



PRODUCT CATEGORY RULES

EN 15804

NPCR 010 version 3.0

Issue date: 10.04.2019

Valid to: 10.04.2024

PCR – Part B for Building boards





REVISION LOG

This is an overview of the changes made to this PCR. Typology of changes:

- Editorial (ed): Text or layout edited, with no change in content.
- Technical (te): Existing content has been changed.
- Addendum (ad): New content has been added.

Naming convention: Version x.y, where x is a major revision and y is a minor revision.

Date (2019-04-10)	Type	Description of change
<i>Version 1.0</i>		
Original version, issued 2019-04-10.		

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Introduction

These product category rules (PCR) are intended for companies preparing an environmental product declaration (EPD) for building boards. The PCR for building boards consist of two parts. This document contains PCR part B for building boards, which is the part of the PCR that is specific for building board products. Part A contains the requirements that are common for all construction products. When preparing an EPD for building boards, all requirements outlined in part A and part B must be followed. In PCR part B, the requirements for PCR part A are referred to in each section where they occur. The purpose of this document is to define clear guidelines for performing the underlying life cycle assessment (LCA) to ensure comparability between EPDs.

This PCR was developed from July 2018 to December 2018, by a Norwegian PCR working group (WG) with representatives from the building board industry and with aid from Ostfold Research (Østfoldforskning) and the EPD programme operator The Norwegian EPD Foundation. This PCR has been developed in accordance with the requirements outlined in the general programme of instructions from the Norwegian EPD programme (EPD-Norway, 2014). There was an aim to harmonise this PCR with prEN 17328, but this was not available during the process and therefore has not been reviewed.

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1 Scope

This document complements the core rules for the product category of construction products as defined in EN 15804:2012+A1:2013 and NPCR part A and is intended to be used in conjunction with those standards.

The intended application of this product category rule (PCR) is to give guidelines for the development of environmental product declarations (EPD) for building boards; either cradle to gate with options or cradle to grave; and to further specify the underlying requirements of the life cycle assessment (LCA). The core rules valid for all construction products are given in standard EN 15804, NPCR Part A, EN 16485 and other relevant published complementary PCR, and are expected to be known by those preparing the EPD.

2 Normative references

NPCR Part A: Construction products and services. Ver. 1.0. April 2017. Oslo: EPD-Norge.

EN 16485 Round and sawn timber - Environmental Product Declarations - Product category rules for wood and wood-based products for use in construction.

NPCR015 Part B: Wood and wood-based products for use in construction. If there are contradictions in requirements between PCR Part A and EN 16485, then PCR Part A shall be given priority.

When prEN 17328 is published as a standard, this shall be reviewed during development of an EPD and should be followed according to this PCR. If the EPD is not following EN 17238 when published, this shall be justified in the LCA report and EPD.

EN 16485 and prEN 17328 are known as complementary product category rules (c-PCR).

3 Terms and Definitions

As in PCR part A and relevant c-PCR. In addition, the following product-specific terms and definitions are given:

3.1 Gypsum plasterboards

Building boards composed of a plaster core encased in, and firmly bonded to paper liners to form flat rectangular boards.

[EN 520]

3.2 Particleboards

Panel material manufactured under pressure and heat from particles of wood (wood flakes, chips, shavings, sawdust, and similar) and/or other lignocellulosic material in particle form (flax shives, hemp shives, bagasse fragments, straw and similar), with the addition of a polymeric adhesive.

[EN 309]



3.3 OSB boards

Multi-layer board mainly made from strands of wood together with a binder. The strands in the external layer are aligned and parallel to the board length or width. The strands in the internal layer or layers can be randomly oriented or aligned, generally at right angles to the strands in the external layers.

[EN 300]

3.4 Wood fibreboards

Panel material with a nominal thickness of 1.5 mm or greater, manufactured from lignocellulosic fibres with application of heat and/or pressure.

[EN 316]

3.6 Plywood

wood-based panel consisting of an assembly of veneers bonded together, with the direction of the grain in alternate layers usually at right angles

[ISO 6707-1]

3.7 Composite panel

panel made from two or more different materials deriving its performance from a combination of the properties of the individual materials, e.g. metal, plywood, particle board and insulation material

[ISO 9229]

3.8 High pressure laminate

Floor and wall covering with a surface layer consisting of one or more thin sheets of fibrous material (usually paper), impregnated with aminoplastic, thermosetting resins (usually melamine).

[EN 13329-2]

3.9 Cement boards

Building boards composed of a core material consisting of mainly cement or a calcium silicate, encased in inorganic fibre nets located on or just below the surfaces. Upper surface may also have some type of treatment like paint coating or texturing.

[EN 12467]

4. Abbreviations

c-PCR Complementary product category rules

EPD Environmental Product Declaration

DU Declared unit

FU Functional unit

PCR Product category rules

LCA Life cycle assessment

LCI Life cycle inventory

LCIA Life cycle impact assessment

RSL Reference service life

ESL Estimated service life

5. General Aspects

5.1 Objective of PCR Part A and B

As in PCR part A and relevant c-PCR.

5.2 Types of EPD in respect to life cycle stages covered

As in PCR part A and relevant c-PCR.

5.3 Comparability of EPD of construction products

As in PCR part A and relevant c-PCR.

5.4 Additional information

As in PCR part A and relevant c-PCR.

5.5 Ownership, responsibility and liability for the EPD

As in PCR part A and relevant c-PCR.

5.6 Communication format

As in PCR part A and relevant c-PCR.

6. Product Category Rules for LCA

As in PCR part A and relevant c-PCR.

6.1 Product Category

As in PCR part A and relevant c-PCR, including the following further clarification:

The product group building boards comprises of all kinds of building boards prepared for trade and are made of different materials. The products that shall follow this PCR, and their related standards, are listed here:

6.1.1 Gypsum plasterboards

Gypsum boards are described in the following standards:

- EN 520 Gypsum plasterboards – Definition, requirements and test methods
- EN 13815 Fibrous gypsum plaster casts - Definitions, requirements and test methods
- EN 13950 Gypsum board thermal/acoustic insulation composite panels - Definitions, requirements and test methods
- EN 14190 Gypsum board products from reprocessing - Definitions, requirements and test methods
- EN 15283 Gypsum boards with fibrous reinforcement - Definitions, requirements and test methods - Part 1: Gypsum boards with mat reinforcement
- EN 15283 Gypsum boards with fibrous reinforcement - Definitions, requirements and test methods - Part 2: Gypsum fibreboards

6.1.4 Cement boards

Cement boards are described in the following standards:

- EN 12467 Fibre-cement flat sheets - Product specification and test methods
- EN 494 Fibre-cement profiled sheets and fittings - Product specification and test methods

6.1.6 Composite boards

Composite boards are described in the following standards:

- ISO 13894-2 High-pressure decorative laminates – Composite elements – Part 2: Specifications for composite elements with wood-based substrates for interior use
- EN 438-7 High-pressure decorative laminates (HPL) - Sheets based on thermosetting resins (Usually called Laminates) - Part 7: Compact laminate and HPL composite panels for internal and external wall and ceiling finishes
- EN 14509 Self-supporting double skin metal faced insulating panels - Factory made products - Specifications

6.1.7 Wood-based panels

Wood-based panels are described in the following standards:

- EN 13986 Wood-based panels for use in construction – Characteristics, evaluation of conformity and marking

6.2 Life cycle stages and their information modules to be declared

6.2.1 General

As in PCR part A and relevant c-PCR, including the following further clarification:

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Transport in all life cycle modules shall include the following:

- Direct emissions during transport (exhaust, tyres, etc.)
- Upstream emissions from fuel extraction, processing and distribution
- Life cycle emissions of vehicles (raw materials, manufacturing, maintenance and disposal)
- Life cycle emissions of infrastructure (raw materials, manufacturing, maintenance and disposal)

6.2.2 A1-A3, Product stage, information modules

As in PCR part A and relevant c-PCR.

6.2.3 A4-A5, Construction process stage, information modules

As in PCR part A and relevant c-PCR, including the following further clarification:

The installation in A5 shall include the following:

- Waste treatment of packaging
- Energy use during installation
- Wastage of material during installation
- Paint or other surface treatment for products which are intended to be surface treated at the building site. When relevant, this includes the jointing compound and jointing tape.

Fasteners (screws) and other additional materials are not included, these are expected to be included at building level assessments.

6.2.4 B1-B5, Use stage, information modules

As in PCR part A and relevant c-PCR, including the following further clarification:

In life cycle module B1, the use phase involves emissions to air, soil and water.

Release of substances to indoor air is relevant when the product is used on the inside of the vapour barrier. Release of substances to soil and water are relevant for building board materials when they are used in direct contact with soil and/or water.

Reduction of emissions to air is also included in life cycle module B1. This can arise from the carbonation of concrete.

In life cycle modules B6-B7, , building boards do not generally require energy or water to operate. Even so, energy and water use shall be modelled.

6.2.5 C1-C4 End-of-life stage, information modules

As in PCR part A and relevant c-PCR.

6.2.6 Benefits and loads beyond the system boundary, information module

As in PCR part A and relevant c-PCR.

6.3 Calculation rules for the LCA

As in PCR part A and relevant c-PCR, including the following further clarification.

For declaring building boards, a functional or declared unit as described here can be used. The functional unit shall be used for products intended for outdoor use. For products for use indoors, the declared unit shall be used.

The scope and variations of products must be declared according to EPD-Norway guidelines. As of 2018, similar products in the same EPD can only be included if the variations of the results for each LCIA category does not exceed +/- 10 %. The variation shall be stated in the EPD. Special care must be given to composite products.

6.3.1 Functional unit

As in PCR part A and relevant c-PCR, including the following further clarification:

The functional unit for a cradle-to-grave EPD is defined as:

1 m² covering surface of installed building board with a specific function, from cradle-to-grave, with activities needed for a study period of 60 years for the building.

Results shall be displayed both per declared unit (cradle-to-gate, A1-A3) and per functional unit based on scenarios for life cycle modules A4-A5, B1-B7, C1-C4 and D.

The functional unit shall also specify:

- Quantified key properties of the product when integrated into the construction works, facilitating a functional equivalent comparison with similar products.
- The defined in-use conditions and time period for these performance characteristics. For wood-based products, the use class according to EN 335 should be included, which defines assumed in-use conditions. The Scheffer index should then be used to describe the geographic in-use condition assumed for the wood-based product.

For surface treatment with pigments, white and egg white (0502-Y) can be used as a proxy for all colours.

6.3.2 Declared unit

As in PCR part A and relevant c-PCR, including the following further clarification:

The declared unit (cradle to gate with options: A1-A5, C1-C4 and D) is defined as:

1 m² covering surface of installed building board, including waste treatment at end-of-life.

or

1 m³ real measure* of installed building board, including waste treatment at end-of-life.

or

1 tonne of installed building board, including waste treatment at end-of-life.

* see Figure 1

Results shall be displayed both per declared unit (cradle-to-gate, A1-A3) and based on scenarios for life cycle modules A4-A5, C1-C4 and D. When m³ and tonne are applied, a formula for calculating the LCA results to actual dimensions shall be included.

6.3.3 Reference service life (RSL)

As in PCR part A and relevant c-PCR.

The reference service life of the product shall be stated for both the declared and functional unit.

6.3.4 System boundaries

As in PCR part A and relevant c-PCR.

6.3.5 Criteria for the exclusion of inputs and outputs (cut-off)

As in PCR part A and relevant c-PCR, including the following further clarification:

The cut-off criteria in EPD-Norway's general program of instruction (GPI) shall also be followed. As of 2018, the key points of the requirements are :

- that processes and activities that do not contribute more than 1 % of the total environmental impact in some of the environmental impacts categories can be left out.
- production of capital, buildings and equipment that are not included shall also be justified according to the GPI. This justification shall be based on quantitative assessments to the cut-off criteria. Conservative assumption can be used when data is missing and is always better than leaving out activities in the inventory.

6.3.6 Selection of data

As in PCR part A and relevant c-PCR, including the following additions:

For transport data in life cycle modules A2 and A4, the data representativeness of the vehicle type, fuel use and load factor must be shown to be realistic and conservative for the actual use and scenario.

6.3.7 Data quality requirements

As in PCR part A and relevant c-PCR, including the following additions:

If data for wood as raw materials are not available from an EPD according to EN 15804 and verified according to ECO Platform, the compliance of the data to EN 15804 and specifications in this PCR must be shown in the LCA report and the LCI must be checked during verification. This includes the whole value chain from forestry and industrial processes.

NOTE: When using databases special attention is needed as many databases do not comply with EN 15804 for all parameters. Typical challenges are completeness, coproduct allocation, and inherent properties such as energy and carbon.

6.3.8 Scenarios at the product level

As in PCR part A and relevant c-PCR, including the following additions:

EN 15978:2011 provides additional guidance on developing scenarios.

6.3.8.1 A4 Transport to the building site

As in PCR part A and relevant c-PCR, including the following additions:

Transport from the manufacturing site to the construction site is estimated based on information from the manufacturer relevant for the intended market. The following default values can be used for developing scenarios at the product level:

- For domestic production, the default travel distance from the manufacturing site to the building site is 300 km.
- For import, the distance is measured from the manufacturing site to a specific storage location, plus a transport distance from the storage location to the building site (300 km if not specified). If no specific storage location is given, then the capital city of the country that the product is being imported to may be used as an approximate location.

6.3.8.2 A5 Installation

As in PCR part A and relevant c-PCR, including the following additions:

The material wastage of building boards at the building site should be estimated based on information from the manufacturer and information on relevance for the intended market. If no estimate is available, then the amount of waste is set to 5% by product weight.

The consumption of necessary accessories for surface treatment shall be based on information given by the manufacturer and is usually documented in product data sheets or installation manuals. Installation of building boards should be carried out according to the manufacturer's guidance for installation, international standards/regulations or national standards/regulations.

6.3.8.3 B1-B7 Use phase

As in PCR part A and relevant c-PCR, including the following additions:

The release of substances to air, soil or ground should be provided as additional information, see chapter 7.4 in EN 15804:2012. These emissions do not need to be included in the LCA if the emissions are not relevant for the LCIA categories included.

Module B2-B5, Maintenance, repair, replacement and refurbishment scenarios are provided by the manufacturer, and shall be relevant for the intended market and intended area of application.

6.3.8.4 C1-C4 End-of-life

As in PCR part A and relevant c-PCR, including the following additions:

Transport from the building/demolition site to the waste treatment/recycling facility is estimated based on information from the manufacturer and shall be relevant for the intended market. Default scenarios for life cycle module C2 transport to waste processing should be based on representative data, e.g. national statistics.

More than one scenario for waste treatment and disposal should be included if there are several relevant common practices, but the most conservative scenario shall always be included. Default conservative scenarios for life cycle modules C3 for waste processing and C4 for waste disposal are listed in Table 1.

Table 1: Default conservative scenarios for life cycle modules C3 and C4.

Product types	C3	C4
Wood-based panels, composite boards	Municipal incineration with energy recovery	Landfilling of ashes from incineration
Plasterboard	Central sorting of mixed construction waste	Landfilling of wasted product in sanitary landfill

6.3.9 Units

As in PCR part A and relevant c-PCR, including the following additions:

There are many ways to quantify the volume of wood. It depends on what we are measuring (from living tree to finished product) and the moisture content (from green wood to dry matter). It is therefore important to be aware of what the dimensions are referring to. One example from a sawmill's perspective is illustrated in Figure 1.

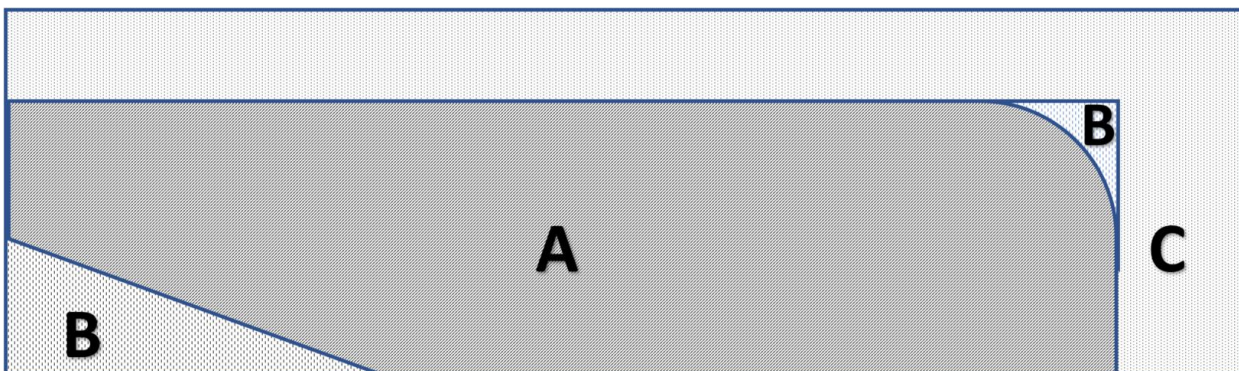


Figure 1: Measuring the volume of wood – illustration of a cross section of sawn timber. A = real measure / real

dimensions of the finished product. $B + C$ = planing allowance / shavings. $A + B$ = actual size. $A + B + C$ = nominal size / basic size. For a rectangular product, the real measure and the actual size are identical.

6.4 Inventory analysis

As in PCR part A and relevant c-PCR.

6.5 Impact assessment

As in PCR part A and relevant c-PCR.

7. Content of the EPD

7.1 Declaration of general information

As in PCR part A and relevant c-PCR, including the following additions:

The material composition of the product shall be listed with specific weights of the main components as it is installed. This information shall be included in the LCA report. Usage areas and conditions must be specified in the EPD. The harmonised standard for which the product is produced according to must be specified in the EPD.

The scope of products declared in an EPD must be specified so that the product range can easily be identified by the customer. The ability of scaling LCA results to other dimensions must also be specified.

7.2 Declaration of environmental parameters derived from LCA

7.2.1 General

As in PCR part A and relevant c-PCR.

7.2.2 Rules for declaring LCA information per module

As in PCR part A and relevant c-PCR.

7.2.3 Parameters describing environmental impacts

As in PCR part A and relevant c-PCR.

7.2.4 Parameters describing resource use

As in PCR part A and relevant c-PCR.

7.2.4.1 Water use

As in PCR part A and relevant c-PCR.

7.2.4.2 Electricity used in A3 Manufacturing

As in PCR part A and relevant c-PCR.

7.2.5 Other environmental information describing waste categories and output flows

As in PCR part A and relevant c-PCR.

7.2.6 Accounting of biogenic carbon during the life cycle

As in PCR part A and relevant c-PCR, including the following additions:

If no specifications are given in PCR part A, biogenic carbon shall be declared according to ISO 21930 or EN 16485.

7.2.7 Greenhouse gas emissions from land use change

As in PCR part A and relevant c-PCR, including the following additions:

If no specifications are given in PCR part A, greenhouse gas emissions from land use change shall be declared according to ISO 21930:2017 or EN 16485.

7.2.8 Carbonation

As in PCR part A and relevant c-PCR, including the following additions:

If no specifications are given in PCR part A, carbonisation shall be declared according to ISO 21930, EN 16757:2017 or NPCR 020 Concrete Products.

7.3 Scenarios and additional technical information

7.3.1 General

As in PCR part A and relevant c-PCR.

7.3.2 Construction process stage

7.3.2.1 A4, Transport from the production site to the construction site.

As in PCR part A and relevant c-PCR, including the following additions:

Transport from the production gate to the construction site is typically carried out using trucks. The distance, type of vehicle, fuel consumption and degree to which the transport capacity is utilised may have a large impact on transport emissions, thus these factors must

be stated. Capacity utilisation is calculated as a percentage (%) of the total load capacity of the vehicle. The percentage given shall be the average of the capacity utilisation including the return trip. Table 2 shows which information shall be provided in the EPD when module A4 is included.

Table 2. Information on the transport to the construction site (A4) required in the EPD.

Type	Capacity utilisation (incl return) %	Type of vehicle, incl emissions class	Distance km	Fuel/energy consumption pr tkm	Fuel energy consumption pr km
Truck					
Railway					
Other transport mode					

7.3.2.2 A5, Installation

As in PCR part A and relevant c-PCR, including the following additions:

The EPD shall specify the following information about the installation scenario:

- The consumption of other materials within the scope of the LCA
- The amount of energy per energy carrier
- Guidance for installation, international standards/regulations or national standards/regulations in which the scenario is based on
- If the EPD deviates from the predefined scenarios, this shall be clearly stated and justified.
- Usage areas and conditions must be specified in the EPD.

7.3.3 Use stage

As in PCR part A and relevant c-PCR, including the following additions:

The number of maintenance and replacement cycles during the service life of the building shall be given.

7.3.4 End of life

As in PCR part A and relevant c-PCR, including the following additions:

It should be mentioned in the EPD if the manufacturers take part in a national or international collection and recycling scheme.

7.4 Additional information

As in PCR part A and relevant c-PCR, including the following further clarification.

This clause includes all significant environmental and health impacts not included in the impact categories of this PCR. See section 7.2.3.

7.4.1 Additional information on release of dangerous substances to indoor air, soil and water

7.4.1.1 Indoor air

As in PCR part A and relevant c-PCR, including the following additions:

Release of substances to indoor air is relevant when the product is used on the inside of the vapour barrier.

The following standard should be applied for measuring emissions to indoor air:

- EN 16516 Construction products: Assessment of release of dangerous substances - Determination of emissions into indoor air

7.4.1.2 Soil, ambient air and water

As in PCR part A and relevant c-PCR, including the following additions:

Release of substances to ground water or soil is relevant for products when they are used in direct contact with the ground or rain water. Until horizontal standards for the measurement of leaching characteristics are available, the following report can be used:

- CEN/TR 17105:2017 Construction products. Assessment of release of dangerous substances. Guidance on the use of ecotoxicity tests applied to construction products

7.4.2 Additional Norwegian requirements

As in PCR part A and relevant c-PCR.

7.4.2.1 Greenhouse gas emissions from electricity use in A3 Manufacturing

As in PCR part A and relevant c-PCR.

7.4.2.2 Dangerous substances and content declaration

As in PCR part A and relevant c-PCR, including the following additions:

Specification of materials and substances that can adversely affect human health and environment shall be reported.

A detailed list of the product's substances (chemicals included in the final product), including CAS number and health class (risk phrases or CLP regulations Regulation (EC) No. 1272/2008) when these are in force, shall be included in the product content declaration. The content of substances shall be declared in terms of weight percentages. Only substances that are mentioned in the raw material safety declaration sheets (SDS) shall be included. The EPD owner has no obligation to investigate the content of ingredients used in raw material production, with the exception of products on the REACH candidate list and the Norwegian Priority List.

In cases where information about contents could affect patent or company secrets, a qualitative list of chemicals and their expected functions is sufficient, including the risk phrases. This does

not apply to substances registered under the REACH Directive.

7.4.2.3 Emission classification of building materials

As in PCR part A and relevant c-PCR.

7.4.2.4 Carbon footprint of products

As in PCR part A and relevant c-PCR, including the following additions for products containing biogenic carbon:

Global warming potential (GWP) should be declared in two sub-categories for all life cycle modules declared in the EPD, in order to make carbon footprint of buildings easier to understand, and to facilitate for comparison to national greenhouse gas accounting. The two sub-categories are listed in Table 3.

Table 3: Sub-categories for GWP

Abbreviation	Name	Explanation
GWP-IOBC	Global warming potential – instantaneous oxidation of biogenic carbon	The accounting assumes that all carbon in bio-based materials will eventually oxidize and can therefore be accounted as an emission at harvest. This implies that the emissions of biogenic methane need to be adjusted so that the carbon that oxidizes from methane is not double counted. In national greenhouse gas accounting methods from IPCC, this approach is known as instantaneous oxidation.
GWP-BCIP	Global warming potential – Biogenic carbon in products and packaging	The flows of carbon to and from the bio-based material is here accounted as CO ₂ at the module in the life cycle where it occurs. This follows the harvested wood products (HWP) methodology in IPCC but is also accounting other bio-based materials than wood.
GWP	Global warming potential	As in the LCIA results. This is the sum of GWP-IOBC and GWP-BCIP.

The differentiation in LCI results between product and packaging should be presented according to ISO 21930:2017, Annex E, Table E.4.

7.5 Aggregation of information modules

As in PCR part A and relevant c-PCR.

8. Project Report

As in PCR part A and relevant c-PCR.

9. Verification and Validity of an EPD

As in PCR part A and relevant c-PCR.

10 Bibliography

As in PCR part A, including the following additions:

EN 633 – Cement bonded particleboards – Definition and classification.

EN 12467 - Fibre-cement flat sheets - Product specification and test methods.

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

EN 16485:2014 Round and sawn wood. Product category rules (PCR) for wood and wood-based products for use in construction.

prEN 17328 Complementary Product Category Rules for Gypsum-based Construction Products

EN 15978. Sustainability of construction works – Assessment of environmental performance of buildings
– Calculation method

EPD-Norway (2014). General program instructions for the Norwegian EPD program.