



EPD

CERTIFICATION

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SCULPT COLLECTION



environmental product declaration



THE INTERNATIONAL EPD® SYSTEM



PORCELAIN STONEWARE SLABS
FOR INTERNAL AND EXTERNAL WALLS AND FLOORINGS
COUNTERTOPS – FURNITURE



| | |
|---------------------------|---|
| EPD® PROGRAMME | THE INTERNATIONAL EPD® SYSTEM, WWW.ENVIRONDEC.COM |
| PROGRAMME OPERATOR | EPD INTERNATIONAL AB |
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An EPD should provide current information and may be updated if conditions change.
The stated validity is therefore subject to the continued registration and publication at www.environdec.com.



1. Programme information

| | |
|------------------------------------|--|
| Programme: | THE INTERNATIONAL EPD® SYSTEM |
| Programme operator address: | EPD International AB Box 210 60 - SE-100 31 Stockholm Sweden |
| Website: | www.environdec.com |
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| CEN standard EN 15804 serves as the core Product Category Rules (PCR) | |
|--|--|
| PCR | PCR 2019:14 Construction products, version 1.0 C-PCR-002 Ceramic tiles (EN 17160:2019), version 2019-12-20 |
| PCR review was conducted by | The Technical Committee of the International EPD® System. See www.environdec.com/TC for a list of members. Review chair: Claudia A Pena, University of Concepcion, -Chile. The review panel may be contacted via info@environdec.com |
| Independent third-party verification of the declaration and data, according to ISO 14025:2006 | <input type="checkbox"/> EPD process certification (Internal) <input checked="" type="checkbox"/> EPD verification (External) |
| Third party verifier: | Ugo Pretato – Individual Verifier Approved by: The International EPD® System Technical Committee, supported by the Secretariat |
| Procedure for follow-up of data during EPD validity involves third party verifier | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |

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EPDs within the same product category but from different programmes may not be comparable.
EPDs of construction products may not be comparable if they do not comply with EN 15804.
For further information about comparability, see EN 15804 and ISO 14025.



■ PRODUCT NAME

Porcelain stoneware slabs.

■ PRODUCT IDENTIFICATION

The range of products in this EPD includes Porcelain stoneware slabs under the brands FIANDRE, ARIOSTEA, FMG, SAPIENSTONE, IRIS, EIFFELGRES and PORCELAINGRES having thicknesses 6-8-9-10-12-13-14-20 mm.



| Thickness 6 mm / Average weight 14,1 kg/m² | | |
|--|-------------------|-----------------|
| Formats (cm) | | |
| 300x150 - 300x100 - 270x100 - 250x120 - 250x100 - 150x150 - 150x75 - 150x100 - 100x100 - 75x75 - 75x37,5 | | |
| COLLECTIONS | | |
| AVENUE XXL | DIESEL LIVING | GRUNGE CONCRETE |
| HI-LITE | LIQUID COSMO | METAL XXL |
| ACTIVE SURFACES | | |
| Thickness 9 mm / Average weight 20,5 kg/m² | | |
| Formats (cm) | | |
| 200x100 - 150x150 - 100x100 - 120x60 - 120x30 - 120x15 - 90x45 - 60x60 - 60x30 - 30x30 | | |
| COLLECTIONS | | |
| ARIZONA CONCRETE | BLOCKS 5.0 | CALX |
| CAMP | CARSO | CEMENT MEXICAN |
| COMBUSTION CRAKLE | COSMIC MARBLE | COUNTRY STONE |
| CUBE | DECK | DESIRE |
| DIESEL LIVING | DOWNTOWN | E-WOOD |
| FRENCH WOODS | GROUND | GRUNGE CONCRETE |
| HARD LEATHER | MADEIRA | MARMÍ 3.0 |
| MELT | METAL PERF | MOVING |
| MUSE | PIETRA DI BASALTO | QUARZITI |
| QUAYSIDE | RESIDE | ROCCIA |
| SHIRE | SOLID CONCRETE | SPACE |
| STAGE | SYNC | TEMPO |
| TERRE | URBAN STYLE | WHOLE |
| ACTIVE SURFACES | | |
| Thickness 13 mm / Average weight 31 kg/m² | | |
| Formats (cm) | | |
| 120x60 - 60x60 - 60x30 - 30x30 - 20x20 | | |
| COLLECTIONS | | |
| DECK | FRENCH WOODS | MADEIRA |
| TERRE | ACTIVE SURFACES | |



| Thickness 6 mm / Average weight 14,1 kg/m² | | |
|--|--------------------|-----------------|
| Formats (cm) 300x150 - 300x100 - 270x100 - 250x120 - 250x100 - 150x150 - 150x75 - 150x100 - 100x100 - 75x75 - 75x37,5 | | |
| COLLECTIONS | | |
| INNOVATIVE SLABS | MATERIE HIGH TECH | TEKNOSTONE |
| ULTRA | ULTRA AGATA | ULTRA BLEND.HT |
| ULTRA CON.CREA. | ULTRA CRYSTAL | ULTRA ICEMENTI |
| ULTRA IRIDIUM | ULTRA MARMI | ULTRA METAL |
| ULTRA ONICI | ULTRA PIETRE | ULTRA RESINE |
| ULTRA TEKNOSTONE | ACTIVE SURFACES | |
| | | |
| Thickness 8 mm / Average weight 18,5 kg/m² | | |
| Formats (cm) 120x60 - 60x60 - 60x30 | | |
| COLLECTIONS | | |
| MARMI CLASSICI | ACTIVE SURFACES | |
| | | |
| Thickness 9 mm / Average weight 20,5 kg/m² | | |
| Formats (cm) 200x100 - 150x150 - 100x100 - 120x60 - 120x30 - 120x15 - 90x45 - 60x60 - 60x30 - 30x30 | | |
| COLLECTIONS | | |
| CON.CREA. | MARMI CENTO2CENTO | MARMI HIGH TECH |
| NORTHSTONE | PIETRE CENTO2CENTO | STARDUST |
| UNIVERSE | ACTIVE SURFACES | |
| | | |
| Thickness 10 mm / Average weight 22 kg/m² | | |
| Formats (cm) 120x60 - 90x45 - 60x60 - 60x30 - 40x40 - 30x30 | | |
| COLLECTIONS | | |
| FRAGMENTA | GREENSTONE | IRIDIUM |
| STARDUST | ACTIVE SURFACES | |



| Thickness 6 mm / Average weight 14,1 kg/m ² | | |
|--|-----------------------|---------------------|
| Formats (cm) | | |
| 300x150 - 300x100 - 270x100 - 250x120 - 250x100 - 150x150 - 150x75 - 150x100 - 100x100 - 75x75 - 75x37,5 | | |
| COLLECTIONS | | |
| MARMI CLASSICI | MAXFINE | MAXFINE AGATA |
| MAXFINE BLAST | MAXFINE CHROMOCODE 3D | MAXFINE CITYSTONE |
| MAXFINE CLUSTER | MAXFINE GEMSTONE | MAXFINE IRON |
| MAXFINE LIMESTONE | MAXFINE MARMI | MAXFINE ONICI |
| MAXFINE PIETRE | MAXFINE ROADS | MAXFINE TRAVERTINO |
| MAXFINE WALK ON | ACTIVE SURFACES | |
| | | |
| Thickness 9 mm / Average weight 20,5 kg/m ² | | |
| Formats (cm) | | |
| 200x100 - 150x150 - 100x100 - 120x60 - 120x30 - 120x15 - 90x45 - 60x60 - 60x30 - 30x30 | | |
| COLLECTIONS | | |
| ENGLISH STONE | GRANIT | MARBLE |
| MARMI | MARMI 200X100 | MARMI CLASSICI |
| PIETRE | SELECT | STREAM |
| WALK ON | ACTIVE SURFACES | |
| | | |
| Thickness 10 mm / Average weight 22 kg/m ² | | |
| Formats (cm) | | |
| 120x60 - 90x45 - 60x60 - 60x30 - 40x40 - 30x30 | | |
| COLLECTIONS | | |
| BLAST | CHROMOCODE 3D | CITYSTONE |
| GRANITI | MARMI CLASSICI | MOONSTONE |
| PIETRA DEL BRENTA | PIETRE | PURE |
| QUARZITE | RIALTO | ROADS |
| ROCK | SHADE | TRAVERTINI |
| TRAX | UNICOLOR | VENICE VILLA |
| ACTIVE SURFACES | | |
| | | |
| Thickness 13 mm / Average weight 31 kg/m ² | | |
| Formats (cm) | | |
| 120x60 - 60x60 - 60x30 - 30x30 - 20x20 | | |
| COLLECTIONS | | |
| CLUSTER | CITYSTONE | MARMI CLASSICI |
| MARMI CLASSICI LIPICA | PIETRE | PROGRAMMA INDUSTRIA |
| ROADS | ROCCE | SHADE |
| STREAM | ACTIVE SURFACES | |
| | | |
| Thickness 14 mm / Average weight 32,5 kg/m ² | | |
| Formats (cm) | | |
| 120x60 - 60x60 - 60x30 - 30x30 - 20x20 | | |
| COLLECTIONS | | |
| GRANITI | PROGRAMMA INDUSTRIA | ROADS |
| ACTIVE SURFACES | | |



| Thickness 6 mm / Average weight 14,1 kg/m² | | |
|--|----------------------|----------------------|
| Formats (cm) 300x150 - 300x100 - 270x100 - 250x120 - 250x100 - 150x150 - 150x75 - 150x100 - 100x100 - 75x75 - 75x37,5 | | |
| COLLECTIONS | | |
| CORE SHADE EXTREME | ESSENZE RARE | FAHRENHEIT EXTREME |
| MAXIMUM | MAXIMUM AGATA | MAXIMUM ASTER |
| MAXIMUM DATAUNI | MAXIMUM EMINENT WOOD | MAXIMUM FJORD |
| MAXIMUM HQ RESIN | MAXIMUM MARMI | MAXIMUM MEGALITH |
| MAXIMUM QUIETSTONES | MAXIMUM ROCK SALT | VOLVO |
| ACTIVE SURFACES | | |
| | | |
| Thickness 8 mm / Average weight 18,5 kg/m² | | |
| Formats (cm) 120x60 - 60x60 - 60x30 | | |
| COLLECTIONS | | |
| MARBLE LAB | ACTIVE SURFACES | |
| | | |
| Thickness 9 mm / Average weight 20,5 kg/m² | | |
| Formats (cm) 200x100 - 150x150 - 100x100 - 120x60 - 120x30 - 120x15 - 90x45 - 60x60 - 60x30 - 30x30 | | |
| COLLECTIONS | | |
| MAGNETO | NEW GRANITE | NEW MARMI |
| NUANCES-JUST FIANDRE | ROC DE BOURGOGNE | SOLIDA |
| ACTIVE SURFACES | | |
| | | |
| Thickness 10 mm / Average weight 22 kg/m² | | |
| Formats (cm) 120x60 - 90x45 - 60x60 - 60x30 - 40x40 - 30x30 | | |
| COLLECTIONS | | |
| DATAUNI | NEW CODE | NEW GRANITE |
| NEW GROUND | NEW ROYAL | NEW STONE |
| NEW MARMI | TINTE UNITE | ACTIVE SURFACES |
| | | |
| Thickness 13 mm / Average weight 31 kg/m² | | |
| Formats (cm) 120x60 - 60x60 - 60x30 - 30x30 - 20x20 | | |
| COLLECTIONS | | |
| NEW GROUND INDUSTRIA | MAGGIORATI | PROTECH |
| ACTIVE SURFACES | | |
| | | |
| Thickness 14 mm / Average weight 32,5 kg/m² | | |
| Formats (cm) 120x60 - 60x60 - 60x30 - 30x30 - 20x20 | | |
| COLLECTIONS | | |
| MAGGIORATI | MEGALITH INDUSTRIA | NEW GROUND INDUSTRIA |
| ACTIVE SURFACES | | |



tilebar

| Thickness 6 mm / Average weight 14,1 kg/m² | | |
|--|------------------|-----------------|
| Formats (cm) | | |
| 300x150 - 300x100 - 270x100 - 250x120 - 250x100 - 150x150 - 150x75 - 150x100 - 100x100 - 75x75 - 75x37,5 | | |
| COLLECTIONS | | |
| MEGAMICRO | | ACTIVE SURFACES |
| | | |
| Thickness 10 mm / Average weight 22 kg/m² | | |
| Formats (cm) | | |
| 120x60 - 90x45 - 60x60 - 60x30 - 40x40 - 30x30 | | |
| COLLECTIONS | | |
| ARGENT | ATMOSPHERE | GRAFITE |
| GREIGETONE | LANDSTONE | LASTRANERA |
| PIETRA D'ARAGONA | PIETRA D'ORIGINE | PIETRA LAVICA |
| PILLART | SENSIBLE | TOUCH |
| TRACE | ACTIVE SURFACES | |
| | | |
| Thickness 13 mm / Average weight 31 kg/m² | | |
| Formats (cm) | | |
| 120x60 - 60x60 - 60x30 - 30x30 - 20x20 | | |
| COLLECTIONS | | |
| GREIGETONE | | ACTIVE SURFACES |



| Thickness 12 mm / Average weight 28,5 kg/m² | |
|---|-----------------|
| Formats (cm) 328x154 | |
| COLLECTIONS | |
| SAPIENSTONE | ACTIVE SURFACES |
| | |
| | |
| Thickness 20 mm / Average weight 51,6 kg/m² | |
| Formats (cm) 328x154 | |
| COLLECTIONS | |
| SAPIENSTONE | ACTIVE SURFACES |



| Thickness 6 mm / Average weight 14,1 kg/m ² | | |
|---|--------------|-------------------|
| Formats (cm) 300x150 - 300x100 - 270x100 - 250x120 - 250x100 - 150x150 - 150x75 - 150x100 - 100x100 - 75x75 - 75x37,5 | | |
| COLLECTIONS | | |
| GREAT METASTONE | GREAT METALS | GREAT ROYAL STONE |
| URBAN | URBAN GREAT | ACTIVE SURFACES |



■ PRODUCT DESCRIPTION

Porcelain stoneware is a special type of ceramic product, used for floors and walls, combining the highest levels of technical features to a particularly prestigious appearance.

The areas of application in the building industry are multiple, these slabs can be used for internal and external walls and floorings.

Porcelain stoneware slab from GranitiFiandre S.p.A. is a product made of allnatural raw materials of proven quality, mined around the world and transformed into one of the most advanced facilities in Europe: the intrinsic values powered by over 50 years of market leadership, constitute a unique blend of innovation, design and sustainability.

In particular, big slabs combine the established and classic features, which have always distinguished the GranitiFiandre porcelain stoneware at the top of the line, with extremely new qualities with high performances: strength, lightness, flexibility, ductility.

Big slabs combine maximum freedom of design with a great flexibility: on the one hand, the maxi-slab drastically reduces the amount of interruptions in the design units, on the other the wide range of all the submultiples ensures great versatility for every need. The large size delivers a new architectural concept, which goes beyond the single slab: it allows designers to reinvent the design criteria, giving them maximum freedom and minimum constraints.

■ UN CPC CODE

3732 Refractory bricks, blocks, tiles and similar refractory ceramic constructional goods, other than those of siliceous earths

■ AMBITO GEOGRAFICO

Global



GranitiFiandre spa





PRODUCT TECHNICAL FEATURES

The products meet requirements defined by the European standard EN 14411 and ISO 13006 Annex G, according to criteria established by test method ISO 10545 - "International Organization for Standardization Specifications for Ceramic Tile", reported below.

Porcelain Stoneware Slabs Bla Group according to UNI EN 14411 Annex G/ISO 13006 Annex G

| TECHNICAL PROPERTIES | STANDARD OR MEASURING METHOD | VALUE REQUIRED EN 14411 Annex G | AVERAGE PRODUCTION VALUES | | |
|---|--------------------------------------|--|--|---------------------------------------|---------------------------------------|
| | | | UGL | | GL |
| | | | THICKNESS 6 - 8 - 9 10 - 13 - 14 mm | THICKNESS 12 - 20 mm | THICKNESS 9 mm |
| Water absorption | ISO 10545-3 | ≤ 0,5 % | ≤ 0,1 % | ≤ 0,1 % | ≤ 0,1 % |
| Lenght and width | ISO 10545-2 | ± 0,6 % | ± 0,1 % | -- | ± 0,2 % |
| Thickness | | ± 5 % | ± 5 % | ± 5 % | ± 5 % |
| Streightness of sides | | ± 0,5 % | ± 0,1 % | -- | ± 0,2 % |
| Rectangularity | | ± 0,5 % | ± 0,1 % | -- | ± 0,2 % |
| Planarity | | ± 0,5 % | ± 0,2 % | ± 0,2 % | ± 0,2 % |
| Modulus of rupture (R) | ISO 10545-4 | ≥ 35 N/mm ² | 49 N/mm ² | 49 N/mm ² | 49 N/mm ² |
| Resistance to deep abrasion | ISO 10545-6 | Max 175 mm ³ | 140 mm ³ | 140 mm ³ | -- |
| Resistance to superficial abrasion | ISO 10545-7 | -- | -- | -- | Variable according to the color |
| Coefficient of linear thermal expansion | ISO 10545-8 | ≤ 9 x10 ⁻⁶ K ⁻¹ | 6,5 x10 ⁻⁶ K ⁻¹ | 6,5 x10 ⁻⁶ K ⁻¹ | 6,5 x10 ⁻⁶ K ⁻¹ |
| Resistance to thermal shock | ISO 10545-9 | Available test method | Compliant | Compliant | Compliant |
| Frost resistance | ISO 10545-12 | Requested | Compliant | Conforme | Conforme |
| Resistance to chemicals * | ISO 10545-13 | Min. Classe B - Prodotti chimici ad uso domestico - Sali per piscina | Compliant | Compliant | Compliant |
| Resistance to staining | ISO 10545-14 | 1<X≤5 | Compliant | Compliant | Compliant |
| Reaction to fire | Decisione 96/603 CE Prova assente | -- | A1 – A1 _{FL} | A1 – A1 _{FL} | A1 – A1 _{FL} |

* With the exception of HYDROFLUORIC acid (HF) or its derivatives and compounds



GranitiFiandre spa



■ PRODUCTION PROCESS

The production process of the ceramic slabs covered by this EPD is divided into a series of working phases as described below.

Raw materials acquisition:

mineral raw materials (clay, sand, feldspar, kaolin, pigments) arrive at the production facilities and are stored in special warehouses.

The clay fraction performs a plasticizing function; the inert fraction (sand) a slimming and structural function, capable of limiting shrinkage and expansion during the firing of the ceramic piece; the feldspathic fraction has a melting function, which allows the glass formation during the baking of the piece.

Mixture preparation:

the mineral raw materials suitably pre-mixed are dosed (in a variable percentage according to the production recipe) inside the milling plants, consisting of continuous mills and turbo dissolvers. At the same time and in appropriate percentages, water (taken from wells and recirculation), fluidifying agent and grinding bodies (consisting of pebbles and alumina spheres) are added to the raw materials. The dough that is formed with a percentage of water equal to about 30% is called "slip". Downstream of this phase, color concentrates (pigments) are also added, in a variable percentage depending on the product to be made.

Spray-drying:

the slip is sprayed inside steel cylinders (atomizers), where it is sprayed to obtain very fine droplets. Subsequently, hot air is introduced for the drying of the drops of slip producing the atomized, mixture of granules with controlled humidity.

Forming:

the atomized powders are mixed, sieved and then compacted by pressing between two surfaces in order to obtain a raw compacted product, the so-called "green tile".

Drying:

the formed tile undergoes a drying process by means of a recirculation of hot air which considerably reduces its humidity to almost negligible levels, and gives it an even higher mechanical load, which allows it to be subjected to various surface processes to confer appropriate aesthetic properties.

Surface processing/glazing:

For unglazed porcelain stoneware, the desired final aesthetic effect is obtained by using digital printers. In the case of glazed porcelain stoneware, the desired final aesthetic effect is conferred by the superficial application of a minimum quantity of glaze.



Firing:

the firing phase has the aim of reinforcing the slab so as to give mechanical characteristics, inertia and physical-chemical resistance appropriate to the different uses. The dried sheet is placed in ovens and cooked. During the cooking cycle, the plate is preheated, cooked and cooled; the durability of these phases and the temperature reached determine the mechanical and resistance characteristics pursued.

Lapping / Polishing (optional):

lapping and polishing are controlled removal operations of the surface layer of ceramic pieces and are carried out to give them a bright surface and a high-quality aesthetic appearance.

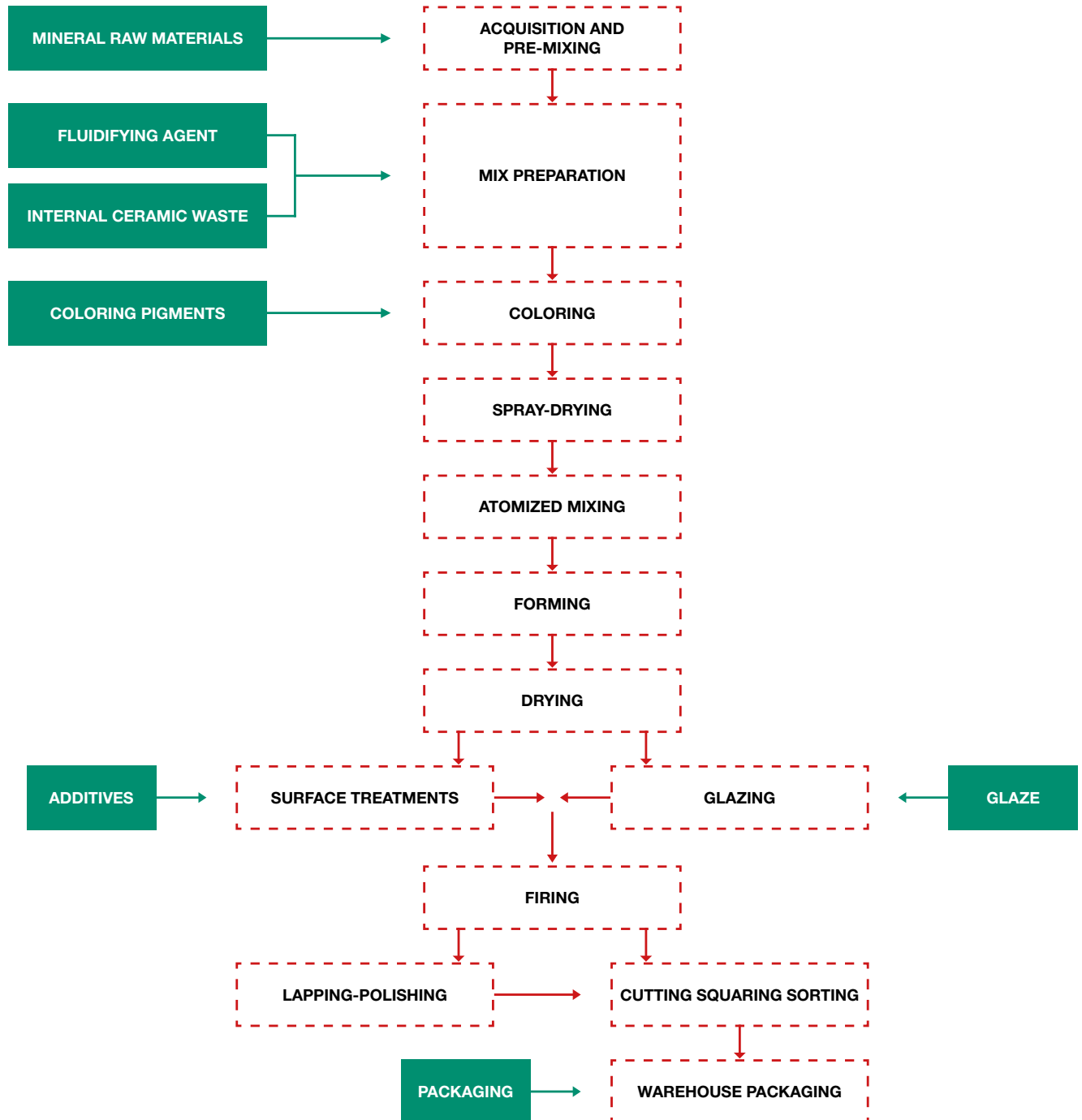
Cutting and squaring:

the cutting phase is necessary to transform the big slabs into the format requested by customers. The cut is made by water jet. Squaring is an optional process aimed at optimizing the geometric properties and obtaining perfectly orthogonal pieces.

Sorting, packaging and storage:

during the sorting phase all the dimensional and qualitative characteristics are checked. This phase is carried out in appropriately equipped automatic lines. The tiles are placed inside punches / trestles appropriately packed with stretch film. The finished packed material is ready to be shipped by lorries or containers to the final user.

■ FLOW DIAGRAM OF THE PRODUCTION PROCESS





| | |
|--------------------------------------|---|
| Functional Unit | Coverage of 1 m2 of flooring in buildings for residential and commercial use for a duration of over 50 years. |
| Reference Service Life (RSL) | The RLS of the tiles is generally over 50 years (BNB 2011). Furthermore, according to the US Green Building Council, the RLS of the tiles could have the same duration as the building itself; therefore, 60 years represents an alternative RSL value for tiles. The environmental performance results reported in this EPD refer to the product RSL with the exception of the B2-Maintenance module for which they refer to 1 year (multiplying the B2 values by 50 or 60 it is possible to obtain performance values relating to the useful life). An RSL has not been defined in accordance with ISO 15686. |
| Temporal representativeness | Primary data relating to the production facilities refer to the year 2018. |
| Database and LCA software | Ecoinvent 3.5 and Simapro 8.5 |
| System boundaries | From cradle to grave + module D (A+B+C+D) |
| Allocation | Allocations relating to input and output flows were made on a mass basis |
| Cut-off | In accordance with EN 15084, a minimum of 95% of the total mass and energy flows per module has been included |
| Electric mix (A3) | Renewables: 8,4%, Fossil: 80,1%; Nuclear: 11,4% (Italian Residual Mix 2018, AIB) Climate impact of electricity production: 561 g CO2 eq./kWh |
| Exclusions | The analysis does not include administrative activities, workers business travels, cleaning activities, construction of machinery and factories. |
| Technical support for the LCA | Bureau Veritas Nexta Srl – www.nexta.bureauveritas.it |



DECLARED MODULES, GEOGRAPHICAL REPRESENTATION, DATA VARIATION

| | Product stage | | | Construction process stage | | Use stage | | | | | | | End of life stage | | | | Resource Recovery stage |
|-------------------------|----------------------|-----------|---------------|----------------------------|---------------------------|-----------|-------------|--------|-------------|---------------|------------------------|-----------------------|----------------------------|-----------|------------------|----------|------------------------------------|
| | Raw materials supply | Transport | Manufacturing | Transport | Construction installation | Use | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | De-construction demolition | Transport | Waste processing | Disposal | Reuse-Recovery-Recycling-potential |
| MODULES | A 1 | A 2 | A 3 | A 4 | A 5 | B 1 | B 2 | B 3 | B 4 | B 5 | B 6 | B 7 | C 1 | C 2 | C 3 | C 4 | D |
| MODULES DECLARED | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| GEOGRAPHY | GLO | GLO | IT | GLO | | | | | | | | | | | | | GLO |
| SPECIFIC DATA | >90% | | | | | | | | | | | | | | | | |

X = Module declared; ND = Module not declared

| | A1 - A3 | | | | | | | |
|-----------------------------|--------------|----------|------------|--------|--------------|--------------|--------------|--------------|
| | 6 mm | 8 mm | 9 mm | 10 mm | 12 mm | 13 mm | 14 mm | 20 mm |
| VARIATION PRODUCTS % | < 10 % | 0% - 15% | -12% + 73% | 0%-25% | <10% | -6% + 11% | -4% + 11% | <10% |
| VARIATION SITES % | Not relevant | 14 | 44 | 10 | Not relevant | Not relevant | Not relevant | Not relevant |



A1-A3 PRODUCT STAGE

A1 - Raw materials supply

The slab is mainly composed of mineral raw materials (clay, quartz, kaolin, feldspar) which come partly directly from quarries and partly from pre and post consumer recycled material and / or from ceramic waste resulting from the ceramic and sanitary sectors. The module includes the processes of extraction of mineral raw materials from European and non-European quarries, selection and grinding of waste from the ceramic and sanitary sector to obtain secondary raw materials, manufacture of the fluidifier and colored pigments, generation of electricity needed for production at the GranitiFiandre facilities.

A2 - Transport

The module includes the transport of raw materials by sea, road and rail to the GranitiFiandre production sites.

A3 - Manufacturing

The module includes the manufacturing activities of the porcelain stoneware slab in the GranitiFiandre facilities, the production of packaging materials and auxiliary materials and the transport and treatment processes of the waste produced.

A4-A5 CONSTRUCTION PROCESS STAGE

A4 – Product transport to building site

The module includes the transport of porcelain stoneware slabs from GranitiFiandre production sites to the customer or to the point of installation. The marketing of the products takes place all over the world.

The transport scenarios used (distances and transport vehicles) are shown in the following table and refer to average data reported in the EN 17160: 2019 standard (Product category rules for ceramic tiles).

| Scenario Information | Unit / description |
|-------------------------------------|--|
| Fuel type and consumption | Diesel – 31,2 l/100 km (National and European destination) |
| Distance | National destination (Truck with a capacity of 16-32 tons): 300 km European destination (Truck with a capacity of 16-32 tons): 1390 km International (non-European) destination (Transoceanic freight ship): 6520 km |
| Capacity utilization | % assumed in Ecoinvent 3.5 |
| Bulk density of transported product | 0,08-1,03 kg/m ³ per Functional Unit, depending on product thickness |

A5 –Product installation

The module includes the product installation phases, the production of auxiliary materials for installation, the treatment of the waste produced from packaging. The tiles are fixed to the surfaces of walls and floors using specific materials. The installation scenarios used are shown in the following table and refer to average data reported in the EN 17160: 2019 standard (Product category rules for ceramic tiles). The production of ceramic waste in the installation phase is negligible.

| Scenario Information | Unit / description |
|---|--|
| Ancillary materials for installation | 6 kg/FU of cementitious adhesive |
| Use of water | No use of water resulting from product installation |
| Use of other resources | No use of other resources resulting from product installation |
| Quantitative description of the type of energy and the consumption during the installation process | No consumption of energy resulting from product installation |
| Waste materials on the building site generated by the product's installation | Packaging waste: Wood: 0,5-3,3 kg/FU depending on product thickness Cardboard: 0,1-0,5 kg/FU depending on product thickness PE stretch Film: 0,01-0,04 kg/FU depending on product thickness |
| Output materials as a result of waste processing at the building's site | Wood: 35% recycling, 16% energy recovery, 49% landfill Cardboard: 67% recycling, 8% energy recovery, 25% landfill PE Stretch Film: 31% recycling, 27% energy recovery, 42% landfill |
| Direct emissions to ambient air, soil and water | No emissions to air, soil or water resulting from product installation |

■ B1-B7 USE STAGE

B1 - Use

During use, ceramic tiles do not use resources nor generate emissions into the environment. At this stage there are no processes that generate environmental impacts.

B2 - Maintenance

The maintenance of the tile consists of cleaning operations with detergents, which varies according to the type of building (residential, commercial, sanitary). The module therefore includes the water supply and detergent production processes.

The maintenance scenarios used are shown in the following table and refer to average data reported in the EN 17160: 2019 standard (Product category rules for ceramic tiles).

The values declared in this stage refer to a time period of 1 year.

| Scenario Information | Unit / description |
|---|--|
| Maintenance process | Periodic cleaning using floor disinfectants. |
| Maintenance cycle | 52/year |
| Ancillary materials for maintenance | Liquid detergent: 0,134 ml/two weeks |
| Waste materials resulting from maintenance | Not relevant |
| Net fresh water consumption during maintenance | 0,1 l/week |
| Energy input during maintenance | No energy input during maintenance |

B3-B4-B5 – Repair, replacement and refurbishment

These types of interventions are not necessary: if correctly installed, the tiles do not require repair, replacement or renovation.

B6 – B7 – Operational energy use and Operational water use

These modules are not relevant for ceramic tiles.

■ C1-C4 END OF LIFE STAGE

C1 – De-construction demolition

This module includes the de-construction and removal of tiles at the end of their life; It is not relevant for ceramic tiles.

C2 – Transport

The module includes the transportation of the demolished tile to a recycling or disposal process.

C3 – Waste processing e C4 - Disposal

The modules include the treatment processes aimed at recycling (C3) and final disposal in landfills (C4) of the tile at the end of life.

| Scenario Information | Unit |
|--|--|
| Collection process | kg/FU collected separately: 0% |
| | Kg/FU collected with mixed construction waste: 100% for all products |
| Recovery system | kg/FU for re-use: 0 |
| | kg/FU for recycling (depending on product thickness): 8,7 (6mm) - 11,5 (8mm) - 12,8 (9mm) - 13,7 (10mm) - 17,7 (12mm) - 19,3 (13mm) - 20,2 (14mm) - 32,1 (20mm) |
| | kg/FU for energy recovery: 0 |
| Disposal | kg/FU for final disposal (depending on product thickness): 5,3 (6mm) - 7,0 (8mm) - 7,7 (9mm) - 8,3 (10mm) - 10,8 (12mm) - 11,7 (13mm) - 12,3 (14mm) - 19,5 (20mm) |
| Waste transportation (distance) | 50 km. The return trip is included in the system. |

■ D REUSE-RECOVERY - RECYCLING-POTENTIAL

Module D accounts for the potential net environmental benefits produced beyond the boundaries of the system studied, deriving from reuse, recovery and recycling processes.

For ceramic tiles in this EPD, the net environmental benefits from recycling of tiles and packaging and the net environmental benefits from energy recovery of packaging are calculated.



The porcelain stoneware slab is mainly composed of **mineral raw materials** (clay, quartz and feldspathic). The composition of the mineral part can vary from product to product depending on the specific mixture used.

The aesthetic aspect is obtained initially by coloring the mixture with suitable **coloring pigments** (consisting mainly of complex inorganic oxides) and subsequently before firing through surface decorations with **inks** or through **glazing** (the glaze is mainly made up of silicate glass).

Auxiliary additives, such as the fluidifying agents necessary to facilitate the grinding process of mineral raw materials, also form part of the product composition.

The packaging materials are cardboard, polyethylene stretch film and wood. The quantity of packaging materials varies according to the thickness and size of the tiles.

Porcelain stoneware slabs DO NOT contain substances with a high degree of concern SVHC contemplated in the ECHA Candidate List in concentrations greater than 0.1% by mass.

The weight content of the porcelain stoneware slabs included in the EPD is shown in the following tables.

| Product components | | Weight % | | Post-consumer material, weight-% | Pre and post consumer material, weight % |
|-----------------------|----------|---------------|-------------|----------------------------------|---|
| | | Average value | Variability | | |
| MINERAL RAW MATERIALS | CLAY | 98 % | 3 ÷ 25 % | 0 % - 29 % | > 40 % (compliant with BREEAM and LEED criteria) |
| | FELDSPAR | | 14 ÷ 38 % | | |
| | KAOLIN | | 0 ÷ 22 % | | |
| | SAND | | 26 ÷ 40 % | | |
| | OTHERS | | 0 ÷ 16 % | | |
| COLORING PIGMENTS | | 0,6 % | 0 ÷ 7 % | 0 % | 0 % |
| INKS * | | 0,8 % | 0 ÷ 1 % | 0 % | 0 % |
| GLAZE * | | 0,8 % | 0 ÷ 7 % | 0 % | 0 % |
| AUXILIARY ADDITIVES | | 0,6 % | 0,3 ÷ 1,1 % | 0 % | 0 % |
| TOTAL | | 100% | - | 0 % ÷ 29 % | > 40 % |

* inks and glaze are alternative

| Packaging materials | Weight % | |
|---------------------|-------------|----------------------|
| | kg/mq | % versus the product |
| CARDBOARD | 0,1 ÷ 0,5 | 0,4 ÷ 2,2 % |
| POLYETHYLENE FILM | 0,01 ÷ 0,04 | 0,06 ÷ 0,13 % |
| WOOD | 0,5 ÷ 3,3 | 2,4 ÷ 9,5 % |



POTENTIAL ENVIRONMENTAL IMPACTS - 6 MM

| Indicators | Unit | A1-A3 | A4 | A5 | B1, B3, B4, B5, B6, B7, C1 | B2 | C2 | C3 | C4 | D |
|---|------------|----------|----------|----------|----------------------------------|----------|----------|----------|----------|-----------|
| GWP-total | kg CO2 eq | 1,62E+01 | 2,22E+00 | 1,75E+00 | 0 | 4,60E-02 | 2,84E-01 | 1,12E-01 | 4,11E-02 | -2,76E-01 |
| GWP-fossil | kg CO2 eq | 1,62E+01 | 2,22E+00 | 1,65E+00 | 0 | 3,56E-02 | 2,83E-01 | 1,11E-01 | 4,11E-02 | -2,70E-01 |
| GWP-biogen. | kg CO2 eq | 2,23E-02 | 8,17E-04 | 9,62E-02 | 0 | 1,37E-04 | 8,82E-05 | 1,65E-04 | 2,53E-05 | -4,12E-03 |
| GWP-luluc | kg CO2 eq | 4,76E-03 | 7,50E-04 | 6,76E-04 | 0 | 1,03E-02 | 8,28E-05 | 8,20E-05 | 1,11E-05 | -1,44E-03 |
| GWP-GHG¹ | kg CO2 eq | 1,62E+01 | 2,22E+00 | 1,66E+00 | 0 | 4,59E-02 | 2,83E-01 | 1,12E-01 | 4,11E-02 | -2,72E-01 |
| ODP | kg CFC11eq | 2,70E-06 | 4,95E-07 | 1,06E-07 | 0 | 2,17E-09 | 6,51E-08 | 1,85E-08 | 1,83E-08 | -3,09E-08 |
| AP | mol H+ eq | 6,05E-02 | 1,83E-02 | 6,32E-03 | 0 | 2,29E-04 | 1,16E-03 | 8,69E-04 | 3,99E-04 | -1,36E-03 |
| EP-freshw. | kg P eq | 2,78E-03 | 2,01E-04 | 2,61E-04 | 0 | 1,30E-05 | 2,27E-05 | 2,73E-05 | 4,60E-06 | -9,61E-05 |
| EP-marine | kg N eq | 1,15E-02 | 4,30E-03 | 1,84E-03 | 0 | 1,43E-04 | 3,39E-04 | 3,10E-04 | 1,32E-04 | -3,41E-04 |
| EP-terrestrial | mol N eq | 1,41E-01 | 4,78E-02 | 1,75E-02 | 0 | 6,47E-04 | 3,74E-03 | 3,38E-03 | 1,45E-03 | -3,22E-03 |
| POCP | kgNMVOceq | 3,73E-02 | 1,35E-02 | 4,71E-03 | 0 | 1,97E-04 | 1,13E-03 | 9,29E-04 | 4,22E-04 | -9,68E-04 |
| ADPmin&met² | kg Sb eq | 7,83E-05 | 5,39E-06 | 1,38E-06 | 0 | 1,57E-07 | 8,42E-07 | 9,76E-08 | 4,53E-08 | -1,16E-06 |
| ADP^{fossil}² | MJ | 2,56E+02 | 3,34E+01 | 1,16E+01 | 0 | 6,78E-01 | 4,32E+00 | 1,63E+00 | 1,24E+00 | -4,18E+00 |
| WDP² | m3 depriv. | 4,73E+00 | 2,25E-01 | 4,48E-01 | 0 | 2,66E-01 | 2,94E-02 | 2,19E-02 | 5,47E-02 | -4,35E-01 |

GWP-total = Climate change;

GWP-fossil = Climate change – fossil;

GWP-biogenic = Climate change – biogenic;

GWP-luluc = Climate change - land use and land use change;

GWP-GHG = GWP total excluded biogenic carbon dioxide emissions and biogenic carbon stored in the product;

ODP = Depletion potential of the stratospheric ozone layer;

AP = Acidification potential, Accumulated Exceedance;

EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment;

EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment;

EP-terrestrial = Eutrophication potential, Accumulated Exceedance;

POCP = Formation potential of tropospheric ozone;

ADP-minerals&metals = Abiotic depletion potential for non-fossil resources;

ADP-fossil = Abiotic depletion for fossil resources potential;

WDP = Water use

1: The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

2: The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.



RESOURCE USE - 6 MM

| Indicators | Unit | A1-A3 | A4 | A5 | B1, B3, B4, B5, B6, B7, C1 | B2 | C2 | C3 | C4 | D |
|--------------|------|----------|----------|----------|----------------------------|----------|----------|----------|----------|-----------|
| PERE | MJ | 5,02E+01 | 4,30E-01 | 1,32E+00 | 0 | 3,43E-01 | 4,56E-02 | 5,82E-02 | 1,01E-02 | -9,22E+00 |
| PERM | MJ | 3,33E+01 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PERT | MJ | 8,35E+01 | 4,30E-01 | 1,32E+00 | 0 | 3,43E-01 | 4,56E-02 | 5,82E-02 | 1,01E-02 | -9,22E+00 |
| PENRE | MJ | 2,77E+02 | 3,54E+01 | 1,23E+01 | 0 | 7,27E-01 | 4,59E+00 | 1,73E+00 | 1,31E+00 | -4,49E+00 |
| PENRM | MJ | 5,52E-01 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PENRT | MJ | 2,77E+02 | 3,54E+01 | 1,23E+01 | 0 | 7,27E-01 | 4,59E+00 | 1,73E+00 | 1,31E+00 | -4,49E+00 |
| SM | Kg | 3,95E-01 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,20E+01 |
| RM | kg | 8,75E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| RSF | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| NRSF | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| FW | m3 | 1,19E-01 | 6,19E-03 | 1,19E-02 | 0 | 7,06E-03 | 7,82E-04 | 6,25E-04 | 1,29E-03 | -1,04E-02 |

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 re-sources;

SM = Use of secondary material;

RM: Use of recycled materials and by-products (according to Green Building Protocols as LEED and BREEAM);

RSF = Use of renewable secondary fuels;

NRSF = Use of non-renewable secondary fuels;

FW = Use of net fresh water

WASTE PRODUCTION - 6 MM

| Indicators | Unit | A1-A3 | A4 | A5 | B1, B3, B4, B5, B6, B7, C1 | B2 | C2 | C3 | C4 | D |
|------------|------|----------|----------|----------|----------------------------|----------|----------|----------|----------|-----------|
| HW | Kg | 1,37E-02 | 2,08E-05 | 2,42E-05 | 0 | 5,58E-07 | 2,73E-06 | 1,42E-06 | 8,28E-07 | -9,00E-06 |
| NHW | Kg | 3,91E-01 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| RW | kg | 7,56E-04 | 2,24E-04 | 5,25E-05 | 0 | 1,05E-06 | 2,92E-05 | 8,79E-06 | 8,19E-06 | -1,28E-05 |

HW = Hazardous waste disposed;

NHW = Non-hazardous waste disposed;

RW = Radioactive waste disposed

OUTPUT FLOWS - 6 MM

| Indicators | Unit | A1-A3 | A4 | A5 | B1, B3, B4, B5, B6, B7, C1 | B2 | C2 | C3 | C4 | D |
|----------------|------|----------|----------|----------|----------------------------|----------|----------|----------|----------|----------|
| REUSE | Kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| RECYCLE | Kg | 5,15E+00 | 0,00E+00 | 6,85E-01 | 0 | 0,00E+00 | 0,00E+00 | 1,24E+01 | 0,00E+00 | 0,00E+00 |
| EN-REC | Kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| EE-E | MJ | 0,00E+00 | 0,00E+00 | 4,51E-01 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| EE-T | MJ | 0,00E+00 | 0,00E+00 | 1,35E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |

REUSE = Components for reuse;
RECYCLE = Materials for recycling;

EN-REC = Materials for energy recovery;
EE-E = Exported energy electricity;

EE-T = Exported energy Thermal energy



POTENTIAL ENVIRONMENTAL IMPACTS - 8 MM

| Indicators | Unit | A1-A3 | A4 | A5 | B1, B3, B4, B5, B6, B7, C1 | B2 | C2 | C3 | C4 | D |
|-----------------------------------|------------|----------|----------|----------|----------------------------|----------|----------|----------|----------|-----------|
| GWP-total | kg CO2 eq | 1,28E+01 | 2,68E+00 | 1,69E+00 | 0 | 4,60E-02 | 3,46E-01 | 1,36E-01 | 5,02E-02 | -1,79E-01 |
| GWP-fossil | kg CO2 eq | 1,28E+01 | 2,68E+00 | 1,63E+00 | 0 | 3,56E-02 | 3,46E-01 | 1,36E-01 | 5,01E-02 | -1,77E-01 |
| GWP-biogen. | kg CO2 eq | 1,13E-02 | 9,86E-04 | 5,83E-02 | 0 | 1,37E-04 | 1,08E-04 | 2,02E-04 | 3,09E-05 | -1,34E-03 |
| GWP-luluc | kg CO2 eq | 2,58E-03 | 9,06E-04 | 6,66E-04 | 0 | 1,03E-02 | 1,01E-04 | 1,00E-04 | 1,36E-05 | -5,19E-04 |
| GWP-GHG¹ | kg CO2 eq | 1,28E+01 | 2,68E+00 | 1,63E+00 | 0 | 4,59E-02 | 3,46E-01 | 1,36E-01 | 5,02E-02 | -1,77E-01 |
| ODP | kg CFC11eq | 2,32E-06 | 5,97E-07 | 9,90E-08 | 0 | 2,17E-09 | 7,94E-08 | 2,25E-08 | 2,23E-08 | -1,99E-08 |
| AP | mol H+ eq | 4,14E-02 | 2,21E-02 | 6,16E-03 | 0 | 2,29E-04 | 1,42E-03 | 1,06E-03 | 4,87E-04 | -9,59E-04 |
| EP-freshw. | kg P eq | 1,63E-03 | 2,43E-04 | 2,57E-04 | 0 | 1,30E-05 | 2,77E-05 | 3,34E-05 | 5,61E-06 | -6,50E-05 |
| EP-marine | kg N eq | 8,47E-03 | 5,20E-03 | 1,62E-03 | 0 | 1,43E-04 | 4,14E-04 | 3,78E-04 | 1,61E-04 | -1,94E-04 |
| EP-terrestrial | mol N eq | 1,01E-01 | 5,78E-02 | 1,69E-02 | 0 | 6,47E-04 | 4,57E-03 | 4,12E-03 | 1,77E-03 | -2,14E-03 |
| POCP | kgNMVOCeq | 2,83E-02 | 1,63E-02 | 4,53E-03 | 0 | 1,97E-04 | 1,39E-03 | 1,13E-03 | 5,15E-04 | -6,33E-04 |
| ADPmin&met² | kg Sb eq | 1,33E-05 | 6,51E-06 | 1,29E-06 | 0 | 1,57E-07 | 1,03E-06 | 1,19E-07 | 5,54E-08 | -1,27E-06 |
| ADPfossil² | MJ | 1,98E+02 | 4,03E+01 | 1,11E+01 | 0 | 6,78E-01 | 5,27E+00 | 1,99E+00 | 1,51E+00 | -3,02E+00 |
| WDP² | m3 depriv. | 2,56E+00 | 2,72E-01 | 4,41E-01 | 0 | 2,66E-01 | 3,59E-02 | 2,68E-02 | 6,68E-02 | -5,32E-01 |

GWP-total = Climate change;

GWP-fossil = Climate change – fossil;

GWP-biogenic = Climate change – biogenic;

GWP-luluc = Climate change - land use and land use change;

GWP-GHG = GWP total excluded biogenic carbon dioxide emissions and biogenic carbon stored in the product;

ODP = Depletion potential of the stratospheric ozone layer;

AP = Acidification potential, Accumulated Exceedance;

EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment;

EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment;

EP-terrestrial = Eutrophication potential, Accumulated Exceedance;

POCP = Formation potential of tropospheric ozone;

ADP-minerals&metals = Abiotic depletion potential for non-fossil resources;

ADP-fossil = Abiotic depletion for fossil resources potential;

WDP = Water use

1: The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

2: The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.



RESOURCE USE - 8 MM

| Indicators | Unit | A1-A3 | A4 | A5 | B1, B3, B4, B5, B6, B7, C1 | B2 | C2 | C3 | C4 | D |
|--------------|------|----------|----------|----------|----------------------------|----------|----------|----------|----------|-----------|
| PERE | MJ | 1,88E+01 | 5,19E-01 | 1,31E+00 | 0 | 3,43E-01 | 5,57E-02 | 7,11E-02 | 1,24E-02 | -3,07E+00 |
| PERM | MJ | 1,50E+01 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PERT | MJ | 3,38E+01 | 5,19E-01 | 1,31E+00 | 0 | 3,43E-01 | 5,57E-02 | 7,11E-02 | 1,24E-02 | -3,07E+00 |
| PENRE | MJ | 2,15E+02 | 4,28E+01 | 1,18E+01 | 0 | 7,27E-01 | 5,60E+00 | 2,11E+00 | 1,61E+00 | -3,24E+00 |
| PENRM | MJ | 1,38E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PENRT | MJ | 2,16E+02 | 4,28E+01 | 1,18E+01 | 0 | 7,27E-01 | 5,60E+00 | 2,11E+00 | 1,61E+00 | -3,24E+00 |
| SM | Kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,52E+01 |
| RM | kg | 9,32E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| RSF | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| NRSF | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| FW | m3 | 6,84E-02 | 7,48E-03 | 1,17E-02 | 0 | 7,06E-03 | 9,55E-04 | 7,63E-04 | 1,58E-03 | -1,25E-02 |

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 re-sources;

SM = Use of secondary material;

RM: Use of recycled materials and by-products (according to Green Building Protocols as LEED and BREEAM);

RSF = Use of renewable secondary fuels;

NRSF = Use of non-renewable secondary fuels;

FW = Use of net fresh water

WASTE PRODUCTION - 8 MM

| Indicators | Unit | A1-A3 | A4 | A5 | B1, B3, B4, B5, B6, B7, C1 | B2 | C2 | C3 | C4 | D |
|------------|------|----------|----------|----------|----------------------------|----------|----------|----------|----------|-----------|
| HW | Kg | 1,01E-02 | 2,51E-05 | 2,38E-05 | 0 | 5,58E-07 | 3,33E-06 | 1,73E-06 | 1,01E-06 | -6,90E-06 |
| NHW | Kg | 5,51E-04 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| RW | kg | 5,63E-04 | 2,71E-04 | 4,96E-05 | 0 | 1,05E-06 | 3,57E-05 | 1,07E-05 | 9,99E-06 | -7,84E-06 |

HW = Hazardous waste disposed;

NHW = Non-hazardous waste disposed;

RW = Radioactive waste disposed

OUTPUT FLOWS - 8 MM

| Indicators | Unit | A1-A3 | A4 | A5 | B1, B3, B4, B5, B6, B7, C1 | B2 | C2 | C3 | C4 | D |
|----------------|------|----------|----------|----------|----------------------------|----------|----------|----------|----------|----------|
| REUSE | Kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| RECYCLE | Kg | 4,25E+00 | 0,00E+00 | 2,24E-01 | 0 | 0,00E+00 | 0,00E+00 | 1,52E+01 | 0,00E+00 | 0,00E+00 |
| EN-REC | Kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| EE-E | MJ | 0,00E+00 | 0,00E+00 | 1,70E-01 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| EE-T | MJ | 0,00E+00 | 0,00E+00 | 5,11E-01 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |

REUSE = Components for reuse;
RECYCLE = Materials for recycling;

EN-REC = Materials for energy recovery;
EE-E = Exported energy electricity;

EE-T = Exported energy Thermal energy



POTENTIAL ENVIRONMENTAL IMPACTS - 9 MM

| Indicators | Unit | A1-A3 | A4 | A5 | B1, B3, B4, B5, B6, B7, C1 | B2 | C2 | C3 | C4 | D |
|-----------------------------------|------------|----------|----------|----------|----------------------------------|----------|----------|----------|----------|-----------|
| GWP-total | kg CO2 eq | 1,39E+01 | 2,96E+00 | 1,69E+00 | 0 | 4,60E-02 | 3,74E-01 | 1,47E-01 | 5,43E-02 | -2,02E-01 |
| GWP-fossil | kg CO2 eq | 1,39E+01 | 2,96E+00 | 1,63E+00 | 0 | 3,56E-02 | 3,74E-01 | 1,47E-01 | 5,42E-02 | -1,99E-01 |
| GWP-biogen. | kg CO2 eq | 1,06E-02 | 1,09E-03 | 5,83E-02 | 0 | 1,37E-04 | 1,16E-04 | 2,18E-04 | 3,34E-05 | -1,73E-03 |
| GWP-luluc | kg CO2 eq | 2,32E-03 | 1,00E-03 | 6,66E-04 | 0 | 1,03E-02 | 1,09E-04 | 1,08E-04 | 1,47E-05 | -6,07E-04 |
| GWP-GHG¹ | kg CO2 eq | 1,39E+01 | 2,96E+00 | 1,63E+00 | 0 | 4,59E-02 | 3,74E-01 | 1,47E-01 | 5,43E-02 | -2,00E-01 |
| ODP | kg CFC11eq | 2,53E-06 | 6,60E-07 | 9,91E-08 | 0 | 2,17E-09 | 8,59E-08 | 2,44E-08 | 2,42E-08 | -2,21E-08 |
| AP | mol H+ eq | 3,94E-02 | 2,45E-02 | 6,16E-03 | 0 | 2,29E-04 | 1,53E-03 | 1,15E-03 | 5,26E-04 | -1,07E-03 |
| EP-freshw. | kg P eq | 1,37E-03 | 2,69E-04 | 2,57E-04 | 0 | 1,30E-05 | 3,00E-05 | 3,61E-05 | 6,07E-06 | -7,36E-05 |
| EP-marine | kg N eq | 7,65E-03 | 5,75E-03 | 1,62E-03 | 0 | 1,43E-04 | 4,48E-04 | 4,09E-04 | 1,74E-04 | -2,24E-04 |
| EP-terrestrial | mol N eq | 1,08E-01 | 6,39E-02 | 1,69E-02 | 0 | 6,47E-04 | 4,94E-03 | 4,46E-03 | 1,91E-03 | -2,41E-03 |
| POCP | kgNMVOCeq | 2,61E-02 | 1,81E-02 | 4,53E-03 | 0 | 1,97E-04 | 1,50E-03 | 1,23E-03 | 5,57E-04 | -7,00E-04 |
| ADPmin&met² | kg Sb eq | 8,37E-06 | 7,20E-06 | 1,29E-06 | 0 | 1,57E-07 | 1,11E-06 | 1,29E-07 | 5,99E-08 | -1,42E-06 |
| ADPfossil² | MJ | 2,10E+02 | 4,46E+01 | 1,11E+01 | 0 | 6,78E-01 | 5,70E+00 | 2,15E+00 | 1,63E+00 | -3,30E+00 |
| WDP² | m3 depriv. | 1,84E+00 | 3,01E-01 | 4,41E-01 | 0 | 2,66E-01 | 3,88E-02 | 2,90E-02 | 7,22E-02 | -5,90E-01 |

GWP-total = Climate change;

GWP-fossil = Climate change – fossil;

GWP-biogenic = Climate change – biogenic;

GWP-luluc = Climate change - land use and land use change;

GWP-GHG = GWP total excluded biogenic carbon dioxide emissions and biogenic carbon stored in the product;

ODP = Depletion potential of the stratospheric ozone layer;

AP = Acidification potential, Accumulated Exceedance;

EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment;

EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment;

EP-terrestrial = Eutrophication potential, Accumulated Exceedance;

POCP = Formation potential of tropospheric ozone;

ADP-minerals&metals = Abiotic depletion potential for non-fossil resources;

ADP-fossil = Abiotic depletion for fossil resources potential;

WDP = Water use

1: The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

2: The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.



RESOURCE USE - 9 MM

| Indicators | Unit | A1-A3 | A4 | A5 | B1, B3, B4, B5, B6, B7, C1 | B2 | C2 | C3 | C4 | D |
|--------------|------|----------|----------|----------|----------------------------|----------|----------|----------|----------|-----------|
| PERE | MJ | 1,81E+01 | 5,74E-01 | 1,31E+00 | 0 | 3,43E-01 | 6,02E-02 | 7,69E-02 | 1,34E-02 | -3,16E+00 |
| PERM | MJ | 1,50E+01 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PERT | MJ | 3,31E+01 | 5,74E-01 | 1,31E+00 | 0 | 3,43E-01 | 6,02E-02 | 7,69E-02 | 1,34E-02 | -3,16E+00 |
| PENRE | MJ | 2,29E+02 | 4,73E+01 | 1,18E+01 | 0 | 7,27E-01 | 6,06E+00 | 2,28E+00 | 1,74E+00 | -3,56E+00 |
| PENRM | MJ | 1,38E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PENRT | MJ | 2,30E+02 | 4,73E+01 | 1,18E+01 | 0 | 7,27E-01 | 6,06E+00 | 2,28E+00 | 1,74E+00 | -3,56E+00 |
| SM | Kg | 4,45E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,20E+01 |
| RM | kg | 9,48E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| RSF | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| NRSF | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| FW | m3 | 5,52E-02 | 8,27E-03 | 1,17E-02 | 0 | 7,06E-03 | 1,03E-03 | 8,26E-04 | 1,71E-03 | -1,39E-02 |

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 re-sources;

SM = Use of secondary material;

RM: Use of recycled materials and by-products (according to Green Building Protocols as LEED and BREEAM);

RSF = Use of renewable secondary fuels;

NRSF = Use of non-renewable secondary fuels;

FW = Use of net fresh water

WASTE PRODUCTION - 9 MM

| Indicators | Unit | A1-A3 | A4 | A5 | B1, B3, B4, B5, B6, B7, C1 | B2 | C2 | C3 | C4 | D |
|------------|------|----------|----------|----------|----------------------------|----------|----------|----------|----------|-----------|
| HW | Kg | 3,68E-02 | 2,78E-05 | 2,38E-05 | 0 | 5,58E-07 | 3,60E-06 | 1,87E-06 | 1,09E-06 | -7,61E-06 |
| NHW | Kg | 5,95E-02 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| RW | kg | 4,02E-04 | 3,00E-04 | 4,96E-05 | 0 | 1,05E-06 | 3,86E-05 | 1,16E-05 | 1,08E-05 | -8,59E-06 |

HW = Hazardous waste disposed;

NHW = Non-hazardous waste disposed;

RW = Radioactive waste disposed

OUTPUT FLOWS - 9 MM

| Indicators | Unit | A1-A3 | A4 | A5 | B1, B3, B4, B5, B6, B7, C1 | B2 | C2 | C3 | C4 | D |
|----------------|------|----------|----------|----------|----------------------------|----------|----------|----------|----------|----------|
| REUSE | Kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| RECYCLE | Kg | 1,73E+00 | 0,00E+00 | 2,39E-01 | 0 | 0,00E+00 | 0,00E+00 | 1,64E+01 | 0,00E+00 | 0,00E+00 |
| EN-REC | Kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| EE-E | MJ | 0,00E+00 | 0,00E+00 | 1,74E-01 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| EE-T | MJ | 0,00E+00 | 0,00E+00 | 5,21E-01 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |

REUSE = Components for reuse;
RECYCLE = Materials for recycling;

EN-REC = Materials for energy recovery;
EE-E = Exported energy electricity;

EE-T = Exported energy Thermal energy



RESOURCE USE - 9 MM

| Indicators | Unit | A1-A3 | A4 | A5 | B1, B3, B4, B5, B6, B7, C1 | B2 | C2 | C3 | C4 | D |
|--------------|------|----------|----------|----------|----------------------------|----------|----------|----------|----------|-----------|
| PERE | MJ | 1,81E+01 | 5,74E-01 | 1,31E+00 | 0 | 3,43E-01 | 6,02E-02 | 7,69E-02 | 1,34E-02 | -3,16E+00 |
| PERM | MJ | 1,50E+01 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PERT | MJ | 3,31E+01 | 5,74E-01 | 1,31E+00 | 0 | 3,43E-01 | 6,02E-02 | 7,69E-02 | 1,34E-02 | -3,16E+00 |
| PENRE | MJ | 2,29E+02 | 4,73E+01 | 1,18E+01 | 0 | 7,27E-01 | 6,06E+00 | 2,28E+00 | 1,74E+00 | -3,56E+00 |
| PENRM | MJ | 1,38E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PENRT | MJ | 2,30E+02 | 4,73E+01 | 1,18E+01 | 0 | 7,27E-01 | 6,06E+00 | 2,28E+00 | 1,74E+00 | -3,56E+00 |
| SM | Kg | 4,45E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,20E+01 |
| RM | kg | 9,48E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| RSF | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| NRSF | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| FW | m3 | 5,52E-02 | 8,27E-03 | 1,17E-02 | 0 | 7,06E-03 | 1,03E-03 | 8,26E-04 | 1,71E-03 | -1,39E-02 |

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 re-sources;

SM = Use of secondary material;

RM: Use of recycled materials and by-products (according to Green Building Protocols as LEED and BREEAM);

RSF = Use of renewable secondary fuels;

NRSF = Use of non-renewable secondary fuels;

FW = Use of net fresh water

WASTE PRODUCTION - 9 MM

| Indicators | Unit | A1-A3 | A4 | A5 | B1, B3, B4, B5, B6, B7, C1 | B2 | C2 | C3 | C4 | D |
|------------|------|----------|----------|----------|----------------------------|----------|----------|----------|----------|-----------|
| HW | Kg | 3,68E-02 | 2,78E-05 | 2,38E-05 | 0 | 5,58E-07 | 3,60E-06 | 1,87E-06 | 1,09E-06 | -7,61E-06 |
| NHW | Kg | 5,95E-02 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| RW | kg | 4,02E-04 | 3,00E-04 | 4,96E-05 | 0 | 1,05E-06 | 3,86E-05 | 1,16E-05 | 1,08E-05 | -8,59E-06 |

HW = Hazardous waste disposed;

NHW = Non-hazardous waste disposed;

RW = Radioactive waste disposed

OUTPUT FLOWS - 9 MM

| Indicators | Unit | A1-A3 | A4 | A5 | B1, B3, B4, B5, B6, B7, C1 | B2 | C2 | C3 | C4 | D |
|----------------|------|----------|----------|----------|----------------------------|----------|----------|----------|----------|----------|
| REUSE | Kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| RECYCLE | Kg | 1,73E+00 | 0,00E+00 | 2,39E-01 | 0 | 0,00E+00 | 0,00E+00 | 1,64E+01 | 0,00E+00 | 0,00E+00 |
| EN-REC | Kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| EE-E | MJ | 0,00E+00 | 0,00E+00 | 1,74E-01 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| EE-T | MJ | 0,00E+00 | 0,00E+00 | 5,21E-01 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |

REUSE = Components for reuse;
RECYCLE = Materials for recycling;

EN-REC = Materials for energy recovery;
EE-E = Exported energy electricity;

EE-T = Exported energy Thermal energy



POTENTIAL ENVIRONMENTAL IMPACTS - 10 MM

| Indicators | Unit | A1-A3 | A4 | A5 | B1, B3, B4, B5, B6, B7, C1 | B2 | C2 | C3 | C4 | D |
|-----------------------------------|------------|----------|----------|----------|----------------------------------|----------|----------|----------|----------|-----------|
| GWP-total | kg CO2 eq | 1,31E+01 | 3,19E+00 | 1,70E+00 | 0 | 4,60E-02 | 3,96E-01 | 1,56E-01 | 5,74E-02 | -2,18E-01 |
| GWP-fossil | kg CO2 eq | 1,31E+01 | 3,19E+00 | 1,64E+00 | 0 | 3,56E-02 | 3,95E-01 | 1,55E-01 | 5,73E-02 | -2,16E-01 |
| GWP-biogen. | kg CO2 eq | 1,14E-02 | 1,17E-03 | 6,31E-02 | 0 | 1,37E-04 | 1,23E-04 | 2,31E-04 | 3,53E-05 | -1,77E-03 |
| GWP-luluc | kg CO2 eq | 2,77E-03 | 1,08E-03 | 6,67E-04 | 0 | 1,03E-02 | 1,15E-04 | 1,14E-04 | 1,55E-05 | -6,64E-04 |
| GWP-GHG¹ | kg CO2 eq | 1,31E+01 | 3,19E+00 | 1,64E+00 | 0 | 4,59E-02 | 3,95E-01 | 1,56E-01 | 5,73E-02 | -2,17E-01 |
| ODP | kg CFC11eq | 2,40E-06 | 7,12E-07 | 9,99E-08 | 0 | 2,17E-09 | 9,08E-08 | 2,57E-08 | 2,55E-08 | -2,43E-08 |
| AP | mol H+ eq | 4,44E-02 | 2,63E-02 | 6,18E-03 | 0 | 2,29E-04 | 1,62E-03 | 1,21E-03 | 5,56E-04 | -1,17E-03 |
| EP-freshw. | kg P eq | 1,56E-03 | 2,90E-04 | 2,57E-04 | 0 | 1,30E-05 | 3,17E-05 | 3,81E-05 | 6,41E-06 | -7,95E-05 |
| EP-marine | kg N eq | 8,89E-03 | 6,19E-03 | 1,65E-03 | 0 | 1,43E-04 | 4,73E-04 | 4,32E-04 | 1,84E-04 | -2,41E-04 |
| EP-terrestrial | mol N eq | 1,06E-01 | 6,88E-02 | 1,70E-02 | 0 | 6,47E-04 | 5,22E-03 | 4,71E-03 | 2,02E-03 | -2,63E-03 |
| POCP | kgNMVOceq | 2,96E-02 | 1,95E-02 | 4,56E-03 | 0 | 1,97E-04 | 1,58E-03 | 1,30E-03 | 5,88E-04 | -7,77E-04 |
| ADPmin&met² | kg Sb eq | 1,05E-05 | 7,76E-06 | 1,30E-06 | 0 | 1,57E-07 | 1,17E-06 | 1,36E-07 | 6,33E-08 | -1,52E-06 |
| ADPfossil² | MJ | 2,03E+02 | 4,80E+01 | 1,12E+01 | 0 | 6,78E-01 | 6,03E+00 | 2,27E+00 | 1,73E+00 | -3,70E+00 |
| WDP² | m3 depriv. | 2,29E+00 | 3,24E-01 | 4,42E-01 | 0 | 2,66E-01 | 4,10E-02 | 3,06E-02 | 7,63E-02 | -6,34E-01 |

GWP-total = Climate change;

GWP-fossil = Climate change – fossil;

GWP-biogenic = Climate change – biogenic;

GWP-luluc = Climate change - land use and land use change;

GWP-GHG = GWP total excluded biogenic carbon dioxide emissions and biogenic carbon stored in the product;

ODP = Depletion potential of the stratospheric ozone layer;

AP = Acidification potential, Accumulated Exceedance;

EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment;

EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment;

EP-terrestrial = Eutrophication potential, Accumulated Exceedance;

POCP = Formation potential of tropospheric ozone;

ADP-minerals&metals = Abiotic depletion potential for non-fossil resources;

ADP-fossil = Abiotic depletion for fossil resources potential;

WDP = Water use

1: The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

2: The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.



RESOURCE USE - 10 MM

| Indicators | Unit | A1-A3 | A4 | A5 | B1, B3, B4, B5, B6, B7, C1 | B2 | C2 | C3 | C4 | D |
|--------------|------|----------|----------|----------|----------------------------|----------|----------|----------|----------|-----------|
| PERE | MJ | 2,18E+01 | 6,18E-01 | 1,31E+00 | 0 | 3,43E-01 | 6,37E-02 | 8,12E-02 | 1,41E-02 | -3,86E+00 |
| PERM | MJ | 1,50E+01 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PERT | MJ | 3,68E+01 | 6,18E-01 | 1,31E+00 | 0 | 3,43E-01 | 6,37E-02 | 8,12E-02 | 1,41E-02 | -3,86E+00 |
| PENRE | MJ | 2,21E+02 | 5,10E+01 | 1,18E+01 | 0 | 7,27E-01 | 6,40E+00 | 2,41E+00 | 1,83E+00 | -3,99E+00 |
| PENRM | MJ | 1,38E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PENRT | MJ | 2,23E+02 | 5,10E+01 | 1,18E+01 | 0 | 7,27E-01 | 6,40E+00 | 2,41E+00 | 1,83E+00 | -3,99E+00 |
| SM | Kg | 2,41E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,50E+01 |
| RM | kg | 1,12E+01 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| RSF | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| NRSF | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| FW | m3 | 7,00E-02 | 8,91E-03 | 1,17E-02 | 0 | 7,06E-03 | 1,09E-03 | 8,72E-04 | 1,80E-03 | -1,49E-02 |

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 re-sources;

SM = Use of secondary material;

RM: Use of recycled materials and by-products (according to Green Building Protocols as LEED and BREEAM);

RSF = Use of renewable secondary fuels;

NRSF = Use of non-renewable secondary fuels;

FW = Use of net fresh water

WASTE PRODUCTION - 10 MM

| Indicators | Unit | A1-A3 | A4 | A5 | B1, B3, B4, B5, B6, B7, C1 | B2 | C2 | C3 | C4 | D |
|------------|------|----------|----------|----------|----------------------------|----------|----------|----------|----------|-----------|
| HW | Kg | 1,20E-02 | 2,99E-05 | 2,39E-05 | 0 | 5,58E-07 | 3,80E-06 | 1,98E-06 | 1,16E-06 | -8,36E-06 |
| NHW | Kg | 6,98E-04 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| RW | kg | 4,71E-04 | 3,23E-04 | 5,00E-05 | 0 | 1,05E-06 | 4,08E-05 | 1,23E-05 | 1,14E-05 | -9,59E-06 |

HW = Hazardous waste disposed;

NHW = Non-hazardous waste disposed;

RW = Radioactive waste disposed

OUTPUT FLOWS - 10 MM

| Indicators | Unit | A1-A3 | A4 | A5 | B1, B3, B4, B5, B6, B7, C1 | B2 | C2 | C3 | C4 | D |
|----------------|------|----------|----------|----------|----------------------------|----------|----------|----------|----------|----------|
| REUSE | Kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| RECYCLE | Kg | 5,06E+00 | 0,00E+00 | 2,84E-01 | 0 | 0,00E+00 | 0,00E+00 | 1,74E+01 | 0,00E+00 | 0,00E+00 |
| EN-REC | Kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| EE-E | MJ | 0,00E+00 | 0,00E+00 | 2,14E-01 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| EE-T | MJ | 0,00E+00 | 0,00E+00 | 6,41E-01 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |

REUSE = Components for reuse;
RECYCLE = Materials for recycling;

EN-REC = Materials for energy recovery;
EE-E = Exported energy electricity;

EE-T = Exported energy Thermal energy



POTENTIAL ENVIRONMENTAL IMPACTS - 12 MM

| Indicators | Unit | A1-A3 | A4 | A5 | B1, B3, B4, B5, B6, B7, C1 | B2 | C2 | C3 | C4 | D |
|-----------------------------------|------------|----------|----------|----------|----------------------------------|----------|----------|----------|----------|-----------|
| GWP-total | kg CO2 eq | 2,84E+01 | 4,28E+00 | 1,78E+00 | 0 | 4,60E-02 | 4,87E-01 | 1,92E-01 | 7,07E-02 | -3,55E-01 |
| GWP-fossil | kg CO2 eq | 2,83E+01 | 4,28E+00 | 1,67E+00 | 0 | 3,56E-02 | 4,87E-01 | 1,92E-01 | 7,06E-02 | -3,51E-01 |
| GWP-biogen. | kg CO2 eq | 2,73E-02 | 1,57E-03 | 1,09E-01 | 0 | 1,37E-04 | 1,52E-04 | 2,84E-04 | 4,35E-05 | -2,80E-03 |
| GWP-luluc | kg CO2 eq | 6,23E-03 | 1,45E-03 | 6,78E-04 | 0 | 1,03E-02 | 1,42E-04 | 1,41E-04 | 1,91E-05 | -1,35E-03 |
| GWP-GHG¹ | kg CO2 eq | 2,84E+01 | 4,28E+00 | 1,67E+00 | 0 | 4,59E-02 | 4,87E-01 | 1,92E-01 | 7,06E-02 | -3,52E-01 |
| ODP | kg CFC11eq | 4,99E-06 | 9,54E-07 | 1,07E-07 | 0 | 2,17E-09 | 1,12E-07 | 3,17E-08 | 3,15E-08 | -4,04E-08 |
| AP | mol H+ eq | 9,37E-02 | 3,53E-02 | 6,36E-03 | 0 | 2,29E-04 | 2,00E-03 | 1,49E-03 | 6,85E-04 | -1,80E-03 |
| EP-freshw. | kg P eq | 4,06E-03 | 3,88E-04 | 2,62E-04 | 0 | 1,30E-05 | 3,91E-05 | 4,70E-05 | 7,90E-06 | -1,21E-04 |
| EP-marine | kg N eq | 1,87E-02 | 8,30E-03 | 1,91E-03 | 0 | 1,43E-04 | 5,83E-04 | 5,33E-04 | 2,26E-04 | -3,76E-04 |
| EP-terrestrial | mol N eq | 2,30E-01 | 9,22E-02 | 1,76E-02 | 0 | 6,47E-04 | 6,43E-03 | 5,80E-03 | 2,49E-03 | -4,05E-03 |
| POCP | kgNMVOCeq | 6,23E-02 | 2,61E-02 | 4,75E-03 | 0 | 1,97E-04 | 1,95E-03 | 1,60E-03 | 7,25E-04 | -1,24E-03 |
| ADPmin&met² | kg Sb eq | 2,69E-05 | 1,04E-05 | 1,40E-06 | 0 | 1,57E-07 | 1,45E-06 | 1,68E-07 | 7,79E-08 | -2,05E-06 |
| ADPfossil² | MJ | 4,41E+02 | 6,44E+01 | 1,17E+01 | 0 | 6,78E-01 | 7,43E+00 | 2,80E+00 | 2,13E+00 | -5,52E+00 |
| WDP² | m3 depriv. | 7,04E+00 | 4,35E-01 | 4,50E-01 | 0 | 2,66E-01 | 5,06E-02 | 3,77E-02 | 9,40E-02 | -8,35E-01 |

GWP-total = Climate change;

GWP-fossil = Climate change – fossil;

GWP-biogenic = Climate change – biogenic;

GWP-luluc = Climate change - land use and land use change;

GWP-GHG = GWP total excluded biogenic carbon dioxide emissions and biogenic carbon stored in the product;

ODP = Depletion potential of the stratospheric ozone layer;

AP = Acidification potential, Accumulated Exceedance;

EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment;

EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment;

EP-terrestrial = Eutrophication potential, Accumulated Exceedance;

POCP = Formation potential of tropospheric ozone;

ADP-minerals&metals = Abiotic depletion potential for non-fossil resources;

ADP-fossil = Abiotic depletion for fossil resources potential;

WDP = Water use

1: The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

2: The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.



RESOURCE USE - 12 MM

| Indicators | Unit | A1-A3 | A4 | A5 | B1, B3, B4, B5, B6, B7, C1 | B2 | C2 | C3 | C4 | D |
|--------------|------|----------|----------|----------|----------------------------|----------|----------|----------|----------|-----------|
| PERE | MJ | 6,22E+01 | 8,29E-01 | 1,32E+00 | 0 | 3,43E-01 | 7,84E-02 | 1,00E-01 | 1,74E-02 | -1,08E+01 |
| PERM | MJ | 1,50E+01 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PERT | MJ | 7,72E+01 | 8,29E-01 | 1,32E+00 | 0 | 3,43E-01 | 7,84E-02 | 1,00E-01 | 1,74E-02 | -1,08E+01 |
| PENRE | MJ | 4,78E+02 | 6,84E+01 | 1,24E+01 | 0 | 7,27E-01 | 7,88E+00 | 2,97E+00 | 2,26E+00 | -5,94E+00 |
| PENRM | MJ | 1,38E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PENRT | MJ | 4,79E+02 | 6,84E+01 | 1,24E+01 | 0 | 7,27E-01 | 7,88E+00 | 2,97E+00 | 2,26E+00 | -5,94E+00 |
| SM | Kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 2,14E+01 |
| RM | kg | 1,69E+01 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| RSF | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| NRSF | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| FW | m3 | 1,79E-01 | 1,19E-02 | 1,19E-02 | 0 | 7,06E-03 | 1,34E-03 | 1,07E-03 | 2,22E-03 | -1,97E-02 |

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 re-sources;

SM = Use of secondary material;

RM: Use of recycled materials and by-products (according to Green Building Protocols as LEED and BREEAM);

RSF = Use of renewable secondary fuels;

NRSF = Use of non-renewable secondary fuels;

FW = Use of net fresh water

WASTE PRODUCTION - 12 MM

| Indicators | Unit | A1-A3 | A4 | A5 | B1, B3, B4, B5, B6, B7, C1 | B2 | C2 | C3 | C4 | D |
|------------|------|----------|----------|----------|----------------------------|----------|----------|----------|----------|-----------|
| HW | Kg | 2,74E-02 | 4,01E-05 | 2,43E-05 | 0 | 5,58E-07 | 4,69E-06 | 2,44E-06 | 1,42E-06 | -1,31E-05 |
| NHW | Kg | 7,93E-01 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| RW | kg | 1,28E-03 | 4,33E-04 | 5,32E-05 | 0 | 1,05E-06 | 5,02E-05 | 1,51E-05 | 1,41E-05 | -1,68E-05 |

HW = Hazardous waste disposed;

NHW = Non-hazardous waste disposed;

RW = Radioactive waste disposed

OUTPUT FLOWS - 12 MM

| Indicators | Unit | A1-A3 | A4 | A5 | B1, B3, B4, B5, B6, B7, C1 | B2 | C2 | C3 | C4 | D |
|----------------|------|----------|----------|----------|----------------------------|----------|----------|----------|----------|----------|
| REUSE | Kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| RECYCLE | Kg | 1,04E+01 | 0,00E+00 | 7,38E-01 | 0 | 0,00E+00 | 0,00E+00 | 2,14E+01 | 0,00E+00 | 0,00E+00 |
| EN-REC | Kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| EE-E | MJ | 0,00E+00 | 0,00E+00 | 5,38E-01 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| EE-T | MJ | 0,00E+00 | 0,00E+00 | 1,61E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |

REUSE = Components for reuse;
RECYCLE = Materials for recycling;

EN-REC = Materials for energy recovery;
EE-E = Exported energy electricity;

EE-T = Exported energy Thermal energy



POTENTIAL ENVIRONMENTAL IMPACTS - 13 MM

| Indicators | Unit | A1-A3 | A4 | A5 | B1, B3, B4, B5, B6, B7, C1 | B2 | C2 | C3 | C4 | D |
|-----------------------------------|------------|----------|----------|----------|----------------------------------|----------|----------|----------|----------|-----------|
| GWP-total | kg CO2 eq | 1,99E+01 | 4,51E+00 | 1,74E+00 | 0 | 4,60E-02 | 5,23E-01 | 2,06E-01 | 7,58E-02 | -3,13E-01 |
| GWP-fossil | kg CO2 eq | 1,99E+01 | 4,50E+00 | 1,66E+00 | 0 | 3,56E-02 | 5,22E-01 | 2,05E-01 | 7,57E-02 | -3,10E-01 |
| GWP-biogen. | kg CO2 eq | 1,69E-02 | 1,66E-03 | 7,48E-02 | 0 | 1,37E-04 | 1,63E-04 | 3,05E-04 | 4,66E-05 | -2,62E-03 |
| GWP-luluc | kg CO2 eq | 4,05E-03 | 1,52E-03 | 6,70E-04 | 0 | 1,03E-02 | 1,53E-04 | 1,51E-04 | 2,05E-05 | -9,83E-04 |
| GWP-GHG¹ | kg CO2 eq | 1,99E+01 | 4,51E+00 | 1,66E+00 | 0 | 4,59E-02 | 5,23E-01 | 2,06E-01 | 7,58E-02 | -3,10E-01 |
| ODP | kg CFC11eq | 3,70E-06 | 1,00E-06 | 1,02E-07 | 0 | 2,17E-09 | 1,20E-07 | 3,40E-08 | 3,37E-08 | -3,51E-08 |
| AP | mol H+ eq | 6,42E-02 | 3,72E-02 | 6,23E-03 | 0 | 2,29E-04 | 2,14E-03 | 1,60E-03 | 7,35E-04 | -1,69E-03 |
| EP-freshw. | kg P eq | 2,20E-03 | 4,09E-04 | 2,59E-04 | 0 | 1,30E-05 | 4,19E-05 | 5,04E-05 | 8,48E-06 | -1,14E-04 |
| EP-marine | kg N eq | 1,28E-02 | 8,74E-03 | 1,72E-03 | 0 | 1,43E-04 | 6,26E-04 | 5,71E-04 | 2,43E-04 | -3,49E-04 |
| EP-terrestrial | mol N eq | 1,53E-01 | 9,71E-02 | 1,72E-02 | 0 | 6,47E-04 | 6,90E-03 | 6,22E-03 | 2,67E-03 | -3,78E-03 |
| POCP | kgNMVOCeq | 4,31E-02 | 2,75E-02 | 4,61E-03 | 0 | 1,97E-04 | 2,09E-03 | 1,71E-03 | 7,78E-04 | -1,12E-03 |
| ADPmin&met² | kg Sb eq | 1,71E-05 | 1,10E-05 | 1,33E-06 | 0 | 1,57E-07 | 1,55E-06 | 1,80E-07 | 8,36E-08 | -2,16E-06 |
| ADPfossil² | MJ | 3,10E+02 | 6,78E+01 | 1,13E+01 | 0 | 6,78E-01 | 7,96E+00 | 3,00E+00 | 2,28E+00 | -5,34E+00 |
| WDP² | m3 depriv. | 3,22E+00 | 4,58E-01 | 4,44E-01 | 0 | 2,66E-01 | 5,42E-02 | 4,04E-02 | 1,01E-01 | -8,95E-01 |

GWP-total = Climate change;

GWP-fossil = Climate change – fossil;

GWP-biogenic = Climate change – biogenic;

GWP-luluc = Climate change - land use and land use change;

GWP-GHG = GWP total excluded biogenic carbon dioxide emissions and biogenic carbon stored in the product;

ODP = Depletion potential of the stratospheric ozone layer;

AP = Acidification potential, Accumulated Exceedance;

EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment;

EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment;

EP-terrestrial = Eutrophication potential, Accumulated Exceedance;

POCP = Formation potential of tropospheric ozone;

ADP-minerals&metals = Abiotic depletion potential for non-fossil resources;

ADP-fossil = Abiotic depletion for fossil resources potential;

WDP = Water use

1: The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

2: The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.



RESOURCE USE - 13 MM

| Indicators | Unit | A1-A3 | A4 | A5 | B1, B3, B4, B5, B6, B7, C1 | B2 | C2 | C3 | C4 | D |
|--------------|------|----------|----------|----------|----------------------------|----------|----------|----------|----------|-----------|
| PERE | MJ | 3,22E+01 | 8,73E-01 | 1,31E+00 | 0 | 3,43E-01 | 8,41E-02 | 1,07E-01 | 1,87E-02 | -5,78E+00 |
| PERM | MJ | 1,50E+01 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PERT | MJ | 4,72E+01 | 8,73E-01 | 1,31E+00 | 0 | 3,43E-01 | 8,41E-02 | 1,07E-01 | 1,87E-02 | -5,78E+00 |
| PENRE | MJ | 3,37E+02 | 7,20E+01 | 1,20E+01 | 0 | 7,27E-01 | 8,46E+00 | 3,19E+00 | 2,42E+00 | -5,75E+00 |
| PENRM | MJ | 1,38E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PENRT | MJ | 3,39E+02 | 7,20E+01 | 1,20E+01 | 0 | 7,27E-01 | 8,46E+00 | 3,19E+00 | 2,42E+00 | -5,75E+00 |
| SM | Kg | 3,44E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,95E+01 |
| RM | kg | 1,60E+01 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| RSF | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| NRSF | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| FW | m3 | 9,89E-02 | 1,26E-02 | 1,18E-02 | 0 | 7,06E-03 | 1,44E-03 | 1,15E-03 | 2,38E-03 | -2,11E-02 |

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 re-sources;

SM = Use of secondary material;

RM: Use of recycled materials and by-products (according to Green Building Protocols as LEED and BREEAM);

RSF = Use of renewable secondary fuels;

NRSF = Use of non-renewable secondary fuels;

FW = Use of net fresh water

WASTE PRODUCTION - 13 MM

| Indicators | Unit | A1-A3 | A4 | A5 | B1, B3, B4, B5, B6, B7, C1 | B2 | C2 | C3 | C4 | D |
|------------|------|----------|----------|----------|----------------------------|----------|----------|----------|----------|-----------|
| HW | Kg | 1,69E-02 | 4,23E-05 | 2,40E-05 | 0 | 5,58E-07 | 5,03E-06 | 2,61E-06 | 1,53E-06 | -1,20E-05 |
| NHW | Kg | 9,83E-04 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| RW | kg | 6,77E-04 | 4,56E-04 | 5,09E-05 | 0 | 1,05E-06 | 5,39E-05 | 1,62E-05 | 1,51E-05 | -1,39E-05 |

HW = Hazardous waste disposed;

NHW = Non-hazardous waste disposed;

RW = Radioactive waste disposed

OUTPUT FLOWS - 13 MM

| Indicators | Unit | A1-A3 | A4 | A5 | B1, B3, B4, B5, B6, B7, C1 | B2 | C2 | C3 | C4 | D |
|----------------|------|----------|----------|----------|----------------------------|----------|----------|----------|----------|----------|
| REUSE | Kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| RECYCLE | Kg | 7,13E+00 | 0,00E+00 | 4,26E-01 | 0 | 0,00E+00 | 0,00E+00 | 2,29E+01 | 0,00E+00 | 0,00E+00 |
| EN-REC | Kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| EE-E | MJ | 0,00E+00 | 0,00E+00 | 3,21E-01 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| EE-T | MJ | 0,00E+00 | 0,00E+00 | 9,62E-01 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |

REUSE = Components for reuse;

RECYCLE = Materials for recycling;

EN-REC = Materials for energy recovery;

EE-E = Exported energy electricity;

EE-T = Exported energy Thermal energy



POTENTIAL ENVIRONMENTAL IMPACTS - 14 MM

| Indicators | Unit | A1-A3 | A4 | A5 | B1, B3, B4, B5, B6, B7, C1 | B2 | C2 | C3 | C4 | D |
|-----------------------------------|------------|----------|----------|----------|----------------------------------|----------|----------|----------|----------|-----------|
| GWP-total | kg CO2 eq | 2,02E+01 | 4,72E+00 | 1,74E+00 | 0 | 4,60E-02 | 5,44E-01 | 2,14E-01 | 7,89E-02 | -3,23E-01 |
| GWP-fossil | kg CO2 eq | 2,02E+01 | 4,71E+00 | 1,66E+00 | 0 | 3,56E-02 | 5,44E-01 | 2,14E-01 | 7,88E-02 | -3,20E-01 |
| GWP-biogen. | kg CO2 eq | 1,72E-02 | 1,74E-03 | 7,48E-02 | 0 | 1,37E-04 | 1,69E-04 | 3,17E-04 | 4,85E-05 | -2,64E-03 |
| GWP-luluc | kg CO2 eq | 4,13E-03 | 1,60E-03 | 6,70E-04 | 0 | 1,03E-02 | 1,59E-04 | 1,57E-04 | 2,13E-05 | -9,92E-04 |
| GWP-GHG¹ | kg CO2 eq | 2,02E+01 | 4,72E+00 | 1,66E+00 | 0 | 4,59E-02 | 5,44E-01 | 2,14E-01 | 7,88E-02 | -3,21E-01 |
| ODP | kg CFC11eq | 3,75E-06 | 1,05E-06 | 1,02E-07 | 0 | 2,17E-09 | 1,25E-07 | 3,54E-08 | 3,51E-08 | -3,62E-08 |
| AP | mol H+ eq | 6,62E-02 | 3,89E-02 | 6,23E-03 | 0 | 2,29E-04 | 2,23E-03 | 1,67E-03 | 7,65E-04 | -1,74E-03 |
| EP-freshw. | kg P eq | 2,26E-03 | 4,28E-04 | 2,59E-04 | 0 | 1,30E-05 | 4,36E-05 | 5,24E-05 | 8,82E-06 | -1,18E-04 |
| EP-marine | kg N eq | 1,33E-02 | 9,15E-03 | 1,72E-03 | 0 | 1,43E-04 | 6,51E-04 | 5,94E-04 | 2,52E-04 | -3,59E-04 |
| EP-terrestrial | mol N eq | 1,58E-01 | 1,02E-01 | 1,72E-02 | 0 | 6,47E-04 | 7,18E-03 | 6,48E-03 | 2,78E-03 | -3,90E-03 |
| POCP | kgNMVOCeq | 4,44E-02 | 2,88E-02 | 4,61E-03 | 0 | 1,97E-04 | 2,18E-03 | 1,78E-03 | 8,09E-04 | -1,15E-03 |
| ADPmin&met² | kg Sb eq | 1,54E-05 | 1,15E-05 | 1,33E-06 | 0 | 1,57E-07 | 1,61E-06 | 1,87E-07 | 8,70E-08 | -2,26E-06 |
| ADPfossil² | MJ | 3,14E+02 | 7,10E+01 | 1,13E+01 | 0 | 6,78E-01 | 8,29E+00 | 3,12E+00 | 2,37E+00 | -5,48E+00 |
| WDP² | m3 depriv. | 3,35E+00 | 4,79E-01 | 4,44E-01 | 0 | 2,66E-01 | 5,64E-02 | 4,21E-02 | 1,05E-01 | -9,38E-01 |

GWP-total = Climate change;

GWP-fossil = Climate change – fossil;

GWP-biogenic = Climate change – biogenic;

GWP-luluc = Climate change - land use and land use change;

GWP-GHG = GWP total excluded biogenic carbon dioxide emissions and biogenic carbon stored in the product;

ODP = Depletion potential of the stratospheric ozone layer;

AP = Acidification potential, Accumulated Exceedance;

EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment;

EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment;

EP-terrestrial = Eutrophication potential, Accumulated Exceedance;

POCP = Formation potential of tropospheric ozone;

ADP-minerals&metals = Abiotic depletion potential for non-fossil resources;

ADP-fossil = Abiotic depletion for fossil resources potential;

WDP = Water use

1: The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

2: The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.



RESOURCE USE - 14 MM

| Indicators | Unit | A1-A3 | A4 | A5 | B1, B3, B4, B5, B6, B7, C1 | B2 | C2 | C3 | C4 | D |
|--------------|------|----------|----------|----------|----------------------------|----------|----------|----------|----------|-----------|
| PERE | MJ | 3,24E+01 | 9,13E-01 | 1,31E+00 | 0 | 3,43E-01 | 8,75E-02 | 1,12E-01 | 1,94E-02 | -5,78E+00 |
| PERM | MJ | 1,50E+01 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PERT | MJ | 4,74E+01 | 9,13E-01 | 1,31E+00 | 0 | 3,43E-01 | 8,75E-02 | 1,12E-01 | 1,94E-02 | -5,78E+00 |
| PENRE | MJ | 3,42E+02 | 7,54E+01 | 1,20E+01 | 0 | 7,27E-01 | 8,80E+00 | 3,32E+00 | 2,52E+00 | -5,90E+00 |
| PENRM | MJ | 1,38E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PENRT | MJ | 3,44E+02 | 7,54E+01 | 1,20E+01 | 0 | 7,27E-01 | 8,80E+00 | 3,32E+00 | 2,52E+00 | -5,90E+00 |
| SM | Kg | 3,61E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 2,03E+01 |
| RM | kg | 1,68E+01 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| RSF | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| NRSF | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| FW | m3 | 1,03E-01 | 1,32E-02 | 1,18E-02 | 0 | 7,06E-03 | 1,50E-03 | 1,20E-03 | 2,48E-03 | -2,20E-02 |

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 re-sources;

SM = Use of secondary material;

RM: Use of recycled materials and by-products (according to Green Building Protocols as LEED and BREEAM);

RSF = Use of renewable secondary fuels;

NRSF = Use of non-renewable secondary fuels;

FW = Use of net fresh water

WASTE PRODUCTION - 14 MM

| Indicators | Unit | A1-A3 | A4 | A5 | B1, B3, B4, B5, B6, B7, C1 | B2 | C2 | C3 | C4 | D |
|------------|------|----------|----------|----------|----------------------------|----------|----------|----------|----------|-----------|
| HW | Kg | 1,77E-02 | 4,42E-05 | 2,40E-05 | 0 | 5,58E-07 | 5,23E-06 | 2,72E-06 | 1,59E-06 | -1,24E-05 |
| NHW | Kg | 1,03E-03 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| RW | kg | 7,00E-04 | 4,77E-04 | 5,09E-05 | 0 | 1,05E-06 | 5,61E-05 | 1,69E-05 | 1,57E-05 | -1,43E-05 |

HW = Hazardous waste disposed;

NHW = Non-hazardous waste disposed;

RW = Radioactive waste disposed

OUTPUT FLOWS - 14 MM

| Indicators | Unit | A1-A3 | A4 | A5 | B1, B3, B4, B5, B6, B7, C1 | B2 | C2 | C3 | C4 | D |
|----------------|------|----------|----------|----------|----------------------------|----------|----------|----------|----------|----------|
| REUSE | Kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| RECYCLE | Kg | 7,47E+00 | 0,00E+00 | 4,26E-01 | 0 | 0,00E+00 | 0,00E+00 | 2,39E+01 | 0,00E+00 | 0,00E+00 |
| EN-REC | Kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| EE-E | MJ | 0,00E+00 | 0,00E+00 | 3,21E-01 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| EE-T | MJ | 0,00E+00 | 0,00E+00 | 9,62E-01 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |

REUSE = Components for reuse;

RECYCLE = Materials for recycling;

EN-REC = Materials for energy recovery;

EE-E = Exported energy electricity;

EE-T = Exported energy Thermal energy



POTENTIAL ENVIRONMENTAL IMPACTS - 20 MM

| Indicators | Unit | A1-A3 | A4 | A5 | B1, B3, B4, B5, B6, B7, C1 | B2 | C2 | C3 | C4 | D |
|-----------------------------------|------------|----------|----------|----------|----------------------------------|----------|----------|----------|----------|-----------|
| GWP-total | kg CO2 eq | 4,71E+01 | 7,76E+00 | 1,89E+00 | 0 | 4,60E-02 | 8,14E-01 | 3,21E-01 | 1,18E-01 | -6,46E-01 |
| GWP-fossil | kg CO2 eq | 4,70E+01 | 7,75E+00 | 1,73E+00 | 0 | 3,56E-02 | 8,13E-01 | 3,20E-01 | 1,18E-01 | -6,39E-01 |
| GWP-biogen. | kg CO2 eq | 4,48E-02 | 2,85E-03 | 1,67E-01 | 0 | 1,37E-04 | 2,53E-04 | 4,75E-04 | 7,26E-05 | -5,12E-03 |
| GWP-luluc | kg CO2 eq | 1,10E-02 | 2,62E-03 | 6,93E-04 | 0 | 1,03E-02 | 2,38E-04 | 2,35E-04 | 3,19E-05 | -2,47E-03 |
| GWP-GHG¹ | kg CO2 eq | 4,70E+01 | 7,75E+00 | 1,73E+00 | 0 | 4,59E-02 | 8,14E-01 | 3,20E-01 | 1,18E-01 | -6,41E-01 |
| ODP | kg CFC11eq | 8,47E-06 | 1,73E-06 | 1,17E-07 | 0 | 2,17E-09 | 1,87E-07 | 5,30E-08 | 5,25E-08 | -7,36E-08 |
| AP | mol H+ eq | 1,51E-01 | 6,40E-02 | 6,59E-03 | 0 | 2,29E-04 | 3,33E-03 | 2,49E-03 | 1,14E-03 | -3,27E-03 |
| EP-freshw. | kg P eq | 6,27E-03 | 7,04E-04 | 2,69E-04 | 0 | 1,30E-05 | 6,52E-05 | 7,84E-05 | 1,32E-05 | -2,21E-04 |
| EP-marine | kg N eq | 3,10E-02 | 1,50E-02 | 2,25E-03 | 0 | 1,43E-04 | 9,74E-04 | 8,89E-04 | 3,78E-04 | -6,86E-04 |
| EP-terrestrial | mol N eq | 3,81E-01 | 1,67E-01 | 1,85E-02 | 0 | 6,47E-04 | 1,07E-02 | 9,69E-03 | 4,16E-03 | -7,37E-03 |
| POCP | kgNMVOCeq | 1,04E-01 | 4,73E-02 | 5,01E-03 | 0 | 1,97E-04 | 3,26E-03 | 2,67E-03 | 1,21E-03 | -2,26E-03 |
| ADPmin&met² | kg Sb eq | 4,67E-05 | 1,88E-05 | 1,54E-06 | 0 | 1,57E-07 | 2,42E-06 | 2,80E-07 | 1,30E-07 | -3,71E-06 |
| ADPfossil² | MJ | 7,31E+02 | 1,17E+02 | 1,24E+01 | 0 | 6,78E-01 | 1,24E+01 | 4,67E+00 | 3,55E+00 | -1,01E+01 |
| WDP² | m3 depriv. | 1,06E+01 | 7,88E-01 | 4,60E-01 | 0 | 2,66E-01 | 8,44E-02 | 6,29E-02 | 1,57E-01 | -1,51E+00 |

GWP-total = Climate change;

GWP-fossil = Climate change – fossil;

GWP-biogenic = Climate change – biogenic;

GWP-luluc = Climate change - land use and land use change;

GWP-GHG = GWP total excluded biogenic carbon dioxide emissions and biogenic carbon stored in the product;

ODP = Depletion potential of the stratospheric ozone layer;

AP = Acidification potential, Accumulated Exceedance;

EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment;

EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment;

EP-terrestrial = Eutrophication potential, Accumulated Exceedance;

POCP = Formation potential of tropospheric ozone;

ADP-minerals&metals = Abiotic depletion potential for non-fossil resources;

ADP-fossil = Abiotic depletion for fossil resources potential;

WDP = Water use

1: The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

2: The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.



RESOURCE USE - 20 MM

| Indicators | Unit | A1-A3 | A4 | A5 | B1, B3, B4, B5, B6, B7, C1 | B2 | C2 | C3 | C4 | D |
|--------------|------|----------|----------|----------|----------------------------|----------|----------|----------|----------|-----------|
| PERE | MJ | 1,10E+02 | 1,50E+00 | 1,33E+00 | 0 | 3,43E-01 | 1,31E-01 | 1,67E-01 | 2,91E-02 | -1,98E+01 |
| PERM | MJ | 1,50E+01 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PERT | MJ | 1,25E+02 | 1,50E+00 | 1,33E+00 | 0 | 3,43E-01 | 1,31E-01 | 1,67E-01 | 2,91E-02 | -1,98E+01 |
| PENRE | MJ | 7,93E+02 | 1,24E+02 | 1,31E+01 | 0 | 7,27E-01 | 1,32E+01 | 4,96E+00 | 3,77E+00 | -1,08E+01 |
| PENRM | MJ | 1,38E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PENRT | MJ | 7,94E+02 | 1,24E+02 | 1,31E+01 | 0 | 7,27E-01 | 1,32E+01 | 4,96E+00 | 3,77E+00 | -1,08E+01 |
| SM | Kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 3,57E+01 |
| RM | kg | 3,06E+01 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| RSF | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| NRSF | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| FW | m3 | 2,71E-01 | 2,16E-02 | 1,22E-02 | 0 | 7,06E-03 | 2,25E-03 | 1,79E-03 | 3,71E-03 | -3,57E-02 |

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 re-sources;

SM = Use of secondary material;

RM: Use of recycled materials and by-products (according to Green Building Protocols as LEED and BREEAM);

RSF = Use of renewable secondary fuels;

NRSF = Use of non-renewable secondary fuels;

FW = Use of net fresh water

WASTE PRODUCTION - 20 MM

| Indicators | Unit | A1-A3 | A4 | A5 | B1, B3, B4, B5, B6, B7, C1 | B2 | C2 | C3 | C4 | D |
|------------|------|----------|----------|----------|----------------------------|----------|----------|----------|----------|-----------|
| HW | Kg | 4,95E-02 | 7,27E-05 | 2,49E-05 | 0 | 5,58E-07 | 7,82E-06 | 4,07E-06 | 2,38E-06 | -2,39E-05 |
| NHW | Kg | 1,44E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| RW | kg | 2,05E-03 | 7,84E-04 | 5,76E-05 | 0 | 1,05E-06 | 8,39E-05 | 2,52E-05 | 2,35E-05 | -3,07E-05 |

HW = Hazardous waste disposed;

NHW = Non-hazardous waste disposed;

RW = Radioactive waste disposed

OUTPUT FLOWS - 20 MM

| Indicators | Unit | A1-A3 | A4 | A5 | B1, B3, B4, B5, B6, B7, C1 | B2 | C2 | C3 | C4 | D |
|----------------|------|----------|----------|----------|----------------------------|----------|----------|----------|----------|----------|
| REUSE | Kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| RECYCLE | Kg | 1,89E+01 | 0,00E+00 | 1,35E+00 | 0 | 0,00E+00 | 0,00E+00 | 3,57E+01 | 0,00E+00 | 0,00E+00 |
| EN-REC | Kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| EE-E | MJ | 0,00E+00 | 0,00E+00 | 9,87E-01 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| EE-T | MJ | 0,00E+00 | 0,00E+00 | 2,96E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |

REUSE = Components for reuse;
RECYCLE = Materials for recycling;

EN-REC = Materials for energy recovery;
EE-E = Exported energy electricity;

EE-T = Exported energy Thermal energy



■ INFORMATION ON BIOGENIC CARBON CONTENT

| Biogenic carbon content | Unit | 6mm | 8mm | 9mm | 10mm | 12mm | 13mm | 14mm | 20mm |
|---|------|----------|----------|----------|----------|----------|----------|----------|----------|
| Biogenic carbon content in product | kg C | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Biogenic carbon content in packaging | kg C | 8,58E-01 | 2,78E-01 | 2,89E-01 | 3,50E-01 | 9,75E-01 | 5,25E-01 | 5,25E-01 | 1,79E+00 |

■ ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS

The values of the following additional environmental impact indicators have been calculated by LCA analysis and are available on request by writing to: info@granitifiandre.it.

| Indicator | Particulate matter emissions | Ionising radiation, human health * | Ecotoxicity (freshwater) ** | Human toxicity, cancer effects ** | Human toxicity, non- cancer effects ** | Land use related impacts / soil quality ** |
|-------------|------------------------------|------------------------------------|-----------------------------|-----------------------------------|--|--|
| Unit | Disease incidence | kBq U235eq | CTUe | CTUe | CTUe | dimensionless |

* This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

** The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.



■ PRODUCT CIRCULARITY

GranitiFiandre products are manufactured using variable amounts of pre and post consumer materials as raw materials input, in quantities exceeding 40% by weight of the product.

At the end of the reference service life of the product, which can be assessed in at least 50 years, the product could be entirely subjected to a simple mechanical crushing treatment for the recovery of material that can be used in various other sectors (for example concrete production, road construction) instead of primary materials.

GranitiFiandre production is a closed-circuit and all the raw materials waste and wastewater are reused into the production cycle.

In our facilities no wastewater are generated from the manufacturing process, since the water used in the washing of the plant and for the squaring process for the almost totality is internally recycled, in particular in the phase of preparation of the dough, and minimally conferred outside for the recovery to authorized parties, in the form of ceramic sludge and unpurified water.

The internal scrap of raw materials as much as possible is internally reused in the preparation of the dough or delivered to external companies for the recovery of materials.

■ AIR QUALITY (USE STAGE)



Our materials do not contain added VOC (volatile organic compounds). With regard to emissions of VOCs and formaldehyde in indoor environments, emissions of GranitiFiandre ceramic tiles are classified A+.

No need for sealants or waxes that could contribute to the emission of harmful VOCs in buildings. The stain-resistant surface reduces the need to use strong detergents. For routine cleaning, a pH-neutral detergent is all that is needed.



■ GREENGUARD – GREENGUARD GOLD

The GREENGUARD Certification ensures that products intended for indoor use are characterized by the absence of emissions of volatile substances, helping to create healthier environments.

The GREENGUARD Gold Certification includes safety factors that take account of sensitive subjects (such as children and elderly) and ensures that the use of a product is acceptable in environments such as schools and health facilities. This certification is widely recognized and accepted by sustainable building programs and building codes worldwide. In the US, it is taken as a reference of the evaluation system of the CHPS buildings (The Collaborative for High Performance Schools) and LEED (Leadership in Energy and Environmental Design).

For more information on the GREENGUARD certified GranitiFiandre products, refer to the website: <https://spot.ul.com>

■ END OF LIFE

GranitiFiandre Porcelain Stoneware slabs offer an additional guarantee of respect for the environment even in the end of life stage. In fact all the materials at the end of their life cycle do not require treatments since, by virtue of the high chemical inertia, do not release substances into the environment. Precisely for this reason they are considered to all effects inert materials. They can be used as fill material for construction sites and as background material for road beds, thus reducing the need for quarried gravel.



■ MINIMUM ENVIRONMENTAL CRITERIA (CAM)

The minimum environmental criteria (CAM) are environmental requirements established by the Italian State in the context of its Green Public Procurement (GPP) policies; they are defined for the various stages of the public administrations purchase process and are aimed at identifying the best design solution, product or service from an environmental point of view along the life cycle, taking into account market availability. For construction products, the criteria adopted by the Decree of the Minister of the Environment for the Protection of the Territory and the Sea of 11 January 2017 ("Entrusting of design and work services for the new construction, renovation and maintenance of public buildings") must be respected. In particular, for ceramic tiles, the criteria selected by Decision 2009/607 / EC of 9 July 2009, which establishes the ecological criteria for the european ECOLABEL program for "hard coverings", must be respected. GranitiFiandre complies with the following minimum environmental criteria on the basis of the test methods provided for by Decision 2009/607/EC of 9 July 2009 (Ecolabel) or other equivalent test methods established by the Competent Authority in the respective environmental permits.

Water consumption

The consumption of water in the production phase, from the preparation of the raw materials to the firing, must not exceed the value of 1 l/kg of product. The waste water produced by the production processes must have a recycling factor of at least 90%.

Air emissions

Total particle emissions for printing, glazing and spray drying ("cold emissions") do not exceed 5 g/m². Air emissions for the firing stage only must not exceed the following values:

| PARAMETER | THRESHOLD (mg/m ³) |
|----------------------------|--------------------------------|
| PARTICULATES (dust) | 200 |
| FLUORIDES (HF) | 200 |

Water emissions

After waste water treatment, the following values must not be exceeded:

| PARAMETER | THRESHOLD (mg/l) |
|-------------------------|------------------|
| SUSPENDED SOLIDS | 40 |
| CADMIUM (Cd) | 0,015 |
| CHROME VI (Cr) | 0,15 |
| LEAD (Pb) | 0,15 |

Waste recovery

At least 85% (by weight) of the total waste generated by the processes must be recovered, according to the general terms and definitions contained in european Directive 75/442/EEC as amended.



This EPD constitutes an upgrade to the "Porcelain stoneware slabs" EPD, revision date 2019-06-26. In this version the LCA analysis has been expanded to cover all phases of the product life cycle ("from cradle to grave"). In addition, potential benefits deriving from flows of matter and energy that leave the system's boundaries (recovery of matter and energy) were accounted for in Module D.

The range of Granitifiandre products covered by the Declaration has been expanded, adding new brands and collections; product groups 13-14-20 mm have been added in this version of the document.

LCA elaborations and EPD contents are based on the PCR "EN 15804: 2012 + A2: 2019 Sustainability of Construction Works" and "2019: 14 Construction products, version 1.0", both updated with respect to those available for the previous version of the EPD.

The comparison of environmental performances with respect to what was stated in the previous version of the EPD is possible only for the Product Stage (A1-A3) for product groups 6-8-9-10-12 mm.

The GWP results reported in this document are slightly higher than those reported in the previous version, due to the variation of the technical specifications adopted, the more accurate data-collection and the intrinsic variability existing within each group of products.



| | |
|----------------------------------|---|
| International EPD® System | General Programme Instructions, Version 3.01 |
| International EPD® System | PCR 2019:14 Construction products, version 1.0 |
| International EPD® System | C-PCR-002 Ceramic tiles (EN 17160:2019), version 2019-12-20 |
| EN 15804:2012+A2:2019 | Sustainability of Construction Works |
| EN 17160:2019 | Product category rules for ceramic tiles |
| ISO 14020:2000 | Environmental labels and declarations-General principles |
| ISO 14025:2010 | Environmental labels and declarations-Type III Environmental Declarations-Principles and procedures |
| ISO 14040:2006 | Environmental management-Life Cycle Assessment-Principles and framework |
| ISO 14044:2018 | Environmental management-Life Cycle Assessment Requirements and guidelines |
| LCA Report | Porcelain stoneware slabs for indoor and outdoor floors and walls, Rev1-July 2020 |