

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804




Owner of the Declaration	Eternit NV
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
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EQUITONE [Linea / Lunara] fibre cement sheets ETEX

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General Information

<p>Eternit NV</p> <hr/> <p>Programme holder IBU – Institut Bauen und Umwelt e.V. Panoramastr. 1 10178 Berlin Germany</p> <hr/> <p>Declaration number EPD-ETE-20190128-CCA1-EN</p> <hr/> <p>This declaration is based on the product category rules: Fibre cement / Fibre concrete, 07.2014 (PCR checked and approved by the SVR)</p> <hr/> <p>Issue date 06/01/2020</p> <hr/> <p>Valid to 05/01/2025</p> <hr/> <p> Dipl. Ing. Hans Peters (chairman of Institut Bauen und Umwelt e.V.)</p> <hr/> <p> Dr. Alexander Röder (Managing Director Institut Bauen und Umwelt e.V.)</p>	<p>EQUITONE [Linea / Lunara]</p> <hr/> <p>Owner of the declaration Eternit NV Kuiermansstraat 1 1880 Kapelle-op-den-Bos Belgium</p> <hr/> <p>Declared product / declared unit The production of 1 m² of an "EQUITONE [Linea / Lunara]" fibre cement sheets with a thickness of 10 mm, and it's related impacts over cradle-to-grave life cycle stages, where the product's expected average reference service life is of 50 years.</p> <hr/> <p>Scope: This EPD presents the average of two products EQUITONE Linea and Lunara fibre cement sheets. This average product is an autoclaved calcium silicate Eternit fiber cement sheet produced by ETEX Services NV at Kapelle-op-den-Bos factory in Belgium and sold in Germany.</p> <hr/> <p>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.</p> <hr/> <p>Verification</p> <table border="1"> <tr> <td colspan="2">The standard <i>EN 15804</i> serves as the core PCR</td> </tr> <tr> <td colspan="2">Independent verification of the declaration and data according to <i>ISO 14025:2010</i></td> </tr> <tr> <td><input type="checkbox"/> internally</td> <td><input checked="" type="checkbox"/> externally</td> </tr> </table> <hr/> <p> Mr Carl-Otto Neven (Independent verifier appointed by SVR)</p>	The standard <i>EN 15804</i> serves as the core PCR		Independent verification of the declaration and data according to <i>ISO 14025:2010</i>		<input type="checkbox"/> internally	<input checked="" type="checkbox"/> externally
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Product

Product description/Product definition

EQUITONE [LINEA / LUNARA] is an autoclaved calcium silicate Eternit fibre cement sheet produced at Kapelle-op-den-Bos production plant, Belgium. The study is based on the annual production of Linea / Lunara from 2016, where all data reported are calculated as a total value per site based on production volumes. It is mainly made of sand, cement, cellulose, wollastonite, clay and lime. This product is used as a panel for exterior (and interior) walls covering. This average product is representative of the following color range TE 20, TE 60 and TE 90 made in 10 mm thick boards. Only pigment composition and texture changes from an EQUITONE LINEA to an EQUITONE LUNARA product.

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 2007;
- have been produced in a unique factory (Kapelle-op-den-Bos) since 2007.

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[BS1] /) applies. The construction product is covered by the harmonised 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

The EQUITONE [LINEA / LUNARA] product is mainly used as a *cladding sheet for ventilated exterior claddings and ceilings and insulated lightweight facade-systems*. The board itself is fixed to a back-structure in wood or metal. This back-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 as a finishing board for roof eaves and verges. In a minor

application, the EQUITONE [LINEA/LUNARA] can be used as protection for insulated foundations.

Technical Data

The following tables include technical data specific to the EQUITONE [LINEA / LUNARA] product.

Constructional data

Name	Value	Unit
Thermal conductivity	39	W/(mK)
Water vapour diffusion resistance factor acc. to DIN V 4108-4, EN ISO 12572	214	-
Gross density	1580	kg/m ³
Compressive strength	-	N/mm ²
Tensile strength	-	N/mm ²
Flexural strength 32-22	32-22	N/mm ²
Modulus of elasticity	14000	N/mm ²
Moisture content at 23 °C, 80% humidity	6	M.-%
Coefficient of thermal expansion	10	10 ⁻⁶ K ⁻¹
Chemical resistance	-	-
Ageing resistance	-	-
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/, No.S650_01_107_159_VO01, dated 20-06-2013.

Base materials/Ancillary materials

Base materials included in the composition of EQUITONE [LINEA/LUNARA] are:

- Sand: 25-40 %
- Lime: < 10 %
- Pigments: 10 %
- Cement: 25-40 %
- Cellulose: < 10 %
- Wollastonite: <10 %
- Clay: <10 %
- Water: 5-20 %
- Other - Approx. 5%

No substances of very high concern (SVHC) are used in the composition of the product.

Manufacture

Façade panels made of fiber cement are manufactured largely in accordance with 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 drains 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 fiber cement layer (fiber cement fleece) is separated and removed from the format roller. The fibre 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 steam-hardened in an autoclave. The façade panels are then calibrated, sanded, surface textured and hydrophobated before being packed and shipped to the customer.

Packaging

The final Linea/Lunara product is placed on a custom-size, not re-usable wooden pallet. On each pallet, there are 10 Linea / Lunara boards placed, and the boards are separated from each other through a paper/carton sheet. The entire pallet with the Linea / Lunara boards is tied together with a PE strap.

Packaging material per functional unit:

Pallet - 0,2278 kg
Carton - 0,0146 kg
PE strap 0,0012 kg.

Reference service life

Linea/Lunara is a rather new product on the market ("2007), and there is no extensive evidence yet regarding its service life. It is estimated that the reference service life of Linea Lunara is the average building life time of 50 years. This is also in line with the category in Bundesinstitut für Bau-, Stadt- und Raumforschung [Federal Institute for Research on Building, Urban Affairs and Spatial Development] (BBSR) with the code 335.511. There are no influences on the aging of the product when applied in accordance with the rules of technology.

LCA: Calculation rules

Declared Unit

The functional unit is defined as: the production of 1 m² (thickness 10 mm) of the average of two products EQUITONE LINEA and EQUITONE LUNARA sheets and its related impacts over cradle-to-grave life cycle stages, where the product's expected average reference service life is of 50 years.

Annexes to the EPD include also the environmental profiles for the two build-up alternatives: wooden frame with steel screws and aluminium frame with aluminium rivets, both on an EPDM layer.

Declared unit

Name	Value	Unit
Declared unit	1	m ²
Gross density 10 mm thickness	16,5	kg/m ²

sheet		
Conversion factor to 1 kg	606	-

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

System boundary

This is a cradle to grave EPD for the EQUITONE [LINEA / LUNARA] 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.

Besides this, in the annexes the environmental profile of the two possible build-up options are provided, to be used when calculations at building level are necessary. For the build-up scenarios the following life cycle stages are included: A1, A2, A3, A4, C2, C3, C4 and D. The impacts related to the life cycle stages A5, B1-7 and C1 are fully allocated to the EQUITONE [LINEA / LUNARA] product.

Estimates and assumptions

The large majority of the raw materials were modeled 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 modeled. 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 EoL of the respective packaging materials. The biogenic carbon contained in the packaging material of the EQUITONE [LINEA/LUNARA] boards (from A3) exits the system at installation (in A5), with the EoL of the respective packaging materials. The packaging materials that include biogenic carbon are the wooden boards and the paper packaging.

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 build-up 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 [LINEA/LUNARA] was done using SimaPro 8.5 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 EQUITONE [LINEA/LUNARA] board. Data for the production process have been delivered to VITO by Etex in a questionnaire format. The EPD is developed with industrial data from 2017. 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 EQUITONE [LINEA/LUNARA] 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 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

VITO will collect 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 (Ecoinvent, October 2019).

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 [LINEA/LUNARA] in Belgium.

Allocation

At Etex, different types of cement fiber products are produced. However, EQUITONE [LINEA/LUNARA] 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 natural 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, by mass allocation.

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.

LCA: Scenarios and additional technical information

Transport to the building site (A4)

For this EPD the EQUITONE [LINEA/LUNARA] product is installed in Germany. The transport to the building site of the Linea/Lunara 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)).

Name	Value	Unit
Plant to merchant distance	545	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 EQUITONE [LINEA/LUNARA] 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 EQUITONE [LINEA/LUNARA] sheets are cut, there is a loss rate between 5-30%, depending on the building shape. For this EPD an average loss rate of 10% is used.

All packaging material for the EQUITONE [LINEA/LUNARA] product is transported to End of Life (EoL) and disposed of in line with the EoL scenarios for Germany

Name	Value	Unit
Electricity consumption	0,0216 kWh per screw	kWh

The product use and installation instructions shall be followed for the specific applications where EQUITONE [LINEA/LUNARA] is used. 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 EQUITONE panels to facades using EQUITONE UNI-screw (/EN 14567/) or A2 (304) Stainless Steel ISR T20 Torx TTAP® 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 EPDM sealing tape.

Build scenario 2: Fastening of EQUITONE panels to facades using Aluminium or Stainless Steel EQUITONE UNI-rivets fixed to a sub construction of adjustable aluminium rails and brackets. Consumption per m²: 1,610kg aluminium, 0,016kg aluminium rivets and 0,018kg Ethylen-Propylen-Dien-Monomer (EPDM) sealing tape.

Use or application of the installed product (B1) see section 2.12 "Use"

Over the 50 years of reference service life (RSL), 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 [LINEA/LUNARA] won't change the composition of the materials and thus no maintenance is needed.

Reference service life

Name	Value	Unit
Life Span (according to BBSR)	50	a

End of Life (C1-C4)

At the end of life of the building the EQUITONE [LINEA/LUNARA] product together with the build-up components are disposed of according to the EoL scenarios. The EoL scenario for EQUITONE [LINEA/LUNARA] is in line with the current situation, where EQUITONE [LINEA/LUNARA] is not recycled, neither used as secondary fuel.

The dismantling of Linea/Lunara involves the same amount of energy as for the installation, which is 0,0216 kWh per screw, where 15 screws are used. Linea/Lunara 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 [LINEA/LUNARA] products can be re-used and recycled. Depending on the mounting system the fibre 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.

Name	Value	Unit
Total materials for recycling Lunara	2.108	kg
Total materials for energy recovery Lunara	1.082	kg
Total materials for recycling build-up 1	0.940	kg
Total materials for energy recovery build-up 1	1.450	kg
Total materials for recycling build-up 2	1.460	kg
Total materials for energy recovery build-up 2	0.180	kg

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: 1 m² "EQUITONE [LINEA / LUNARA]" cement sheets

Parameter	Unit	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP	[kg CO ₂ -Eq.]	7.80E+0	8.96E-1	1.09E+0	1.58E+0	1.37E+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	7.96E-2	-4.22E-1
ODP	[kg CFC11-Eq.]	6.40E-7	1.53E-7	3.20E-7	2.91E-7	1.56E-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	2.91E-8	-4.36E-8
AP	[kg SO ₂ -Eq.]	2.62E-2	1.25E-2	2.47E-2	3.50E-2	3.89E-2	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	5.24E-4	-1.06E-3
EP	[kg (PO ₄) ³⁻ -Eq.]	4.25E-3	1.24E-3	1.01E-3	3.84E-4	1.01E-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	1.02E-4	-1.30E-4
POCP	[kg ethene-Eq.]	1.29E-3	4.18E-4	2.38E-4	2.59E-4	2.47E-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	1.98E-5	-8.83E-5
ADPE	[kg Sb-Eq.]	8.44E-6	1.26E-6	1.59E-6	4.86E-6	2.00E-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	1.01E-7	-1.89E-7
ADPF	[MJ]	5.31E+1	1.37E+1	2.84E+1	2.54E+1	1.47E+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	2.35E+0	1.01E+1

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: 1 m² "EQUITONE [LINEA / LUNARA]" cement sheets

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]	5.59E+1	2.30E-1	1.05E+1	2.52E-1	7.10E+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	6.86E-2	4.66E+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]	7.29E+1	1.37E+1	4.34E+1	2.45E+1	1.97E+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	2.67E+0	1.27E+1
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]	1.10E-1	2.28E-3	1.49E-2	3.83E-3	1.42E-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	2.53E-3	-2.17E-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: 1 m² "EQUITONE [LINEA / LUNARA]" cement sheets

Parameter	Unit	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	[kg]	5.29E-5	8.11E-6	4.14E-5	1.55E-5	2.29E-5	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	1.12E-6	-8.54E-6
NHWD	[kg]	1.12E+0	2.87E-1	1.58E-1	1.13E+0	4.11E-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	-4.32E-3
RWD	[kg]	3.17E-4	8.85E-5	2.15E-4	1.64E-4	9.46E-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	1.97E-5	-3.18E-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	2.11E+0
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	1.08E+0
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																	

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