawn up in accordance with EN 15804:2012 + A1:2013.

6.3.2 Declared unit

To be drawn up in accordance with EN 15804:2012 + A1:2013.

6.3.3 Reference Service Life (RSL)

To be drawn up in accordance with EN 15804:2012 + A1:2013.

6.3.4 System boundaries

To be drawn up in accordance with EN 15804:2012 + A1:2013.

6.3.5 Criteria for the exclusion of inputs and outputs

To be drawn up in accordance with EN 15804:2012 + A1:2013.

6.3.6 Selection of data

To be drawn up in accordance with EN 15804:2012 + A1:2013.

6.3.7 Data quality requirements

To be drawn up in accordance with EN 15804:2012 + A1:2013.

6.3.8 Developing product level scenarios

To be drawn up in accordance with EN 15804:2012 + A1:2013.

6.3.9 Units

To be drawn up in accordance with EN 15804:2012 + A1:2013.

6.4 Inventory analysis

To be drawn up in accordance with EN 15804:2012 + A1:2013.

6.4.1 Collecting data

To be drawn up in accordance with EN 15804:2012 + A1:2013.

6.4.2 Calculation procedures

To be drawn up in accordance with EN 15804:2012 + A1:2013.

6.4.3 Allocation of input flows and output emissions

The principles referred to in section 6.4.3 of EN 15804:2012 + A1:2013 must be followed when allocating input flows and output emissions into the environment. More detailed information about the allocation can be given in the product group-specific instructions for RTS EPDs. Information about wood products shall be provided in accordance with the PCR for wood products (EN 16485:2014). This does not apply to the carbon store of wood products, which, based on European practices, shall be declared as additional information in section 7.3 instead of module B1.

Eco-profile of the energy consumed

When calculating the environmental profile of construction products, process-specific information shall be used, where available, for the emissions of various forms of energy. For the time being, in all other cases, a possible source is, for example, the information contained in the data banks.

For construction products manufactured in Finland, it is advisable to use a specific profile for the electricity generated or, alternatively, the average electricity consumption in Finland calculated as a five-year average. If the EPD covers manufacturing in different countries, it is advisable to follow the order of priority

a) to be used in manufacturing,

b) European average,

c) in the calculation, the average value based on the country-specific electricity production distributions of the manufacturing countries

d) average weighted with product production volumes.

EXAMPLES OF ACCEPTABLE DATA BANKS
•European Reference Life Cycle Database (ELCD) (http://lca.jrc.ec.europa.eu/lcainfohub/dataset2.vm?id=85)
•GaBi (http://www.gabi-software.com/databases/gabi-databases/)
•ecoinvent database (www.ecoinvent.ch)

The eco-profile of the energy consumed shall be reported and explained in the project report. If recovered fuels are used, they shall be allocated as waste or fuel from recycled materials in section A3. Fuel acquisition is always part of the process. If the product is used as recovered fuel, the

emissions caused by its combustion shall be allocated in section A3 (Manufacturing). The author of the declaration must specify how the information has been reported. The method used shall be specified in the additional information. The author shall provide more detailed information and declare it in the project report.

6.4.3.1 General

To be drawn up in accordance with EN 15804:2012 + A1:2013.

6.4.3.2 Co-product allocation

To be drawn up in accordance with EN 15804:2012 + A1:2013.

6.4.3.3 Allocation procedure of reuse, recycling and other recovery

Waste flows are treated as recoverable material in accordance with EN 15804:2012 + A1:2013. In the calculation, the direct emissions of waste processing shall be taken into account until waste processing has reached the so-called "end of waste" state. When a building is demolished, all materials are, in principle, waste. When the material meets the criteria for "end of waste" state outlined in the standard, the material is no longer waste. See section 6.3.4.5 of the standard.

The allocation procedure is necessary when calculating the data of section D. The substitution effects are defined according to the formula below (Formula 1). The share of virgin raw material is 1 – R1.

$$(R_2 - R_1) \times \left(E_{recycled} - E^* V \times \frac{Q_{S,}}{Q_P} \right)$$

Formula 1 The formula takes into account waste generation, use of resources and net emissions compensated by material recycling. Furthermore, the formula takes into account the quality ratio between replacement material and virgin material and reduces the recovered material already used by the product system, i.e. the net benefits. The share of virgin raw material is 1 – R1.

Formula 1 variable	Declaration
E *recycled*	Environmental load of recycling (e.g., CO_2 emissions)
Qs	Quality of secondary material
Qp	Quality of primary material
Qs/Qp	Quality ratio of materials used
R1	Use of recovered material (kg/kg)
R2	Departure of recovered material (kg/kg)
E**V*	Environmental load of primary product (e.g., CO_2 emissions)

Formula 1 Variables and definitions

6.5 Impact assessment

To be drawn up in accordance with EN 15804:2012 + A1:2013.

7 Content of the EPD

To be drawn up in accordance with EN 15804:2012 + A1:2013.

7.1 Declaration of general information

To be drawn up in accordance with EN 15804:2012 + A1:2013.

7.2 Declaration of environmental parameters derived from LCA

To be drawn up in accordance with EN 15804:2012 + A1:2013.

7.2.1 General

To be drawn up in accordance with EN 15804:2012 + A1:2013.

7.2.2 Rules for declaring LCA information per module

To be drawn up in accordance with EN 15804:2012 + A1:2013.

7.2.3 Indicators describing environmental impacts

To be drawn up in accordance with EN 15804:2012 + A1:2013.

7.2.4 Indicators describing the use of resources

To be drawn up in accordance with EN 15804:2012 + A1:2013.

7.2.5 Other environmental information describing different waste categories and output flows

To be drawn up in accordance with EN 15804:2012 + A1:2013.

7.3 Scenarios and additional technical information

RTS EPDs can be drawn up for the substances, preparations, products, product groups, product combinations, building parts or technical equipment to be used during construction. They can be product-specific (one product, one place of manufacturing) or product type-specific (one product, many places of manufacturing).

7.3.1 General

As regards the electricity and district heating used in modules A3, the following additional information shall be included in the declaration: quality of electricity and district heating data and at least CO_2 emissions (kg CO_2 eq. /kWh). The term "data quality" refers to, for example, the five-year average for each supplier.

Table 1: declaration of the average values (1, 3 and 5 years) for electricity and district heating. The information shall be declared in the project report.

Object	Value	Data quality
A3 Electricity data quality and CO_2 emissions kg CO_2 eq. /kWh		
District heating/cooling data quality and CO2 emissions kg CO2 eq. /kWh		

7.3.2 Construction process stage

7.3.2.1 A4, Transport to the construction site

The eco-profile of transport must be declared. In principle, the correct information shall be used. If no information is available, the most common transport method in the sector shall be used instead. Technical specifications shall be provided in accordance with Table 7 of section 7.3.2.1 of the standard. The quality of the information used shall also be specified. As source of environmental information, it is possible to use, for example, the sources of information referred to in section 6.4.3.

The average transport distances and fuel manufacturing emissions shall be taken into account in conjunction with transport. The form of transport shall also be specified.

If the environmental impact of an empty return is significant, it shall also be taken into account in the calculations. If, due to the transport equipment or another factor, the average profiles are inadequate to describe the environmental impacts of a transport event, this must be specified in the project report and, where necessary, an inventory must be carried out of product-specific transport material and energy flows. Alternatively, the distance from the place of manufacturing to Helsinki can be used as the transport distance.

Table 2: declaration of the average values (1, 3 and 5 years) for transport. The information shall be declared in the project report.

Object	Value	Data quality
A4 Specific transport emissions, CO_2 emissions kg CO_2 eq. /tn x km		
A4 Average transport distance km		

7.3.2.2 A5 Installation in the building

To be drawn up in accordance with EN 15804:2012 + A1:2013.

7.3.3 B1...B7 Use stage

7.3.3.1 B1...B5 Use stage related to the building fabric

To be drawn up in accordance with EN 15804:2012 + A1:2013.

7.3.3.2 Reference service life

To be drawn up in accordance with EN 15804:2012 + A1:2013.

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

Eco-profile of the energy consumed

When calculating the environmental profile of construction products, process-specific information shall be used, where available, for the emissions of various forms of energy. In all other cases, it is possible to use as source of environmental information, for example, the sources of information referred to in section 6.4.3.

As regards the energy consumed, it must be ensured that the production profile used when calculating the aforementioned databases corresponds sufficiently well to the production profile of the energy consumed at the time of calculating the emissions. The eco-profile of the energy consumed shall be reported and explained in the project report. See section 7.3.2.1.

7.3.4 End-of-life stage

To be drawn up in accordance with EN 15804:2012 + A1:2013.

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

7.4.1 Indoor air

Additional information on the emissions of dangerous substances to indoor air, soil and water during the use stage shall be provided in accordance with section 7.4 of EN 15804:2012 + A1:2013. In RTS EPDs, it is also possible to declare the product's M emission class for construction materials (where applicable) or the emissions measurement results.

7.4.2 Soil and water

To be drawn up in accordance with EN 15804:2012 + A1:2013.

7.5 Aggregation of information modules

RTS EPDs shall be drawn up in accordance with the modular structure and subdivision into life cycle stages referred to in EN 15804:2012 + A1:2013.

RTS EPDs must cover at least the product manufacturing phase, from the acquisition of raw materials to the factory's gate, i.e. information modules A1 … A3. Furthermore, as per the protocol (RTS PCR), EPDs (RTS EPDs) must include modules A4, C1, C2, C3, C4 and D in compliance with the provisions of section 6.2.1.

In accordance with EN 15804:2012 + A1:2013, RTS EPDs must include a product description and a list of the SVHC substances listed on the candidate list of the European Chemicals Agency (ECHA) (http://echa.europa.eu/web/guest/candidate-list-table) contained in the product.

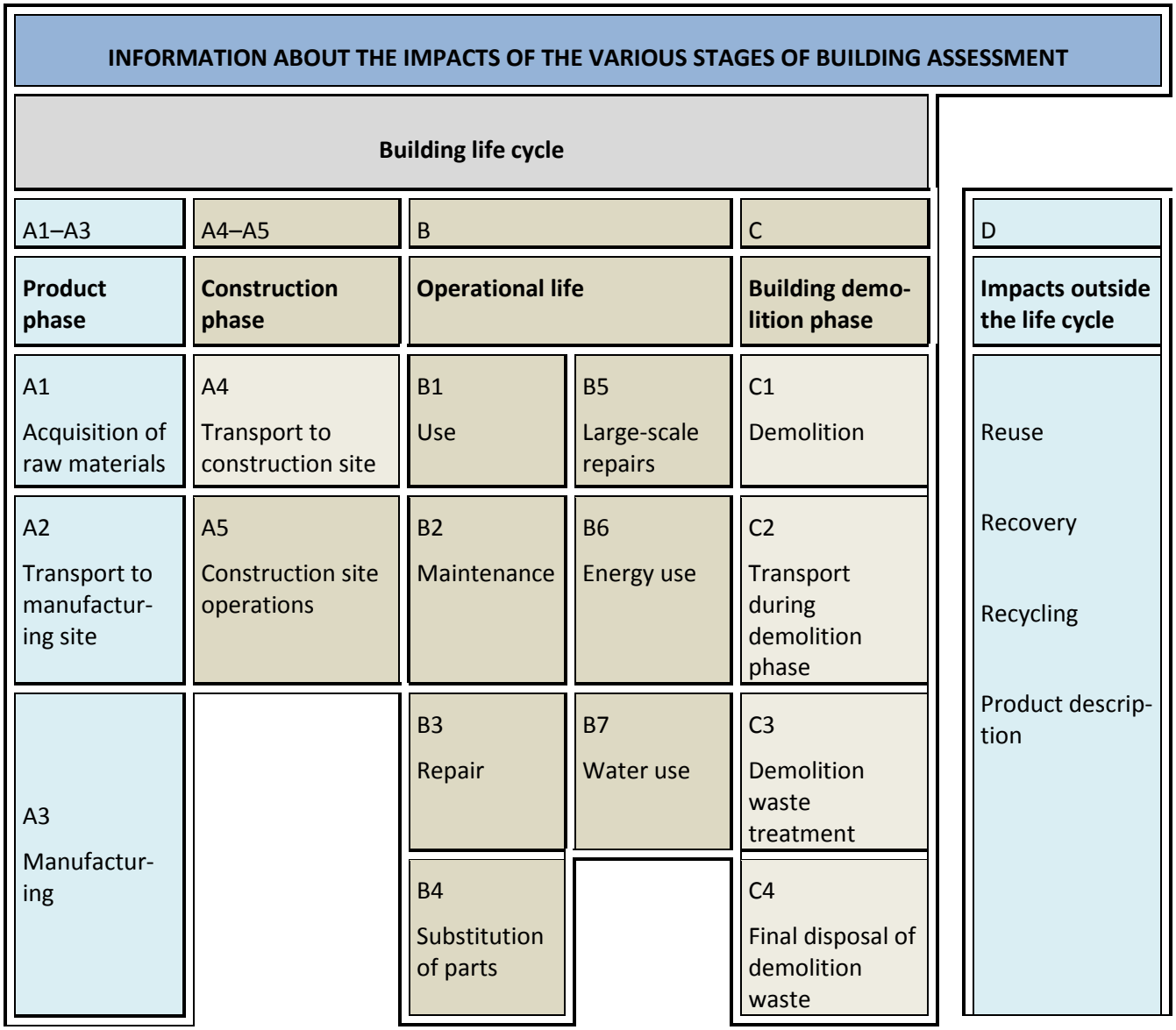


Figure 1. *Stages of a construction product's life cycle and associated information modules EN 15804:2012 + A1:2013/.*

8 RTS EPD project report: General rules for drawing up RTS EPDs

8.1 General

To be drawn up in accordance with EN 15804:2012 + A1:2013.

8.2 LCA-related elements of the project report

To be drawn up in accordance with EN 15804:2012 + A1:2013.

8.3 Documentation of additional information

To be drawn up in accordance with EN 15804:2012 + A1:2013.

8.4 Data availability for verification

The EPDs for construction products to be published as RTS EPDs are drawn up in accordance with EN 15804:2012 + A1:2013 and with the additional instructions referred to in section 3 of the protocol (RTS PCR). The additional instructions supplement EN 15804:2012 + A1:2013.

9 Verification and validity of an EPD

Additional general instructions concerning drawing up EPDs to be published as RTS EPDs and supplementing EN 15804:2012 + A1:2013.

Verification

Verification is carried out in accordance with the ISO 14025 principles. A list of approved verifiers is available at http://epd.rts.fi.

Approval as RTS EPD

The approval shall be carried out by a workgroup approved by the PT18 RTS EPD Committee. The verification data and the EPD drawn up by the company shall be checked during the approval process. All necessary information is contained in the declaration template. The declaration drawn up by the company must contain all required information.

The company/organisation can use either its own declaration layout or the RTS declaration template. The approved EPDs are published on the website of the Building Information Foundation RTS sr at http://epd.rts.fi. Companies whose declarations have been approved as RTS EPD shall undertake to comply with the general instructions on EPDs of the Building Information Foundation RTS sr ("RTS EPD, general instructions").

Figure 2: RTS EPD sign

Approval process

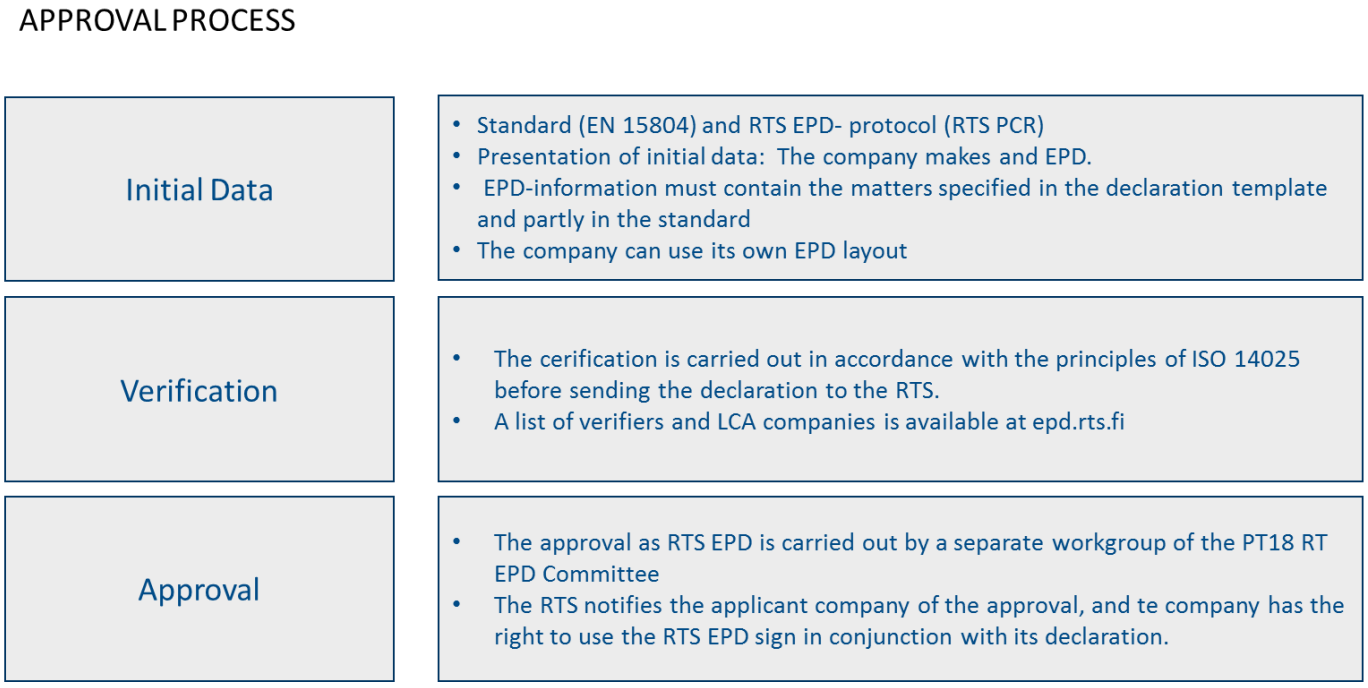


Figure 3: RTS EPD approval process

Impact assessment

The emissions obtained as a result of the inventory analysis shall be converted into impact classes as referred to in Table 3 of EN 15804:2012 + A1:2013 using characterisation coefficients compliant with the standard.