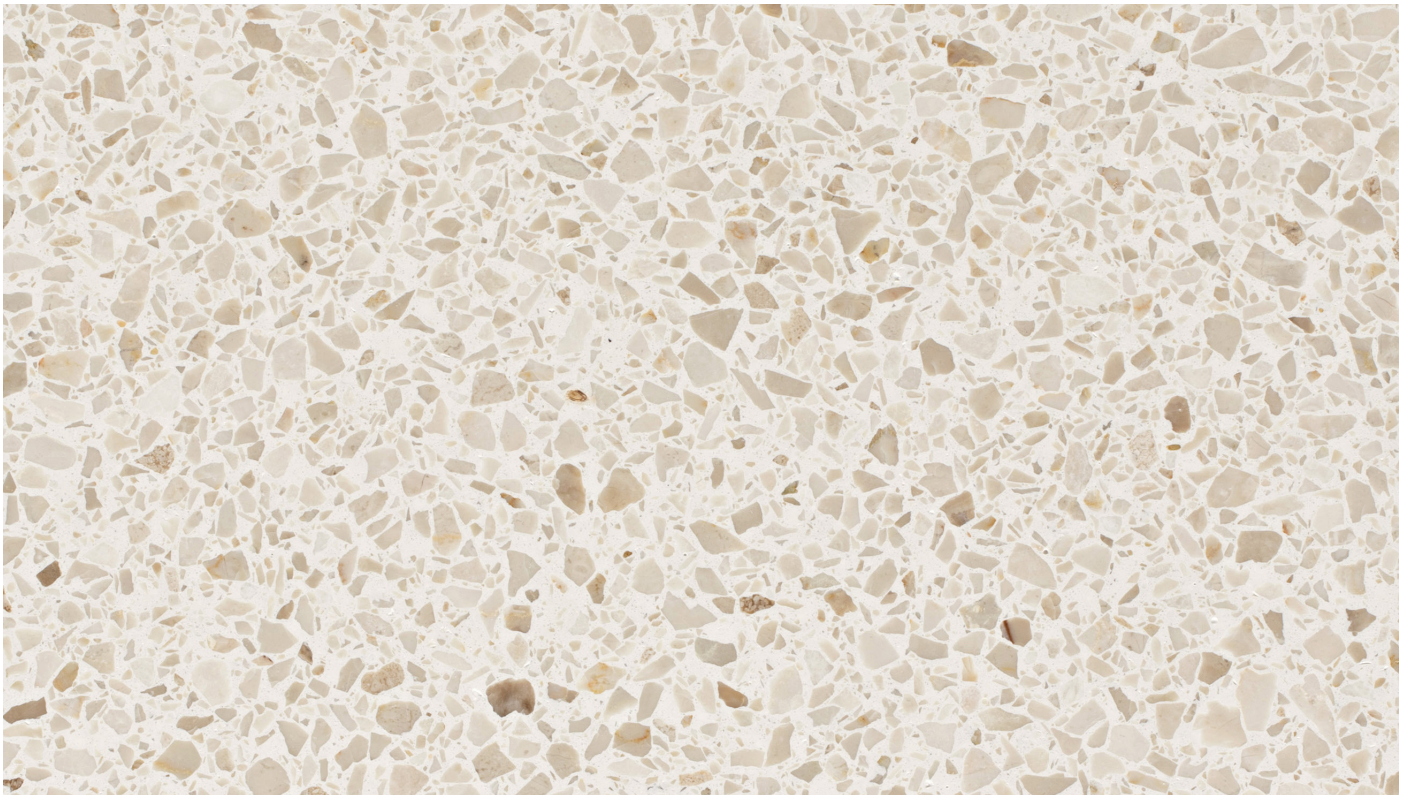
ENVIRONMENTAL PRODUCT DECLARATION

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

TERRAZZO SLABS

(1.5 cm, 2 cm, 2.5 cm, 3 cm, 4 cm)



Programme:	>	The International EPD® System (www.environdec.com)
Programme operator:	>	EPD International AB
EPD registration number:	>	S-P-06626
Publication date:	>	2022-09-08
Valid until:	>	2027-09-07

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subjected 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

E-mail: info@environdec.com

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

Product category rules (PCR):
PCR 2019:14 Construction products, version 1.11
Product Category Rules for concrete and concrete elements (UNI EN 16757: 2017)

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. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact.

Independent third-party verification of the declaration and data, according to ISO 14025:2006:
■ External
☐ Internal
covering
☐ EPD process certification
■ EPD verification

Third party verifier:
Certiquality s.r.l.
Accredited by: ACCREDIA. n. 003Hrev17

Procedure for follow-up during EPD validity involves third party verifier:
■ Yes
☐ No

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

2. COMPANY INFORMATION

OWNER OF THE EPD

Agglotech SpA, via Monte Santa Viola 16, Verona (Italy).

DESCRIPTION OF THE ORGANISATION

Agglotech SpA is Europe's largest producer of terrazzo. It is our mission to promote the use of marble-cement agglomerates as a versatile, natural cladding material that provides excellent levels of performance. We invest constantly in innovation and in our plant and equipment because we believe that improving existing products and developing new ones is essential in order to maintain the highest quality standards in our marble-cement.

CERTIFICATIONS

Agglotech meets the highest quality standards and obtained the following certifications:
- TÜV LGA, technical certification following the EN 13748 standard requirements.
- CE mark, certifying compliance with applicable European Community standards.
- Indoor Advantage Gold, certifying interior products for low VOC emissions.

3. PRODUCT INFORMATION

PRODUCT NAME

Marble-cement agglomerate semi-finished Terrazzo slabs.

PRODUCT IDENTIFICATION

This EPD is based on a single product which can be produced with 5 different thicknesses; considering that the impact indicators do not fall into the +/- 10% limit, the following thicknesses are disclosed:

TERRAZZO SLABS	
Thickness (cm)	Weight slab 253x142 (kg)
1,2	112
2	187
2,5	234
3	280
4	374

PRODUCT DESCRIPTION

Terrazzo slabs are cut from marble-cement blocks and then transformed into finished products or sold as semi-finished. They are made of marble aggregate, Portland cement, water, additives (a mix of ethoxylated alcohol and other organic chemicals) and pigments, once the slabs are cut from the marble block, they are polished and treated with protective water and stain repellent. The production process is performed in Grezzana and Marzana production sites.

Agglotech is able to meet a diverse set of needs and develop custom-made products, therefore Terrazzo slabs may be provided with different finishes: honed, polished, brushed or brush-hammered.

UN CPC CODE

375 Articles of concrete, cement and plaster.

GEOGRAPHICAL REGION

Global.
(EU for Module A1-A2 and IT for Module A3)

PRODUCT TECHNICAL FEATURES

The products meet requirements defined by the European standard EN 13748: 2005 on terrazzo tiles.

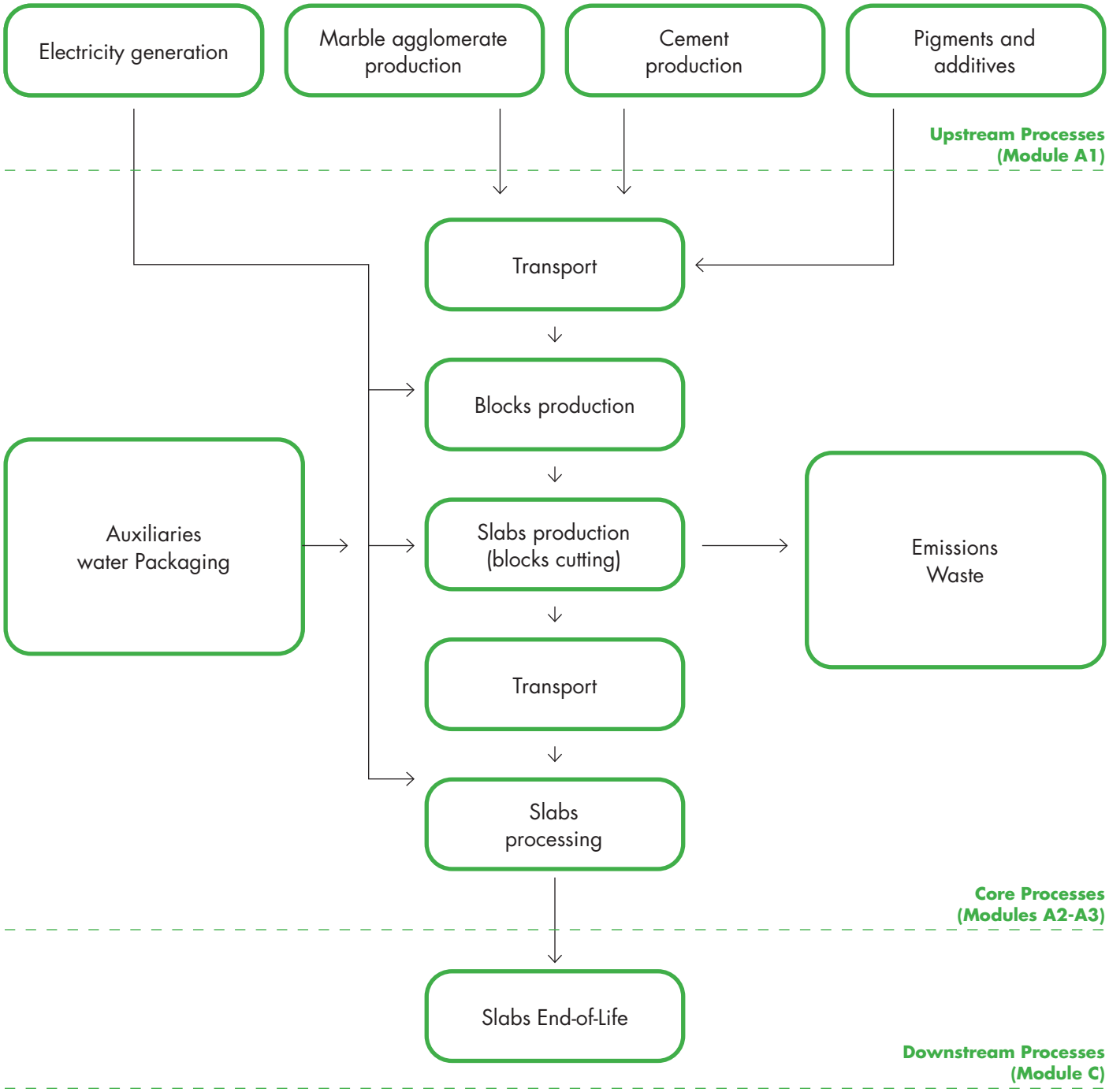
PRODUCTION PROCESS

The production process of marble aggregate slabs covered by this EPD is organised as follow:

RAW MATERIAL COLLECTION	More than 99% of the raw materials used in the production process in represented by marble grit, Portland cement and water. Additives and pigments are added in lower percentages. Most of raw materials are produced in Italy, with some exception from other European Countries. Marble grit is produced by local suppliers with different sizes and colours enabling the widest possible customization of the final product. Portland cement is added as versatile, natural binding material, avoiding the use of resins.
BLOCK PRODUCTION	All raw materials are mixed inside a mould, placed on a vibrating platform to reach the right density and shape, let solidify and then wrapped in a protective film and left to season for at least 28 days. Throughout this seasoning process and before the cut, all blocks undergo strict quality controls.
SLABS PRODUCTION	Once seasoned the blocks are cut into slabs of different thicknesses according to needs. This process is realized through metal saw blades with diamond bits, and the aid of water harvested from rain.
SLABS PROCESSING	The slabs are transported to a second production site where they are calibrated to reach a homogeneous thickness, polished a first time through the use of abrasive stones, treated with a resin to fill any possible imperfection, polished a second time to remove the exceeding and unnecessary resin and finally treated with a water and spray repellent. All the water and resin used in the process are recovered with an automatic system and re-used. Once ready, a plastic film is applied on one side of each slab to prevent any damage.

The following figure is a graphical representation of the system boundaries of the study.

Figure 1. System boundaries



4. LCA INFORMATION

FUNCTIONAL UNIT	1 m2 of polished and superficially treated semi-finished slab.
REFERENCE SERVICE LIFE (RSL)	Not applicable.
TEMPORAL REPRESENTATIVENESS	Primary data relating to the production facilities refer to period 01/10/2020 – 30/09/2021.
DATABASE AND LCA SOFTWARE	Ecoinvent 3.7.1 and Simapro 9.2
SYSTEM BOUNDARIES	From cradle to gate + module C1-C4 and module D
EXCLUDED LIFE CYCLE PHASES	Being a semi-finished product, Modules A4-A5 and Module B are not included in the analysis.
ALLOCATION	Allocations regarding the input flows (production of marble agglomerate) were made on an economic basis.
CUT-OFF	In accordance with EN 15804, a minimum of 95% of the total mass and energy flows per module has been included.
ELECTRIC MIX (A1-A3)	Italian residual mix.
EXCLUSIONS	The analysis does not include administrative activities, workers business travels, cleaning activities, construction of machinery and factories.
DATA QUALITY	The Data Quality assessment was performed following the instructions of the standard EN 15804: 2021, evaluating the geographical, technical and temporal representativeness of all data used. The detailed assessment can be found in the LCA supporting study.
TECHNICAL SUPPORT FOR THE LCA	Ergo srl, spin-off of Sant'Anna School of Advanced Studies.

	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	Deconstruction 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	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	EU	EU	IT	-									GLO	GLO	GLO	GLO	GLO
Specific data	>90%																
Variation – Products	Not relevant																
Variation – Sites	Not relevant																

A1 – A3 PRODUCT STAGE

A1 – RAW MATERIALS SUPPLY

The slab is mainly composed of marble grit and cement with lower percentages of additives, water and pigments. Marble grit is produced from marble left fragments and from quarry waste, generated during the marble block production. These materials are collected and grinded at different sizes and then transported to Agglotech production site. Most of raw materials are produced in Italy, with the exception of a small percentage of marble grit coming from Hungary, part of pigments and additives. The module includes the production of all raw materials and the generation of electricity needed for the production processes of all Agglotech facilities.

A2 – TRANSPORT

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

A3 – MANUFACTURING

The module includes the manufacturing activities of the marble agglomerate slabs at Agglotech facilities (blocks production, slabs cut and slabs polishing), the production and transportation of packaging materials and ancillary materials and the transport and treatment of production waste.

C1 – C4 END OF LIFE STAGE

C1 – DECONSTRUCTION, DEMOLITION
The deconstruction activities and the removal phase are included in this study.

C2 – TRANSPORT
This module includes the transportation of discarded/demolished slabs to a recycling or a disposal place.

C3 – WASTE PROCESSING
This module includes the treatment of waste coming from marble agglomerate slabs; particularly the percentage intended for recycling. The scenario is based on ISO 17160: 2019 indications.

C4 – DISPOSAL
This module includes the treatment of waste coming from marble agglomerate slabs; particularly the percentage intended for landfill disposal. The scenario is based on ISO 17160: 2019 indications.

D BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY

REUSE, RECOVERY, RECYCLING POTENTIAL
Module D "assesses the impact of the net flows of recovered materials (recycled or reused) from the life cycle stages A to C […], except those which have been allocated as co-product in module A1-3" (PCR 2019: 14, version 1.11). In this EPD "Loads and Benefits from export of secondary materials" (net environmental benefits from recycling activities) and "Loads and Benefits from export of energy as a result of landfilling" (net environmental benefits from energy recovery) are considered; the latter is equal to 0 since no data on LHV (Low Heating Value) for construction waste are available.

5. CONTENT DECLARATION

The main components of a slab are marble agglomerate, cement and water; mixed with low percentages of additives and pigments.
The packaging material is a plastic film applied over the slabs' surface.
Marble agglomerate slabs do not contain substances with high degree of concern SHVC contemplated in the ECHA Candidate List in concentrations greater than 0.1% by mass.
The marble agglomerate slabs' composition is shown in the following table:

COMPONENTS	WEIGHT %	
	AVERAGE VALUE	VARIABILITY
Marble agglomerate	79,51%	-
Portland Cement	11,06%	-
Water	8,88%	-
Additives	0,41%	-
Pigments	0,13%	-

The packaging weight refers to the total amount of plastic film used for products distribution in the reference period. The slabs' total weight is calculated es an estimation considering the total sqm produced and the average weight of a slab.

PACKAGING MATERIALS	WEIGHT (KG)	WEIGHT (% VS THE PRODUCT)
LDPE	31.915,00	0,09%

CORE ENVIRONMENTAL IMPACT INDICATORS – 1,2 cm SLAB

Indicators		Unit	A1	A2	A3	C1	C2	C3	C4	D
Global Warming Potential **(GWP)**	IPCC GWP*	Kg CO_2 eq	6,46E+00	1,05E-01	8,09E-01	1,01E-01	2,60E-01	0	-3,34E-01	-2,55E+00
	Fossil	Kg CO_2 eq	6,53E+00	1,06E-01	8,20E-01	1,02E-01	2,62E-01	0	-3,33E-01	-2,51E+00
	Biogenic	Kg CO_2 eq	2,54E-01	2,51E-04	7,15E-04	8,08E-05	5,69E-04	0	2,33E-04	-8,52E-02
	Land use and transformation	Kg CO_2 eq	4,36E-03	3,67E-05	3,33E-04	8,14E-06	9,17E-05	0	1,07E-05	-1,14E-03
	TOTAL	Kg CO_2 eq	6,79E+00	1,06E-01	8,21E-01	1,03E-01	2,63E-01	0	-3,33E-01	-2,60E+00
Depletion potential of the stratospheric ozone layer (**ODP**)		Kg CFC 11 eq	6,48E-07	2,41E-08	1,66E-07	2,21E-08	5,86E-08	0	1,98E-08	-1,12E-07
Acidification potential (**AP**)		mol H^+ eq	2,38E-02	4,73E-04	5,75E-03	1,07E-03	1,32E-03	0	4,26E-04	-9,05E-03
Eutrophication potential (**EP-freshwater**)		Kg P eq	1,13E-03	7,11E-06	1,13E-03	3,09E-06	1,91E-05	0	3,53E-06	-4,23E-04
Eutrophication potential (**EP-marine**)		Kg N eq.	5,70E-03	1,39E-04	5,70E-03	4,74E-04	4,55E-04	0	1,55E-04	-2,35E-03
Eutrophication potential, Accumulated Exceedance (**EP-terrestrial**)		Mol N eq.	6,18E-02	1,52E-03	6,18E-02	5,19E-03	4,97E-03	0	1,69E-03	-2,55E-02
Formation potential of tropospheric ozone (**POCP**)		kg NMVOC eq.	1,90E-02	4,60E-04	6,78E-03	1,43E-03	1,41E-03	0	4,88E-04	-6,66E-03
Abiotic depletion potential – Elements (**ADP-el**)[1]		kg Sb eq.	2,45E-05	3,81E-07	1,51E-05	4,14E-08	9,38E-07	0	9,22E-08	-7,62E-06
Abiotic depletion potential – Fossil fuels (**ADP-fossil**)[1]		MJ, net calorific value	7,06E+01	1,60E+00	1,62E+01	1,41E+00	3,95E+00	0	1,33E+00	-1,56E+01
Water deprivation potential (**WDP**)[1]		m3 world eq. deprived	1,28E+00	4,56E-03	1,69E+00	2,03E-03	1,22E-02	0	3,29E-02	-2,03E-01

1: 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.

ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS – 1,2 cm SLAB

Indicators	Unit	A1	A2	A3	C1	C2	C3	C4	D
Potential incidence of disease due to P emissions (**PM**)	Disease incidence	3,16E-06	7,15E-09	1,21E-07	1,52E-07	1,88E-08	0	8,76E-09	-9,21E-09
Potential Human exposure efficiency relative to U235 (**IRP**)[2]	kBq U235 ep.	5,35E-01	8,37E-03	7,64E-02	6,42E-03	1,94E-02	0	6,24E-03	-8,89E-02
Potential Comparative Toxic Unit for ecosystems (**ETP-fw**)[3]	CTUe	7,13E+01	1,22E+00	1,21E+01	8,03E-01	3,19E+00	0	7,80E-01	-5,06E+01
Potential Comparative Toxic Unit for humans (**HTP-c**)[3]	CTUh	3,87E-09	4,43E-11	5,03E-10	3,94E-11	1,08E-10	0	2,27E-11	-7,96E-10
Potential Comparative Toxic Unit for humans (**HTP-nc**)[3]	CTUh	5,07E-08	1,22E-09	8,12E-09	5,70E-10	3,09E-09	0	4,24E-10	-2,05E-08
Potential soil quality index (**SQP**)[3]	dimensionless	2,77E+01	1,10E+00	1,09E+01	1,83E-01	2,71E+00	0	2,88E+00	-3,41E+01

2: 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.

3: 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 PARAMETERS – 1,2 cm SLAB

Indicators	Unit	A1	A2	A3	C1	C2	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ, net calorific value	1,01E+01	2,16E-02	5,55E-01	7,30E-03	4,91E-02	0	1,82E-02	-2,38E+00
Use of renewable primary energy resources used as raw materials	MJ, net calorific value	7,51E-04	4,60E-06	8,98E-05	1,57E-06	1,16E-05	0	7,74E-06	-5,18E-04
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ, net calorific value	1,01E+01	2,16E-02	5,56E-01	7,30E-03	4,91E-02	0	1,82E-02	-2,39E+00
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ, net calorific value	7,06E+01	1,60E+00	1,62E+01	1,41E+00	3,95E+00	0	1,33E+00	-1,56E+01
Use of non-renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0	0	0
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ, net calorific value	7,06E+01	1,60E+00	1,62E+01	1,41E+00	3,95E+00	0	1,33E+00	-1,56E+01
Use of Secondary material	kg	0	0	0	0	0	0	0	0
Use of Renewable secondary fuels	MJ, net calorific value	0	0	0	0	0	0	0	0
Use of Non-renewable secondary fuels	MJ, net calorific value	0	0	0	0	0	0	0	0
Net use of fresh water	m3	3,44E-02	1,44E-04	4,04E-02	7,06E-05	3,28E-04	0	1,50E-03	4,24E-02

WASTE PRODUCTION – 1,2 cm SLAB

Indicators	Unit	A1	A2	A3	C1	C2	C3	C4	D
Hazardous waste disposed	kg	1,56E-04	4,14E-06	2,86E-05	3,80E-06	1,03E-05	0	1,72E-06	-1,98E-05
Non-hazardous waste disposed	kg	8,94E-01	7,61E-02	2,22E+01	1,70E-03	1,88E-01	0	9,36E+00	-2,12E-01
Radioactive waste disposed	kg	2,68E-04	1,10E-05	7,93E-05	9,80E-06	2,65E-05	0	8,91E-06	-6,02E-05

OUTPUT FLOWS – 1,2 cm SLAB

Indicators	Unit	A1	A2	A3	C1	C2	C3	C4	D
Components for reuse	kg	0	0	0	0	0	0	0	0
Material for recycling	kg	0	0	2,62E-03	0	0	2,18E+01	0	0
Materials for energy recovery	kg	0	0	4,45E-04	0	0	0	0	0
Exported energy, electricity	MJ per energy carrier	0	0	8,00E-03	0	0	0	0	0
Exported energy, thermal	MJ per energy carrier	0	0	8,00E-03	0	0	0	0	0

CORE ENVIRONMENTAL IMPACT INDICATORS – 2 cm SLAB

Indicators		Unit	A1	A2	A3	C1	C2	C3	C4	D
Global Warming Potential **(GWP)**	IPCC GWP*	Kg CO_2 eq	9,84E+00	1,74E-01	8,32E-01	1,69E-01	4,35E-01	0	-5,58E-01	-4,26E+00
	Fossil	Kg CO_2 eq	9,94E+00	1,76E-01	8,43E-01	1,71E-01	4,38E-01	0	-5,56E-01	-4,19E+00
	Biogenic	Kg CO_2 eq	4,07E-01	4,16E-04	7,58E-04	1,35E-04	9,49E-04	0	3,90E-04	-1,42E-01
	Land use and transformation	Kg CO_2 eq	7,03E-03	6,08E-05	3,39E-04	1,36E-05	1,53E-04	0	1,79E-05	-1,91E-03
	TOTAL	Kg CO_2 eq	1,04E+01	1,76E-01	8,44E-01	1,71E-01	4,39E-01	0	-5,56E-01	-4,33E+00
Depletion potential of the stratospheric ozone layer (**ODP**)		Kg CFC 11 eq	9,64E-07	3,99E-08	1,71E-07	3,69E-08	9,79E-08	0	3,31E-08	-1,87E-07
Acidification potential (**AP**)		mol H^+ eq	3,56E-02	7,85E-04	5,94E-03	1,78E-03	2,20E-03	0	7,11E-04	-1,51E-02
Eutrophication potential (**EP-freshwater**)		Kg P eq	1,62E-03	1,18E-05	1,26E-04	5,17E-06	3,18E-05	0	5,89E-06	-7,06E-04
Eutrophication potential (**EP-marine**)		Kg N eq.	8,79E-03	2,31E-04	2,19E-03	7,91E-04	7,60E-04	0	2,58E-04	-3,92E-03
Eutrophication potential, Accumulated Exceedance (**EP-terrestrial**)		Mol N eq.	9,59E-02	2,52E-03	2,38E-02	8,66E-03	8,30E-03	0	2,83E-03	-4,25E-02
Formation potential of tropospheric ozone (**POCP**)		kg NMVOC eq.	2,89E-02	7,62E-04	7,02E-03	2,38E-03	2,36E-03	0	8,14E-04	-1,11E-02
Abiotic depletion potential – Elements (**ADP-el**)[1]		kg Sb eq.	3,31E-05	6,31E-07	1,52E-05	6,91E-08	1,57E-06	0	1,54E-07	-1,27E-05
Abiotic depletion potential – Fossil fuels (**ADP-fossil**)[1]		MJ, net calorific value	1,02E+02	2,66E+00	1,66E+01	2,35E+00	6,59E+00	0	2,22E+00	-2,61E+01
Water deprivation potential (**WDP**)[1]		m3 world eq. deprived	1,79E+00	7,55E-03	1,78E+00	3,39E-03	2,03E-02	0	5,50E-02	-3,40E-01

1: 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.

ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS – 2 cm SLAB

Indicators	Unit	A1	A2	A3	C1	C2	C3	C4	D
Potential incidence of disease due to P emissions (**PM**)	Disease incidence	5,25E-06	1,18E-08	1,26E-07	2,54E-07	3,14E-08	0	1,46E-08	-1,54E-08
Potential Human exposure efficiency relative to U235 (**IRP**)[2]	kBq U235 ep.	7,63E-01	1,39E-02	7,82E-02	1,07E-02	3,24E-02	0	1,04E-02	-1,48E-01
Potential Comparative Toxic Unit for ecosystems (**ETP-fw**)[3]	CTUe	1,04E+02	2,03E+00	1,24E+01	1,34E+00	5,33E+00	0	1,30E+00	-8,45E+01
Potential Comparative Toxic Unit for humans (**HTP-c**)[3]	CTUh	5,32E-09	7,35E-11	5,12E-10	6,58E-11	1,80E-10	0	3,78E-11	-1,33E-09
Potential Comparative Toxic Unit for humans (**HTP-nc**)[3]	CTUh	7,45E-08	2,02E-09	8,29E-09	9,52E-10	5,16E-09	0	7,08E-10	-3,42E-08
Potential soil quality index (**SQP**)[3]	dimensionless	3,94E+01	1,82E+00	1,10E+01	3,05E-01	4,52E+00	0	4,80E+00	-5,69E+01

2: 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.

3: 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 PARAMETERS – 2 cm SLAB

Indicators	Unit	A1	A2	A3	C1	C2	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ, net calorific value	1,34E+01	3,58E-02	5,62E-01	1,22E-02	8,19E-02	0	3,04E-02	-3,98E+00
Use of renewable primary energy resources used as raw materials	MJ, net calorific value	1,12E-03	7,61E-06	9,09E-05	2,63E-06	1,93E-05	0	1,29E-05	-8,65E-04
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ, net calorific value	1,34E+01	3,58E-02	5,62E-01	1,22E-02	8,19E-02	0	3,04E-02	-3,98E+00
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ, net calorific value	1,02E+02	2,66E+00	1,66E+01	2,35E+00	6,59E+00	0	2,22E+00	-2,61E+01
Use of non-renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0	0	0
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ, net calorific value	1,02E+02	2,66E+00	1,66E+01	2,35E+00	6,59E+00	0	2,22E+00	-2,61E+01
Use of Secondary material	kg	0	0	0	0	0	0	0	0
Use of Renewable secondary fuels	MJ, net calorific value	0	0	0	0	0	0	0	0
Use of Non-renewable secondary fuels	MJ, net calorific value	0	0	0	0	0	0	0	0
Net use of fresh water	m3	4,90E-02	2,38E-04	4,24E-02	1,18E-04	5,47E-04	0	2,50E-03	7,08E-02

WASTE PRODUCTION – 2 cm SLAB

Indicators	Unit	A1	A2	A3	C1	C2	C3	C4	D
Hazardous waste disposed	kg	2,11E-04	6,85E-06	2,94E-05	6,34E-06	1,72E-05	0	2,87E-06	-3,31E-05
Non-hazardous waste disposed	kg	1,45E+00	1,26E-01	2,22E+01	2,83E-03	3,14E-01	0	1,56E+01	-3,55E-01
Radioactive waste disposed	kg	4,07E-04	1,82E-05	8,15E-05	1,64E-05	4,42E-05	0	1,49E-05	-1,00E-04

OUTPUT FLOWS – 2 cm SLAB

Indicators	Unit	A1	A2	A3	C1	C2	C3	C4	D
Components for reuse	kg	0	0	0	0	0	0	0	0
Material for recycling	kg	0	0	2,71E-03	0	0	3,65E+01	0	0
Materials for energy recovery	kg	0	0	4,60E-04	0	0	0	0	0
Exported energy, electricity	MJ per energy carrier	0	0	8,28E-03	0	0	0	0	0
Exported energy, thermal	MJ per energy carrier	0	0	8,28E-03	0	0	0	0	0

CORE ENVIRONMENTAL IMPACT INDICATORS – 2,5 cm SLAB

Indicators		Unit	A1	A2	A3	C1	C2	C3	C4	D
Global Warming Potential **(GWP)**	IPCC GWP*	Kg CO_2 eq	1,20E+01	2,18E-01	8,46E-01	2,12E-01	5,44E-01	0	-6,98E-01	-5,33E+00
	Fossil	Kg CO_2 eq	1,21E+01	2,19E-01	8,57E-01	2,14E-01	5,48E-01	0	-6,96E-01	-5,24E+00
	Biogenic	Kg CO_2 eq	5,03E-01	5,20E-04	7,85E-04	1,69E-04	1,19E-03	0	4,88E-04	-1,78E-01
	Land use and transformation	Kg CO_2 eq	8,71E-03	7,59E-05	3,42E-04	1,70E-05	1,92E-04	0	2,24E-05	-2,39E-03
	TOTAL	Kg CO_2 eq	1,26E+01	2,20E-01	8,58E-01	2,14E-01	5,49E-01	0	-6,96E-01	-5,42E+00
Depletion potential of the stratospheric ozone layer (**ODP**)		Kg CFC 11 eq	1,16E-06	4,99E-08	1,74E-07	4,62E-08	1,22E-07	0	4,14E-08	-2,34E-07
Acidification potential (**AP**)		mol H^+ eq	4,30E-02	9,80E-04	6,05E-03	2,23E-03	2,76E-03	0	8,89E-04	-1,89E-02
Eutrophication potential (**EP-freshwater**)		Kg P eq	1,93E-03	1,47E-05	1,27E-04	6,46E-06	3,99E-05	0	7,37E-06	-8,83E-04
Eutrophication potential (**EP-marine**)		Kg N eq.	1,07E-02	2,88E-04	2,24E-03	9,90E-04	9,51E-04	0	3,23E-04	-4,90E-03
Eutrophication potential, Accumulated Exceedance (**EP-terrestrial**)		Mol N eq.	1,17E-01	3,15E-03	2,44E-02	1,08E-02	1,04E-02	0	3,54E-03	-5,32E-02
Formation potential of tropospheric ozone (**POCP**)		kg NMVOC eq.	3,51E-02	9,52E-04	7,17E-03	2,98E-03	2,96E-03	0	1,02E-03	-1,39E-02
Abiotic depletion potential – Elements (**ADP-el**)[1]		kg Sb eq.	3,86E-05	7,88E-07	1,52E-05	8,65E-08	1,96E-06	0	1,93E-07	-1,59E-05
Abiotic depletion potential – Fossil fuels (**ADP-fossil**)[1]		MJ, net calorific value	1,22E+02	3,32E+00	1,68E+01	2,94E+00	8,25E+00	0	2,78E+00	-3,26E+01
Water deprivation potential (**WDP**)[1]		m3 world eq. deprived	2,11E+00	9,43E-03	1,84E+00	4,25E-03	2,54E-02	0	6,88E-02	-4,25E-01

1: 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.

ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS – 2,5 cm SLAB

Indicators	Unit	A1	A2	A3	C1	C2	C3	C4	D
Potential incidence of disease due to P emissions (**PM**)	Disease incidence	6,56E-06	1,48E-08	1,28E-07	3,17E-07	3,92E-08	0	1,83E-08	-1,92E-08
Potential Human exposure efficiency relative to U235 (**IRP**)[2]	kBq U235 ep.	9,06E-01	1,73E-02	7,93E-02	1,34E-02	4,06E-02	0	1,30E-02	-1,86E-01
Potential Comparative Toxic Unit for ecosystems (**ETP-fw**)[3]	CTUe	1,24E+02	2,53E+00	1,25E+01	1,68E+00	6,67E+00	0	1,63E+00	-1,06E+02
Potential Comparative Toxic Unit for humans (**HTP-c**)[3]	CTUh	6,23E-09	9,17E-11	5,18E-10	8,23E-11	2,25E-10	0	4,73E-11	-1,66E-09
Potential Comparative Toxic Unit for humans (**HTP-nc**)[3]	CTUh	8,93E-08	2,53E-09	8,40E-09	1,19E-09	6,46E-09	0	8,86E-10	-4,28E-08
Potential soil quality index (**SQP**)[3]	dimensionless	4,68E+01	2,27E+00	1,11E+01	3,82E-01	5,65E+00	0	6,01E+00	-7,12E+01

2: 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.

3: 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 PARAMETERS – 2,5 cm SLAB

Indicators	Unit	A1	A2	A3	C1	C2	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ, net calorific value	1,55E+01	4,46E-02	5,66E-01	1,52E-02	1,03E-01	0	3,81E-02	-4,98E+00
Use of renewable primary energy resources used as raw materials	MJ, net calorific value	1,35E-03	9,51E-06	9,16E-05	3,29E-06	2,42E-05	0	1,62E-05	-1,08E-03
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ, net calorific value	1,55E+01	4,46E-02	5,66E-01	1,52E-02	1,03E-01	0	3,81E-02	-4,98E+00
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ, net calorific value	1,22E+02	3,32E+00	1,68E+01	2,94E+00	8,25E+00	0	2,78E+00	-3,26E+01
Use of non-renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0	0	0
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ, net calorific value	1,22E+02	3,32E+00	1,68E+01	2,94E+00	8,25E+00	0	2,78E+00	-3,26E+01
Use of Secondary material	kg	0	0	0	0	0	0	0	0
Use of Renewable secondary fuels	MJ, net calorific value	0	0	0	0	0	0	0	0
Use of Non-renewable secondary fuels	MJ, net calorific value	0	0	0	0	0	0	0	0
Net use of fresh water	m3	5,81E-02	2,98E-04	4,36E-02	1,47E-04	6,85E-04	0	3,13E-03	8,86E-02

WASTE PRODUCTION – 2,5 cm SLAB

Indicators	Unit	A1	A2	A3	C1	C2	C3	C4	D
Hazardous waste disposed	kg	2,46E-04	8,56E-06	2,99E-05	7,93E-06	2,16E-05	0	3,59E-06	-4,15E-05
Non-hazardous waste disposed	kg	1,80E+00	1,57E-01	2,22E+01	3,55E-03	3,93E-01	0	1,95E+01	-4,44E-01
Radioactive waste disposed	kg	4,95E-04	2,27E-05	8,28E-05	2,05E-05	5,53E-05	0	1,86E-05	-1,26E-04

OUTPUT FLOWS – 2,5 cm SLAB

Indicators	Unit	A1	A2	A3	C1	C2	C3	C4	D
Components for reuse	kg	0	0	0	0	0	0	0	0
Material for recycling	kg	0	0	2,76E-03	0	0	4,56E+01	0	0
Materials for energy recovery	kg	0	0	4,70E-04	0	0	0	0	0
Exported energy, electricity	MJ per energy carrier	0	0	8,46E-03	0	0	0	0	0
Exported energy, thermal	MJ per energy carrier	0	0	8,46E-03	0	0	0	0	0

CORE ENVIRONMENTAL IMPACT INDICATORS – 3 cm SLAB

Indicators		Unit	A1	A2	A3	C1	C2	C3	C4	D
Global Warming Potential **(GWP)**	IPCC GWP*	Kg CO_2 eq	1,40E+01	2,60E-01	8,60E-01	2,54E-01	6,51E-01	0	-8,35E-01	-6,37E+00
	Fossil	Kg CO_2 eq	1,42E+01	2,62E-01	8,71E-01	2,56E-01	6,56E-01	0	-8,33E-01	-6,27E+00
	Biogenic	Kg CO_2 eq	5,97E-01	6,21E-04	8,12E-04	2,02E-04	1,42E-03	0	5,84E-04	-2,13E-01
	Land use and transformation	Kg CO_2 eq	1,03E-02	9,07E-05	3,45E-04	2,03E-05	2,29E-04	0	2,68E-05	-2,86E-03
	TOTAL	Kg CO_2 eq	1,48E+01	2,63E-01	8,73E-01	2,56E-01	6,57E-01	0	-8,33E-01	-6,49E+00
Depletion potential of the stratospheric ozone layer (**ODP**)		Kg CFC 11 eq	1,35E-06	5,96E-08	1,77E-07	5,52E-08	1,47E-07	0	4,95E-08	-2,80E-07
Acidification potential (**AP**)		mol H^+ eq	5,03E-02	1,17E-03	6,17E-03	2,67E-03	3,30E-03	0	1,06E-03	-2,26E-02
Eutrophication potential (**EP-freshwater**)		Kg P eq	2,23E-03	1,76E-05	1,28E-04	7,74E-06	4,77E-05	0	8,82E-06	-1,06E-03
Eutrophication potential (**EP-marine**)		Kg N eq.	1,26E-02	3,44E-04	2,29E-03	1,18E-03	1,14E-03	0	3,86E-04	-5,86E-03
Eutrophication potential, Accumulated Exceedance (**EP-terrestrial**)		Mol N eq.	1,38E-01	3,77E-03	2,49E-02	1,30E-02	1,24E-02	0	4,23E-03	-6,37E-02
Formation potential of tropospheric ozone (**POCP**)		kg NMVOC eq.	4,11E-02	1,14E-03	7,32E-03	3,56E-03	3,54E-03	0	1,22E-03	-1,66E-02
Abiotic depletion potential – Elements (**ADP-el**)[1]		kg Sb eq.	4,38E-05	9,41E-07	1,52E-05	1,04E-07	2,34E-06	0	2,31E-07	-1,91E-05
Abiotic depletion potential – Fossil fuels (**ADP-fossil**)[1]		MJ, net calorific value	1,42E+02	3,97E+00	1,71E+01	3,52E+00	9,87E+00	0	3,33E+00	-3,90E+01
Water deprivation potential (**WDP**)[1]		m3 world eq. deprived	2,42E+00	1,13E-02	1,89E+00	5,08E-03	3,04E-02	0	8,23E-02	-5,09E-01

1: 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.

ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS – 3 cm SLAB

Indicators	Unit	A1	A2	A3	C1	C2	C3	C4	D
Potential incidence of disease due to P emissions (**PM**)	Disease incidence	7,84E-06	1,77E-08	1,31E-07	3,80E-07	4,69E-08	0	2,19E-08	-2,30E-08
Potential Human exposure efficiency relative to U235 (**IRP**)[2]	kBq U235 ep.	1,05E+00	2,07E-02	8,03E-02	1,61E-02	4,86E-02	0	1,56E-02	-2,22E-01
Potential Comparative Toxic Unit for ecosystems (**ETP-fw**)[3]	CTUe	1,44E+02	3,03E+00	1,26E+01	2,01E+00	7,98E+00	0	1,95E+00	-1,26E+02
Potential Comparative Toxic Unit for humans (**HTP-c**)[3]	CTUh	7,11E-09	1,10E-10	5,23E-10	9,85E-11	2,70E-10	0	5,66E-11	-1,99E-09
Potential Comparative Toxic Unit for humans (**HTP-nc**)[3]	CTUh	1,04E-07	3,02E-09	8,50E-09	1,43E-09	7,73E-09	0	1,06E-09	-5,12E-08
Potential soil quality index (**SQP**)[3]	dimensionless	5,40E+01	2,71E+00	1,11E+01	4,57E-01	6,76E+00	0	7,19E+00	-8,52E+01

2: 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.

3: 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 PARAMETERS – 3 cm SLAB

Indicators	Unit	A1	A2	A3	C1	C2	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ, net calorific value	1,75E+01	5,33E-02	5,70E-01	1,82E-02	1,23E-01	0	4,55E-02	-5,96E+00
Use of renewable primary energy resources used as raw materials	MJ, net calorific value	1,57E-03	1,14E-05	9,23E-05	3,94E-06	2,89E-05	0	1,93E-05	-1,29E-03
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ, net calorific value	1,75E+01	5,33E-02	5,70E-01	1,82E-02	1,23E-01	0	4,56E-02	-5,96E+00
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ, net calorific value	1,42E+02	3,97E+00	1,71E+01	3,52E+00	9,87E+00	0	3,33E+00	-3,90E+01
Use of non-renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0	0	0
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ, net calorific value	1,42E+02	3,97E+00	1,71E+01	3,52E+00	9,87E+00	0	3,33E+00	-3,90E+01
Use of Secondary material	kg	0	0	0	0	0	0	0	0
Use of Renewable secondary fuels	MJ, net calorific value	0	0	0	0	0	0	0	0
Use of Non-renewable secondary fuels	MJ, net calorific value	0	0	0	0	0	0	0	0
Net use of fresh water	m3	6,70E-02	3,56E-04	4,49E-02	1,76E-04	8,20E-04	0	3,75E-03	1,06E-01

WASTE PRODUCTION – 3 cm SLAB

Indicators	Unit	A1	A2	A3	C1	C2	C3	C4	D
Hazardous waste disposed	kg	2,80E-04	1,02E-05	3,04E-05	9,49E-06	2,58E-05	0	4,30E-06	-4,96E-05
Non-hazardous waste disposed	kg	2,14E+00	1,88E-01	2,22E+01	4,24E-03	4,70E-01	0	2,34E+01	-5,31E-01
Radioactive waste disposed	kg	5,81E-04	2,72E-05	8,41E-05	2,45E-05	6,62E-05	0	2,23E-05	-1,50E-04

OUTPUT FLOWS – 3 cm SLAB

Indicators	Unit	A1	A2	A3	C1	C2	C3	C4	D
Components for reuse	kg	0	0	0	0	0	0	0	0
Material for recycling	kg	0	0	2,81E-03	0	0	5,46E+01	0	0
Materials for energy recovery	kg	0	0	4,79E-04	0	0	0	0	0
Exported energy, electricity	MJ per energy carrier	0	0	8,64E-03	0	0	0	0	0
Exported energy, thermal	MJ per energy carrier	0	0	8,64E-03	0	0	0	0	0

CORE ENVIRONMENTAL IMPACT INDICATORS – 4 cm SLAB

Indicators		Unit	A1	A2	A3	C1	C2	C3	C4	D
Global Warming Potential **(GWP)**	IPCC GWP*	Kg CO_2 eq	1,83E+01	3,47E-01	8,88E-01	3,39E-01	8,69E-01	0	-1,12E+00	-8,51E+00
	Fossil	Kg CO_2 eq	1,85E+01	3,49E-01	9,00E-01	3,42E-01	8,76E-01	0	-1,11E+00	-8,38E+00
	Biogenic	Kg CO_2 eq	7,89E-01	8,28E-04	8,66E-04	2,70E-04	1,90E-03	0	7,80E-04	-2,85E-01
	Land use and transformation	Kg CO_2 eq	1,37E-02	1,21E-04	3,52E-04	2,72E-05	3,06E-04	0	3,58E-05	-3,82E-03
	TOTAL	Kg CO_2 eq	1,93E+01	3,50E-01	9,01E-01	3,42E-01	8,78E-01	0	-1,11E+00	-8,67E+00
Depletion potential of the stratospheric ozone layer (**ODP**)		Kg CFC 11 eq	1,75E-06	7,94E-08	1,82E-07	7,38E-08	1,96E-07	0	6,61E-08	-3,74E-07
Acidification potential (**AP**)		mol H^+ eq	6,51E-02	1,56E-03	6,40E-03	3,57E-03	4,40E-03	0	1,42E-03	-3,02E-02
Eutrophication potential (**EP-freshwater**)		Kg P eq	2,84E-03	2,34E-05	1,30E-04	1,03E-05	6,37E-05	0	1,18E-05	-1,41E-03
Eutrophication potential (**EP-marine**)		Kg N eq.	1,65E-02	4,59E-04	2,38E-03	1,58E-03	1,52E-03	0	5,16E-04	-7,83E-03
Eutrophication potential, Accumulated Exceedance (**EP-terrestrial**)		Mol N eq.	1,81E-01	5,02E-03	2,59E-02	1,73E-02	1,66E-02	0	5,65E-03	-8,50E-02
Formation potential of tropospheric ozone (**POCP**)		kg NMVOC eq.	5,35E-02	1,52E-03	7,62E-03	4,76E-03	4,72E-03	0	1,63E-03	-2,22E-02
Abiotic depletion potential – Elements (**ADP-el**)[1]		kg Sb eq.	5,46E-05	1,25E-06	1,53E-05	1,38E-07	3,13E-06	0	3,08E-07	-2,55E-05
Abiotic depletion potential – Fossil fuels (**ADP-fossil**)[1]		MJ, net calorific value	1,82E+02	5,29E+00	1,75E+01	4,70E+00	1,32E+01	0	4,44E+00	-5,21E+01
Water deprivation potential (**WDP**)[1]		m3 world eq. deprived	3,05E+00	1,50E-02	2,01E+00	6,79E-03	4,07E-02	0	1,10E-01	-6,79E-01

1: 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.

ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS – 4 cm SLAB

Indicators	Unit	A1	A2	A3	C1	C2	C3	C4	D
Potential incidence of disease due to P emissions (**PM**)	Disease incidence	1,05E-05	2,36E-08	1,36E-07	5,07E-07	6,27E-08	0	2,92E-08	-3,08E-08
Potential Human exposure efficiency relative to U235 (**IRP**)[2]	kBq U235 ep.	1,33E+00	2,76E-02	8,25E-02	2,14E-02	6,49E-02	0	2,08E-02	-2,97E-01
Potential Comparative Toxic Unit for ecosystems (**ETP-fw**)[3]	CTUe	1,84E+02	4,03E+00	1,29E+01	2,68E+00	1,07E+01	0	2,60E+00	-1,69E+02
Potential Comparative Toxic Unit for humans (**HTP-c**)[3]	CTUh	8,93E-09	1,46E-10	5,35E-10	1,32E-10	3,60E-10	0	7,57E-11	-2,66E-09
Potential Comparative Toxic Unit for humans (**HTP-nc**)[3]	CTUh	1,34E-07	4,02E-09	8,72E-09	1,90E-09	1,03E-08	0	1,42E-09	-6,84E-08
Potential soil quality index (**SQP**)[3]	dimensionless	6,86E+01	3,61E+00	1,12E+01	6,10E-01	9,04E+00	0	9,60E+00	-1,14E+02

2: 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.

3: 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 PARAMETERS – 4 cm SLAB

Indicators	Unit	A1	A2	A3	C1	C2	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ, net calorific value	2,17E+01	7,11E-02	5,79E-01	2,44E-02	1,64E-01	0	6,08E-02	-7,96E+00
Use of renewable primary energy resources used as raw materials	MJ, net calorific value	2,03E-03	1,51E-05	9,36E-05	5,26E-06	3,86E-05	0	2,58E-05	-1,73E-03
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ, net calorific value	2,17E+01	7,11E-02	5,79E-01	2,44E-02	1,64E-01	0	6,09E-02	-7,97E+00
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ, net calorific value	1,82E+02	5,29E+00	1,75E+01	4,70E+00	1,32E+01	0	4,44E+00	-5,21E+01
Use of non-renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0	0	0
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ, net calorific value	1,82E+02	5,29E+00	1,75E+01	4,70E+00	1,32E+01	0	4,44E+00	-5,21E+01
Use of Secondary material	kg	0	0	0	0	0	0	0	0
Use of Renewable secondary fuels	MJ, net calorific value	0	0	0	0	0	0	0	0
Use of Non-renewable secondary fuels	MJ, net calorific value	0	0	0	0	0	0	0	0
Net use of fresh water	m3	8,53E-02	4,74E-04	4,74E-02	2,36E-04	1,09E-03	0	5,00E-03	1,42E-01

WASTE PRODUCTION – 4 cm SLAB

Indicators	Unit	A1	A2	A3	C1	C2	C3	C4	D
Hazardous waste disposed	kg	3,49E-04	1,36E-05	3,14E-05	1,27E-05	3,45E-05	0	5,74E-06	-6,63E-05
Non-hazardous waste disposed	kg	2,84E+00	2,51E-01	2,22E+01	5,67E-03	6,28E-01	0	3,12E+01	-7,09E-01
Radioactive waste disposed	kg	7,56E-04	3,62E-05	8,68E-05	3,27E-05	8,84E-05	0	2,98E-05	-2,01E-04

RESOURCE USE PARAMETERS – 4 cm SLAB

Indicators	Unit	A1	A2	A3	C1	C2	C3	C4	D
Components for reuse	kg	0	0	0	0	0	0	0	0
Material for recycling	kg	0	0	2,92E-03	0	0	7,29E+01	0	0
Materials for energy recovery	kg	0	0	4,98E-04	0	0	0	0	0
Exported energy, electricity	MJ per energy carrier	0	0	8,99E-03	0	0	0	0	0
Exported energy, thermal	MJ per energy carrier	0	0	8,99E-03	0	0	0	0	0

6. ADDITIONAL INFORMATION

As stated in ISO 16757: 2017 Annex BB "carbonation of concrete is a chemical reaction, a natural process by which CO2 in the ambient air penetrates the concrete and reacts with hydration products in the concrete. […] For concrete carbonation this means that part of the carbon dioxide emitted during cement production is rebound to the concrete during use and end of life stages of a structure". The theoretical CO2 uptake related to carbonation depends on several factors like: mass of binder (therefore the cement class), exposure conditions and time.

Considering that module B was not included in the analysis and that slabs are covered by a plastic film during the storage period, carbonation was only considered for the end-of-life stage and, particularly, for Module C4. Following the instruction of ISO 16757:2017, a potential CO2 uptake of 106,18 kg CO2/m3 of slab was considered.

Considering the absence of other relevant instruction, the end-of-life scenario of slabs is modelled as described by ISO 17160: 2019 (Product Category Rules for ceramic tiles):

SLABS E-O-L	%
Recycling	70%
Landfill	30%

7. REFERENCES

EPD INTERNATIONAL (2019) General Programme Instruction for the International EPD® System. Version 3.01. www.environdec.com

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UNI EN 15804:2012+A2:2019+AC. Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products

UNI EN 16757: 2017. Sustainability of construction works – Environmental product declarations – Product Category Rules for concrete and concrete elements

UNI EN 17160: 2019. Product category rules for ceramic tiles

UNI EN ISO 14025:2010. Environmental labels and declarations – Type III environmental declarations – Principles and procedures

UNI EN ISO 14040:2021. Environmental management – Life cycle assessment – Principles and framework

UNI EN ISO 14044:2021. Environmental management – Life cycle assessment – Requirements and guidelines

LCA SUPPORTING STUDY, REV01, 27072022. Life Cycle Assessment delle lastre in graniglia di marmo da 1.2 cm, 2 cm, 2.5 cm, 3 cm, 4 cm; prodotte da Agglotech S.p.A.; stabilimenti di Grezzana e Marzana (Verona), Italia.