ENVIRONMENTAL PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A1*

Owner of the Declaration	Eternit NV
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
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Issue date	06/02/2020
Valid to	05/02/2025

EQUITONE [Pictura / Natura Pro fibre cement board]

ETEX

Institut Bauen und Umwelt e.V.

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General Information

Eternit NV	EQUITONE [Pictura / Natura Pro fibre cement board]
Programme holder IBU – Institut Bauen und Umwelt e.V. Panoramastr. 1 10178 Berlin Germany	**Owner of the declaration** Eternit NV Kuiermansstraat 1 1880 Kapelle-op-den-Bos Belgium
Declaration number EPD-ETE-20190179-CCC1-EN	**Declared product / declared unit** The production of 1 m² of a "PICTURA & NATURA PRO" boards with a thickness of 8 mm and its related impacts over cradle-to-grave life cycle stages, where the product's expected average reference service life is of 50 years
This declaration is based on the product category rules: Fibre cement / Fibre concrete, 07.2014 (PCR checked and approved by the SVR)	**Scope:** This EPD presents the LCA of the product EQUITONE Pictura and Natura fibre cement boards. PICTURA & NATURA PRO is a coated fibre cement sheet produced at Neubeckum production plant, Germany.
Issue date 06/02/2020	The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.
Valid to 05/02/2025	The EPD was created according to the specifications of *EN 15804+A1*. In the following, the standard will be simplified as *EN 15804*.
	**Verification** The standard *EN 15804* serves as the core PCR Independent verification of the declaration and data according to *ISO 14025:2010* ☐ internally ☒ externally
Dipl. Ing. Hans Peters (chairman of Institut Bauen und Umwelt e.V.)	
	
Dr. Alexander Röder (Managing Director Institut Bauen und Umwelt e.V.))	Mr Carl-Otto Neven (Independent verifier appointed by SVR)

Product

Product description/Product definition
PICTURA & NATURA PRO is a coated fibre cement sheet produced at Neubeckum production plant, Germany. The study is based on the annual production of PICTURA & NATURA PRO from 2017, where all data reported are calculated as total value per site based on production volumes. It is mainly made of cement, synthetic fibres, cellulose, pigments, water and additives, and multiple layers of coating and a UV cured functional layer. This product is used as a panel for exterior walls covering. This average product is representative of the full colour range made in 8 mm and 12 mm thick boards. There are only pigment composition changes in the matrix and coating which distinguishes PICTURA & NATURA PRO products from each other.
All products from this range:

- have been manufactured according to the same industrial process;
- have homogenous physical properties;
- have the same density;
- have been in the European market since 2008;
- have been produced in a unique factory (Neubeckum) since 2008.

For the placing on the market of the product in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland) *Regulation (EU) No. 305/2011 (CPR)* applies. The construction product is covered by the harmonized Declaration of performance No. S650_01_153_V02 from 01/08/2015, in line with *EN 12467:2012+A1*: *2016 + A2: 2006* – Fibre cement flat sheets. For the application and use the respective national provisions apply.

Application
PICTURA & NATURA PRO product is mainly used as a cladding sheet for ventilated exterior claddings and ceilings. The board itself is fixed to a sub-structure on

wood or metal. This sub-structure is mounted on a supporting wall in a massive construction (such as bricks, concrete, ...), lightweight skeleton (steel, wood) or prefabricated solutions. The application field is new construction and renovation of low, middle high and high rise buildings.
It is also used as an exterior ceiling and roof cladding. In a minor application, the PICTURA & NATURA PRO can be used as protection for insulated outside walls.

Technical Data
The following tables include technical data specific to the EQUITONE [Pictura / Natura fibre cement board] product.

Constructional data

Name	Value	Unit
Tensile strength (perpendicular to the board)	1.95	N/mm²
Thermal conductivity	0.60	W/(mK)
Swelling (30% to 95% r.h.)	1.18	mm/m
Sound absorption coefficient	NA	%
Gross density	1750 ± 100	kg/m³
Compressive strength (perpendicular to the board)	41	N/nm²
Bending strength (acc EN 12467)	17,0 / 22,0	N/nm²
Modulus of elasticity	12000	N/nm²
Moisture content at 23°C , 80% humidity	6	M.-%
Coefficient of thermal expansion	9.4	10-6 K-1
Chemical resistance	Similar to concrete C 35/45	-
Aging resistance	Similar to concrete C 35/45	-
Permanent temperature resistance	80	°C

Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to *EN 12467:2012 + A2:2018* 'Fibre-cement flat sheets, No.S650_01_107_159_VO01, dated 20-06-2013.

Base materials/Ancillary materials
Base materials included in the composition of EQUITONE [PICTURA/NATURA PRO] are:
- Pigments: 10 %
- Cement: 70-80 %
- Cellulose: < 10 %
- Water: 5-10 %
- Coating layers: < 5%
- Other - Approx. 5%

No substances of very high concern (SVHC) are used in the composition of the product. Also no secondary materials were used.

Manufacture
Façade panels made of fibre cement are manufactured largely in accordance to an automated winding process: the raw materials are mixed with water to prepare a homogenous mixture. Rotating screen cylinders are immersed in this fibre cement pulp which drain internally. The screen surface is covered in a thin film of fibre cement which is transferred onto an infinite conveyor belt from where it is conveyed to a format roller which is gradually covered in an increasingly thicker layer of fibre cement. Once the requisite material thickness is achieved, the still moist and malleable fibre cement layer (fibre cement fleece) is separated and removed from the format roller. The fibres cement fleece is cut to size. Leftovers are returned to the production process preventing any waste from being incurred. The sheets are then laid on templates, pressed and cured for 21 days in the warehouse. The façade panels are then dried. In a first step the boards are coated with an aqueous acrylic paint, dried and are finished with a high-quality UV coat in order to increase the durability of the boards. This UV coat is cured with UV light whereupon the stacking takes place.

Packaging
The final PICTURA & NATURA PRO product is placed on a custom-size, not re-usable wooden pallet. On each pallet there are 30 pieces PICTURA & NATURA PRO 8 mm boards placed (20 pieces for 12mm), and the boards are separated in pairs with a PE foam layer. The entire pallet with the PICTURA & NATURA PRO boards is tied together protected with a cover foil and hold together with metal straps.
Packaging material per functional unit:
Pallet - 0,6881 kg
Carton - 0,0485 kg
PE Cover foil - 0,0110 kg
PU foam layer - 0,0210 kg
Metal strap - 0,0260 kg.

Reference service life
PICTURA & NATURA PRO is a rather new product on the market (°2008), and there is not extensive evidence yet regarding its reference service life. However there are some studies that suggest that it is feasible to assume that this product lasts for the average lifetime of a building. Therefore for PICTURA & NATURA PRO it is estimated that the reference service life is the average building life time of more than 50 years.

LCA: Calculation rules

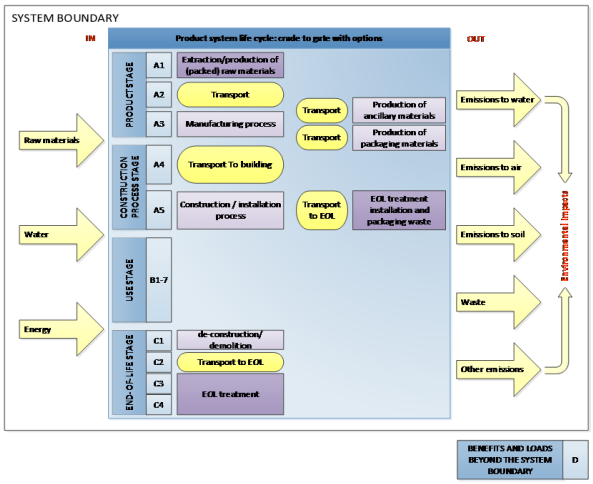
Declared Unit
The functional unit is defined as: the production of 1 m² of a "PICTURA & NATURA PRO" boards with a thickness of 8 mm and its related impacts over cradle-to-grave life cycle stages, where the product's expected average reference service life is of 50 years.

Declared unit

Name	Value	Unit
Declared unit	1	m²
Gross density (8 mm thickness)	1850	kg/m³
Conversion factor to 1 kg	0.067	-

This product is representative for Germany, where data were collected for 2017.

System boundary
This is a cradle to grave EPD for the EQUITONE [Pictura / Natura Pro fibre cement board] with the following life cycle stages included: A1, A2, A3, A4, A5, B1-7, C1, C2, C3, C4 and D. For A1, A2 and A3 specific quantities and distances were collected by ETEX NV and processed by VITO. For transportation, the default capacity utilisation factor of the transportation datasets was used, as all transportations were mass-based.



Estimates and assumptions
The large majority of the raw materials were modelled with *Ecoinvent 3.5* datasets. In very few instances (pigments) no specific dataset was found in the database, and a proxy was used instead. All operating data, i.e. all of the starting materials used, thermal energy, internal fuel consumption and electricity consumption, all direct waste as well as all emission measurements available were taken into account in the analyses. The packaging materials that include biogenic carbon are the wooden boards and the cardboard packaging. No uptake nor release of biogenic carbon is modelled. The biogenic carbon contained in the packaging material of the raw materials (from A1) exit the system during the production phase (in A3), with the End of Life (EoL) of the respective packaging materials. The biogenic carbon contained in the packaging material of the EQUITONE [Pictura / Natura Pro fibre cement board] (from A3) exits the system at installation (in A5), with the EoL of the respective packaging materials.

Cut-off criteria

- The set-up of the study aimed at the minimum at the cut-off criteria of 1 % of renewable and non-renewable primary energy usage and 1 % of the total mass input of that unit process, in line with *EN 15804*. During the data collection process all known inputs and outputs were accounted for, and the only processes not taken into consideration in the foreground are listed below:*Accidental pollutions* are often difficult to distinguish from emissions that occur under normal conditions (accidental pollutions are not measured and reported separately) and are therefore not considered in this study.
- Environmental impacts caused by the *personnel of the production plants* are not included in the LCA, e.g. waste from the cafeteria and sanitary installations, accidental pollution caused by human mistakes, or environmental effects caused by commuter traffic. Heating or cooling of the plants in order to ensure a comfortable indoor climate for the personnel, for example, is also neglected.
- The packaging of the raw materials for the buildup is not considered in this study is under the cut-off criteria.
- A sensitivity analysis was done during the LCI of Cedral and concluded that the wearable sieves and cutting knives had a neglectable impact, less than 1%, on each damage category. For this reason these inputs were omitted from this study.

Background data
The life cycle assessment of EQUITONE [Pictura / Natura Pro fibre cement board] was done using *SimaPro 8.5.2.0* software and *Ecoinvent 3.5* database.

Data quality
In the LCA study, different levels of data requirements and data collection exist. A distinction is made between company-specific, application-specific and generic data.

Etex company-specific data:
Company-specific data concern the data for the production of the PICTURA & NATURA PRO board. Data for the production process have been delivered to the LCA expert by Etex in a questionnaire format. Collected data is of very good quality. Background data are of very good quality as well, with few exceptions where are of good quality, for the cases where we had to use proxies.

Application-specific data
Application-specific data deals with all life cycle phases from the transportation of the packed PICTURA & NATURA PRO to the construction site, transport to end of life (EOL) treatment and the final EOL treatment scenario. Some of the related scenarios (for transport to the construction site, construction process, use stage, and demolition process) were provided by Etex, other were developed together by VITO and Etex based on specific sources. Data quality is therefore of very good quality wherever specific distances and EOL scenarios were provided, and of good quality where average distances and PCRs default scenarios were used.

Generic data
The LCA expert collected publicly available generic data for all background processes such as the production of electricity, transportation by means of a specific truck, etc. The main LCI source for this kind of background processes will be the *Ecoinvent v3.5* database.
Data quality of the generic data is of good quality. Geography is respected for electricity mixes throughout the system. The time representativeness is that of the Ecoinvent generic datasets, where only valid datasets were used. Same applies to precision and completeness, as improving these quality criteria

for the specific study is beyond the scope of this study.

Period under review
Data were collected for 2017 for the production process of EQUITONE [Pictura / Natura Pro fibre cement board] in Germany.

Allocation
At Etex, different types of cement fibre products are produced. However, PICTURA & NATURA PRO products are produced only on certain production lines, with no co-products being produced as part of the process. Only facility-level data were available for electricity use, the use of NATURA PRO gas, etc. The facility-level data have been allocated to the analyzed product using their respective annual production volume (physical relationship), therefore volume allocation is applied. Material inputs and outputs which were not available at the product level, such as waste, were allocated similarly.

Comparability
Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account.

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LCA: Scenarios and additional technical information

Transport to the building site (A4)
For this study, the PICTURA & NATURA PRO product is installed in Germany. The transport to the building site of the PICTURA & NATURA PRO products and the additional build-up components is done by truck in 2 steps: (1) from the Etex plant to the merchant, with a big truck (16-32 t), (2) from the merchant to the building site (85% with a big truck (16-32 t) and 15% with a small truck (3,5 - 7,5 t)). Whenever storage at the merchant depos is involved no losses occur. Also, due to the nature of the product, no inputs or outputs are necessary for the storage (no energy, no emissions).

Name	Value	Unit
Plant to merchant distance	237	km
Merchant to the building site - distance	35	km

Installation into the building (A5)
The installation involves an amount of 0,0216 kWh per screw used to fix the PICTURA & NATURA PRO product, where 15 screws are necessary for the functional unit. The dataset used to model the impacts is “Electricity, low voltage {DE}| market for | Cut-off, S”. During the installation, depending on how the PICTURA & NATURA PRO boards are cut, there is a loss rate between 5-30%. For this study, an average loss rate of 10% is used.
All packaging material for the PICTURA & NATURA PRO product is transported to EoL and disposed of in line with the EoL scenarios for Germany.

Build-up alternatives are presented below, and annexes will present the environmental profiles of these build-ups for use at the building level.
- Build scenario 1: Fastening of [PICTURA & NATURA PRO] panels to facades using UNI-screw (material nr 1.4567) or A2 (304) Stainless Steel ISR 20 screw fixed to a sub-construction of wooden framing. These recommendations apply to the most common areas of application. Consumption per m²: 2,389 kg wood, 0,033kg stainless steel screws and 0,018kg (ethylene Propylene diene monomer rubber) EPDM sealing tape.

EPDM sealing tape.
-Main build scenario 2: Fastening of [PICTURA & NATURA PRO] panels to facades using Aluminum EQUITONE UNI-rivets fixed to a sub construction of adjustable aluminium rails and brackets. Consumption per m²: 1,610kg aluminium and 0,016kg aluminium rivets screws and 0,018kg (ethylene Propylene diene monomer rubber) EPDM sealing tape.

Name	Value	Unit
Electricity consumption per screw	0.0216	kWh

Use or application of the installed product (B1-B7) see section 2.12 "Use"
Over the 50 years of Reference service life, if correctly installed, there are no impacts for the use phase.

Maintenance (B2)
Maintenance requirement will depend on the specific design and application. Usually, EQUITONE [PICTURA & NATURA PRO] won’t change the composition of the materials and thus no maintenance is needed.

Reference service life

Name	Value	Unit
Reference service life (according to BBSR)	50	a

End of life (C1-C4)
At the end of life of the building the EQUITONE [Pictura / Natura Pro fibre cement board] product together with the build-up components are disposed of according to the EoL scenarios. The EoL scenario for EQUITONE [Pictura / Natura Pro fibre cement board] is in line with the current situation, where EQUITONE [Pictura / Natura Pro fibre cement board] is not recycled, neither used as secondary fuel.

The dismantling of PICTURA & NATURA PRO involves the same amount of energy as for the installation, which is 0,0216 kWh per screw, where 15 screws are used. The dataset used to model the impacts is “Electricity, low voltage {DE}| market for | Cut-off, S”.
PICTURA & NATURA PRO boards are 100% landfilled. The waste is classified under code 10 13 11 according to the *European Waste Catalogue (/EWC/)*. The build-up follows the end-of-life scenario for metals or wooden materials in Germany.

Reuse, recovery and/or recycling potentials (D), relevant scenario information
Studies showed that EQUITONE [PICTURA & NATURA PRO] products can be re-used and recycled. Depending on the mounting system the fiber cement products can be removed non-destructively by unscrewing or opening the studs. The current EPD assumes 100% landfilling of the product at its end of life.

LCA: Results

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE NOT DECLARED; MNR = MODULE NOT RELEVANT)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
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	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A1: 1 m² EQUITONE [Pictura / Natura Pro fibre cement board]

Parameter	Unit	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP	[kg CO_2-Eq.]	1.19E+1	3.65E-1	4.04E+0	7.30E-1	1.95E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.96E-1	1.29E-1	0.00E+0	9.68E-2	-2.67E-1
ODP	[kg CFC11-Eq.]	1.01E-6	6.24E-8	4.84E-7	1.35E-7	1.86E-7	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	9.63E-9	2.38E-8	0.00E+0	2.66E-8	-3.37E-8
AP	[kg SO_2-Eq.]	2.99E-2	4.44E-3	1.62E-2	2.35E-3	6.37E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	8.99E-4	4.16E-4	0.00E+0	6.31E-4	-7.30E-4
EP	[kg $(PO_4)^{3-}$-Eq.]	1.02E-2	4.52E-4	4.38E-3	3.92E-4	1.83E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.46E-4	6.95E-5	0.00E+0	1.34E-4	-1.19E-4
POCP	[kg ethene-Eq.]	1.44E-3	1.53E-4	5.61E-4	1.20E-4	2.56E-4	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.89E-5	2.11E-5	0.00E+0	2.13E-5	-6.64E-5
ADPE	[kg Sb-Eq.]	9.94E-6	5.72E-7	3.28E-6	2.30E-6	2.02E-6	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.86E-7	3.88E-7	0.00E+0	1.18E-7	-2.60E-7
ADPF	[MJ]	8.75E+1	5.59E+0	7.57E+1	1.18E+1	2.08E+1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.13E+0	2.08E+0	0.00E+0	2.53E+0	-4.19E+0

Caption	GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources

RESULTS OF THE LCA - RESOURCE USE according to EN 15804+A1: 1 m² EQUITONE [Pictura / Natura Pro fibre cement board]

Parameter	Unit	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERM	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERT	[MJ]	1.92E+1	9.17E-2	2.02E+1	1.18E-1	4.37E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.06E-1	2.05E-2	0.00E+0	9.27E-2	-8.78E+0
PENRE	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PENRM	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PENRT	[MJ]	1.03E+2	5.57E+0	9.89E+1	1.13E+1	2.62E+1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.70E+0	2.00E+0	0.00E+0	2.68E+0	-5.86E+0
SM	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
RSF	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	[m^3]	1.90E-1	9.40E-4	2.38E-2	1.77E-3	2.27E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	8.44E-4	3.14E-4	0.00E+0	2.51E-3	-1.21E-3

Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES according to EN 15804+A1: 1 m² EQUITONE [Pictura / Natura Pro fibre cement board]

Parameter	Unit	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	[kg]	1.08E-1	3.43E-6	1.14E-3	7.23E-6	1.09E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.07E-5	1.25E-6	0.00E+0	2.50E-6	-1.03E-5
NHWD	[kg]	5.66E-1	1.28E-1	2.53E-1	5.19E-1	2.92E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.05E-2	9.36E-2	0.00E+0	1.42E+1	-2.60E-2
RWD	[kg]	2.67E-4	3.59E-5	2.06E-4	7.59E-5	7.52E-5	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.28E-5	1.34E-5	0.00E+0	1.64E-5	-2.30E-5
CRU	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MFR	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.40E-1
MER	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.55E-1
EEE	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EET	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0

Caption	HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EEE = Exported thermal energy

References

International Organization for Standardization, Switzerland, ISO standards:

· **ISO 12572**

ISO 12572: 2016: Hygrothermal performance of building materials and products - Determination of water vapor transmission properties - Cup method.

· **ISO 14001**

ISO14001: 2015: Environmental management systems - Requirements with guidance for use

· **ISO 14025**

ISO 14025: 2006**:** Environmental labels and declarations - General principles.

· **ISO 14040**

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

· **ISO 14044**

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

· **ISO 9001**

ISO 9001: 2015: Quality management systems -- Requirements.

DIN V 4108-4

DIN V 4108-4: 2007: Thermal insulation and energy economy in buildings - Part 4: Hygrothermal design values

EN 12467:2012 + A1:2016 + A2:2006

EN 12467:2012 + A1:2016 + A2:2006 Fibre-cement flat sheets - Product specifications and test methods

EN 13501-1+A1

EN 13501-1+A1:2007 Fire classification of construction products and building elements. Classification using test data from reaction to fire test

EN 14567

EN 14567:1999 Personal protective equipment for protection against falls from a height - Single-point anchor devices

EN 15804

EN 15804:2012-04+A1 2013, Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

BBSR -

https://www.bbsr.bund.de/BBSR/EN/RP/FutureBuilding/2SustainableBuildingQuality/2009/ServiceLife/01_Start_dossier.html?nn=391866&notFirst=true&docId=390900

Durability of Autoclaved Cellulose Fiber Cement Composites, A.M.Cooke, Managing Director, Building Materials and Technology Pty Ltd, Sydney, NSW, Australia

Ecoinvent 3.5

Ecoinvent 3.5, Ecoinvent Centre, www.ecoinvent.orgInformation sheet http://noam.equitone.com/file.php?id=05baa7d0-7e8c-47af-bd2d-b00a6737a2d2

EWC

European Waste Catalogue (/EWC/) established by Commission Decision 2000/532/EC

IBU 2016

IBU (2016): General Programme Instructions for the Preparation of EPDs at the Institut Bauen und Umwelt e.V., Version 1.1 Institut Bauen und Umwelt e.V., Berlin. www.ibu-epd.de

Measuring agency / Protocol

Measuring agency / Protocol / Date: Hygiene-Institut des Ruhrgebietes, Gelsenkirchen; No. A-234757-13-To,12.09.2013.

OHSAS

Occupational, health and safety assessment series (OHSAS) 18001;2007

REGULATION (EU) No 305/2011 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 9 March 2011, laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC

Simapro 8.5

Pre Consultants, SimaPro 8.5 software 2018

PCR Part A 2018

IBU (2018). *PCR guidance-texts for Building-related products and services. Part A Calculation rules for the LCA*, version 1.7

PCR Part B 2018

IBU (2018). *PCR guidance-texts for Building-related products and services. Part B: Requirements on the EPD for Fibre cement / Fibre concrete*, version 1.7

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