Environmental Product Declaration

Under the general rules of the Environmental Footprint Institute
Product Group Classification: UN CPC 37410
In accordance with ISO 14025 and EN 15804:2012+A2:2019/AC:2021 for:

Sealants & Joints, Tile Adhesive & Grout, Thermal Insulation and Protective Coating

Program:
Environmental Footprint Institute

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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 verification and registration at www.environmentalfootprintinstitute.org

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1.0 DOCUMENT INFORMATION

Program	The Environmental Footprint Institute
Product Group Classification	UN CPC 37410
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Geographical Scope	Manufactured in Kingdom of Saudi Arabia (KSA) and Distributed in Gulf Cooperation Countries

2.0 INTRODUCTION

This report contains the environmental performance of the manufacturing process of Sealants & Joints, Tile Adhesive & Grout, Thermal Insulation and Protective Coating manufactured by Saudi Vetonit Co Ltd. This Environmental Product Declaration (EPD) has been developed using the Life Cycle Assessment (LCA) methodology. The environmental impact values calculated are expressed to one-kg of Sealants & Joints, Tile Adhesive & Grout, Thermal Insulation and Protective Coating.

The assessed life cycle includes all phases in the manufacturing process of Sealants & Joints, Tile Adhesive & Grout, Thermal Insulation and Protective Coating in a “cradle to gate with options” scope. This LCA covers transportation of Raw materials, production, distribution of final product to the customer and end of life stages.

This EPD has been conducted according to the Environmental Footprint Institute regulations and it has been certified and registered in The Environmental Footprint Institute. The EPD regulation is a system for the international use of Type III Environmental Declarations, according to ISO 14025:2006. Not only the system, but also its applications, is described in the Programmer’s General Indications (PGI). This report has been made following the specifications given in the European standard EN 15804:2012+A2:2019/AC:2021.

3.0 GENERAL INFORMATION

Saudi Vetonit Co. Ltd. (Saveto) built up a reputation since early eighties in the field of manufacturing finishing building materials and became a market leader in Saudi Arabia and other countries in the region and continued to strengthen its position as a leading manufacturer in construction chemicals market.

Saveto's focus on the MENA region enabled the company to become the leading manufacturer in the region. Saveto offers premium quality products best in class regarding compatibility with the regional exposure conditions by integrating an extensive distribution network and world-class technical support and customer service. Saveto Group provides the ultimate formula of success through servicing the construction market in three core business segments (Projects Division, Vetonit Retail Division and Saveto Thermal Insulation Division). Saveto with its three core business segments offer a large variety of products in service of the construction industry.

3.1 Analyzed Product

The assessed system in this Environmental Product Declaration (EPD) comprises the full life cycle of **Sealants & Joints, Tile Adhesive & Grout, Thermal Insulation and Protective Coating** by Saudi Vetonit Co. Ltd in its factory in Saudi Arabia. The assessment has been done using the production data from December 2021 – November 2022.

Sl No	Product Name	Description
Sealant & Joints		
1	Vetoflex PU780	It is suitable for movement and connection joints for indoor and outdoor application
Tile Adhesive & Grout		
1	Premium Project Fix	Cementitious mortar adhesive composed of hydraulic binders, selected aggregates, and special additives.
2	Vetoset CA540	Cement-based professional grade highly deformable tile adhesive that works with most tiles & flexible substrates.
3	Vetonit Tile Grout	Cementitious polymer modified composed of hydraulic binders, aggregates, special additives, & polymers.
Thermal Insulation		
1	Vetotherm Flex	Polymer-modified deformable cementitious adhesive specially designed for permanent fixing of thermal insulation boards to a wide range of substrates, including concrete and masonry.
Protective Coating		

1	Vetoproof EC720	Two-component non-toxic high-performance solvent-free epoxy coating system that adheres perfectly to concrete substrates.
2	Vetoproof EC722	Two-component polysulphide modified epoxy protective coating for concrete surfaces
3	Vetotop AC441	Single component penetrating silane-siloxane primer and a single component elastomeric pigmented coating, ready for immediate site use.

3.2 Applications

Vetoflex PU780

Primer less sealing pre-cast panel joints and expansion joints.

Movement and static joint sealing in various construction industry requirements.

Vetonit Tile Grout

Grouting of walls and floor joints subjected to a varying range of dry or humid conditions

Vetotherm Flex

Fiber mesh reinforced base coat as part of EIFS / ETICS systems.

Ready to receive a wide range of decorative finishes

Vetoproof EC722

Internal Protective lining for potable water, concrete tanks.

Protective lining for ponds and swimming pools. Hard-wearing and chemically resistant floor coating in industrial areas.

Premium Project Fix

Tiling on smooth concrete surfaces, lightweight bricks, blocks, plasterboards

Suitable for dry & wet conditions

Vetoset CA540

Ceramic tiles, natural stone conglomerates (Granite & Marble, Terrazo), Porcelain,

Vetoproof EC720

Waterproofing of concrete, asbestos, cement, and gypsum board surfaces.

Water tanks and reservoirs.

Vetotop AC441

To protect atmospherically exposed reinforced concrete structures from attack by acid gases, chloride ions, oxygen, and water

Suitable to protect all cementitious substrates and masonry, including those in coastal environments.

3.3 Declared Unit

The Declared Unit of the Life Cycle Assessments is One-kg of Sealants & Joints, Tile Adhesive & Grout, Thermal Insulation and Protective Coating. All direct and indirect environmental impacts, as well as the use of resources, are reported referred to this unit. This EPD presents separately the environmental impacts associated to the LCA of all the products listed in 3.1.

3.4 System Boundaries

This EPD covers all product stages from “cradle to gate with options”, i.e this LCA covers Production stage A1-A3, Transportation A4, End of life stages C1-C4 and Resource recovery stage D.

The procedures that are not controlled by the company, but are included in this environmental study, are:

- The extraction and production of fuels.
- The production of electricity.
- The production of the machinery, buildings, and vehicles.

All related direct and indirect environmental impacts related to these elements have been calculated and were included in the LCAs in this EPD.

The scope of this EPD is "cradle to gate with options".

Possible scopes of the LCA defined in the European standard EN 15804:2012+A2:2019/AC:2021 are:

	Production Stage			Construction Process Stage		Use Stage							End of Life Stage				Resource Recovery Stage
	Raw Materials	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	**X**	**X**	**X**	**X**	**X**
Geography	KSA/ GLO	KSA/ GLO	KSA	KSA/ GCC	-	-	-	-	-	-	-	-	GLO	GLO	GLO	GLO	GLO
Specific data	GWP > 90%				-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	The environmental impact GWP-GHG of the products declared are within the tolerance of +/- 10%																
Variation – sites	Manufactured in one site				-	-	-	-	-	-	-	-	-	-	-	-	-

X = Included, ND=Module not declared, NR= Module not relevant, GCC – Gulf Cooperation Countries

Modules from A5 to B7 are not included (X refers to considered stage; NR refers to not relevant stage and ND to not declared stage).

Upstream Processes (A1: Raw Material Supply): Production for each product starts with mainly transported from other parts of the world and some locally sourced. 'Raw material supply' includes raw material extraction before production.

Core Processes (A2: Transportation, A3: Manufacturing and A4: Transport): Transport is relevant for delivery of raw materials to the plant and the transport of materials within the plant. Sealants & Joints, Tile Adhesive & Grout, Thermal Insulation and Protective Coating production starts with receipt of raw materials, sieving powders, weighing ingredients, mixing ingredients and packaging & wrapping. Electricity and Diesel are consumed in the production process. Sealants & Joints, Tile Adhesive & Grout, Thermal Insulation and Protective Coating products are distributed to customer's sites.

3.5 Product Stages

A simplified model of the manufacturing and distribution process is described in the following diagrams, enumerating the main activities included in the system boundaries. The process and facilities are also linked to the phases of the product life cycle (A1-A4) The first phase in the LCA is the production of Sealants & Joints, Tile Adhesive & Grout, Thermal Insulation and Protective Coating.

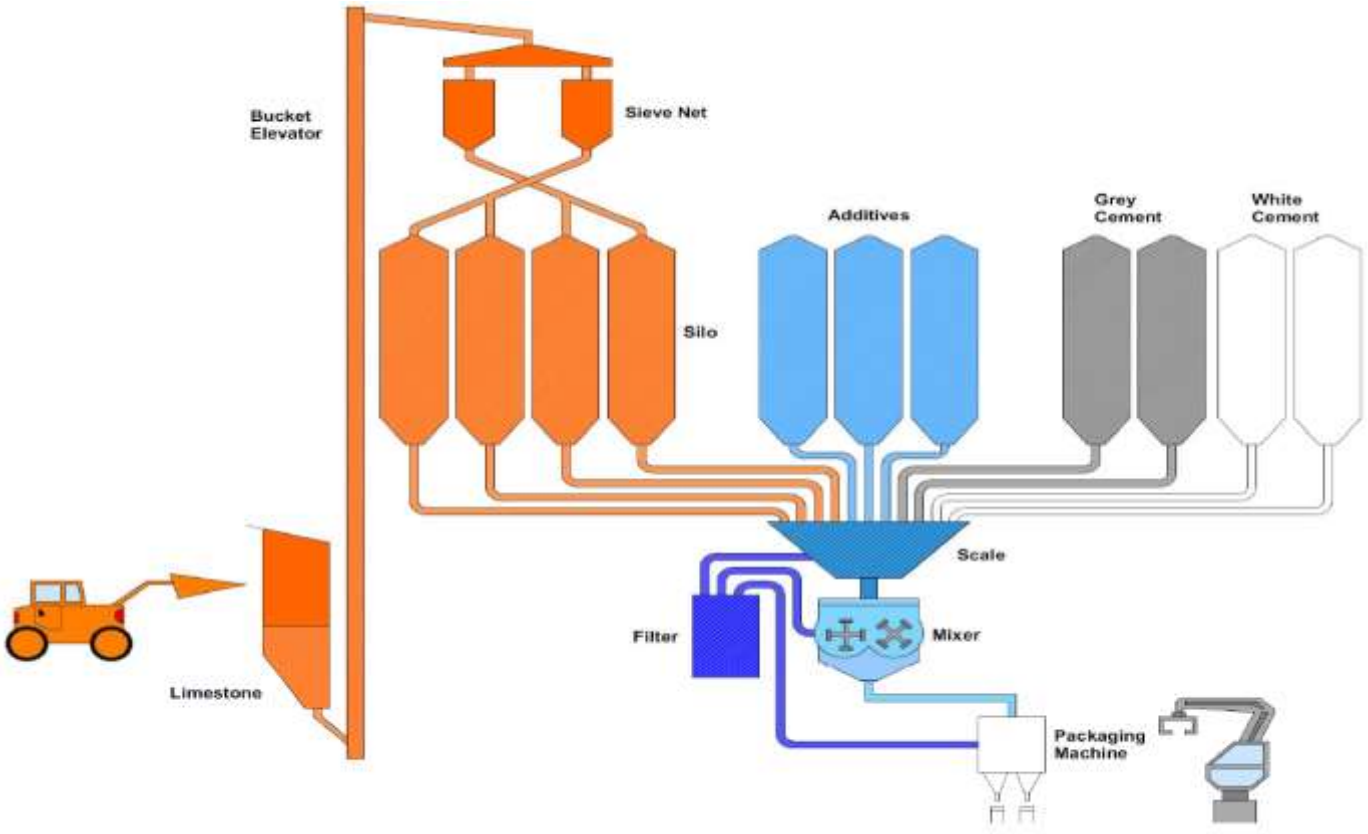
Scope of this Life Cycle Assessment 'Cradle to Gate with Options'					
A1 Raw Materials Production	**A2 Transport raw materials**	**A3 Manufacture**	**A4 Distribution**	**End of use Stage (C1-C4)**	**Recovering and Recycling (D)**
					
Raw Materials and Chemicals	Transport from supplier by Road	filling into hopper, sieve screening, drying, mixing etc	Transport to customers by trucks	Deconstruction/ demolition, transport, disposal.	Reuse, recovery and recycling potential

The following diagram designed using Air.e LCA software shows and example of the materials, fuels consumption, energy consumption, transports and other elements and procedures included in the assessments.

Life Cycle Assessment Modeling (sample of one product)

The following diagram is a more detailed description of the A3 phase.

Manufacturing Process



3.6 Content Declaration*

Materials	Percentage	Materials	Percentage
OPC	20-55%	HEMC	0-0.05%
Limestone Powder	20-65%	HPMC	0-0.05%
Silica Sand	40-65%	VAC/E	0-5%
Isocyanate Pre-polymers	25-40%	Cellulose Fiber	0-0.25%
Fillers	40-60%	Calcium Formate	0-1%
Calcium Oxide	0-5%	Fe3O4 pigment	0-1%
FeO(OH) pigment	0-1%	Fe2O3 pigment	0-1%
Cellulose ether	0-0.6%	Silica Flour	35-50%
Epoxy Resin	25-30%	Acrylic Latex	30-50%
Additives	0-10%	Water	5-15%
Titanium Dioxide	5-10%	-	-

*Each end product has different % levels and may not contain all of the above listed materials.

Materials		
Post-consumer material, weight-%	**Biogenic material, weight-% and kg C/kg**	**Renewable material, weight-%**
0	0	0

Packaging Materials				
Product	**Packaging Materials**	**Weight Kg**	**Weight % (Versus the Product)**	**Weight biogenic carbon, kg C/kg**
Vetoflex PU780	Wooden Pallet	0.044	0.004	0.022
	Bags LDPE	2.56	0.256	0
Premium Project Fix	Wooden Pallet	0.044	0.004	0.022
	Bags LDPE	2.56	0.256	0
Vetoset CA540	Wooden Pallet	0.044	0.004	0.022
	Bags LDPE	2.56	0.256	0
Vetonit Tile Grout	Wooden Pallet	0.044	0.004	0.022
	Bags LDPE	2.56	0.256	0
Vetotherm Flex	Wooden Pallet	0.044	0.004	0.022
	Bags LDPE	2.56	0.256	0
Vetoproof EC720	Wooden Pallet	0.044	0.004	0.022
	Bags LDPE	2.56	0.256	0
Vetoproof EC722	Wooden Pallet	0.044	0.004	0.022
	Bags LDPE	2.56	0.256	0
Vetotop AC441	Wooden Pallet	0.044	0.004	0.022
	Bags LDPE	2.56	0.256	0

3.7 Substances listed in the "Candidate List of SVHC"

During the life cycle of the product no hazardous substance listed in the "Candidate List of Substances of Very High Concern (SVHC) for authorization" has been used in a percentage higher than 0.1% of the weight of the product.

4.0 TECHNICAL INFORMATION

4.1 Calculation Methodology

This EPD represents a Type III Environmental Declarations according to ISO 14025:2006. The Life Cycle Assessment (LCA) has been developed following the ISO 14040 International Standard. The environmental impacts calculation method reported in this EPD follow the EF 3.1 (ILCD). The report has been done following the specifications given in the European standard EN 15804:2012+A2:2019/AC:2021, as Product Category Rules.

4.2 Emission Factors

Emission factors and environmental impacts of elements in life cycles that are not directly controlled by Saudi Vetonit Co Ltd KSA have been analyzed using external studies and external emissions factors databases like Ecoinvent due to the lack of direct data. The next paragraphs describe the calculation rules and criteria applied in the calculation of the environmental performance of this type of elements in the LCA.

Raw Materials and Chemicals

Datasets from Ecoinvent 3.8.0 with emission factors for raw materials has been characterized to adjust them to the characteristics of manufacturing of Saudi Vetonit Co Ltd suppliers or counties where suppliers are located. Datasets from Ecoinvent 3.8.0 with emission factors for generic chemicals have been characterized to adjust them to the characteristics of the products manufactured by Saudi Vetonit Co Ltd suppliers.

Electricity

A specific dataset with the Life Cycle Inventory (LCI) corresponding to the electricity mix in Saudi Arabia, has been used for this LCA.

Fuels Production and Consumption

Specific datasets with the emissions factors corresponding to the fuel combustion in Saudi Vetonit Co Ltd plant and machinery have been developed for these LCAs. Indirect emissions due to diesel production and transportation are also included in the environmental impact values calculation reported in this report. In the calculation was estimated a diesel calorific value of 43 kg/l and a density of 0,85 kg/l for diesel.

Transport to the construction site Stage – A4

The Plasters & Masonry, Concrete Repair and Renders & Finishes are provided to customers all over the world. To create a scenario of the A4 phase, all the coils sold from December 2021 – November 2022 has been analyzed as representative of the international transport. The transport means are international cargo ships and 3.5-7.5t & >32t trucks, Euro 6.

4.3 Calculation Rules

Version 3.14.0.15 of software Air.e LCA™ with Ecoinvent™ 3.9 database has been used for LCA modeling and impacts calculations.

Minor components are not directly related to the product, with less than 1% impact, such as office supplies, has been excluded from the assessment.

All transports of components have been included in the LCA considering real distances travelled by materials used from December 2021 – November 2022. Transport of raw materials needed to produce Sealants & Joints, Tile Adhesive & Grout, Thermal Insulation and Protective Coating is estimated in a global scale according to Ecoinvent™ criteria. Main means of transport have been included for materials purchases. As exact port locations are not known in detail, transport distances have been calculated from a one of the ports in the country of origin to the factory. Operation in port has also been excluded.

Road distances calculated using Google Maps. Maritime distances calculated using Marine Traffic Voyage Planner.

Cut-off rules: more than 99% of the materials and energy consumption have been included. The Polluter Pays Principle and the Modularity Principle have been followed.

4.4 By Products Assignment

Economic allocation was applied and the allocation was performed according to the PCR. Economic allocation was based on the income of each product. There is no List of by-Products used in this EPD.

4.5 Additional Environmental Information

Module C1: Demolition and construction - Demolition of this product is part of the demolition of the building itself. Therefore, it is assumed that the energy used for the demolition of building products has minor significance and the environmental impact of this module is set to be zero.

Module C2: Transportation of demolished items- This module contemplates the transportation of construction waste from SAVETO to the nearest waste treatment point which can be estimated to be 50 km in a 16-32 ton lorry, considering it to be the most common in the area.

Module C3: Waste Processing - Several researches and investigations by industry executives concluded that 85% of construction and demolition waste is to be recycled and about 15% landfilled. The construction waste is commonly recycled into bedding aggregated products used for infrastructure and thus the dataset was modeled to fit this assumption. For the waste processing, an energy consumption of 0.01 kWh of electricity/kg of waste input was calculated.

Module C4 Disposal - This module represents 15% of the construction waste which is to be disposed of in a landfill.

Module D Reuse, Recycling & Recovery Potential - calculates the potential environmental benefits of recycling and reusing construction and building materials. 85% of the product is assumed to be recycled to bedding aggregated products used for infrastructures of roads, sidewalks, etc.

5.0 ENVIRONMENTAL PERFORMACE

5.1 Potential Environment Impacts

In the following tables, the environmental performance of the declared units “One-kg of Sealants & Joints, Tile Adhesive & Grout, Thermal Insulation and Protective Coating” are presented for the Saudi Vetonit Co Ltd product totalized and for every sub-phase of the life cycles.

During the assessment it was not evident to distinguish the differences in the consumption of electricity, water, diesel, raw material and chemicals during the manufacturing process of the different types of Sealants & Joints, Tile Adhesive & Grout, Thermal Insulation and Protective Coating. Hence, the calculation is based on total production vs total consumption against production of the product. Packaging material has been excluded because of the low impact in the final results.
Environmental impacts are calculated using the EF-3.1, (ILCD).

Vetoflex PU780

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

Core Environmental Impact Indicators

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Climate change (GWP) – fossil	kg CO2e	9.15E-01	1.82E-01	4.60E-02	ND	ND	0.00E+00	5.82E-03	8.37E-03	3.95E-04	-3.37E-03
Climate change (GWP) – biogenic	kg CO2e	1.83E-03	2.74E-05	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.21E-06	6.50E-08	-4.18E-07
Climate change (GWP) – LULUC	kg CO2e	2.26E-03	7.82E-06	0.00E+00	ND	ND	0.00E+00	0.00E+00	3.19E-07	3.54E-08	-2.75E-07
Climate change (GWP) – total	kg CO2e	9.19E-01	1.82E-01	4.60E-02	ND	ND	0.00E+00	5.82E-03	8.37E-03	3.95E-04	-3.75E-03
Ozone depletion	kg CFC11e	4.76E-08	3.37E-08	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.31E-09	8.00E-11	-7.30E-10
Acidification	mol H+e	4.62E-03	1.14E-03	2.00E-05	ND	ND	0.00E+00	2.05E-06	5.00E-05	4.01E-06	-4.00E-05
Eutrophication, aquatic freshwater	kg PO4e	5.21E-04	7.04E-06	0.00E+00	ND	ND	0.00E+00	0.00E+00	2.83E-07	6.26E-08	-3.12E-07
Eutrophication, aquatic freshwater	Kg P eq	1.70E-04	2.29E-06	0.00E+00	ND	ND	0.00E+00	0.00E+00	9.22E-08	2.04E-08	-1.02E-07
Eutrophication, aquatic marine	kg Ne	1.11E-03	1.66E-04	8.07E-06	ND	ND	0.00E+00	1.02E-06	7.60E-06	1.72E-06	-1.57E-05
Eutrophication, terrestrial	mol Ne	9.76E-03	1.81E-03	9.00E-05	ND	ND	0.00E+00	1.00E-05	8.00E-05	2.00E-05	-1.70E-04
Photochemical ozone formation	kg NMVOCe	3.74E-03	5.48E-04	2.39E-05	ND	ND	0.00E+00	3.03E-06	2.48E-05	5.27E-06	-4.72E-05
Abiotic depletion, minerals & metals	kg Sbe	4.21E-06	1.07E-07	0.00E+00	ND	ND	0.00E+00	0.00E+00	4.88E-09	2.20E-10	-1.84E-09
Abiotic depletion of fossil resources	MJ	1.97E+01	3.03E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.25E-01	5.63E-03	-4.95E-02
Water use	m3e depr.	0.00E+00	9.90E-03	0.00E+00	ND	ND	0.00E+00	0.00E+00	4.59E-04	1.33E-05	-1.10E-04

EN 15804+ A2 disclaimers for Abiotic depletion and Water use indicators and all optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

Additional Environmental Impact Indicators

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Particulate matter	Incidence	3.94E-08	7.87E-09	8.28E-11	ND	ND	0.00E+00	1.08E-11	3.63E-10	1.05E-10	-4.30E-09
Ionizing radiation, human health	kBq U235e	2.75E-02	7.50E-03	0.00E+00	ND	ND	0.00E+00	0.00E+00	2.79E-07	2.34E-05	-2.11E-04
Eco-toxicity (freshwater)	CTUe	7.68E+00	9.17E-01	1.30E-04	ND	ND	0.00E+00	2.00E-05	3.86E-02	1.47E-03	-1.29E-02
Human toxicity, cancer effects	CTUh	6.12E-10	4.21E-11	1.58E-12	ND	ND	0.00E+00	2.00E-13	1.93E-12	1.13E-13	-9.38E-13
Human toxicity, non-cancer effects	CTUh	5.64E-09	4.45E-10	3.09E-11	ND	ND	0.00E+00	3.85E-12	1.97E-11	8.74E-13	-6.17E-12
Land use related impacts/soil quality	-	1.67E+00	2.51E-01	0.00E+00	ND	ND	0.00E+00	0.00E+00	9.73E-03	6.86E-03	-5.93E-03

EN 15804+A2 disclaimer for Ionizing radiation, human health. 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.

Environmental impacts – GWP-GHG

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP-GHG	kg CO2e	9.18E-01	1.82E-01	4.60E-02	0.00E+00	0.00E+00	0.00E+00	5.82E-03	8.37E-03	3.95E-04	-3.75E-03

This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 5 (IPCC 2013) This indicator Is almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Use of Natural Resources

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Renewable PER used as energy	MJ	4.46E-01	6.15E-03	0.00E+00	ND	ND	0.00E+00	0.00E+00	2.48E-04	4.66E-05	-2.63E-04
Renewable PER used as materials	MJ	1.27E-03	4.33E-05	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.84E-06	1.60E-07	-1.31E-06
Total use of renewable PER	MJ	4.47E-01	6.19E-03	0.00E+00	ND	ND	0.00E+00	0.00E+00	2.50E-04	4.68E-05	-2.64E-04

Non-renew. PER used as energy	MJ	1.97E+01	3.03E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.25E-01	5.63E-03	-4.95E-02
Non-renew. PER used as materials	MJ	1.07E-06	1.80E-08	0.00E+00	ND	ND	0.00E+00	0.00E+00	7.46E-10	1.58E-10	-7.09E-10
Total use of non-renewable PER	MJ	1.97E+01	3.03E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.25E-01	5.63E-03	-4.95E-02
Use of secondary materials	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renew. secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m3	0.00E+00	4.93E+01	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

PER abbreviation stands for primary energy a resource

End of Life - Waste

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Hazardous waste	Kg	0.00E+00	2.96E+04	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-hazardous waste	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Radioactive waste	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

End of Life - Outflows

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Components for reuse	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-2.47E+04
Materials for recycling	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	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	ND	ND	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	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Premium Project Fix

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

Core Environmental Impact Indicators

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Climate change (GWP) – fossil	kg CO2e	5.96E-01	3.25E-02	3.04E-02	ND	ND	0.00E+00	5.82E-03	8.37E-03	3.95E-04	-3.37E-03
Climate change (GWP) – biogenic	kg CO2e	8.98E-04	7.27E-06	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.21E-06	6.50E-08	-4.18E-07
Climate change (GWP) – LULUC	kg CO2e	5.98E-04	2.11E-06	0.00E+00	ND	ND	0.00E+00	0.00E+00	3.19E-07	3.54E-08	-2.75E-07
Climate change (GWP) – total	kg CO2e	5.98E-01	3.25E-02	3.04E-02	ND	ND	0.00E+00	5.82E-03	8.37E-03	3.95E-04	-3.75E-03
Ozone depletion	kg CFC11e	2.35E-08	4.14E-09	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.31E-09	8.00E-11	-7.30E-10
Acidification	mol H+e	1.99E-03	2.90E-04	1.00E-05	ND	ND	0.00E+00	2.05E-06	5.00E-05	4.01E-06	-4.00E-05
Eutrophication, aquatic freshwater	kg PO4e	2.34E-04	1.52E-06	0.00E+00	ND	ND	0.00E+00	0.00E+00	2.83E-07	6.26E-08	-3.12E-07
Eutrophication, aquatic freshwater	Kg P eq	7.63E-05	4.94E-07	0.00E+00	ND	ND	0.00E+00	0.00E+00	9.22E-08	2.04E-08	-1.02E-07
Eutrophication, aquatic marine	kg Ne	5.41E-04	9.25E-05	5.34E-06	ND	ND	0.00E+00	1.02E-06	7.60E-06	1.72E-06	-1.57E-05
Eutrophication, terrestrial	mol Ne	5.82E-03	1.01E-03	6.00E-05	ND	ND	0.00E+00	1.00E-05	8.00E-05	2.00E-05	-1.70E-04
Photochemical ozone formation	kg NMVOCe	1.58E-03	2.70E-04	1.58E-05	ND	ND	0.00E+00	3.03E-06	2.48E-05	5.27E-06	-4.72E-05
Abiotic depletion, minerals & metals	kg Sbe	2.44E-06	3.63E-08	0.00E+00	ND	ND	0.00E+00	0.00E+00	4.88E-09	2.20E-10	-1.84E-09
Abiotic depletion of fossil resources	MJ	4.46E+00	3.75E-01	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.25E-01	5.63E-03	-4.95E-02
Water use	m3e depr.	0.00E+00	1.36E-03	0.00E+00	ND	ND	0.00E+00	0.00E+00	4.59E-04	1.33E-05	-1.10E-04

EN 15804+ A2 disclaimers for Abiotic depletion and Water use indicators and all optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

Additional Environmental Impact Indicators

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Particulate matter	Incidence	1.53E-08	1.11E-09	5.48E-11	ND	ND	0.00E+00	1.08E-11	3.63E-10	1.05E-10	-4.30E-09
Ionizing radiation, human health	kBq U235e	1.44E-02	9.44E-04	0.00E+00	ND	ND	0.00E+00	0.00E+00	2.79E-07	2.34E-05	-2.11E-04
Eco-toxicity (freshwater)	CTUe	1.89E+00	1.15E-01	9.00E-06	ND	ND	0.00E+00	2.00E-05	3.86E-02	1.47E-03	-1.29E-02
Human toxicity, cancer effects	CTUh	1.79E-10	6.34E-12	1.04E-12	ND	ND	0.00E+00	2.00E-13	1.93E-12	1.13E-13	-9.38E-13
Human toxicity, non-cancer effects	CTUh	4.17E-09	7.87E-11	2.04E-11	ND	ND	0.00E+00	3.85E-12	1.97E-11	8.74E-13	-6.17E-12
Land use related impacts/soil quality	-	1.73E+00	3.24E-02	0.00E+00	ND	ND	0.00E+00	0.00E+00	9.73E-03	6.86E-03	-5.93E-03

EN 15804+A2 disclaimer for Ionizing radiation, human health. 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.

Environmental impacts – GWP-GHG

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP-GHG	kg CO2e	5.97E-01	3.25E-02	3.04E-02	0.00E+00	0.00E+00	0.00E+00	5.82E-03	8.37E-03	3.95E-04	-3.75E-03

This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 5 (IPCC 2013) This indicator Is almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Use of Natural Resources

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Renewable PER used as energy	MJ	2.03E-01	1.30E-03	0.00E+00	ND	ND	0.00E+00	0.00E+00	2.48E-04	4.66E-05	-2.63E-04
Renewable PER used as materials	MJ	8.15E-04	7.79E-06	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.84E-06	1.60E-07	-1.31E-06
Total use of renewable PER	MJ	2.04E-01	1.31E-03	0.00E+00	ND	ND	0.00E+00	0.00E+00	2.50E-04	4.68E-05	-2.64E-04

Non-renew. PER used as energy	MJ	4.46E+00	3.75E-01	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.25E-01	5.63E-03	-4.95E-02
Non-renew. PER used as materials	MJ	1.55E-06	3.91E-09	0.00E+00	ND	ND	0.00E+00	0.00E+00	7.46E-10	1.58E-10	-7.09E-10
Total use of non-renewable PER	MJ	4.46E+00	3.75E-01	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.25E-01	5.63E-03	-4.95E-02
Use of secondary materials	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renew. secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m3	0.00E+00	1.10E+03	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

PER abbreviation stands for primary energy a resource

End of Life - Waste

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Hazardous waste	Kg	0.00E+00	6.58E+05	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-hazardous waste	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Radioactive waste	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

End of Life - Outflows

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Components for reuse	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-4.49E+06
Materials for recycling	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	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	ND	ND	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	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Vetoset CA540

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

Core Environmental Impact Indicators

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Climate change (GWP) – fossil	kg CO2e	5.52E-01	2.45E-02	3.60E-02	ND	ND	0.00E+00	5.82E-03	8.37E-03	3.95E-04	-3.37E-03
Climate change (GWP) – biogenic	kg CO2e	8.61E-04	3.71E-06	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.21E-06	6.50E-08	-4.18E-07
Climate change (GWP) – LULUC	kg CO2e	5.96E-04	1.06E-06	0.00E+00	ND	ND	0.00E+00	0.00E+00	3.19E-07	3.54E-08	-2.75E-07
Climate change (GWP) – total	kg CO2e	5.54E-01	2.45E-02	3.60E-02	ND	ND	0.00E+00	5.82E-03	8.37E-03	3.95E-04	-3.75E-03
Ozone depletion	kg CFC11e	2.16E-08	4.56E-09	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.31E-09	8.00E-11	-7.30E-10
Acidification	mol H+e	1.85E-03	1.50E-04	1.00E-05	ND	ND	0.00E+00	2.05E-06	5.00E-05	4.01E-06	-4.00E-05
Eutrophication, aquatic freshwater	kg PO4e	2.08E-04	9.53E-07	0.00E+00	ND	ND	0.00E+00	0.00E+00	2.83E-07	6.26E-08	-3.12E-07
Eutrophication, aquatic freshwater	Kg P eq	6.79E-05	3.10E-07	0.00E+00	ND	ND	0.00E+00	0.00E+00	9.22E-08	2.04E-08	-1.02E-07
Eutrophication, aquatic marine	kg Ne	4.98E-04	2.24E-05	6.32E-06	ND	ND	0.00E+00	1.02E-06	7.60E-06	1.72E-06	-1.57E-05
Eutrophication, terrestrial	mol Ne	5.45E-03	2.50E-04	7.00E-05	ND	ND	0.00E+00	1.00E-05	8.00E-05	2.00E-05	-1.70E-04
Photochemical ozone formation	kg NMVOCe	1.42E-03	7.42E-05	1.87E-05	ND	ND	0.00E+00	3.03E-06	2.48E-05	5.27E-06	-4.72E-05
Abiotic depletion, minerals & metals	kg Sbe	2.31E-06	1.45E-08	0.00E+00	ND	ND	0.00E+00	0.00E+00	4.88E-09	2.20E-10	-1.84E-09
Abiotic depletion of fossil resources	MJ	4.20E+00	4.10E-01	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.25E-01	5.63E-03	-4.95E-02
Water use	m3e depr.	0.00E+00	1.34E-03	0.00E+00	ND	ND	0.00E+00	0.00E+00	4.59E-04	1.33E-05	-1.10E-04

EN 15804+ A2 disclaimers for Abiotic depletion and Water use indicators and all optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

Additional Environmental Impact Indicators

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Particulate matter	Incidence	1.43E-08	1.07E-09	6.48E-11	ND	ND	0.00E+00	1.08E-11	3.63E-10	1.05E-10	-4.30E-09
Ionizing radiation, human health	kBq U235e	1.34E-02	1.01E-03	0.00E+00	ND	ND	0.00E+00	0.00E+00	2.79E-07	2.34E-05	-2.11E-04
Eco-toxicity (freshwater)	CTUe	1.74E+00	1.24E-01	1.00E-04	ND	ND	0.00E+00	2.00E-05	3.86E-02	1.47E-03	-1.29E-02
Human toxicity, cancer effects	CTUh	1.74E-10	5.70E-12	1.23E-12	ND	ND	0.00E+00	2.00E-13	1.93E-12	1.13E-13	-9.38E-13
Human toxicity, non-cancer effects	CTUh	3.89E-09	6.02E-11	2.42E-11	ND	ND	0.00E+00	3.85E-12	1.97E-11	8.74E-13	-6.17E-12
Land use related impacts/soil quality	-	1.67E+00	3.40E-02	0.00E+00	ND	ND	0.00E+00	0.00E+00	9.73E-03	6.86E-03	-5.93E-03

EN 15804+A2 disclaimer for Ionizing radiation, human health. 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.

Environmental impacts – GWP-GHG

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP-GHG	kg CO2e	5.53E-01	2.45E-02	3.60E-02	0.00E+00	0.00E+00	0.00E+00	5.82E-03	8.37E-03	3.95E-04	-3.75E-03

This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 5 (IPCC 2013) This indicator Is almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Use of Natural Resources

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Renewable PER used as energy	MJ	8.32E-04	1.89E-01	0.00E+00	ND	ND	0.00E+00	0.00E+00	2.48E-04	4.66E-05	-2.63E-04
Renewable PER used as materials	MJ	5.85E-06	7.24E-04	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.84E-06	1.60E-07	-1.31E-06
Total use of renewable PER	MJ	8.38E-04	1.90E-01	0.00E+00	ND	ND	0.00E+00	0.00E+00	2.50E-04	4.68E-05	-2.64E-04

Non-renew. PER used as energy	MJ	4.10E-01	4.61E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.25E-01	5.63E-03	-4.95E-02
Non-renew. PER used as materials	MJ	2.43E-09	1.43E-06	0.00E+00	ND	ND	0.00E+00	0.00E+00	7.46E-10	1.58E-10	-7.09E-10
Total use of non-renewable PER	MJ	4.10E-01	4.61E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.25E-01	5.63E-03	-4.95E-02
Use of secondary materials	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renew. secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m3	0.00E+00	1.15E+03	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

PER abbreviation stands for primary energy a resource

End of Life - Waste

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Hazardous waste	Kg	0.00E+00	6.93E+05	0.00E+00	ND	ND	0.00E+00	0.00E+00	3.82E+06	0.00E+00	0.00E+00
Non-hazardous waste	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Radioactive waste	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

End of Life - Outflows

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Components for reuse	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-4.27E+06
Materials for recycling	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	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	ND	ND	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	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Vetonit Tile Grout

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

Core Environmental Impact Indicators

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Climate change (GWP) – fossil	kg CO2e	5.60E-01	1.90E-02	4.26E-02	ND	ND	0.00E+00	5.82E-03	8.37E-03	3.95E-04	-3.37E-03
Climate change (GWP) – biogenic	kg CO2e	8.73E-04	2.88E-06	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.21E-06	6.50E-08	-4.18E-07
Climate change (GWP) – LULUC	kg CO2e	5.39E-04	8.22E-07	0.00E+00	ND	ND	0.00E+00	0.00E+00	3.19E-07	3.54E-08	-2.75E-07
Climate change (GWP) – total	kg CO2e	5.61E-01	1.90E-02	4.26E-02	ND	ND	0.00E+00	5.82E-03	8.37E-03	3.95E-04	-3.75E-03
Ozone depletion	kg CFC11e	2.34E-08	3.54E-09	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.31E-09	8.00E-11	-7.30E-10
Acidification	mol H+e	1.96E-03	1.20E-04	1.00E-05	ND	ND	0.00E+00	2.05E-06	5.00E-05	4.01E-06	-4.00E-05
Eutrophication, aquatic freshwater	kg PO4e	2.23E-04	7.40E-07	0.00E+00	ND	ND	0.00E+00	0.00E+00	2.83E-07	6.26E-08	-3.12E-07
Eutrophication, aquatic freshwater	Kg P eq	7.26E-05	2.41E-07	0.00E+00	ND	ND	0.00E+00	0.00E+00	9.22E-08	2.04E-08	-1.02E-07
Eutrophication, aquatic marine	kg Ne	4.98E-04	1.74E-05	7.48E-06	ND	ND	0.00E+00	1.02E-06	7.60E-06	1.72E-06	-1.57E-05
Eutrophication, terrestrial	mol Ne	5.46E-03	1.90E-04	8.00E-05	ND	ND	0.00E+00	1.00E-05	8.00E-05	2.00E-05	-1.70E-04
Photochemical ozone formation	kg NMVOCe	1.49E-03	5.76E-05	2.21E-05	ND	ND	0.00E+00	3.03E-06	2.48E-05	5.27E-06	-4.72E-05
Abiotic depletion, minerals & metals	kg Sbe	3.64E-06	1.13E-08	0.00E+00	ND	ND	0.00E+00	0.00E+00	4.88E-09	2.20E-10	-1.84E-09
Abiotic depletion of fossil resources	MJ	4.54E+00	3.18E-01	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.25E-01	5.63E-03	-4.95E-02
Water use	m3e depr.	0.00E+00	1.04E-03	0.00E+00	ND	ND	0.00E+00	0.00E+00	4.59E-04	1.33E-05	-1.10E-04

EN 15804+ A2 disclaimers for Abiotic depletion and Water use indicators and all optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

Additional Environmental Impact Indicators

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Particulate matter	Incidence	1.51E-08	8.27E-10	7.67E-11	ND	ND	0.00E+00	1.08E-11	3.63E-10	1.05E-10	-4.30E-09
Ionizing radiation, human health	kBq U235e	1.40E-02	7.88E-04	0.00E+00	ND	ND	0.00E+00	0.00E+00	2.79E-07	2.34E-05	-2.11E-04
Eco-toxicity (freshwater)	CTUe	1.78E+00	9.63E-02	1.20E-04	ND	ND	0.00E+00	2.00E-05	3.86E-02	1.47E-03	-1.29E-02
Human toxicity, cancer effects	CTUh	1.96E-10	4.43E-12	1.46E-12	ND	ND	0.00E+00	2.00E-13	1.93E-12	1.13E-13	-9.38E-13
Human toxicity, non-cancer effects	CTUh	4.40E-09	4.68E-11	2.87E-11	ND	ND	0.00E+00	3.85E-12	1.97E-11	8.74E-13	-6.17E-12
Land use related impacts/soil quality	-	1.64E+00	2.64E-02	0.00E+00	ND	ND	0.00E+00	0.00E+00	9.73E-03	6.86E-03	-5.93E-03

EN 15804+A2 disclaimer for Ionizing radiation, human health. 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.

Environmental impacts – GWP-GHG

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP-GHG	kg CO2e	5.60E-01	1.90E-02	4.26E-02	0.00E+00	0.00E+00	0.00E+00	5.82E-03	8.37E-03	3.95E-04	-3.75E-03

This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 5 (IPCC 2013) This indicator Is almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Use of Natural Resources

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Renewable PER used as energy	MJ	2.03E-01	6.46E-04	0.00E+00	ND	ND	0.00E+00	0.00E+00	2.48E-04	4.66E-05	-2.63E-04
Renewable PER used as materials	MJ	8.07E-04	4.55E-06	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.84E-06	1.60E-07	-1.31E-06
Total use of renewable PER	MJ	2.04E-01	6.51E-04	0.00E+00	ND	ND	0.00E+00	0.00E+00	2.50E-04	4.68E-05	-2.64E-04

Non-renew. PER used as energy	MJ	4.54E+00	3.18E-01	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.25E-01	5.63E-03	-4.95E-02
Non-renew. PER used as materials	MJ	1.55E-06	1.89E-09	0.00E+00	ND	ND	0.00E+00	0.00E+00	7.46E-10	1.58E-10	-7.09E-10
Total use of non-renewable PER	MJ	4.54E+00	3.18E-01	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.25E-01	5.63E-03	-4.95E-02
Use of secondary materials	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renew. secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m3	0.00E+00	1.44E+03	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

PER abbreviation stands for primary energy a resource

End of Life - Waste

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Hazardous waste	Kg	0.00E+00	8.65E+05	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-hazardous waste	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Radioactive waste	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

End of Life - Outflows

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Components for reuse	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-6.85E+06
Materials for recycling	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	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	ND	ND	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	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Vetotherm Flex

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

Core Environmental Impact Indicators

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Climate change (GWP) – fossil	kg CO2e	6.04E-01	2.21E-02	5.57E-02	ND	ND	0.00E+00	5.82E-03	8.37E-03	3.95E-04	-3.37E-03
Climate change (GWP) – biogenic	kg CO2e	9.59E-04	3.34E-06	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.21E-06	6.50E-08	-4.18E-07
Climate change (GWP) – LULUC	kg CO2e	5.96E-04	9.53E-07	0.00E+00	ND	ND	0.00E+00	0.00E+00	3.19E-07	3.54E-08	-2.75E-07
Climate change (GWP) – total	kg CO2e	6.06E-01	2.21E-02	5.57E-02	ND	ND	0.00E+00	5.82E-03	8.37E-03	3.95E-04	-3.75E-03
Ozone depletion	kg CFC11e	2.32E-08	4.10E-09	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.31E-09	8.00E-11	-7.30E-10
Acidification	mol H+e	2.04E-03	1.40E-03	2.00E-05	ND	ND	0.00E+00	2.05E-06	5.00E-05	4.01E-06	-4.00E-05
Eutrophication, aquatic freshwater	kg PO4e	2.36E-04	8.58E-07	0.00E+00	ND	ND	0.00E+00	0.00E+00	2.83E-07	6.26E-08	-3.12E-07
Eutrophication, aquatic freshwater	Kg P eq	7.70E-05	2.79E-07	0.00E+00	ND	ND	0.00E+00	0.00E+00	9.22E-08	2.04E-08	-1.02E-07
Eutrophication, aquatic marine	kg Ne	5.48E-04	2.02E-05	9.77E-06	ND	ND	0.00E+00	1.02E-06	7.60E-06	1.72E-06	-1.57E-05
Eutrophication, terrestrial	mol Ne	5.88E-03	2.20E-04	1.10E-04	ND	ND	0.00E+00	1.00E-05	8.00E-05	2.00E-05	-1.70E-04
Photochemical ozone formation	kg NMVOCe	1.61E-03	6.68E-05	2.89E-05	ND	ND	0.00E+00	3.03E-06	2.48E-05	5.27E-06	-4.72E-05
Abiotic depletion, minerals & metals	kg Sbe	2.44E-06	1.31E-08	0.00E+00	ND	ND	0.00E+00	0.00E+00	4.88E-09	2.20E-10	-1.84E-09
Abiotic depletion of fossil resources	MJ	4.77E+00	3.69E-01	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.25E-01	5.63E-03	-4.95E-02
Water use	m3e depr.	0.00E+00	1.21E-03	0.00E+00	ND	ND	0.00E+00	0.00E+00	4.59E-04	1.33E-05	-1.10E-04

EN 15804+ A2 disclaimers for Abiotic depletion and Water use indicators and all optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

Additional Environmental Impact Indicators

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Particulate matter	Incidence	1.59E-08	9.59E-10	1.00E-10	ND	ND	0.00E+00	1.08E-11	3.63E-10	1.05E-10	-4.30E-09
Ionizing radiation, human health	kBq U235e	1.43E-02	9.13E-04	0.00E+00	ND	ND	0.00E+00	0.00E+00	2.79E-07	2.34E-05	-2.11E-04
Eco-toxicity (freshwater)	CTUe	1.92E+00	1.12E-01	1.60E-04	ND	ND	0.00E+00	2.00E-05	3.86E-02	1.47E-03	-1.29E-02
Human toxicity, cancer effects	CTUh	1.82E-10	5.13E-12	1.91E-12	ND	ND	0.00E+00	2.00E-13	1.93E-12	1.13E-13	-9.38E-13
Human toxicity, non-cancer effects	CTUh	4.17E-09	5.42E-11	3.74E-11	ND	ND	0.00E+00	3.85E-12	1.97E-11	8.74E-13	-6.17E-12
Land use related impacts/soil quality	-	1.72E+00	3.06E-02	0.00E+00	ND	ND	0.00E+00	0.00E+00	9.73E-03	6.86E-03	-5.93E-03

EN 15804+A2 disclaimer for Ionizing radiation, human health. 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.

Environmental impacts – GWP-GHG

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP-GHG	kg CO2e	6.05E-01	2.21E-02	5.57E-02	0.00E+00	0.00E+00	0.00E+00	5.82E-03	8.37E-03	3.95E-04	-3.75E-03

This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 5 (IPCC 2013) This indicator Is almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Use of Natural Resources

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Renewable PER used as energy	MJ	2.02E-01	7.49E-04	0.00E+00	ND	ND	0.00E+00	0.00E+00	2.48E-04	4.66E-05	-2.63E-04
Renewable PER used as materials	MJ	7.96E-04	5.27E-06	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.84E-06	1.60E-07	-1.31E-06
Total use of renewable PER	MJ	2.03E-01	7.54E-04	0.00E+00	ND	ND	0.00E+00	0.00E+00	2.50E-04	4.68E-05	-2.64E-04

Non-renew. PER used as energy	MJ	4.77E+00	3.69E-01	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.25E-01	5.63E-03	-4.95E-02
Non-renew. PER used as materials	MJ	1.53E-06	2.19E-09	0.00E+00	ND	ND	0.00E+00	0.00E+00	7.46E-10	1.58E-10	-7.09E-10
Total use of non-renewable PER	MJ	4.77E+00	3.69E-01	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.25E-01	5.63E-03	-4.95E-02
Use of secondary materials	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renew. secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m3	0.00E+00	1.14E+03	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

PER abbreviation stands for primary energy a resource

End of Life - Waste

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Hazardous waste	Kg	0.00E+00	6.85E+05	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-hazardous waste	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Radioactive waste	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

End of Life - Outflows

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Components for reuse	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-4.68E+06
Materials for recycling	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	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	ND	ND	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	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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

Core Environmental Impact Indicators

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Climate change (GWP) – fossil	kg CO2e	3.31E+00	6.64E-02	2.72E-03	ND	ND	0.00E+00	5.82E-03	8.37E-03	3.95E-04	-3.37E-03
Climate change (GWP) – biogenic	kg CO2e	6.06E-03	1.01E-05	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.21E-06	6.50E-08	-4.18E-07
Climate change (GWP) – LULUC	kg CO2e	2.99E-03	2.87E-06	0.00E+00	ND	ND	0.00E+00	0.00E+00	3.19E-07	3.54E-08	-2.75E-07
Climate change (GWP) – total	kg CO2e	3.32E+00	6.64E-02	2.72E-03	ND	ND	0.00E+00	5.82E-03	8.37E-03	3.95E-04	-3.75E-03
Ozone depletion	kg CFC11e	4.03E-07	1.24E-08	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.31E-09	8.00E-11	-7.30E-10
Acidification	mol H+e	1.48E-02	4.20E-04	9.53E-07	ND	ND	0.00E+00	2.05E-06	5.00E-05	4.01E-06	-4.00E-05
Eutrophication, aquatic freshwater	kg PO4e	2.55E-03	2.58E-06	0.00E+00	ND	ND	0.00E+00	0.00E+00	2.83E-07	6.26E-08	-3.12E-07
Eutrophication, aquatic freshwater	Kg P eq	8.31E-04	8.41E-07	0.00E+00	ND	ND	0.00E+00	0.00E+00	9.22E-08	2.04E-08	-1.02E-07
Eutrophication, aquatic marine	kg Ne	2.82E-03	6.08E-05	4.78E-07	ND	ND	0.00E+00	1.02E-06	7.60E-06	1.72E-06	-1.57E-05
Eutrophication, terrestrial	mol Ne	2.88E-02	6.60E-04	5.34E-06	ND	ND	0.00E+00	1.00E-05	8.00E-05	2.00E-05	-1.70E-04
Photochemical ozone formation	kg NMVOCe	1.14E-02	2.01E-04	1.41E-06	ND	ND	0.00E+00	3.03E-06	2.48E-05	5.27E-06	-4.72E-05
Abiotic depletion, minerals & metals	kg Sbe	3.45E-05	3.94E-08	0.00E+00	ND	ND	0.00E+00	0.00E+00	4.88E-09	2.20E-10	-1.84E-09
Abiotic depletion of fossil resources	MJ	6.29E+01	1.11E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.25E-01	5.63E-03	-4.95E-02
Water use	m3e depr.	0.00E+00	3.63E-03	0.00E+00	ND	ND	0.00E+00	0.00E+00	4.59E-04	1.33E-05	-1.10E-04

EN 15804+ A2 disclaimers for Abiotic depletion and Water use indicators and all optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

Additional Environmental Impact Indicators

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Particulate matter	Incidence	1.32E-07	2.89E-09	4.90E-12	ND	ND	0.00E+00	1.08E-11	3.63E-10	1.05E-10	-4.30E-09
Ionizing radiation, human health	kBq U235e	1.96E-01	2.75E-03	0.00E+00	ND	ND	0.00E+00	0.00E+00	2.79E-07	2.34E-05	-2.11E-04
Eco-toxicity (freshwater)	CTUe	1.18E+02	3.36E-01	7.77E-06	ND	ND	0.00E+00	2.00E-05	3.86E-02	1.47E-03	-1.29E-02
Human toxicity, cancer effects	CTUh	3.19E-09	1.55E-11	9.34E-14	ND	ND	0.00E+00	2.00E-13	1.93E-12	1.13E-13	-9.38E-13
Human toxicity, non-cancer effects	CTUh	3.40E-08	1.63E-10	1.83E-12	ND	ND	0.00E+00	3.85E-12	1.97E-11	8.74E-13	-6.17E-12
Land use related impacts/soil quality	-	7.56E+00	9.22E-02	0.00E+00	ND	ND	0.00E+00	0.00E+00	9.73E-03	6.86E-03	-5.93E-03

EN 15804+A2 disclaimer for Ionizing radiation, human health. 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.

Environmental impacts – GWP-GHG

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP-GHG	kg CO2e	3.32E+00	6.64E-02	2.72E-03	0.00E+00	0.00E+00	0.00E+00	5.82E-03	8.37E-03	3.95E-04	-3.75E-03

This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 5 (IPCC 2013) This indicator Is almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Use of Natural Resources

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Renewable PER used as energy	MJ	2.47E+00	2.26E-03	0.00E+00	ND	ND	0.00E+00	0.00E+00	2.48E-04	4.66E-05	-2.63E-04
Renewable PER used as materials	MJ	1.04E-02	1.59E-05	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.84E-06	1.60E-07	-1.31E-06
Total use of renewable PER	MJ	2.48E+00	2.28E-03	0.00E+00	ND	ND	0.00E+00	0.00E+00	2.50E-04	4.68E-05	-2.64E-04

Non-renew. PER used as energy	MJ	6.29E+01	1.11E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.25E-01	5.63E-03	-4.95E-02
Non-renew. PER used as materials	MJ	6.02E-06	6.60E-09	0.00E+00	ND	ND	0.00E+00	0.00E+00	7.46E-10	1.58E-10	-7.09E-10
Total use of non-renewable PER	MJ	6.29E+01	1.11E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.25E-01	5.63E-03	-4.95E-02
Use of secondary materials	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renew. secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m3	0.00E+00	4.81E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

PER abbreviation stands for primary energy a resource

End of Life - Waste

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Hazardous waste	Kg	0.00E+00	2.89E+03	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-hazardous waste	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Radioactive waste	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

End of Life - Outflows

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Components for reuse	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-6.57E+03
Materials for recycling	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	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	ND	ND	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	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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

Core Environmental Impact Indicators

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Climate change (GWP) – fossil	kg CO2e	3.30E+00	5.92E-02	1.12E-01	ND	ND	0.00E+00	5.82E-03	8.37E-03	3.95E-04	-3.37E-03
Climate change (GWP) – biogenic	kg CO2e	6.35E-03	8.97E-06	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.21E-06	6.50E-08	-4.18E-07
Climate change (GWP) – LULUC	kg CO2e	3.05E-03	2.56E-06	0.00E+00	ND	ND	0.00E+00	0.00E+00	3.19E-07	3.54E-08	-2.75E-07
Climate change (GWP) – total	kg CO2e	3.31E+00	5.92E-02	1.12E-01	ND	ND	0.00E+00	5.82E-03	8.37E-03	3.95E-04	-3.75E-03
Ozone depletion	kg CFC11e	4.28E-07	1.10E-08	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.31E-09	8.00E-11	-7.30E-10
Acidification	mol H+e	1.54E-02	3.70E-04	4.00E-05	ND	ND	0.00E+00	2.05E-06	5.00E-05	4.01E-06	-4.00E-05
Eutrophication, aquatic freshwater	kg PO4e	2.69E-03	2.30E-06	0.00E+00	ND	ND	0.00E+00	0.00E+00	2.83E-07	6.26E-08	-3.12E-07
Eutrophication, aquatic freshwater	Kg P eq	8.77E-04	7.50E-07	0.00E+00	ND	ND	0.00E+00	0.00E+00	9.22E-08	2.04E-08	-1.02E-07
Eutrophication, aquatic marine	kg Ne	2.92E-03	5.42E-05	1.96E-05	ND	ND	0.00E+00	1.02E-06	7.60E-06	1.72E-06	-1.57E-05
Eutrophication, terrestrial	mol Ne	2.99E-02	5.90E-04	2.20E-04	ND	ND	0.00E+00	1.00E-05	8.00E-05	2.00E-05	-1.70E-04
Photochemical ozone formation	kg NMVOCe	1.18E-02	1.79E-04	5.79E-05	ND	ND	0.00E+00	3.03E-06	2.48E-05	5.27E-06	-4.72E-05
Abiotic depletion, minerals & metals	kg Sbe	3.64E-05	3.52E-08	0.00E+00	ND	ND	0.00E+00	0.00E+00	4.88E-09	2.20E-10	-1.84E-09
Abiotic depletion of fossil resources	MJ	6.60E+01	9.90E-01	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.25E-01	5.63E-03	-4.95E-02
Water use	m3e depr.	0.00E+00	3.24E-03	0.00E+00	ND	ND	0.00E+00	0.00E+00	4.59E-04	1.33E-05	-1.10E-04

EN 15804+ A2 disclaimers for Abiotic depletion and Water use indicators and all optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

Additional Environmental Impact Indicators

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Particulate matter	Incidence	1.38E-07	2.57E-09	2.01E-10	ND	ND	0.00E+00	1.08E-11	3.63E-10	1.05E-10	-4.30E-09
Ionizing radiation, human health	kBq U235e	2.08E-01	2.45E-03	0.00E+00	ND	ND	0.00E+00	0.00E+00	2.79E-07	2.34E-05	-2.11E-04
Eco-toxicity (freshwater)	CTUe	1.26E+02	3.00E-01	3.20E-04	ND	ND	0.00E+00	2.00E-05	3.86E-02	1.47E-03	-1.29E-02
Human toxicity, cancer effects	CTUh	3.37E-09	1.38E-11	3.83E-12	ND	ND	0.00E+00	2.00E-13	1.93E-12	1.13E-13	-9.38E-13
Human toxicity, non-cancer effects	CTUh	3.58E-08	1.46E-10	7.50E-11	ND	ND	0.00E+00	3.85E-12	1.97E-11	8.74E-13	-6.17E-12
Land use related impacts/soil quality	-	7.96E+00	8.22E-02	0.00E+00	ND	ND	0.00E+00	0.00E+00	9.73E-03	6.86E-03	-5.93E-03

EN 15804+A2 disclaimer for Ionizing radiation, human health. 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.

Environmental impacts – GWP-GHG

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP-GHG	kg CO2e	3.30E+00	5.92E-02	1.12E-01	0.00E+00	0.00E+00	0.00E+00	5.82E-03	8.37E-03	3.95E-04	-3.75E-03

This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 5 (IPCC 2013) This indicator Is almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Use of Natural Resources

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Renewable PER used as energy	MJ	2.61E+00	2.01E-03	0.00E+00	ND	ND	0.00E+00	0.00E+00	2.48E-04	4.66E-05	-2.63E-04
Renewable PER used as materials	MJ	1.10E-02	1.41E-05	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.84E-06	1.60E-07	-1.31E-06
Total use of renewable PER	MJ	2.62E+00	2.02E-03	0.00E+00	ND	ND	0.00E+00	0.00E+00	2.50E-04	4.68E-05	-2.64E-04

Non-renew. PER used as energy	MJ	6.60E+01	9.90E-01	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.25E-01	5.63E-03	-4.95E-02
Non-renew. PER used as materials	MJ	6.36E-06	5.88E-09	0.00E+00	ND	ND	0.00E+00	0.00E+00	7.46E-10	1.58E-10	-7.09E-10
Total use of non-renewable PER	MJ	6.60E+01	9.90E-01	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.25E-01	5.63E-03	-4.95E-02
Use of secondary materials	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renew. secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m3	0.00E+00	1.87E+01	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

PER abbreviation stands for primary energy a resource

End of Life - Waste

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Hazardous waste	Kg	0.00E+00	1.12E+04	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-hazardous waste	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Radioactive waste	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

End of Life - Outflows

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Components for reuse	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-2.86E+04
Materials for recycling	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	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	ND	ND	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	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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

Core Environmental Impact Indicators

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Climate change (GWP) – fossil	kg CO2e	5.30E-01	3.14E-02	2.95E-02	ND	ND	0.00E+00	5.82E-03	8.37E-03	3.95E-04	-3.37E-03
Climate change (GWP) – biogenic	kg CO2e	8.96E-04	4.75E-06	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.21E-06	6.50E-08	-4.18E-07
Climate change (GWP) – LULUC	kg CO2e	6.21E-04	1.36E-06	0.00E+00	ND	ND	0.00E+00	0.00E+00	3.19E-07	3.54E-08	-2.75E-07
Climate change (GWP) – total	kg CO2e	5.32E-01	3.14E-02	2.95E-02	ND	ND	0.00E+00	5.82E-03	8.37E-03	3.95E-04	-3.75E-03
Ozone depletion	kg CFC11e	2.14E-08	5.84E-09	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.31E-09	8.00E-11	-7.30E-10
Acidification	mol H+e	1.96E-03	2.00E-04	1.00E-05	ND	ND	0.00E+00	2.05E-06	5.00E-05	4.01E-06	-4.00E-05
Eutrophication, aquatic freshwater	kg PO4e	2.28E-04	1.22E-06	0.00E+00	ND	ND	0.00E+00	0.00E+00	2.83E-07	6.26E-08	-3.12E-07
Eutrophication, aquatic freshwater	Kg P eq	7.42E-05	3.97E-07	0.00E+00	ND	ND	0.00E+00	0.00E+00	9.22E-08	2.04E-08	-1.02E-07
Eutrophication, aquatic marine	kg Ne	5.06E-04	2.87E-05	5.17E-06	ND	ND	0.00E+00	1.02E-06	7.60E-06	1.72E-06	-1.57E-05
Eutrophication, terrestrial	mol Ne	5.27E-03	3.10E-04	6.00E-05	ND	ND	0.00E+00	1.00E-05	8.00E-05	2.00E-05	-1.70E-04
Photochemical ozone formation	kg NMVOCe	1.53E-03	9.50E-05	1.53E-05	ND	ND	0.00E+00	3.03E-06	2.48E-05	5.27E-06	-4.72E-05
Abiotic depletion, minerals & metals	kg Sbe	2.27E-06	1.86E-08	0.00E+00	ND	ND	0.00E+00	0.00E+00	4.88E-09	2.20E-10	-1.84E-09
Abiotic depletion of fossil resources	MJ	5.25E+00	5.24E-01	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.25E-01	5.63E-03	-4.95E-02
Water use	m3e depr.	0.00E+00	1.72E-03	0.00E+00	ND	ND	0.00E+00	0.00E+00	4.59E-04	1.33E-05	-1.10E-04

EN 15804+ A2 disclaimers for Abiotic depletion and Water use indicators and all optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

Additional Environmental Impact Indicators

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Particulate matter	Incidence	1.48E-08	1.36E-09	5.31E-11	ND	ND	0.00E+00	1.08E-11	3.63E-10	1.05E-10	-4.30E-09
Ionizing radiation, human health	kBq U235e	1.37E-02	1.30E-03	0.00E+00	ND	ND	0.00E+00	0.00E+00	2.79E-07	2.34E-05	-2.11E-04
Eco-toxicity (freshwater)	CTUe	2.11E+00	1.59E-01	8.00E-05	ND	ND	0.00E+00	2.00E-05	3.86E-02	1.47E-03	-1.29E-02
Human toxicity, cancer effects	CTUh	1.86E-10	7.30E-12	1.01E-12	ND	ND	0.00E+00	2.00E-13	1.93E-12	1.13E-13	-9.38E-13
Human toxicity, non-cancer effects	CTUh	3.76E-09	7.71E-11	1.98E-11	ND	ND	0.00E+00	3.85E-12	1.97E-11	8.74E-13	-6.17E-12
Land use related impacts/soil quality	-	1.55E+00	4.35E-02	0.00E+00	ND	ND	0.00E+00	0.00E+00	9.73E-03	6.86E-03	-5.93E-03

EN 15804+A2 disclaimer for Ionizing radiation, human health. 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.

Environmental impacts – GWP-GHG

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP-GHG	kg CO2e	5.31E-01	3.14E-02	2.95E-02	0.00E+00	0.00E+00	0.00E+00	5.82E-03	8.37E-03	3.95E-04	-3.75E-03

This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 5 (IPCC 2013) This indicator Is almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Use of Natural Resources

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Renewable PER used as energy	MJ	1.91E-01	1.07E-03	0.00E+00	ND	ND	0.00E+00	0.00E+00	2.48E-04	4.66E-05	-2.63E-04
Renewable PER used as materials	MJ	6.59E-04	7.50E-06	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.84E-06	1.60E-07	-1.31E-06
Total use of renewable PER	MJ	1.92E-01	1.08E-03	0.00E+00	ND	ND	0.00E+00	0.00E+00	2.50E-04	4.68E-05	-2.64E-04

Non-renew. PER used as energy	MJ	5.25E+00	5.24E-01	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.25E-01	5.63E-03	-4.95E-02
Non-renew. PER used as materials	MJ	1.29E-06	3.12E-09	0.00E+00	ND	ND	0.00E+00	0.00E+00	7.46E-10	1.58E-10	-7.09E-10
Total use of non-renewable PER	MJ	5.25E+00	5.24E-01	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.25E-01	5.63E-03	-4.95E-02
Use of secondary materials	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renew. secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m3	0.00E+00	1.20E+01	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

PER abbreviation stands for primary energy a resource

End of Life – Waste

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Hazardous waste	Kg	0.00E+00	7.21E+03	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-hazardous waste	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Radioactive waste	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

End of Life – Outflows

Impact Category	Unit	A1-A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Components for reuse	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-3.47E+04
Materials for recycling	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	Kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	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	ND	ND	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	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Biogenic Carbon Content (for all products listed)

Details	Unit	A1-A3
Biogenic carbon content in product	Kg C	0
Biogenic carbon content in packaging	Kg C	0

5.2 Interpretation of LCA Study Results

In general terms, as it is shown in the table of core environmental impact indicators, A1-A2 module has the higher impact, representing above 90% of the whole impact. A3 module has a less impact. C2 and C4 module has little impact too, representing at most 0.16% and 0.01% respectively of the whole impact. Finally, Module D represents savings between 0.1% and 20% of the total impact.

6.0 VERIFICATION

Diffusion Institution	The Environmental Footprint Institute Calle CIRCE 49A Madrid 28022 Spain www.environmentalfootprintinstitute.org
Registration Number	230704EPD CR:P-3100
Issue Date	25.07.2023
Valid until	25.07.2028
Product Category Rules	P-3100 (EN 15804:2012+A2:2019/AC:2021)
Product Group Classification	UN CPC 37410
Reference year for Data	December 2021 – November 2022
Geographical Scope	Manufactured in Kingdom of Saudi Arabia (KSA) and Distributed in Gulf Cooperation Countries

Product category rules (PCR): P-3100 (EN 15804:2012+A2:2019/AC:2021)
PCR review was conducted by: The Environmental Footprint Institute.
Independent verification of the declaration and data, according to ISO 14025:2006 and ISO 14040: ☐ EPD Process Certification (internal) ☒ EPD Verification (external)
Third party verifier: Mr. Iván Jiménez Accredited by: The Environmental Footprint Institute.

7.0 MANDATORY STATEMENTS

Explanatory material can be obtained from EPD owner and/or LCA author. Contact information can be found below. The owner of the declaration shall be liable for the underlying information and evidence. The LCA Author shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

The verifier and The Environmental Footprint Institute do not make any claim or present any responsibility about the legality of the product.

EPDs within the same product category but from different programmes may not be comparable.

8.0 CONTACT INFORMATION

EPD Owner	Saudi Vetonit Co Ltd. P.O.BOX 52235 Riyadh 11563, Saudi Arabia Tel: +966 11 265 3334 mmomani@saveto.com www.saveto.com
LCA Author	Alan B.Christopher GCAS Quality Certifications P.O.Box 65561, Dubai, UAE www.gcasquality.com info.dubai@gcasquality.com +971-4-3437552
Programme Operator	The Environmental Footprint Institute Calle Circe 49A Madrid, Spain www.environmentalfootprintinstitute.com info@ environmentalfootprintinstitute.com

9.0 REFERENCES

This Environmental Footprint has been developed and diffused following the instructions of the Environmental Footprint Institute.

LCA Report: Life Cycle Inventory of Sealants & Joints, Tile Adhesive & Grout, Thermal Insulation and Protective Coating.

Software: Air.e LCA Version 3.14.0.15 www.solidforest.com

Main database: Ecoinvent 3.9 www.ecoinvent.org

Geographical scope of the EPD: Manufactured in Kingdom of Saudi Arabia (KSA) and Distributed in Gulf Cooperation Countries

Normative: ISO 14040:2006 “Environmental management -- life cycle assessment -- principles and framework”; ISO 14044:2006 “Environmental management -- life cycle assessment -- requirements and guidelines”; ISO 14020 “Environmental Labelling: General Principles”; ISO 14025:2006 “Environmental labels and declarations -- type III environmental declarations -- principles and procedures” and EN 15804.

Product Category Rules: P-3100 (EN 15804:2012+A2:2019/AC:2021)
