ENVIRONMENTAL PRODUCT DECLARATION

In accordance with EN 15804 + A1

Aquaroc

A cement board with additional hardness for environments with very high humidity

Placo SAINT-GOBAIN

EPD®

THE INTERNATIONAL EPD® SYSTEM

Date: 2017/09/26
Version : 1.1
Revision date : 2018/06/08
Valid until : 2022/09/25

EPD VERIFIED

The environmental impacts of this product have been assessed over its whole life cycle. Its Environmental Product Declaration has been verified by an independent third party.

N° VERIFICATION

S-P-00943

General information

The information in this statement is provided under the responsibility of Saint Gobain Placo (producer of the EPD) according to EN 15804 + A1

Reading Guide

Reading example: : 9,0E-3=-0.009
The following display rules apply:

- When the result of calculation of the inventory is zero, then zero is displayed.
- When the module is not declared, the value "MND" is displayed

Manufacturer: PLACOPLATRE - 105 route d'Argenteuil 95240 Cormeilles-en-Parisis
Programme used: International EPD System **http://www.environdec.com/**
EPD registration number/declaration number: S-P - 00943
PCR identification EN 15804 as the core PCR + The International EPD® System PCR 2012:01 version 2.2 for Construction Products and CPC 54 construction services
Site of manufacture: PLACOPLATRE - 105 route d'Argenteuil 95240 Cormeilles-en-Parisis
Product / product family name and manufacturer represented: Saint Gobain Placo Aquaroc 12.5mm
Declaration issued: 2017/09/26
Valid until: 2022/09/25

Demonstration of verification: an independent verification of the declaration was made, according to ISO 14025:2010. This verification was external and conducted by the following third party: Marcel Gomez, Torrent de Vallmora 24-26 1º 2ª 08320 El Masnou ,Spain. www.marcelgomez.com
EPD Prepared by: Central SHEAR, Saint Gobain Gypsum, Techincal Building, BPB Limited, Gotham Road, East Leake, Leicestershire, LE12 6JS, United Kingdom. Contact. **Benoit.Prunier-Duparge@saint-gobain.com**

Declared Unit: The Declared unit is 1 m2 of Saint Gobain Placo Aquaroc 12.5 mm cement board with a weight of 13.5 kg /m2.

Declaration of Hazardous substances: (Candidate list of Substances of Very High Concern): None

Scope: Italy, Germany, Spain, Switzerland, Sweden and France

CEN standard EN 15804 serves as the core PCR[a]	
PCR:	PCR 2012:01 Construction products and Construction services, Version 2.2

PCR review was conducted by:	The Technical Committee of the International EPD® System. Chair: Massimo Marino. Contact via info@environdec.com
Independent verification of the declaration, according to EN ISO 14025:2010 ☐ **Internal** ☒ **External**	
Third party verifier:	Marcel Gómez Ferrer. www.marcelgomez.com
Accredited or approved by	The International EPD System Chair, Massimo Marino

Product description

Product description and use:

Lightweight open mesh reinforced cement board for indoor and outdoor partitions, ceilings and claddings.

Content declaration:

Gypsum, cement, additives.

LCA calculation information

EPD TYPE DECLARED	Cradle to Gate with options
DECLARED UNIT	1 m² of installed board.
SYSTEM BOUNDARIES	Cradle to Gate with options: Mandatory stages A1 – 3, A4 – A5, B1 – 7, and C1 – 4 .
REFERENCE SERVICE LIFE (RSL)	50
CUT-OFF RULES	Life Cycle Inventory data for a minimum of 99% of total inflows to the upstream and core module shall be included
ALLOCATIONS	Production data. Recycling, energy and waste data have been calculated on a mass basis.
GEOGRAPHICAL COVERAGE AND TIME PERIOD	Scope includes Italy, Germany, Spain, Sweden, Switzerland and France Data included is collected from one production site, Cormeilles. Cradle to gate with options. Specific data was collected at the site for the reference year 2016.
PRODUCT CPC CODE	37520
CONTENT DECLARATION	No substances of very high concern.

According to ISO 21930, Environmental product declarations within the same product category from different programs may not be comparable. EPD's of construction products may not be comparable if they do not comply with EN 15804

Life cycle stages

Flow diagram of the Life Cycle

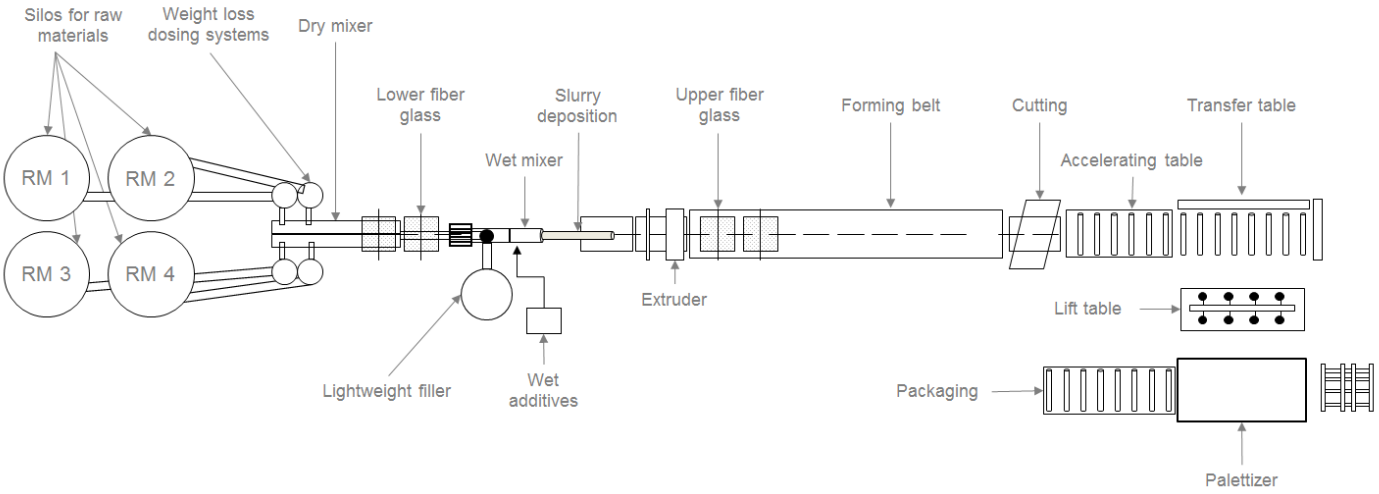
Product stage, A1-A3

Description of the stage:
A1, raw material extraction and processing, processing of secondary material input (e.g. recycling processes. This includes the extraction and processing of all raw materials and energy, which occur upstream from the manufacturing process.

A2, transport to the manufacturer. The raw materials are transported to the manufacturing site. The modelling includes road, boat and/or train transportation of each raw material.

A3, manufacturing, including provision of all materials, products and energy, as well as waste processing up to the end-of-waste state or disposal of final residues during the product stage. This module includes the manufacture of products and the manufacture of packaging. The production of packaging material is taken into account at this stage. The processing of any waste arising from this stage is also included.

Manufacturing process flow diagram



Manufacture:
The initial materials are homogenously mixed to form a gypsum and cement slurry that is spread via multiple hose outlets onto a glass mat liner on a moving conveyor belt. A second liner is fed onto the production line from above to form the board. The board continues along the production line where it is finished, dried, and cut to size.

Construction process stage, A4-A5

Description of the stage:
A4, transport to the building site,
A5, installation into the building, including provision of all materials, products and energy, as well as waste processing up to the end-of-waste state or disposal of final residues during the construction process stage. These information modules also include all impacts and aspects related to any losses during this construction process stage (i.e. production, transport, and waste processing and disposal of the lost products and materials).

Transport to the building site:

PARAMETER	VALUE (expressed per Declared/Declared unit)
Fuel type and consumption of vehicle or vehicle type used for transport e.g. long distance truck, boat, etc.	Truck, diesel , 0.386 litres per km
Distance	1242 (km)
Capacity utilisation (including empty returns)	100 %, 30% empty returns
Bulk density of transported products	1080 (kg/m3)
Volume capacity utilisation factor	1

Installation in the building:

PARAMETER	VALUE (expressed per Declared/Declared unit)
Ancillary materials for installation (specified by materials)	Jointing compound 0.33 kg/m2 board, tape 1.1m /m2 board, screws 8 /m2 board
Water use	None

Other resource use	None
Quantitative description of energy type (regional mix) and consumption during the installation process	None modelled
Wastage of materials on the building site before waste processing, generated by the product's installation (specified by type)	Board: 0.675 kg (5 % scrap rate at installation) to landfill Screws: 0.0008 kg to landfill Jointing Compound: 0.0165 kg to landfill Jointing Tape 0.0002 kg to landfill Packaging: Wooden Pallets: 0.796 kg/m2 Polythene Shrink wrap: 0.009 kg/m2
Output materials (specified by type) as results of waste processing at the building site e.g. of collection for recycling, for energy recovering, disposal (specified by route)	Board: 0.675 kg (5 % scrap rate at installation) to landfill Screws: 0.0008 kg to landfill Jointing Compound: 0.0165 kg to landfill Jointing Tape 0.0002 kg to landfill Packaging: Wooden Pallets: 0.796 kg/m2 to landfill Polythene Shrink wrap: 0.009 kg/m2 to landfill
Direct emissions to ambient air, soil and water	No direct emissions during installation.

Use stage (excluding potential savings), B1-B7

Description of the stage:

The use stage, related to the building fabric includes:
B1, use or application of the installed product;
B2, maintenance;
B3, repair;
B4, replacement;
B5, refurbishment, including provision and transport of all materials, products and related energy and water use, as well as waste processing up to the end-of-waste state or disposal of final residues during this part of the use stage. These information modules also include all impacts and aspects related to the losses during this part of the use stage (i.e. production, transport, and waste processing and disposal of the lost products and materials).

Maintenance:

PARAMETER	VALUE (expressed per Declared/Declared unit) / DESCRIPTION
Maintenance process	None required during cement board lifetime
Maintenance cycle	None required during cement board lifetime
Ancillary materials for maintenance (e.g. cleaning agent, specify materials)	None required during cement board lifetime
Wastage material during maintenance (specify materials)	None required during cement board lifetime
Net fresh water consumption during maintenance	None required during cement board lifetime
Energy input during maintenance (e.g. vacuum cleaning), energy carrier type, (e.g. electricity) and amount, if applicable and relevant	None required during cement board lifetime

Repair:

PARAMETER	VALUE (expressed per Declared/Declared unit) / DESCRIPTION
Repair process	None required during cement board lifetime
Inspection process	None required during cement board lifetime
Repair cycle	None required during cement board lifetime
Ancillary materials (e.g. lubricant, specify materials)	None required during cement board lifetime
Wastage material during repair (specify materials)	None required during cement board lifetime
Net fresh water consumption during repair	None required during cement board lifetime
Energy input during repair (e.g. crane activity), energy carrier type, (e.g. electricity) and amount if applicable and relevant	None required during cement board lifetime

Replacement:

PARAMETER	VALUE (expressed per Declared/Declared unit) / DESCRIPTION
Replacement cycle	None required during cement board lifetime
Energy input during replacement (e.g. crane activity), energy carrier type, (e.g. electricity) and amount if applicable and relevant	None required during cement board lifetime
Exchange of worn parts during the product's life cycle (e.g. zinc galvanized steel sheet), specify materials	None required during cement board lifetime

Refurbishment:

PARAMETER	VALUE (expressed per Declared/Declared unit) / DESCRIPTION
Refurbishment process	None required during cement board lifetime
Refurbishment cycle	None required during cement board lifetime
Material input for refurbishment (e.g. bricks), including ancillary materials for the refurbishment process (e.g. lubricant, specify materials)	None required during cement board lifetime
Wastage material during refurbishment (specify materials)	None required during cement board lifetime
Energy input during refurbishment (e.g. crane activity), energy carrier type, (e.g. electricity) and amount	None required during cement board lifetime
Further assumptions for scenario development (e.g. frequency and time period of use, number of occupants)	None required during cement board lifetime

Use of energy and water:

PARAMETER	VALUE (expressed per Declared/Declared unit) / DESCRIPTION
Ancillary materials specified by material	None required during cement board lifetime
Net fresh water consumption	None required during cement board lifetime
Type of energy carrier (e.g. electricity, natural gas, district heating)	None required during cement board lifetime
Power output of equipment	None required during cement board lifetime
Characteristic performance (e.g. energy efficiency, emissions, variation of performance with capacity utilisation etc.)	None required during cement board lifetime
Further assumptions for scenario development (e.g. frequency and time period of use, number of occupants)	None required during cement board lifetime

End-of-life stage C1-C4

Description of the stage: The end-of-life stage includes:
C1, de-construction, demolition;
C2, transport to waste processing;
C3, waste processing for reuse, recovery and/or recycling;
C4, disposal, including provision and all transport, provision of all materials, products and related energy and water use.

End-of-life:

PARAMETER	VALUE (expressed per Declared/Declared unit) / DESCRIPTION
Collection process specified by type	13.85 kg of cement board in installation materials collected with mixed construction waste
Recovery system specified by type	None
Disposal specified by type	13.85 kg disposed of in landfill
Assumptions for scenario development (e.g. transportation)	On average, Gypsum waste is transported 100 km by road from construction / demolition sites to end of life treatment or disposal.

LCA results

Description of the system boundary (X = Included in LCA, MND = Module Not Declared).

The declared unit is 1 m2 of Saint Gobain Placo Aquaroc 12.5 mm cement board with a weight of 13.5 kg /m2.

CML 2001 has been used as the impact model. Specific data has been supplied by the plant for the manufacturing year 2016, and generic data come from the Thinkstep and Ecoinvent databases. The latest available modules have been used wherever possible, and all modules are linked to an Electricity factor for the year 2012.

All emissions to air, water, and soil, and all materials and energy used have been included, with the exception of long-term emissions (>100 years).

PRODUCT STAGE			CONSTRUCTION STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
Raw material supply	Transport	Manufacturing	Transport	Construction-Installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-recovery
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	MND

ENVIRONMENTAL IMPACTS

Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				Module D
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse & recovery
Global Warming Potential (GWP 100) - *kg CO_2 equiv/FU*	5.91	0.778	0.387	0	0	0	0	0	0	0	0.0616	0.065	0	0.226	MND
Ozone Depletion (ODP) *kg CFC 11 equiv/FU*	3.89E-08	9.16E-14	1.95E-09	0	0	0	0	0	0	0	1.62E-14	7.65E-15	0	2.13E-13	MND
Acidification potential (AP) *kg SO_2 equiv/FU*	0.015	0.00315	0.00121	0	0	0	0	0	0	0	2.18E-04	2.63E-04	0	1.34E-03	MND
Eutrophication potential (EP) *kg $(PO_4)^{3-}$ equiv/FU*	0.00893	7.56E-04	0.000513	0	0	0	0	0	0	0	1.26E-05	6.32E-05	0	1.82E-04	MND
Photochemical ozone creation (POPC) *kg Ethylene equiv/FU*	0.00369	-1.33E-03*	0.000161	0	0	0	0	0	0	0	1.43E-05	-1.11E-04*	0	1.05E-04	MND
Abiotic depletion potential for non-fossil ressources (ADP-elements) - *kg Sb equiv/FU*	2.24E-05	1.25E-08	4.08E-06	0	0	0	0	0	0	0	1.69E-09	1.04E-09	0	7.89E-08	MND
Abiotic depletion potential for fossil ressources (ADP-fossil fuels) - *MJ/FU*	58.9	10.7	4.09	0	0	0	0	0	0	0	0.772	0.894	0	2.93	MND

*Occasionally negative values have been found in life cycle stages where the only process included is transport (A4 and C2). After investigation, these values are due to the characterization factor (FC) of "nitrogen monoxide" of -0.427. For GaBi transport data this flow (being the main contributor) leads to a positive impact of the transport on the Photochemical Ozone Creation indicator, which seems to be contrary to the expected results (smog in congested urban areas). Since this indicator is very dependent on the spatial and geographical dimensions considered.

RESOURCE USE

Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				Module D
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse & recovery
Use of renewable primary energy excluding renewable primary energy resources used as raw materials *MJ/FU*	16.2	-	-	-	-	-	-	-	-	-	-	-	-	-	MND
Use of renewable primary energy used as raw materials *MJ/FU*	15.29	-	-	-	-	-	-	-	-	-	-	-	-	-	MND
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) *MJ/FU*	31.49	0.262	1.1	0	0	0	0	0	0	0	0.00233	0.0219	0	0.354	MND
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials - *MJ/FU*	62.9	-	-	-	-	-	-	-	-	-	-	-	-	-	MND
Use of non-renewable primary energy used as raw materials *MJ/FU*	0.39	-	-	-	-	-	-	-	-	-	-	-	-	-	MND
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) - *MJ/FU*	63.29	10.7	4.34	0	0	0	0	0	0	0	0.774	0.896	0	3.03	MND
Use of secondary material *kg/FU*	0	0	0.00132	0	0	0	0	0	0	0	0	0	0	0	MND
Use of renewable secondary fuels- *MJ/FU*	0	0	0	0	0	0	0	0	0	0	0.00E+00	0.00E+00	0	0.00E+00	MND

Use of non-renewable secondary fuels - *MJ/FU*	0	0	0	0	0	0	0	0	0	0	0.00E+00	0.00E+00	0	0.00E+00	MND
Use of net fresh water - *m^3/FU*	0.0162	9.16E-05	0.00114	0	0	0	0	0	0	0	4.98E-06	7.66E-06	0	5.75E-04	MND

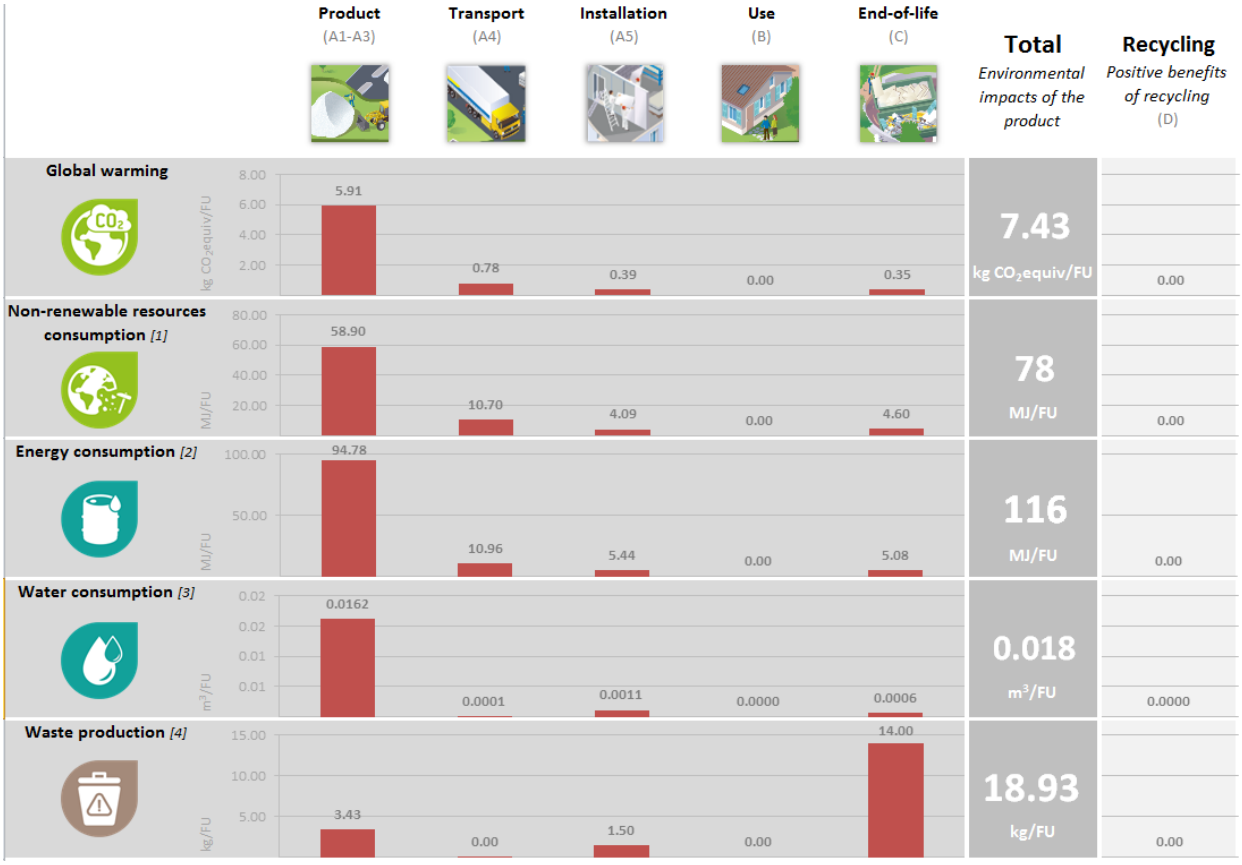
WASTE CATEGORIES

Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				Module D
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse & recovery
Hazardous waste disposed *kg/FU*	7.91E-08	4.39E-08	9.09E-09	0	0	0	0	0	0	0	9.34E-11	3.67E-09	0	4.79E-08	MND
Non-hazardous (excluding inert) waste disposed *kg/FU*	3.43	0.000117	1.4975	0	0	0	0	0	0	0	1.13E-04	9.79E-06	0	13.8497	MND
Radioactive waste disposed *kg/FU*	0.0014	1.17E-05	9.06E-05	0	0	0	0	0	0	0	9.77E-07	9.80E-07	0	4.09E-05	MND

OUTPUT FLOWS

Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				Module D
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse & recovery
Components for re-use *kg/FU*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	MND
Materials for recycling *kg/FU*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	MND
Materials for energy recovery *kg/FU*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	MND
Exported energy, detailed by energy carrier *MJ/FU*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	MND

LCA results interpretation



[1] This indicator corresponds to the abiotic depletion potential of fossil resources.

[2] This indicator corresponds to the total use of primary energy.

[3] This indicator corresponds to the use of net fresh water.

[4] This indicator corresponds to the sum of hazardous, non-hazardous and radioactive waste disposed.

References;

1.The International EPD System PCR for Construction Products and CPC 54 Construction Services V2.2

2. Saint Gobain Environmental Product Declaration Methodological Guide for Construction Products

3. EN 520:2004+A1:2009
Gypsum cement boards - Part 1: Definitions, requirements and test methods

4. EN 15804:2012 + A1:2013
Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products

5. ISO 21930:2007
Sustainability in building construction – Environmental declaration of building products

6. ISO 14025:2006
Environmental labels and declarations – Type III environmental declarations – Principles and procedures

7. ISO 14040:2006
Environmental management. Life cycle assessment. Principles and framework

8. ISO 14044:2006
Environmental management. Life cycle assessment. Requirements and guidelines

9. ISO 9001:2008
Quality management systems. Requirements

10. ISO 14001:2004
Environmental management systems – Requirements with guidance for use

11. OHSAS 18001:2007
Occupational health and safety management systems. Requirements

12. EN 14190:2014
Gypsum board products from reprocessing. Definitions, requirements and test methods

13. The underlying LCA performed using Thinkstep Gabi.

14. General Programme Instructions for The International EPD® System v 2.5