



ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025:2006
and EN 15804:2012+A2:2019/AC:2021 for:

**EUVAL® terrazzo,
2cm, 3cm and 4cm thickness**

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

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General information

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)

Product Category Rules (PCR): 2019:14, version 1.11

Owner of the EPD: EURAGGLO s.r.l. Via Domenico da Lugo 12 - 37023 Lugo di Grezzana - VR - Italy

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The EPD owner has the sole ownership, liability, and responsibility for the EPD.

LCA accountability:

LCA and EPD were conducted by



STUDIO GALLIAN S.A.S.

Sede legale: Via Raffaello Sanzio 8 – 45100 Rovigo (RO)

Sede operativa: Via dell'Industria 9 – 35040 – Boara Pisani (PD)

Independent third-party verification of the declaration and data

According to ISO 14025:2006, via:

TÜV ITALIA s.r.l.

is an approved certification body accountable for the third-party verification

The certification body is accredited by: ACCREDIA

Procedure for follow-up of data during EPD validity does not involve third party verifier.

Programme operator:

Programme:	The International EPD [®] System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
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EPDs within the same product category but registered in different EPD programmes may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison.

EURAGGLO - Company information

EUVAL's long history begins in the year 1974, when the family Nicolini has produced the first blocks of cement-based terrazzo. In the years our know-how together with high technology plant has brought us to introduce in the market a product with very high technical performances and quality.

In the year 1987 was founded the brand name EUVAL[®], today recognize worldwide as the leading mark of terrazzo in Europe for the realization of stairs, floors and walls in terrazzo for schools, airports, stations, shopping centres, hospitals but also for residential buildings, museums and hotels.

Our mission is to offer our customers new solutions that meet the different architectural and aesthetic needs, paying attention to new trends and developments in architecture.

The "know-how", the selection of the best raw materials and the use of advanced technologies allow us to create an high quality and reliable product with excellent technical performances such as resistance, durability through the years and ease of maintenance.

EUVAL[®] has always believed in the importance of developing a contemporary architecture respecting the environment. For several years, our company create a sustainable product choosing carefully only natural raw materials without any chemical addition, to improve the quality and safety in the areas where it is laid.

EUVAL[®] terrazzo has a high percentage of pre-consumer recycled content, that allows to receive the LEED certification (Leadership in Energy and Environmental Design). All the technical and structural characteristics of our materials comply with all the requirements for receiving LEED credits for a building.

Headquarters:

Via Domenico da Lugo, 12 37023 - Lugo di Grezzana, Verona – Italy

Slabs Warehouse

Via Domenico da Lugo, 15 37023 - Lugo di Grezzana, Verona – Italy

Block production plant:

Via Domenico da Lugo, 41 37023 – Lugo di Grezzana, Verona - Italy

Certifications



DIN 18500-1
EN 13748-1

EUVAL® terrazzo complies with the high-quality requirements of DIN V 18500 and DIN EN 13748-1 standards, which are constantly checked by our staff and by the German Institute Güteschutz Hessenbeton e. V. in Wiesbaden.



The CE marking declares that the product meets the security directives required by the European Union, which aims to preserve human health and safety in the building's constructions. For all EUVAL terrazzo materials are available the declarations of performance CE (DoP) and CE marking sheets, in accordance to Annex ZA of the standard EN 13748-1.



The LEED certification system (Leadership in Energy and Environmental Design) is an international certification program that promote and increase the high performances of sustainable buildings.

EUVAL terrazzo is certified from TÜV Italia in compliance to the requirement to achieve the LEED credits. The LEED credits obtained from the different products in the building allow to gain credits to achieve different certification levels.

EUVAL® - Product information

EUVAL® TERRAZZO CEMENT BASE

Classification according to the UN CPC code: 3769

EUVAL terrazzo is an agglomerate produced in blocks using marble chips, white cement CEM II/B-LL 42,5 R, water, and oxide colour without any resin or chemical substances.



EUVAL produces his terrazzo with a high technology plant of latest generation, where white cement and marble chips in different sizes are dosed, mixed and transformed through a vibro-compaction system, into large, rough blocks that measure 305x125x85cm and 305x140x85cm.

After 28 days the blocks reach the required seasoning time resulting in a durable and long-lasting material that can be cut into slabs, tiles, skirtings and cut to size.

All the material are available in different thicknesses: 2cm, 3cm, 4cm.



Technical information

Flexural strength

Flexural strength is the limit value of applied 3-point load that a specimen can withstand without reaching fracture. The value is expressed in $N/mm^2 = MPa$.

According to DIN EN 13748-1, the test performed on 4 specimens should give an average value $\geq 5.00 MPa$, and no value should be less than 4.00 MPa. The values of EUVAL® terrazzo comply the norm requirement.

Abrasion resistance

Abrasion resistance is the ability to resist the action of wear caused by walking, traffic intensity and rubbing by mechanical bodies (trolleys, etc.). The value is expressed in $cm^3/50cm^2$.

According to DIN EN 13748-1 if the test is carried out according to Böhme, the values should be $\leq 30 cm^3 / 50 cm^2$. Terrazzo materials, intended to be subjected to abrasive stresses, must fall into classes II or III (according to the table below). Class I may be required for materials intended to be subjected to special abrasive stresses. Abrasion resistance is classified into 3 classes (see Table 1):

Table 1. Abrasion resistance classes

Class	Maximum values for single test Volume loss in the test performed according to DIN 52108
I	18 $cm^3 / 50 cm^2$
II	20 $cm^3 / 50 cm^2$
III	26 $cm^3 / 50 cm^2$

EUVAL Terrazzo materials comply the hardness class I and II.

Water absorption

Water absorption is the amount of water a tile can absorb depending on the degree of porosity of the material. According to EN 13748-1, the test result should not exceed 8M.-%. The values of EUVAL[®] materials on untreated and unimpregnated materials are ≤ 8 M.-%

After impregnation (recommended after laying and complete drying of surfaces) the values can be between 2 - 2.5%.

Anti-slip classification

When planning a floor covering, it is particularly important to know the slip-resistance rating of a material, so as to know how to correctly choose the appropriate slip-resistance rating needed, in consideration of the environment in which the material will be laid.

The slip resistance of an EUVAL[®] terrazzo surface is performed according to the guidelines of EN 13748-1 according to DIN 51130 (Böhme).

The German standard "GERMAN RAMP TESTER" DIN 51130 describes the procedures for performing the slip test and in relation to the slipperiness of the material assigns a classification coefficient "R", ranging from R9 to R13 (see Table 2).

Table 2. Slip resistance classes

Classification	Inclination Angle	Surface	Intended Use
R9	Da 6° a 10°	Polished R9	Entrances, stairways and floors of public places
		Brushed R9	
R10	Da 10° a 19°	Polished R10	Kitchens, toilets, locker rooms and laundries
R11	Da 19° a 27°	Sanded R11	Warehouses and parking lots
R12	Da 27° a 35°		
R13	> 35°		

Fire resistance

EUVAL[®] terrazzo is non-flammable, and in case of fire it does not emit smoke or harmful substances. According to EN 13748-1 without any kind of test it is classified in fire class A1fl.

Specific weight

EUVAL[®] terrazzo can be produced in varying thicknesses, both in terms of centimeters and fractions of centimeters. Despite this, generally the slab is produced in three thickness sizes, shown here in Table 3. In general, the specific gravity of terrazzo under study is 2,600 kg/m³.

Table 3. Thicknesses and weights for the considered variants of EUVAL[®]

Thickness	kg / m ²
2 cm	52 kg/m ²
3 cm	78 kg/m ²
4 cm	104 kg/m ²

The product contains no hazardous substances and no substances of very high concern (SVHC) on the REACH Candidate List / published by the European Chemicals Agency in a concentration more than 0,1% (by unit weight).

LCA information

For the EPD declaration, the functional unit of matter and energy flows was referred to as:

**1 m² of terrazzo slab at different thicknesses:
2 cm - 3 cm - 4 cm thick**

Below the process flow is shown. The phase of extraction happens in quarries in Italy.

The process of phases A1-A3 is done in Euragglo s.r.l. factory in Lugo di Grezzana, or external companies, however located in the same location in Italy.

The phase of packing and shipment is also done in Euragglo s.r.l. factory in Lugo di Grezzana.

The data used refer to the calendar year 2021. The LCA study was carried out during the year 2022.

LCA phases

This EPD is of the “cradle to gate with options” type and includes the mandatory modules:

- *A1 - Raw materials*

This stage includes the production of the raw material required for the manufacture of an EUVAL[®] terrazzo slab. At this stage, the raw materials that make up the terrazzo block and a number of auxiliary materials for the processing stages of the same are purchased by Euragglo s.r.l. from company suppliers.

- *A2 – Transport*

The transport of raw materials to the EURAGGLO s.r.l. production site is characterized in this phase, with the exclusion of water used in the cementitious compound mix, for which supply no transport needs to be used. The transportation distance was calculated using Google Maps.

- *A3 – Manufacturing*

The processes included in the "core" A3 stage of the product considered are divided as shown below in Table 4.

Table 4. List of A3 production processes.

Process name	Code	N.	Activities included in the process
Input	A3	1	Raw material input
Production of the 305x125x90cm – 305x140x90cm block		2	Storage
		3	Mixing of raw materials with water
		4	Passing through two vibrating benches
		5	Drying
		6	Extraction from formwork by block tipping
		7	Showers
		8	Seasoning and storage on yard
		9	Internal transport of block
Semi-finished processing		10	Handling by overhead crane
		12	Handling in transfer cart
		13	Cutting in gang saw with diamond blades
		14	Transportation by overhead crane on A-frame
Floor processing		15	SOCOMAC line: transverse cutting, gripping with suction cups, polishing machine, longitudinal cutting, grouting
Packaging		16	Manual packing

○ *A4 - Downstream transport*

The stage includes transportation from Euragglo headquarters to the customer's destination. To calculate the average transportation scenario, all orders in the reference year (2021) were surveyed and the following data were analyzed and processed:

- the square meters sent per job order and the reference thickness to calculate the weight of the batch sent
- the destination (and thus distance) covered by each shipment
- the mode of shipment (truck or container)

- *C1 - Deconstruction/Demolition*
- *C2 - Transport to waste processing*
- *C3 - Waste processing*
- *C4 – Disposal*
- *D - Reuse/Recovery/Recycling potential*

The end-of-life phase includes dismantling (C1), transportation of the waste materials to the factory (C2), and any processes of reuse or transfer to end-of-life treatment (C3-C4).

The slabs, as a furniture product, are indeed reusable in any new installation, despite this is not an operation that is often done, due to the difficulty of removing the slabs in such a way that they do not break; therefore, the end-of-life scenario exemplified in the life cycle involves the recovery of the slab, but in the form of an inert material, possibly in the cementitious material category.

In fact, the product under consideration mainly involves two types of end-of-life treatment: an initial dismantling or demolition operation of the same and subsequent transport to treatment sites for materials recycling, or at the landfill as inert waste that cannot be reused. When a product with cement components reaches the end of its useful life, it can be reused, recycled, landfilled, or burned to produce energy.

Landfilling is currently the most common end-of-life route for aggregate products, due to the administrative and legal complexities of considering waste or scrap as by-products suitable for re-entry into the production cycle.

Although it is becoming increasingly common to recycle them, a conservative (worst case) approach was taken and therefore datasets corresponding, for slabs, to final waste disposal were selected.

Having to include within the study the end-of-life phases of the product (C1-C4), first the C1 phase, i.e., dismantling, was considered. The latter was considered insignificant, due to the fact that it does not involve actual dismantling, but possibly demolition of the building or part of the building in which the slabs are installed.

Regarding phase C2 and phase C4, i.e., the transportation of residual materials to the treatment site and the respective end-of-life treatment, the MUD 2021 of Euragglo s.r.l. was analysed to identify the waste streams, which are reported and described below:

- Production waste: this waste consists of parts of the terrazzo block that due to cutting issues and/or imperfections are discarded during processing steps.
- Sawmill sludge and cement dust waste: waste derived from the use of water within processing and cutting plants, which is collected and filtered through filter presses, the residue of which is then transported to a destination address in Grezzana (VR).
- Diamond heads: waste derived from the wear of diamond heads used for polishing slabs. According to primary data from the company, the discarded diamond heads consist of only the steel component, i.e., the actual "head," as the remaining abrasive component is completely consumed by use.
- Slab: the end-of-life treatment of slab is considered the same as the treatment of production waste, cement waste and the dry part of sawing sludge.

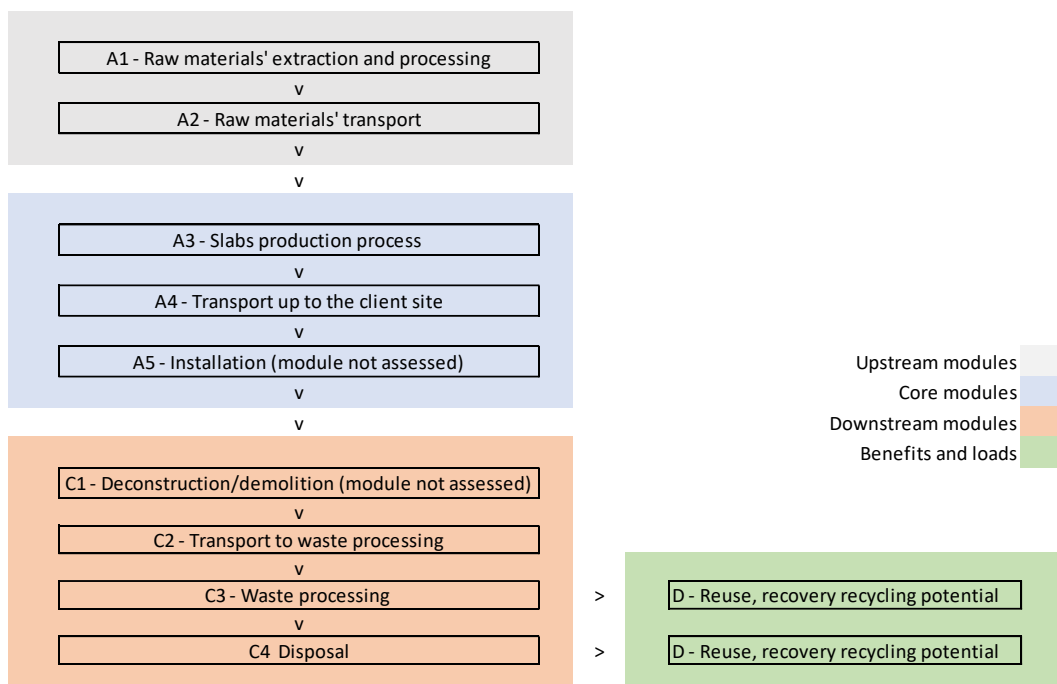


Figure 1. System diagram

Cut-off criteria

In accordance with the cut-off rule, the following were excluded from the assessment:

- the packaging of raw materials
- the electrical consumption of some of the auxiliary equipment for transporting the raw materials to the processing space and used for the packaging phase (forklifts and wheel loaders for handling the marble chips, for the slabs transport A-frame and for closing the wooden crates)
- the water consumption of some plants at the Via Domenico da Lugo 12 production site, which have a small influence on the percentage of water consumption of the plants, from the same production site, considered in this study (the plants considered are the cutting gang saw, the Socomac tiles production line, and the Donatoni tiles production line)
- the impacts derived from the use of filter presses for filtering production water
- the impacts derived from consumption related to lighting and heating/cooling of production and office sites, as well as impacts related to personnel.

Allocation procedures

In this study, some mass allocation procedures are considered, mainly for the following flows:

- Consumption of auxiliary materials (water, diamond heads, diesel and LPG for internal handling)
- Consumption of packaging materials (pallets, crates, polyethylene sheets, styrofoam, straps, seals, angle bars, slats)
- Consumption of energy carriers for block processing (electrical energy of equipment for various stages)
- Processing waste streams (cutting waste, sawing mud, diamond head remnants, cement dust).

Data quality

The data used for the environmental impact assessment are:

- Specific data collected at Euragglo s.r.l. site and referred to the year 2021 for the core activities (consumption, distances etc);
- Selected generic data for almost all processes used for the LCA model (datasets from Ecoinvent 3.8);
- Proxy data contribute to the final impacts is less than 5%.

Table 5. Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material 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
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X
Geography	IT	IT	IT	IT	-	-	-	-	-	-	-	-	-	IT	IT	IT	IT
Specific data used	> 90% GWP				-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	10 < X < 60%				-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	Not relevant				-	-	-	-	-	-	-	-	-	-	-	-	-

Content information

Table 6. Content information for raw materials

Component	Raw materials									
	Weight (kg)			Weight % (versus the product)			Biogenic material, weight (kg) And kg C/kg			
	2 cm	3 cm	4 cm	2 cm	3 cm	4 cm	2 cm	3 cm	4 cm	kg C / kg
Cement	7,099	10,649	14,199	13,65	13,65	13,65	1,05E-03	1,58E-03	2,10E-03	1,48E-04
Grit	41,66	62,49	83,32	80,12	80,12	80,12	1,11E-02	1,66E-02	2,22E-02	2,66E-04
Color Oxides	0,325	0,488	0,488	0,63	0,63	0,63	7,77E-04	1,17E-03	1,17E-03	2,39E-03
Fluidizer	0,025	0,037	0,037	0,05	0,05	0,05	7,90E-05	1,17E-04	1,17E-04	3,16E-03
Water	2,915	4,373	4,373	5,61	5,61	5,61	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Table 7. Content information for packaging materials (scenario 1, road)

Packaging materials – Scenario 1 (road)										
Component	Weight (kg)			Weight % (versus the product)			Biogenic material, weight (kg) And kg C/kg			
	2 cm	3 cm	4 cm	2 cm	3 cm	4 cm	2 cm	3 cm	4 cm	kg C / kg
Spruce paddle	0,55	0,76	1,1	76,31	87,37	87,37	2,15E-03	2,97E-03	4,30E-03	3,91E-03
Slats	0,02	0,03	0,05	3,2	3,67	3,67	1,43E-06	2,14E-06	3,57E-06	7,13E-05
Pre-cut polyethylene sheet	0,01	0,01	0,02	1,28	1,46	1,46	1,36E-07	1,36E-07	2,72E-07	1,36E-05
Styrofoam K/20	0,02	0,02	0,04	2,44	2,8	2,8	9,52E-10	9,52E-10	1,90E-09	4,76E-08
Strapping	0	0,01	0,01	0,66	0,75	0,75	0,00E+00	1,28E-07	1,28E-07	1,28E-05
Steel strap seals	0,00	0,00	0,00	0,15	0,17	0,17	0,00E+00	0,00E+00	0,00E+00	9,72E-05
Polyethylene TRT Caps	0,01	0,02	0,02	1,65	1,89	1,89	5,45E-08	1,09E-07	1,09E-07	5,45E-06
Cardboard corners	0,1	0,02	0,02	14,31	1,89	1,89	3,46E-06	6,92E-07	6,92E-07	3,46E-05

Table 8. Content information for packaging materials (scenario 2, sea)

Packaging materials – Scenario 2 (sea)										
Component	Weight (kg)			Weight % (versus the product)			Biogenic material, weight (kg) And kg C/kg			
	2 cm	3 cm	4 cm	2 cm	3 cm	4 cm	2 cm	3 cm	4 cm	kg C / kg
Spruce case	1,28	1,93	2,55	84,57	84,57	84,57	5,00E-03	7,55E-03	9,97E-03	3,91E-03
Slats	0,03	0,05	0,07	2,24	2,24	2,24	2,14E-06	3,57E-06	4,99E-06	7,13E-05
Pre-cut polyethylene sheet	0,01	0,02	0,03	0,89	0,89	0,89	1,36E-07	2,72E-07	4,08E-07	1,36E-05
Styrofoam K/20	0,03	0,04	0,05	1,71	1,71	1,71	1,43E-09	1,90E-09	2,38E-09	4,76E-08
Strapping	0,01	0,01	0,01	0,46	0,46	0,46	1,28E-07	1,28E-07	1,28E-07	1,28E-05
Steel strap seals	0	0	0	0,11	0,11	0,11	0,00E+00	0,00E+00	0,00E+00	9,72E-05
Cardboard corners	0,15	0,23	0,3	10,02	10,02	10,02	5,19E-06	7,96E-06	1,04E-05	3,46E-05

No dangerous substances from the candidate list of SVHC for Authorisation have been found among the products used.

Environmental Information

Potential environmental impact – mandatory indicators according to EN 15804

Table 7. Mandatory indicators for potential environmental impact – EUVAL® 2 cm thickness

Results per functional or declared unit									
Indicator	Unit	A1	A2	A3	Total A1-A3	A4	C2	C4	D
GWP-fossil	kg CO ₂ eq.	9,72E+00	9,23E-01	5,11E-01	1,12E+01	3,28E+00	2,22E-01	4,55E-01	-1,62E+00
GWP-biogenic	kg CO ₂ eq.	-1,43E+00	8,31E-04	3,41E-03	-1,42E+00	2,83E-03	1,99E-04	3,16E-03	-1,05E-01
GWP-luluc	kg CO ₂ eq.	4,64E-03	3,63E-04	3,86E-04	5,39E-03	1,33E-03	8,70E-05	3,52E-04	-3,22E-05
GWP-total	kg CO ₂ eq.	8,30E+00	9,24E-01	5,15E-01	9,74E+00	3,29E+00	2,22E-01	4,58E-01	-1,73E+00
ODP	kg CFC 11 eq.	8,65E-07	2,14E-07	1,14E-07	1,19E-06	7,56E-07	5,13E-08	1,02E-07	-9,20E-09
AP	mol H ⁺ eq.	4,08E-02	3,75E-03	4,13E-03	4,87E-02	1,68E-02	9,00E-04	3,77E-03	-2,85E-03
EP-freshwater	kg P eq.	1,38E-03	5,95E-05	1,24E-04	1,56E-03	2,08E-04	1,43E-05	1,15E-04	-1,79E-04
EP-marine	kg N eq.	1,17E-02	1,13E-03	1,54E-03	1,44E-02	4,83E-03	2,71E-04	1,41E-03	-6,81E-04
EP-terrestrial	mol N eq.	1,30E-01	1,23E-02	1,67E-02	1,59E-01	5,30E-02	2,96E-03	1,53E-02	-8,10E-03
POCP	kg NMVOC eq.	3,63E-02	3,78E-03	4,70E-03	4,47E-02	1,57E-02	9,07E-04	4,30E-03	-2,01E-03
ADP-minerals&metals*	kg Sb eq.	9,15E+01	1,40E+01	9,17E+00	1,15E+02	4,94E+01	3,35E+00	8,22E+00	-3,90E+00
ADP-fossil*	MJ	2,05E-05	3,21E-06	1,64E-06	2,54E-05	1,12E-05	7,71E-07	1,45E-06	-5,19E-06
WDP*	m ³	2,01E+00	4,18E-02	1,86E-01	2,24E+00	1,46E-01	1,00E-02	1,72E-01	-2,71E-02

Acronyms: GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; 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 (user) deprivation potential, deprivation-weighted water consumption

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

Table 8. Mandatory indicators for potential environmental impact – EUVAL® 3 cm thickness

Results per functional or declared unit									
Indicator	Unit	A1	A2	A3	Total A1-A3	A4	C2	C4	D
GWP-fossil	kg CO ₂ eq.	1,38E+01	1,38E+00	7,56E-01	1,60E+01	4,91E+00	3,28E-01	6,75E-01	-2,43E+00
GWP-biogenic	kg CO ₂ eq.	-1,89E+00	1,24E-03	5,05E-03	-1,88E+00	4,24E-03	2,95E-04	4,70E-03	-1,57E-01
GWP-luluc	kg CO ₂ eq.	6,59E-03	5,43E-04	5,71E-04	7,70E-03	1,99E-03	1,29E-04	5,22E-04	-4,75E-05
GWP-total	kg CO ₂ eq.	1,19E+01	1,38E+00	7,62E-01	1,41E+01	4,92E+00	3,29E-01	6,80E-01	-2,59E+00
ODP	kg CFC 11 eq.	1,20E-06	3,20E-07	1,69E-07	1,69E-06	1,13E-06	7,60E-08	1,51E-07	-1,36E-08
AP	mol H ⁺ eq.	5,84E-02	5,61E-03	6,11E-03	7,01E-02	2,51E-02	1,33E-03	5,59E-03	-4,25E-03
EP-freshwater	kg P eq.	1,93E-03	8,91E-05	1,84E-04	2,21E-03	3,11E-04	2,11E-05	1,70E-04	-2,67E-04
EP-marine	kg N eq.	1,70E-02	1,69E-03	2,28E-03	2,10E-02	7,23E-03	4,01E-04	2,09E-03	-1,02E-03
EP-terrestrial	mol N eq.	1,89E-01	1,85E-02	2,47E-02	2,32E-01	7,93E-02	4,39E-03	2,27E-02	-1,21E-02
POCP	kg NMVOC eq.	5,25E-02	5,66E-03	6,95E-03	6,51E-02	2,35E-02	1,34E-03	6,38E-03	-3,00E-03
ADP-minerals&metals*	kg Sb eq.	1,27E+02	2,09E+01	1,36E+01	1,61E+02	7,39E+01	4,96E+00	1,22E+01	-5,81E+00
ADP-fossil*	MJ	2,88E-05	4,81E-06	2,42E-06	3,60E-05	1,67E-05	1,14E-06	2,16E-06	-7,76E-06
WDP*	m ³	2,77E+00	6,26E-02	2,75E-01	3,11E+00	2,18E-01	1,49E-02	2,56E-01	-4,03E-02

Table 9. Mandatory indicators for potential environmental impact – EUVAL® 4 cm thickness

Results per functional or declared unit									
Indicator	Unit	A1	A2	A3	Total A1-A3	A4	C2	C4	D
GWP-fossil	kg CO ₂ eq.	1,81E+01	1,84E+00	1,00E+00	2,09E+01	6,56E+00	4,35E-01	8,95E-01	-3,24E+00
GWP-biogenic	kg CO ₂ eq.	-2,74E+00	1,66E-03	6,68E-03	-2,73E+00	5,66E-03	3,91E-04	6,23E-03	-2,09E-01
GWP-luluc	kg CO ₂ eq.	8,96E-03	7,23E-04	7,55E-04	1,04E-02	2,66E-03	1,71E-04	6,92E-04	-6,40E-05
GWP-total	kg CO ₂ eq.	1,53E+01	1,84E+00	1,01E+00	1,82E+01	6,56E+00	4,35E-01	9,02E-01	-3,45E+00
ODP	kg CFC 11 eq.	1,55E-06	4,26E-07	2,24E-07	2,20E-06	1,51E-06	1,01E-07	2,00E-07	-1,83E-08
AP	mol H ⁺ eq.	7,66E-02	7,48E-03	8,08E-03	9,21E-02	3,35E-02	1,76E-03	7,41E-03	-5,69E-03
EP-freshwater	kg P eq.	2,53E-03	1,19E-04	2,43E-04	2,89E-03	4,15E-04	2,80E-05	2,26E-04	-3,57E-04
EP-marine	kg N eq.	2,24E-02	2,25E-03	3,01E-03	2,77E-02	9,65E-03	5,32E-04	2,78E-03	-1,36E-03
EP-terrestrial	mol N eq.	2,50E-01	2,46E-02	3,27E-02	3,07E-01	1,06E-01	5,81E-03	3,01E-02	-1,62E-02
POCP	kg NMVOC eq.	6,95E-02	7,54E-03	9,20E-03	8,62E-02	3,14E-02	1,78E-03	8,45E-03	-4,02E-03
ADP-minerals&metals*	kg Sb eq.	1,65E+02	2,78E+01	1,79E+01	2,10E+02	9,86E+01	6,57E+00	1,62E+01	-7,78E+00
ADP-fossil*	MJ	3,80E-05	6,40E-06	3,21E-06	4,76E-05	2,23E-05	1,51E-06	2,86E-06	-1,04E-05
WDP*	m ³	3,61E+00	8,34E-02	3,64E-01	4,06E+00	2,91E-01	1,97E-02	3,39E-01	-5,40E-02

Potential environmental impact – additional mandatory and voluntary indicators

Table 10. Additional mandatory indicators and voluntary indicators – EUVAL® slab, 2, 3 and 4 cm thickness

Results per functional or declared unit										
Indicator	Unit	Thickness	A1	A2	A3	Total A1-A3	A4	C2	C4	D
GWP-GHG ¹	kg CO ₂ eq.	2 cm	9,61E+00	9,16E-01	5,06E-01	1,10E+01	3,26E+00	2,20E-01	4,50E-01	-1,62E+00
		3 cm	1,37E+01	1,37E+00	7,48E-01	1,58E+01	4,87E+00	3,26E-01	6,68E-01	-2,42E+00
		4 cm	1,79E+01	1,83E+00	9,89E-01	2,07E+01	6,50E+00	4,31E-01	8,86E-01	-3,23E+00

Use of resources

Table 11. Indicators for resources use – EUVAL® 2 cm thickness

Results per functional or declared unit										
Indicator	Unit	A1	A2	A3	Total A1-A3	A4	C2	C4	D	
PERE	MJ	2,71E+00	1,50E-01	3,13E-01	3,18E+00	5,23E-01	3,61E-02	2,88E-01	-1,15E+00	
PERM	MJ	2,90E+01	4,64E-02	6,04E-02	2,91E+01	1,62E-01	1,11E-02	5,53E-02	-1,27E-01	
PERT	MJ	3,17E+01	1,97E-01	3,73E-01	3,23E+01	6,84E-01	4,72E-02	3,44E-01	-1,27E+00	
PENRE	MJ	9,62E+01	1,48E+01	9,73E+00	1,21E+02	5,24E+01	3,56E+00	8,72E+00	-4,09E+00	
PENRM	MJ	1,85E+00	0,00E+00	0,00E+00	1,85E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	
PENRT	MJ	9,81E+01	1,48E+01	9,73E+00	1,23E+02	5,24E+01	3,56E+00	8,72E+00	-4,09E+00	
SM	kg	2,88E+01	0,00E+00	0,00E+00	2,88E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	
FW	m ³	5,59E-02	1,56E-03	5,40E-03	6,29E-02	5,42E-03	3,74E-04	5,00E-03	-3,07E-02	

Acronyms: 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; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

¹ This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO₂ is set to zero.

Table 12. Indicators for resources use – EUVAL® 3 cm thickness

Results per functional or declared unit									
Indicator	Unit	A1	A2	A3	Total A1-A3	A4	C2	C4	D
PERE	MJ	3,81E+00	2,25E-01	4,62E-01	4,50E+00	7,82E-01	5,35E-02	4,28E-01	-1,71E+00
PERM	MJ	3,87E+01	6,95E-02	8,94E-02	3,88E+01	2,42E-01	1,65E-02	8,21E-02	-1,90E-01
PERT	MJ	4,25E+01	2,95E-01	5,52E-01	4,33E+01	1,02E+00	7,00E-02	5,10E-01	-1,90E+00
PENRE	MJ	1,33E+02	2,22E+01	1,44E+01	1,70E+02	7,84E+01	5,27E+00	1,29E+01	-6,10E+00
PENRM	MJ	2,51E+00	0,00E+00	0,00E+00	2,51E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	1,36E+02	2,22E+01	1,44E+01	1,72E+02	7,84E+01	5,27E+00	1,29E+01	-6,10E+00
SM	kg	4,31E+01	0,00E+00	0,00E+00	4,31E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m ³	7,76E-02	2,33E-03	7,98E-03	8,79E-02	8,11E-03	5,53E-04	7,42E-03	-4,59E-02

Table 13. Indicators for resources use – EUVAL® 4 cm thickness

Results per functional or declared unit									
Indicator	Unit	A1	A2	A3	Total A1-A3	A4	C2	C4	D
PERE	MJ	4,35E+00	3,00E-01	6,12E-01	5,26E+00	1,04E+00	7,08E-02	5,67E-01	-2,29E+00
PERM	MJ	5,53E+01	9,26E-02	1,18E-01	5,55E+01	3,23E-01	2,19E-02	1,09E-01	-2,53E-01
PERT	MJ	5,96E+01	3,93E-01	7,30E-01	6,08E+01	1,37E+00	9,27E-02	6,76E-01	-2,54E+00
PENRE	MJ	1,73E+02	2,96E+01	1,90E+01	2,21E+02	1,05E+02	6,98E+00	1,72E+01	-8,15E+00
PENRM	MJ	3,60E+00	0,00E+00	0,00E+00	3,60E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	1,76E+02	2,96E+01	1,90E+01	2,25E+02	1,05E+02	6,98E+00	1,72E+01	-8,15E+00
SM	kg	3,14E+01	0,00E+00	0,00E+00	3,14E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m ³	1,01E-01	3,10E-03	1,06E-02	1,15E-01	1,08E-02	7,33E-04	9,84E-03	-6,13E-02

Waste production

Table 14. Indicators for waste production – EUVAL® 2 cm thickness

Results per functional or declared unit									
Indicator	Unit	A1	A2	A3	Total A1-A3	A4	C2	C4	D
Hazardous waste disposed – HW	kg	1,48E-04	3,65E-05	1,78E-05	2,02E-04	1,26E-04	8,75E-06	1,58E-05	-1,62E-06
Non-hazardous waste disposed – NHW	kg	0,00E+00	0,00E+00	1,99E+01	1,99E+01	0,00E+00	0,00E+00	5,20E+01	0,00E+00
Radioactive waste disposed - RW	kg	3,33E-04	9,44E-05	5,99E-05	4,88E-04	3,34E-04	2,27E-05	5,36E-05	-1,77E-05

Table 15. Indicators for waste production – EUVAL® 3 cm thickness

Results per functional or declared unit									
Indicator	Unit	A1	A2	A3	Total A1-A3	A4	C2	C4	D
Hazardous waste disposed – HW	kg	2,04E-04	5,46E-05	2,64E-05	2,85E-04	1,89E-04	1,30E-05	2,34E-05	-2,39E-06
Non-hazardous waste disposed – NHW	kg	0,00E+00	0,00E+00	2,84E+01	2,84E+01	0,00E+00	0,00E+00	7,80E+01	0,00E+00
Radioactive waste disposed - RW	kg	4,76E-04	1,41E-04	8,85E-05	7,06E-04	5,00E-04	3,36E-05	7,96E-05	-2,64E-05

Table 16. Indicators for waste production – EUVAL® 4 cm thickness

Results per functional or declared unit									
Indicator	Unit	A1	A2	A3	Total A1-A3	A4	C2	C4	D
Hazardous waste disposed – HW	kg	2,63E-04	7,27E-05	3,49E-05	3,71E-04	2,52E-04	1,72E-05	3,10E-05	-3,22E-06
Non-hazardous waste disposed – NHW	kg	0,00E+00	0,00E+00	3,67E+01	3,67E+01	0,00E+00	0,00E+00	1,04E+02	0,00E+00
Radioactive waste disposed - RW	kg	6,25E-04	1,88E-04	1,17E-04	9,31E-04	6,67E-04	4,45E-05	1,06E-04	-3,54E-05

Output flows

Table 17. Indicators for output flows – EUVAL® 2 cm thickness

Results per functional or declared unit									
Indicator	Unit	A1	A2	A3	Total A1-A3	A4	C2	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,20E+01	0,00E+00
Materials for energy recovery	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, thermal	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Table 17. Indicators for output flows – EUVAL® 3 cm thickness

Results per functional or declared unit									
Indicator	Unit	A1	A2	A3	Total A1-A3	A4	C2	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,80E+01	0,00E+00
Materials for energy recovery	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, thermal	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Table 17. Indicators for output flows – EUVAL® 4 cm thickness

Results per functional or declared unit									
Indicator	Unit	A1	A2	A3	Total A1-A3	A4	C2	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,04E+02	0,00E+00
Materials for energy recovery	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, thermal	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

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- UNI EN ISO 14040 - Environmental management - Life cycle assessment - Principles and framework
- UNI EN ISO 14044 - Environmental management - Life cycle assessment - Requirements and guidelines