

Environmental and Health Product Declaration  
Fiche de Déclaration Environnementale et Sanitaire

**STONE AND FACING PLATES  
(MASS LESS THAN 40 KG/M<sup>2</sup>) - ORSOL**

**Surface mass less than 40 kg/m<sup>2</sup>**

**(Including implementation products, excluding any preparation of the support)**

*In accordance with the NF EN 15804+A2 standard and its national supplement NF EN 15804+A2/CN*



INIES registration number: 20230934972

DT DPM 2023-09

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06/11/2023

## Warning

This declaration was produced by the Centre d'Etudes et de Recherches de l'Industrie du Béton (CERIB), on the initiative of the company ORSOL. The information contained in this declaration is provided under the responsibility of ORSOL declaring the EHPD according to NF EN 15804+A2 and the national supplement NF EN 15804+A2/CN.

Any use, in whole or in part, of the information provided in this document must at least be accompanied by the full reference of the original EHPD as well as its producer, who will be able to provide a complete copy.

The NF EN 15804+A2 standard, the national supplement NF EN 15804+A2/CN and the NF EN 16757:2022 standard serve as product category definition rules (SPC).

*NOTE 1 The literal translation of "EPD (Environmental Product Declaration)" is "DEP" (Déclaration Environnementale de Produit). However, in France, the term EHPD (Environmental and Health Declaration Sheet) is commonly used, which includes both the Environmental Declaration and Health Information for the product that is the subject of this EHPD. The EHPD is therefore indeed a "DEP" supplemented by health information.*

## Reading guide

The following display rules are used:

- Values are expressed according to the simplified scientific notation:  $0.0123 = 1.23 \cdot 10^{-2} = 1.23E-2$ ;
- When the inventory calculation result is zero, then the value zero is displayed.
- The units used are specified in front of each flow: the kilogram "kg", the gram "g", the kilowatt-hour "kWh", the megajoule "MJ", the square metre "m<sup>2</sup>", the kelvin "K", the watt "W", the kilometre "km", the millimetre "mm".

Abbreviations used:

- CERIB: Centre for Studies and Research of the Concrete Industry;
- EPD: Environmental Product Declaration;
- EHPD: Environmental and Health Declaration Sheet;
- UF: Functional Unit.

## Caution of using the EPD for product comparison

The EHPD of construction products may not be comparable if they do not comply with the NF EN 15804+A2 standard.

The NF EN 15804+A2 standard defined in §5.3 Comparability of EPDs for construction products, the conditions under which construction products may be compared, on the basis of the information provided by the EHPD:

*"Therefore, a comparison of the environmental performance of construction products using EPD information should be based on the use of the products and their impacts on the building, and should take into account the entire life cycle (all information modules)."*

*NOTE 1 Outside the context of the environmental assessment of a building, EHPD are not tools for comparing construction products and services.*

*NOTE 2 For the assessment of the contribution of buildings to sustainable development, a comparison of environmental aspects and impacts should be undertaken in conjunction with the socio-economic aspects and impacts of the building.*

*NOTE 3 For the interpretation of a comparison, reference values are required.*

## Contact

### MATIÈRE

100 chemin de Landesque  
47330 Saint-Quentin-du-Dropt  
www.orsol.fr

## 1. General information

This EHPD complies with the NF EN ISO 14025 and NF EN 15804+A2/CN and NF EN 16757:2022 RCP standards for concrete and concrete elements.

### 1.1. Registrant and the site(s) or manufacturer(s) for which the EPD is representative

This declaration was produced by the Centre for Studies and Research of the Concrete Industry (CERIB), on the initiative of MATIERA. The information contained therein is provided under the responsibility of MATIERA, declaring this EHPD according to the NF EN 15804+A2 standard and its national supplement NF EN15804+A2/CN.

Owner - Notifier	LCA Practitioner
<b>MATIERA</b> 100 chemin de Landesque 47330 Saint-Quentin-du-Dropt www.orsol.fr	CERIB - Centre d'Etudes et de Recherches de l'Industrie du Béton 1 rue des Longs Réages CS 10010 28233 Epernon CEDEX 02 37 18 48 00 <a href="mailto:environnement@cerib.com">environnement@cerib.com</a> <a href="http://www.cerib.com">www.cerib.com</a>
Manufacturer Site Saint-Quentin-du-Dropt (47)	

### 1.2. Type and nature of the declaration

This declaration is an individual declaration of the range and covers the life cycle from cradle to grave completed by module D.

### 1.3. Product identification and trade reference(s) and place of production

The EHPD is representative of concrete facing plates and stones intended for wall facing (interior and exterior). This product with a surface mass of less than 40 kg/m<sup>2</sup>, described in §2.2, is manufactured in France by the MATIERA plant in Saint-Quentin-du-Dropt (47).

### 1.4. Date of publication

The EHPD has been audited by an external third party under the number 20230934972 as part of the INIES verification program by POUSSE Maxime; authorized auditor.

1<sup>st</sup> publication date : 06/11/2023

Update date: -

## 1.5. Verification and validity

The information relating to the validity of this EHPD is consistent with the specifications contained in the project report. The EHPD has been independently audited externally under the ISO 14025 (2010 version) compliant environmental declaration program by:

CEN standard EN 15804 and standard NF EN 16757 serve as SPC <sup>a)</sup>	
Independent verification of the declaration, in accordance with EN ISO 14025:2010 <input type="checkbox"/> Internal <input checked="" type="checkbox"/> External	
(As applicable <sup>b)</sup> ) Third-party verification: POUSSE Maxime	
Registration number for the INIES program in accordance with ISO 14025:	20230934972
Date of 1 <sup>st</sup> publication:	06/11/2023
Updated date:	-
Date of verification:	06/11/2023
Validity period:	5 years
<small>(a) Rules for defining product categories</small>	
<small>(b) Optional for business-to-business communication, mandatory for communication between a business and its customers (see EN ISO 14025:2010, 9.4)</small>	

This information is available at: [www.inies.fr](http://www.inies.fr)



**This EHPD has been translated under the responsibility of MATIERA (ORSOL PRODUCTION).**

**Only the french version is valid for compliance with French regulations.  
This translated version is not sufficient to claim compliance with any  
declaration programme other than the INIES programme.**

## 2. Description of the business unit and product

### 2.1. Business Unit

To provide the cladding function aesthetically on 1m<sup>2</sup> of building wall for a 50-year service life.

### 2.2. Product

Facing sheets and stones are concrete products intended for wall cladding (interior and exterior). The product subject to the EHPD with a surface mass of 32.41 kg/m<sup>2</sup> corresponds to a standard product representative of a range of stones and facing slabs with a surface mass of less than 40 kg/m<sup>2</sup> with various dimensions less than 2000 cm<sup>2</sup> for the natural stone form and less than 3300 cm<sup>2</sup> for the plate form. The characteristics of the standard product are obtained by making a weighted average of the sales of this product range made by ORSOL.

Regarding the use of the products, the products are installed in accordance with DTU 52.2 with an ORSOL "ORFLEX HP" adhesive mortar and a wall joint mortar ORSOL "MORTIER JOINT MUR".

### 2.3. Use– Scope

The products are intended for the cladding of interior and exterior walls, and installed in accordance with the specifications of the CSTB technical opinion under the ATEX number 2926-V1 ORSOL.

### 2.4. Other technical characteristics not included in the Functional Unit

See Product Data Sheet.

### 2.5. Main components and/or materials of the product

Product:

- 32.41 kg (excl. processing losses)

Distribution Packaging:

- 0.439 kg of wood (pallet)
- 0.02 kg of polyethylene cover
- 0.02 kg of PP strapping

Additional implementation product (excluding losses):

- 6.33 kg of dry bonding mortar
- 5.58 kg of grout mortar
- 4.33 L for mixing the mortar

Note: The substrate is considered suitable to receive the siding.

Support preparation products may be necessary depending on the type of wall on which the cladding will be installed. These products are not included in the EHPD. Depending on the case, it can be plaster, glass mesh or another glue.

### 2.6. Substances on the candidate list according to the REACH Regulation (if greater than 0.1%)

No substances on the list declared more than 0.1% by mass.

## 2.7. Proof of fitness for use

See ATEX n° 2926-V1 ORSOL (update TA currently being drafted with a view to its formalisation in July 2024).

## 2.8. Distribution channel

Distribution channel: BtoB and BtoC

## 2.9. Description of the reference life

Parameters	Securities
Reference life	50 years
Declared product properties (ex-factory)	Refer to the product data sheet and ATEX No. 2926-V1 ORSOL.
Theoretical application parameters (if imposed by the manufacturer), including references to appropriate requirements and application codes	The installation must be carried out according to the recommendations of DTU 52.2, of the IDEAPOSE ORSOL installation process.
Presumed quality of the work	The work must meet the requirements of the DTU mentioned above.
Indoor environment (for indoor applications)	Use corresponding to the scope of the NF 771-3 standard
Outdoor environment (for outdoor applications)	Use corresponding to the scope of the NF 771-3 standard
Terms of Use	Use corresponding to the scope of the NF 771-3 standard and DTU 52.2
Maintenance Maintenance Scenario	1 water wash cycle every 10 years.

## 2.10. Biogenic carbon content information

Parameter	Unit	Value
Biogenic carbon content of the product (ex-factory)	kg of C	0
Biogenic carbon content of the associated packaging (ex factory)	kg of C	0,171

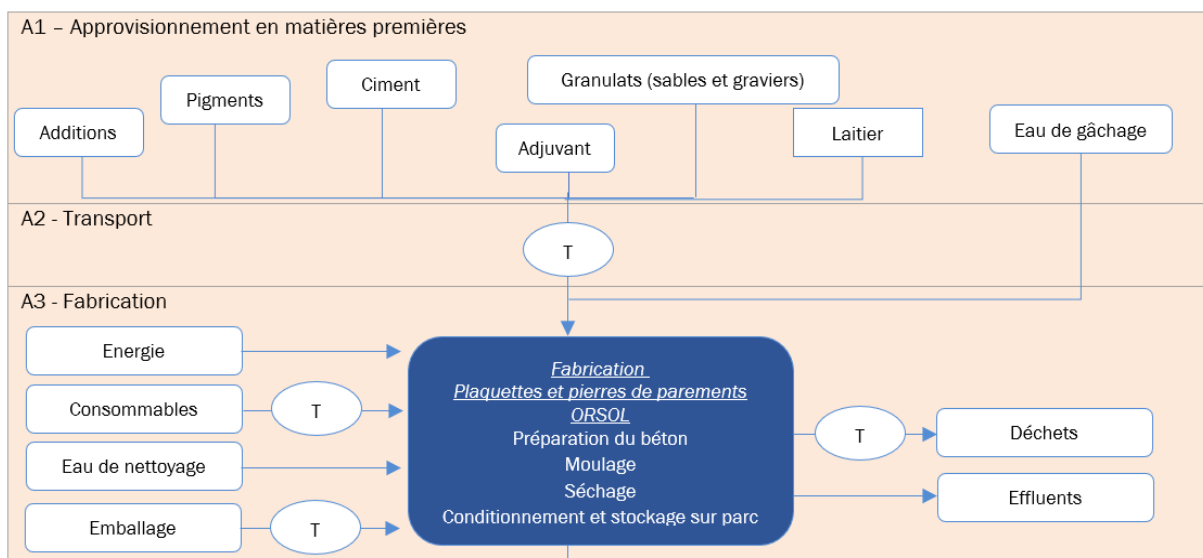
### 3. Life Cycle Stages

Description of the boundaries of the system (X = included in the LCA; MND = module not declared)														
PRODUCTION STAGE	STAGE OF THE CONSTRUCTION PROCESS		STAGE OF USE							END-OF-LIFE STAGE				BENEFITS AND EXPENSES BEYOND THE BOUNDARIES OF THE SYSTEM
	Transport	Construction process, installation	Usage	Maintenance	Repair	Replacement	Rehabilitation	Energy use during the use stage	Water use during the stage	Demolition / Deconstruction	Transport	Waste treatment	Elimination	Possibility of reuse, recovery, recycling
A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

#### 3.1. Production Steps: A1-A3

The production stage includes:

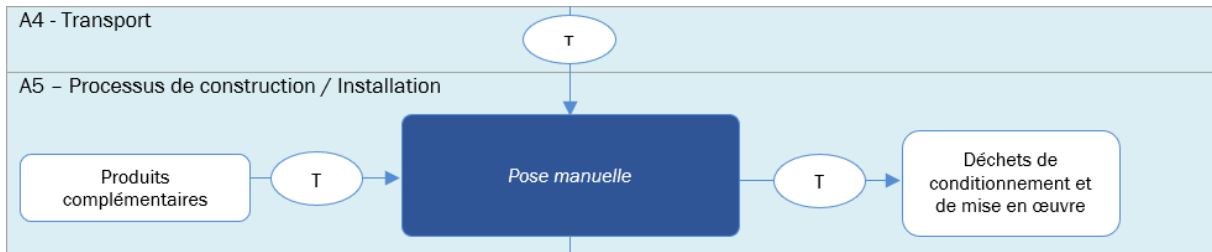
- The production of the raw materials that make up the product (cement, aggregates, admixtures, and water);
- The transport of these raw materials for the supply of the manufacturing site;
- The manufacture of the product (including in particular the energy consumption, materials and products necessary for the operation of the site as well as the transport and management of the waste generated by the manufacture).



### 3.2. Construction Stages: A4-A5

The construction phase includes:

- The transport of products between the production site and the site;
- The production and transport of installation scraps, as well as the production and transport of products complementary to the installation;
- The implementation of the products on the site.



#### A4– Transport to the site

Parameters	Securities
Fuel type and vehicle consumption	Road transport: 33 litres of diesel per 100 km fully loaded
Average distance to the construction site	562 km
Capacity utilization (including empty returns)	33% 30% empty returns
Bulk density of transported products	Products on pallet: approx. 1200 kg/m <sup>3</sup>
Utilization factor of the capacitance by volume	<1

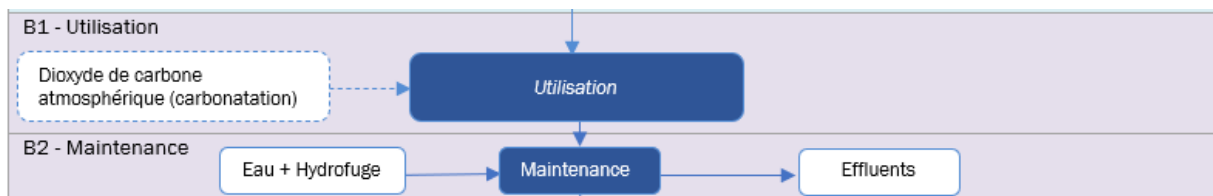
**A5– Installation in the building**

Parameters	Securities
Ancillary inputs for installation	6.33 kg of dry bonding mortar (including 3% losses) 5.58 kg of dry grout mortar (including 5% losses) 0.117 L of water repellent (for outdoor or wet installation)
Water use	4.33 L for mixing mortars
Use of other resources	No consumption
Quantitative description of the type of energy (regional mix) and consumption during the installation process	11E-3 KWh of French electricity for mixing the mortar
Waste materials at the construction site prior to the treatment of waste generated by the product installation (specified by type)	Installation falls: - 0.97 kg of product - 0.468 kg of mortar (0.189 kg of adhesive mortar and 0.279 kg of mineral plaster mortar -counted in the SNMI EHPD)  Packaging waste: - 0.493 kg of wood - 0.02 kg of polyethylene cover - 0.02 kg of strapping
Outgoing materials (specified by type) generated by waste treatment at the construction site, e.g. collection for recycling, energy recovery, disposal (specified by route)	Installation falls: - 0.681 kg of recycled concrete (70%) - 0.292 kg of concrete removed (30%)  Packaging waste: - 0.337 kg of recovered wood (68.5%) - 0.155 kg of incinerated wood (31.5%) - 0.015 kg of polyethylene recovered (78%) - 2.4E-3 kg of incinerated polyethylene (12%) - 2E-3 kg of polyethylene buried (10%)
Direct emissions to ambient air, soil and water	Considered negligible apart from the waste accounted for elsewhere

**3.3. Stages of implementation life: B1-B7**

The implementation life stage includes:

- Use of the product under normal conditions of use, including the carbonation process.



**B1– Use**

Parameters	Securities
Concrete carbonation process	1.158 kg of atmospheric carbon dioxide

Carbonation is a chemical process by which carbon dioxide from the ambient air is absorbed by the concrete. During the life of the structure, carbon dioxide from the atmosphere enters the concrete from the surface of the material. The carbon dioxide can then react with the products resulting from the hydration of the cement. Carbonation gradually changes the chemical composition and microstructure. The carbonation calculation is

based on a product scenario used as exterior wall cladding, which is a conservative scenario. To take into account carbonation, the stage of implementation was chosen for the calculation following the recommendations of the NF EN 16757:2022 RCP standard for concrete and concrete elements.

In the case of ORSOL facing sheets and stones, the carbonation calculation excluded the grouting products and was carried out considering that the products cover an entire surface area of 1m<sup>2</sup>. This conservative scenario was considered due to the variable dimensions of the ORSOL facing plates and stones and the lack of information on the composition of the mortars.

**B2 to B5 – Maintenance, Repair, Replacement and Rehabilitation**

The durability of the product is increased by regular maintenance. The stones and facing plates are cleaned by manual washing with water.

Parameters	Securities
Maintenance Process	Manual water and water-repellent washing for stones and plates installed outdoors or in wet environments
Maintenance cycle	1 cycle every 10 years for washing and possibly 1 cycle every 5 years for water repellent
Ancillary inputs for maintenance	-
Waste generated during maintenance	29.3 litres of effluent
Net Fresh Water Consumption During Maintenance	29.3 liters
Energy input during maintenance	0 kWh

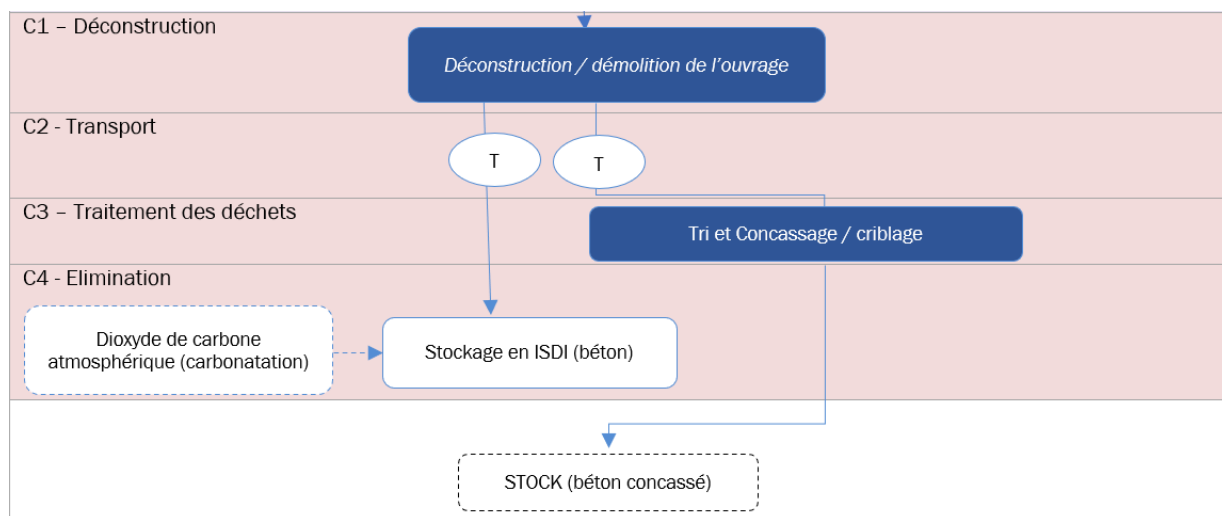
**B6 and B7– Energy and Water Use**

Not applicable.

**3.4. End-of-life stages: C1-C4**

The end-of-life stage includes:

- The deconstruction and demolition of the product using a mechanical machine;
- The transport of concrete waste demolition materials to a sorting centre or storage facility for recovery or disposal;
- For the recovered part, treatment by crushing/screening of concrete waste with a view to reuse it as secondary aggregates and separation of reinforcing steels with a view to their recycling;
- For the part eliminated, storage in a storage facility for inert waste (ISDI).



C1-C4– End of Life

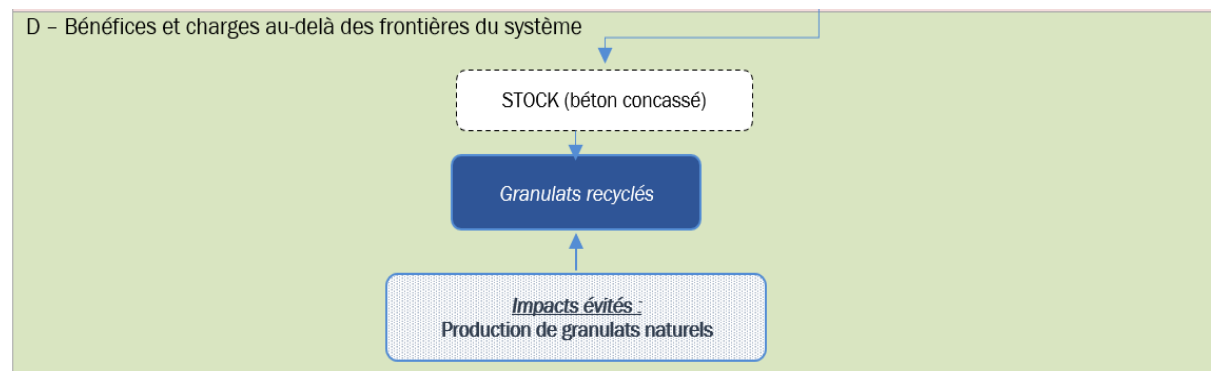
Parameters	Securities
Collection process specified by type	Demolition of the wall after deconstruction with loading and transport to a sorting or disposal centre
Recovery system specified by type	31.4 kg for recycling
Disposal specified by type	13.5 kg for final disposal
Assumptions for scenario development	Waste transport distance: - 30 km for disposed waste - 30 km for recycled concrete waste
Carbonation process*	5.58 E-4 kg of atmospheric carbon dioxide

**3.5. Potential for recycling/reuse/recovery: module D**

Materials saved

The material recovery of concrete waste by sorting and crushing makes it possible to make available recycled aggregates, most often used in road engineering, and thus avoid the production of natural aggregates beyond the boundaries of the system.

Materials/recovered materials outside the system boundaries	Recycling processes beyond system boundaries	Materials/materials saved	Associated quantities
Secondary Crushed Concrete Aggregates	The required processes are accounted for in modules C3 and D, as well as transport	Natural aggregates	31.4 kg



**Carbonation:**

The concrete that makes up the secondary aggregates, produced by crushing the waste, will continue to carbonate during storage and use. The surface area of exchange of this concrete with the ambient air increases, thus helping to accelerate the carbonation process. The concrete that makes up the aggregates will eventually be completely carbonated.

Carbonation will take place during modules C1 to C3, after demolition and until the concrete aggregate is removed from waste status. As the delay on these modules cannot be justified at present by statistical data, no carbonation has been counted on these modules.

No carbonation is counted in Module D.

## 4. Information for Life Cycle Assessment calculation

CPR used	NF EN 15804:2012+A2:2019 NF EN 15804+A2/CN:2022 NF EN 16757:2022 SPC for concrete and concrete elements, in particular for the consideration of carbonation
System boundaries	Individual declaration of range covering the life cycle from cradle to grave supplemented by module D. <u>Cut-off rule:</u> The cut-off rules set out in the NF EN 15804+A2 and NF EN 15804+A2/CN standards are respected (1% per process, 5% per module, on the mass of inputs, renewable and non-renewable energy).
Allowances	Mass allocations for incoming and outgoing production sites that could not be separately allocated to the product covered by the EHPD. Consumption of raw materials is specific to the products considered and represents the main contributor to most environmental impacts. For slag, an economic allocation of 1.4% was applied to the impacts of pig iron in accordance with the rules established by the Ministry and the INIES programme.
Geographical representativeness	1 manufacturing site, representing 100% of the production of the French market.
Temporal representativeness	Years of production data: 2022 <u>Software:</u> SimaPro 9.4 <u>Secondary database:</u> Ecoinvent 3.8 (2021) <u>ICV or EPD used:</u> Aalborg Cement 2021 UNPG Aggregates 2017 EFCA Admixtures 2021
Variability of results	This declaration is of the "individual" type and covers the range of products with a surface mass of less than 40 kg/m <sup>2</sup> . The variability of the results on the 3 environmental indicators for the different products in the range covered is less than 35% deviation from the average. The average environmental indicators are therefore retained.
Specific data	The assessment of the quality of the main specific data is as follows: <ul style="list-style-type: none"> <li>- 50% of the data with an average rating of "very good"</li> <li>- 50% of the data with an average rating of "good"</li> </ul>
Generic data	The assessment of the quality of key generic data is as follows: <ul style="list-style-type: none"> <li>- 8% of the data with an average rating of "very good"</li> <li>- 67% of the data with an average rating of "good"</li> <li>- 25% of the data with an average rating of "average"</li> </ul> These generic data are considered plausible, complete and consistent in accordance with NF EN 15804+A2/CN, Annex E2.2.2

## 5. Life Cycle Assessment Results

Below are the tables summarizing the LCA results.

Due to rounding, totals may not add up to the sum of rounding.

For energy indicators used as a feedstock: a negative value corresponds to the change in use from feedstock to fuel (e.g. in the case of incineration).

Application of Annex I of NF EN15804+A2/CN.

**BASELINE ENVIRONMENTAL IMPACT INDICATORS**

	A1/A2/A3 Production Stage	Construction stage		Stage of use							End-of-life stage				D Benefits and costs beyond the boundaries of the system
		A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Rehabilitation	B6 Energy use	B7 Water use	C1 Demolition / Deconstruction	C2 Transport	C3 Waste treatment	C4 Elimination	
Climate change - total <i>kg of CO<sub>2</sub> equiv/UF</i>	4,61	2,09	5,27	-1,16	1.11E-01	0	0	0	0	0	1.70E-01	1.84E-01	3.57E-02	3.19E-02	-3.38E-02
Climate change - fossil <i>kg of CO<sub>2</sub> equiv/UF</i>	5,24	2,09	4,64	-1,16	1.06E-01	0	0	0	0	0	1.70E-01	1.84E-01	3.52E-02	3.18E-02	-3.31E-02
Climate change - biogenic <i>kg CO<sub>2</sub> equiv/UF</i>	-6.32E-01	6.76E-04	6.31E-01	0	8,95E-04	0	0	0	0	0	5.04E-05	6.03E-05	4.18E-04	1.21E-04	-6,21E-04
Climate change - land cover and transformation of land cover <i>kg CO<sub>2</sub> equiv/UF</i>	1,91E-03	1,67E-05	2,45E-03	0	3,36E-03	0	0	0	0	0	4,19E-06	1,48E-06	3,54E-05	1,53E-06	-2,73E-05
Ozone depletion <i>kg CFC 11 equiv/UF</i>	3,30E-07	4,89E-07	1,43E-06	0	7,76E-06	0	0	0	0	0	3,80E-08	4,36E-08	6,22E-09	7,23E-09	-8,85E-09
Acidification <i>mole de H<sup>+</sup> equiv/UF</i>	2,58E-02	7,03E-03	1,52E-02	0	6,13E-04	0	0	0	0	0	1,83E-03	6,38E-04	2,85E-04	3,42E-04	-2,46E-04
Aquatic eutrophication - freshwater <i>kg P equiv/UF</i>	9,03E-04	1,05E-06	4,44E-05	0	3,21E-06	0	0	0	0	0	1,19E-07	9,40E-08	4,73E-06	2,95E-08	-2,15E-06
Aquatic - marine eutrophication <i>kg of N equiv/UF</i>	4,11E-03	2,22E-03	2,10E-03	0	1,45E-04	0	0	0	0	0	8,20E-04	2,04E-04	1,17E-04	1,53E-04	-1,43E-04
Terrestrial eutrophication <i>mole of N equiv/UF</i>	4,24E-02	2,44E-02	2,39E-02	0	1,30E-03	0	0	0	0	0	9,00E-03	2,25E-03	9,82E-04	1,68E-03	-9,83E-04
Photochemical ozone formation <i>kg NMVOC equiv/UF</i>	1,76E-02	6,68E-03	2,01E-02	0	3,99E-04	0	0	0	0	0	2,46E-03	6,12E-04	2,45E-04	4,59E-04	-2,16E-04
Depletion of abiotic resources (minerals and metals)** <i>kg Sb equiv/UF</i>	1,59E-04	8,95E-08	2,49E-05	0	2,08E-08	0	0	0	0	0	8,76E-09	7,97E-09	2,67E-07	1,65E-09	2,50E-08
Depletion of abiotic resources (fossil fuels)** <i>MJ/UF</i>	6,92E+01	2,92E+01	4,19E+01	0	1,35	0	0	0	0	0	2,35	2,60	6,59E-01	4,47E-01	-1,18
Water Requirement** <i>m<sup>3</sup> of deprivation equiv. in the world/UF</i>	3,39E+01	-4,88E-03	6,22E+01	0	1,27	0	0	0	0	0	6,05E-04	-4,35E-04	1,10E-02	1,20E-04	-6,40E-02

**ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS**

	A1/A2/A3 Production Stage	Construction stage		Stage of use							End-of-life stage			D Benefits and costs beyond the boundaries of the system	
		A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Rehabilitation	B6 Energy use	B7 Water use	C1 Demolition / Deconstruction	C2 Transport	C3 Waste treatment		C4 Elimination
Fine particle emissions <i>Disease index/UF</i>	1.27E-07	2.00E-07	7.44E-08	0	8,15E-09	0	0	0	0	0	3,85E-07	1.37E-08	1.98E-08	9,47E-09	-5.07E-08
Ionizing radiation (human health)* <i>kBq of U<sub>235</sub> equiv/UF</i>	2,90	1.27E-01	1.63E-01	0	3.53E-03	0	0	0	0	0	1.02E-02	1.13E-02	4.11E-03	1.97E-03	-1.14E-02
Ecotoxicity - freshwater** <i>CTUe/UF</i>	1,55E+01	1,27E+01	9,95	0	1,32E+01	0	0	0	0	0	7,85E-01	1,06	9,50E-01	1,66E-01	-1,14
Human toxicity - carcinogenic effects** <i>CTUh/UF</i>	4.15E-09	1.77E-10	3,24E-10	0	8,92E-11	0	0	0	0	0	1.02E-11	1.48E-11	1,27E-10	2.07E-12	1.44E-10
Human toxicity - non-cancer effects** <i>CTUh/UF</i>	2.95E-08	2.42E-08	9,92E-09	0	1.79E-09	0	0	0	0	0	8,19E-10	1.72E-09	2.58E-09	1.68E-10	5.09E-09
Land Use Impacts / Soil Quality** <i>Dimensionless/UF</i>	5,49E+01	7,85E-02	1,88E+01	0	6,42E-01	0	0	0	0	0	7,38E-03	7,00E-03	3,55E-02	-2,12	-1.94E-02

*ND: Not declared \* Exemption from liability 1: The calculation of the impacts of this indicator does not take into account the consequences of possible nuclear accidents, occupational exposure or the disposal of radioactive waste in underground facilities. Ionizing radiation from soil, radon and some building materials are not also measured by this indicator \*\* Disclaimer 2: The results of these environmental impact indicators should be used with caution because the uncertainties in these results are high or because experience with these indicators is limited*

**USE OF NATURAL RESOURCES**

	A1/A2/A3 Production Stage	Construction stage		Stage of use							End-of-life stage				D Benefits and costs beyond the boundaries of the system
		A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Rehabilitation	B6 Energy use	B7 Water use	C1 Demolition / Deconstruction	C2 Transport	C3 Waste treatment	C4 Elimination	
Use of renewable primary energy, excluding primary energy resources renewable used as renewable materials - MJ/UF	7,41	4,48E-02	5,41	0	2,71E-01	0	0	0	0	0	3,79E-03	3,99E-03	2,25E-02	1,23E-02	-3,97E-02
Use of renewable primary energy resources used as raw materials - MJ/UF	6,39	0	-2,65	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total use of renewable primary energy resources (primary energy and resources) primary energy used as raw materials) - MJ/UF</b>	1,38E+01	4,48E-02	2,76	0	2,71E-01	0	0	0	0	0	3,79E-03	3,99E-03	2,25E-02	1,23E-02	-3,97E-02
Use of non-renewable primary energy, excluding non-primary energy resources renewables used as feedstock - MJ/UF	6,84E+01	2,92E+01	4,99E+01	0	1,34	0	0	0	0	0	2,35	2,60	6,59E-01	4,47E-01	-1,18
Use of non-renewable primary energy resources used as raw materials - MJ/UF	1,69	0	3,54	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total use of non-renewable primary energy resources (primary energy and resources) primary energy used as raw materials) - MJ/UF</b>	7,00E+01	2,92E+01	5,35E+01	0	1,35	0	0	0	0	0	2,35	2,60	6,59E-01	4,47E-01	-1,18
Secondary material use - kg/UF	2.52E-02	0	9,42E-02	0	0	0	0	0	0	0	0	0	1.54E-03	0	3.16E+01
Use of secondary renewable fuels - MJ/UF	0	0	1,38	0	0	0	0	0	0	0	0	0	0	0	0
Use of non-renewable secondary fuels - MJ/UF	0	0	1,99	0	0	0	0	0	0	0	0	0	0	0	0
Net Freshwater Use- m <sup>3</sup> /UF	7,82E-02	7,71E-05	3,26E-02	0	4,57E-03	0	0	0	0	0	2E-05	6,87E-06	4,50E-04	7,15E-06	6,92E-04

**CATEGORY DE WASTE**

	A1/A2/A3 Production Stage	Construction stage		Stage of use							End-of-life stage				D Benefits and costs beyond the boundaries of the system
		A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Rehabilitation	B6 Energy use	B7 Water use	C1 Demolition / Deconstruction	C2 Transport	C3 Waste treatment	C4 Elimination	
Hazardous waste disposed of - kg/UF	6,77E-02	8,87E-04	4,35E-02	0	3,58E-02	0	0	0	0	0	1,34E-04	7,91E-05	3,27E-03	2,86E-05	1,10E-03
Non-hazardous waste disposed - kg/UF	1,31	1,05E-02	1,43	0	2,91E-02	0	0	0	0	0	1,49E-03	9,37E-04	3,78E-02	1,35E+01	9,38E-03
Radioactive waste disposed of - kg/UF	6,97E-04	2,09E-04	4,28E-04	0	2,96E-06	0	0	0	0	0	1,68E-05	1,86E-05	5,33E-06	3,21E-06	-1,47E-05

**OUTPUT FLOWS**

	A1/A2/A3 Production Stage	Construction stage		Stage of use							End-of-life stage				D Benefits and costs beyond the boundaries of the system
		A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Rehabilitation	B6 Energy use	B7 Water use	C1 Demolition / Deconstruction	C2 Transport	C3 Waste treatment	C4 Elimination	
Components for reuse - kg/UF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Materials for recycling - kg/UF	6,61E-01	0	1,30	0	0	0	0	0	0	0	0	0	3,18E+01	0	-9,26E-03
Materials for energy recovery- kg/UF	1,88E-04	0	5,64E-06	0	0	0	0	0	0	0	0	0	0	0	0
Electrical Energy Supplied Outdoors- MJ/UF	9,58E-03	0	2,07E-01	0	0	0	0	0	0	0	0	0	0	0	0
Steam Energy Supplied Outdoors- MJ/UF	2,25E-02	0	4,83E-01	0	0	0	0	0	0	0	0	0	0	0	0
Energy Gas and process supplied externally- MJ/UF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ENVIRONMENTAL IMPACTS						
Aggregation of the different modules to achieve a " Stage Total " or "Life Cycle Total"						
Impact / Flux	Production stage	Construction stage	Stage of use	End-of-life stage	Total life cycle	Profit and expense stage
BASELINE ENVIRONMENTAL IMPACT INDICATORS						
Global warming - total <i>kg of CO<sub>2</sub> equiv/UF</i>	4,61	7,36	-1,05	4.21E-01	<b>11,34</b>	-3,38E-02
Global warming - fossil <i>kg of CO<sub>2</sub> equiv/UF</i>	5,24	6,73	-1,05	4.20E-01	<b>11,34</b>	-3.31E-02
Global warming - biogenic <i>kg of CO<sub>2</sub> equiv/UF</i>	-6,32E-01	6.31E-01	8,95E-04	6,49E-04	<b>5,68E-04</b>	-6,21E-04
Global warming - land use and land use transformation <i>kg of CO<sub>2</sub> equiv/UF</i>	1.91E-03	2.46E-03	3.36E-03	4.26E-05	<b>7,78E-03</b>	-2.73E-05
Ozone depletion <i>kg of CFC 11 equiv/UF</i>	3,30E-07	1.92E-06	7.76E-06	9,50E-08	<b>1.01E-05</b>	-8,85E-09
Acidification <i>H+ equiv/UF mole</i>	2.58E-02	2.22E-02	6,13E-04	3.09E-03	<b>5.17E-02</b>	-2,46E-04
Aquatic eutrophication– freshwater <i>kg of P equiv/UF</i>	9.03E-04	4,55E-05	3.21E-06	4.97E-06	<b>9,57E-04</b>	-2.15E-06
Aquatic - marine eutrophication <i>kg of N equiv/UF</i>	4.11E-03	4.32E-03	1.45E-04	1.29E-03	<b>9,86E-03</b>	-1,43E-04
Terrestrial eutrophication <i>mole de N equiv/UF</i>	4.24E-02	4.83E-02	1.30E-03	1.39E-02	<b>1.06E-01</b>	-9,83E-04
Formation of photochemical ozone <i>kg of NMVOC equiv/UF</i>	1.76E-02	2.68E-02	3.99E-04	3.78E-03	<b>4.86E-02</b>	-2.16E-04
Depletion of abiotic resources (minerals and metals)** <i>kg Sb equiv/UF</i>	1.59E-04	2,50E-05	2.08E-08	2.86E-07	<b>1.85E-04</b>	2.50E-08
Depletion of abiotic resources (fossil fuels)** <i>MJ/UF</i>	6,92E+01	7,10E+01	1,35	6,06	<b>1,48E+02</b>	-1,18
Water Requirement*** <i>m<sup>3</sup> of deprivation equivalent in the world/UF</i>	3,39E+01	6,22E+01	1,27	1.13E-02	<b>97,46</b>	-6,40E-02

**ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS**

Fine particle emissions <i>disease incidence/UF</i>	1.27E-07	2.75E-07	8,15E-09	4.28E-07	<b>8,38E-07</b>	-5.07E-08
Ionizing radiation - human health* <i>kBq of U<sub>235</sub> equiv/UF</i>	2,90	2.90E-01	3.53E-03	2.76E-02	<b>3,22</b>	-1.14E-02
Ecotoxicity - freshwater** <i>CTU<sub>e</sub>/UF</i>	1,55E+01	2,26E+01	1,32E+01	2,96	<b>5,44E+01</b>	-1,14
Human toxicity - carcinogenic effects** <i>CTU<sub>h</sub>/UF</i>	4.15E-09	5.01E-10	8,92E-11	1.54E-10	<b>4.89E-09</b>	1.44E-10
Human toxicity - non-cancer effects** <i>CTU<sub>h</sub>/UF</i>	2.95E-08	3.41E-08	1.79E-09	5,29E-09	<b>7.06E-08</b>	5.09E-09
Land Use Impacts/ Soil Quality**	5,49E+01	1,89E+01	6,42E-01	-2,07E+00	<b>7,24E+01</b>	-1.94E-02

*ND: Not declared \* Exemption from liability 1: The calculation of the impacts of this indicator does not take into account the consequences of possible nuclear accidents, occupational exposure or the disposal of radioactive waste in underground facilities. Ionizing radiation from soil, radon and some building materials are not also measured by this indicator*

*\*\* Disclaimer 2: The results of these environmental impact indicators should be used with caution because the uncertainties in these results are high or because experience with these indicators is limited*

RESOURCE CONSUMPTION						
Use of renewable primary energy, excluding primary energy resources renewables used as feedstock - MJ/UF	7,41	5,45	2,71E-01	4,26E-02	1,32E+01	-3,97E-02
Use of renewable primary energy resources used as feedstock - MJ/UF	6,39	-2,65	0	0	3,74	0
<b>Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) - MJ/UF</b>	1,38E+01	2,81	2,71E-01	4,26E-02	1,69E+01	-3,97E-02
Use of non-renewable primary energy, excluding non-renewable primary energy resources used as feedstock - MJ/UF	6,84E+01	7,91E+01	1,34	6,06	1,55E+02	-1,18E+00
Use of non-renewable primary energy resources used as feedstock - MJ/UF	1,69	3,54	0	0	5,23	0
<b>Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) - MJ/UF</b>	7,00E+01	8,27E+01	1,35	6,06	1,60E+02	-1,18
Use of secondary materials - MJ/UF	2,52E-02	9,42E-02	0	1,54E-03	1,21E-01	3,16E+01
Use of secondary materials renewable fuels - MJ/UF	0	1,38	0	0	1,38	0
Use of non-renewable secondary fuels - MJ/UF	0	1,99	0	0	1,99	0
Net Freshwater Use - m <sup>3</sup> /UF	7,82E-02	3,27E-02	4,57E-03	4,84E-04	1,16E-01	6,92E-04
WASTE CATEGORIES						
Hazardous waste - kg/UF	6,77E-02	4,44E-02	3,58E-02	3,51E-03	1,51E-01	1,10E-03
Non-hazardous waste - kg/UF	1,31	1,44	2,91E-02	1,36E+01	1,64E+01	9,38E-03
Radioactive waste - kg/UF	6,97E-04	6,37E-04	2,96E-06	4,39E-05	1,38E-03	-1,47E-05
OUTPUT FLOWS						
Components for reuse - kg/UF	0	0	0	0	0	0
Materials for recycling - kg/UF	6,61E-01	1,30	0	3,18E+01	3,37E+01	-9,26E-03
Materials for energy recovery - kg/UF	1,88E-04	5,64E-06	0	0	1,94E-04	0
Electrical energy supplied externally - MJ/UF	9,58E-03	2,07E-01	0	0	2,17E-01	0
Energy Steam supplied externally - MJ/UF	2,25E-02	4,83E-01	0	0	5,05E-01	0
Energy Gas and process supplied externally - MJ/UF	0	0	0	0	0	0

## 6. Additional information on the release of hazardous substances into indoor air, soil and water during the use stage

### 6.1. Indoor air

#### VOCs and formaldehydes

No tests have been conducted specifically on the product.

The product covered by the EHPD is one of the products not concerned (Decree No. 2011-321 of 23 March 2011 and Order of 19 April 2011, relating to the labelling of emissions of volatile pollutants from construction products or wall or floor coverings and paints and varnishes).

#### Resistance to the development of fungal growth

No tests have been conducted specifically on the product.

As a mineral material, concrete is not in itself a growth medium for microorganisms such as mould.

#### Emissions radioactives

The radioactivity data of the product's constituents lead to a value of index I (calculated in accordance with Decree No. 2018-434 of 4 June 2018) of less than 1, indicating that the product is not likely to cause an exceedance of the reference level for exposure to gamma radiation of 1 mSv/year.

### 6.2. Soil and water

The product is not in contact with water intended for human consumption. It is therefore not concerned with the quality of the water inside the building.

The product is in contact with runoff water on the façade of the building.

No tests have been conducted specifically on the product.

## 7. Contribution of the product to the indoor quality of life of buildings

### 7.1. Characteristics of the product contributing to the creation of hygrothermal comfort conditions in the building

No hydrothermal performance tests have been conducted specifically on the product.

### 7.2. Characteristics of the product contributing to the creation of acoustic comfort conditions in the building

No acoustic performance tests have been performed on the product.

### 7.3. Product characteristics contributing to the creation of visual comfort conditions in the building

Visual performance testing has not been performed on the product.

### 7.4. Product characteristics contributing to the creation of olfactory comfort conditions in the building

No tests have been conducted specifically on the product.

In normal conditions of use, the product does not affect the olfactory comfort of the building.