HOLCIM

Environmental and Health Product Declaration

Fiche de Déclaration Environnementale et Sanitaire

DUCTAL® - FCLAD® CLADDING PANELS

excluding framework

FDES VÉRIFIÉE inies

In accordance with NF EN 15804+A1and its national supplement NF EN 15804/CN

October 2022 - version 1.0

CERIB Concrete expertise

Contents

Please note

This statement has been produced by Lafarge Cement Distribution in collaboration with the Centre d'Etudes et de Recherches de l'Industrie du Béton (CERIB). The information contained herein is provided under the responsibility of Lafarge Distribution in accordance with the NF EN 15804+A1 standard and its national supplement NF EN 15804/CN.

Any use, in whole or in part, of the information provided in this document must at least be accompanied by a full reference to the original Environmental (and Health) Product Declaration (EPD) and to its producer, who is able to provide a full copy.

Standard EN 15804+A1, the national supplement NF EN 15804/CN and NF EN 16757 serve as the rules for defining product categories (RCP).

NOTE: The literal French translation of "EPD (Environmental Product Declaration)" is "DEP" (Déclaration Environnementale de Produit). However, in France, the term FDES (Fiche de Déclaration Environnementale et Sanitaire) is commonly used, which includes both the Environmental Declaration and the Health information for the product covered by the FDES. The FDES is therefore actually an "EPD" supplemented by health information.

Reading guide

The following graphic rules are used:

- Values are expressed in simplified scientific notation: 0.0123 = $1.23.10^{-2}$ = 1.23E-2;
- When the result of the inventory calculation is null, 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 "m2", the kelvin "K", the watt "W", the kilometre "km", the millimetre "mm".

Abbreviations used:

- CERIB Centre d'Etudes et de Recherches de l'Industrie du Béton [Concrete Industry Research Centre]
- EPD: Environmental Product Declaration
- FDES: Environmental Product and Health Declaration
- UF: Functional Unit

Precaution in the use of the EPD for product comparison

EPDs of construction products may not be comparable if they do not comply with NF EN 15804+A1 and its national supplement NF EN 15804/CN.

Standard NF EN 15804+A1 defines 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 EPD:

"*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 whole life cycle (all information modules*)"

Contacts

Lafarge Ciment Distribution

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92130 Issy Les Moulineaux

FRANCE

1. General information

This EPD complies with NF EN ISO 14025 and NF EN 15804+A1 and NF EN 16757: June 2017 PCR for concrete and concrete items.

1.1. Manufacturer

This statement has been produced by Lafarge Distribution in collaboration with the Centre d'Etudes et de Recherches de l'Industrie du Béton (CERIB). The information contained herein is provided under the responsibility of Lafarge Ciment Distribution in accordance with NF EN 15804+A1 and its national supplement NF EN 15804/CN.

Sponsor - Declarer - ACV Practitioner Author of the EPD and the report
Lafarge Ciment Distribution 1416 Boulevard Garibaldi 92130 Issy Les Moulineaux FRANCE
Manufacturer
Fehr Technology AG Achern site (Germany)

1.2. The site(s), manufacturer or group of manufacturers or their representatives for which the EPD is representative

The EPD is representative of the Ductal®-Fclad® cladding panel product, manufactured in Germany by the Achern plant of Fehr Technology AG.

1.3. Nature of the declaration

This declaration is an individual declaration and covers the life cycle from cradle to grave supplemented by the informative module D.

1.4. Verification and validity

Information relating to the validity of this EPD is consistent with the specifications in the project report.

The EPD has been independently verified according to the AFNOR-INIES programme by:

CEN standard EN 15804 and NF EN 16757 are used as the PCR [a)]	
Independent verification of the declaration in accordance with EN ISO 14025:2010 ☐ Internal ☒ External	
(As applicable [b)]) Third party verification: [Yannick Le Guern and Pierre-Alexis Duvernois]	
INIES registration number:	20220529972
Date of 1st publication:	26/10/2022
Date of update:	
Date checked:	26/10/2022
End date of validity:	25/10/2027 (valid for 5 years)

[a] Product Category Rules

[b] Optional for business-to-business communication, mandatory for business-to-consumer communication (see EN ISO 14025:2010, 9.4)

This information is available at the following address:

www.inies.fr

2. Product description

2.1. Functional unit

1 m2 of Ductal white applied cladding panels and fixings (excluding framework) for a reference life of 50 years.

2.2. Product

The product is used as a panel for external cladding. The cladding function is fulfilled by a concrete façade cladding incorporating the Ductal® (Ultra High Performance Fibre Concrete) cementitious premix.

The main characteristics of these cladding panels are:

- Dimensions: up to 1.8 m wide and up to 4 m long
- Thickness: 16 mm
- Weight: 37.1 kg/m²

The panels are mounted on the external façade on the fastening system (Technical Notice No. 2.2/20-1809_V1). This EPD does not consider the framework but includes the panel fixing system.

2.3. Usage - Scope

The product under consideration is a finishing panel made of concrete elements used to create non-load-bearing architectural façades. The architectural panels may be installed vertically or horizontally on the wall. Installation of one-piece corner elements and also under over-hangs is possible.

The nature of the substrate can be of several types: concrete / masonry / wood-framed buildings or façades. Ductal cladding elements can be supplied in a variety of finishes and colours. The most common is the smooth, white finish, with a fully moulded and made-to-measure product.

For other possible applications or for technical performance, please refer to the Ductal website: https://www.ductal.com/en/cladding and to the Technical Notice n° 2.2/20-1809_V1.

2.4. Other technical characteristics not contained in the Functional Unit

- Reaction to fire classification: A2-s1,d0
- Installation in earthquake zones
- Q4 Impact performance
- One-piece corner possible
- Can be installed under over-hangs

2.5. Main components and/or materials of the product

Product:

- 37.1 kg of Ductal panel (there is no loss during installation)

Distribution packaging:

- 0.16 kg PE film

Complementary product for mounting:

- 0.06 kg aluminium clip
- 0.01 kg of stainless steel insert and bolt

2.6. Substances on the candidate list under REACH (if above 0.1%)

No listed substance declared at more than 0.1% by mass.

2.7. Reference lifetime

Parameters	Values
Reference lifetime	50 years
Declared product properties (ex-works) and finish, etc.	ATec no. 2.2/20-1809_V1
Theoretical application parameters (if imposed by the manufacturer), including references to appropriate practices	The installation must be carried out in accordance with the recommendations of the above-mentioned Technical Notice
Presumed quality of work, where the installation is in accordance with the manufacturer's instructions	See Technical Notice
Outdoor environment (for outdoor applications), e.g. weather, pollutants, UV and wind exposure, building orientation, shading, temperature	See Technical Notice
Indoor environment (for indoor applications), e.g. temperature, humidity, chemical exposure	Not applicable.
Conditions of use, e.g. frequency of use, mechanical exposure	Standard use.
Maintenance, e.g. required frequency, type and quality and replacement of replaceable components	Clean with clear water according to ATec.

2.8. Biogenic carbon content

Parameters	Units	Value
Biogenic carbon content of the product	kg of C	0

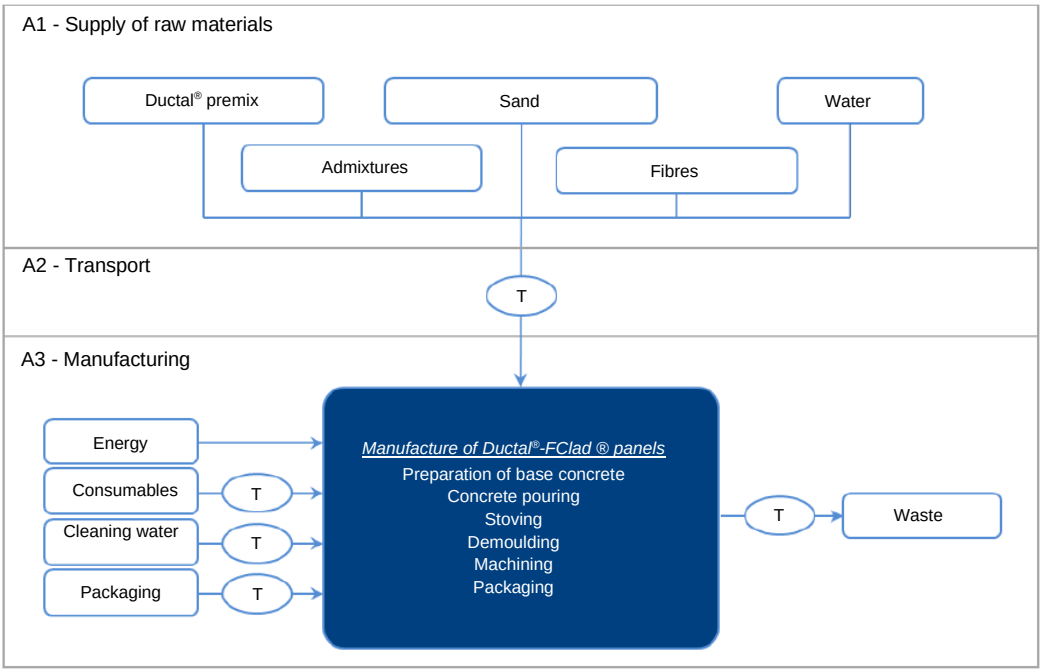
3. Life cycle stages

Description of system boundaries (X = included in the LCA; MND = non-declared module)														
PRODUCTION STAGE	STAGE OF THE CONSTRUCTION PROCESS		IN-USE STAGE							END-OF-LIFE STAGE				BENEFITS AND BURDENS BEYOND THE BOUNDARIES OF THE SYSTEM
Product	Transport	Construction, installation process	Use	Maintenance	Repair	Replacement	Rehabilitation	Energy usage during the in-use stage	Water usage during the in-use 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 stages: A1-A3

The production stage includes:

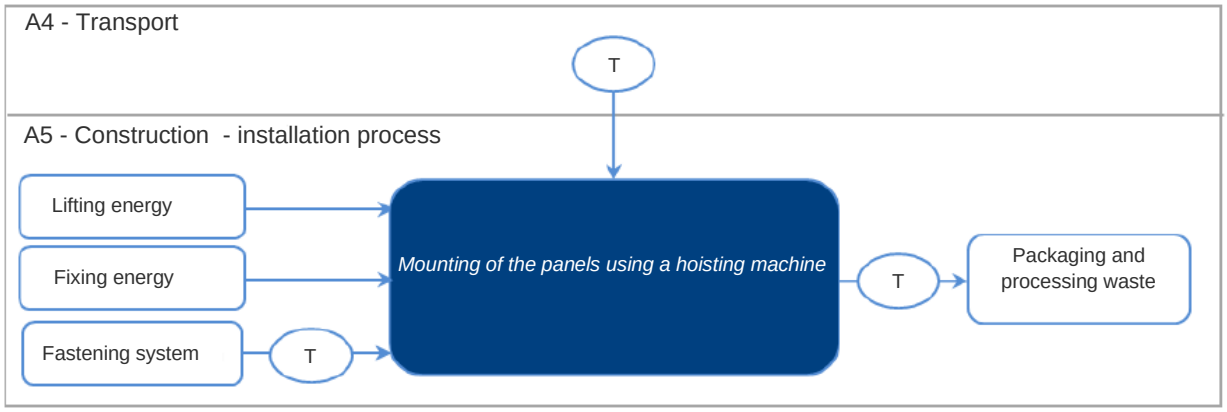
- The production of the constituent raw materials that make up the product (Ductal® premix, aggregates, fibres, water and inserts for fixing);
- The transport of these raw materials to supply the manufacturing site;
- The manufacture of the product (including in particular the consumption of energy,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



3.2. Construction stages: A4-A5

The construction stage includes:

- Transport of products between the production site and the construction site;
- The production and transport of complementary products for installation;
- The application of the products on site.



A4 - Transport

Parameters	Values
Fuel type and vehicle consumption	38 litres of diesel per 100 km at full load 25.3 litres of diesel per 100 km unladen
Distance (km)	500 km for Ductal
Capacity utilisation (including empty returns)	Average actual load: 15.61 tonnes Payload: 26 tonnes Empty return rate: 100%
Bulk UF mass of transported products	39 kg
Volume capacity utilisation coefficient	<1

A5 - Construction/Installation

Parameters	Values
Auxiliary inputs (clips, inserts and bolts) for installation	0.07 kg/UF
Ready-mixed concrete	No consumption
Water usage	No consumption
Use of other resources	No consumption
Quantitative description of energy type (regional mix) and consumption during the installation process	0.1 kWh of electricity in France for bolting the fixings 0.48 L of diesel for lifting the panels
Waste generated at the construction site prior to treatment of waste generated by the product installation (specified by type)	Ductal® - FClad® cladding panels are made to measure in the factory. Packaging waste: - 0.16 kg of polyethylene packaging film

Outgoing materials (specified by type) generated by waste treatment at the construction site, e.g. collection for recycling, energy recovery, disposal (specified by stream)	The fall rate during application is 1%.
Direct emissions to air, soil and water	Considered negligible apart from the waste accounted for elsewhere

3.3. Stages of usage: B1-B7

B1 to B5 - Usage, Maintenance, Repair, Replacement and Rehabilitation

Due to the extremely low porosity of UHPC concrete, no carbonation of the concrete is considered.

Under normal conditions of use, the product does not require maintenance, repair, replacement or rehabilitation during the in-use stage.

According to the technical notice, cleaning the surface of Ductal panels with water is recommended. In B2 cleaning every 5 years has been taken into account.

Parameters	Values
Maintenance process	Cleaning of the panels with clear water according to ATec °2.2/20-1809_V1
Maintenance cycle	9 times during 50 year life (every 5 years)
Auxiliary inputs for maintenance	No consumption
Product waste from maintenance	No waste
Net freshwater consumption	0.13 L / maintenance
Energy consumption	No consumption

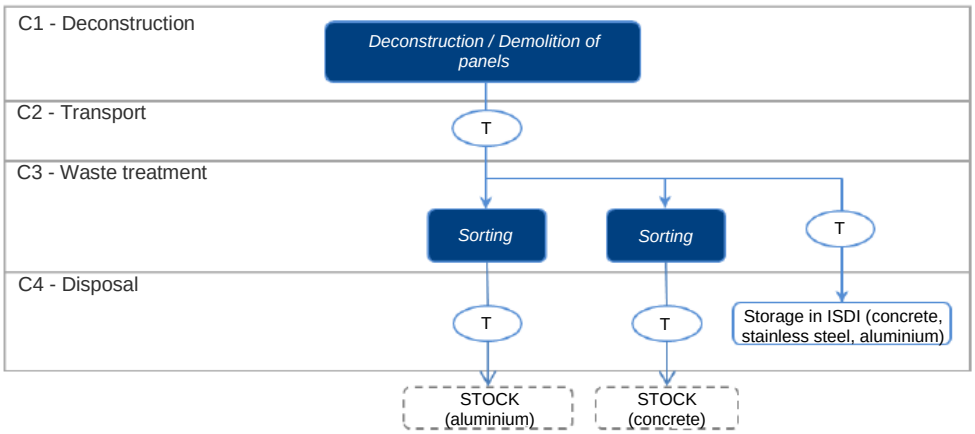
B6 and B7 - Energy and Water usage

Not Applicable

3.4. End of life stages: C1-C4

The end-of-life stage includes:

- The deconstruction and demolition of the product manually;
- The transport of demolition materials (concrete and fixing system waste) to a separation centre or storage facility for recovery or disposal;
- For the recovered part, treatment by separation of the aluminium for recycling;
- For the disposed part, storage in a storage facility for inert waste (ISDI).



C1-C4 - End of life

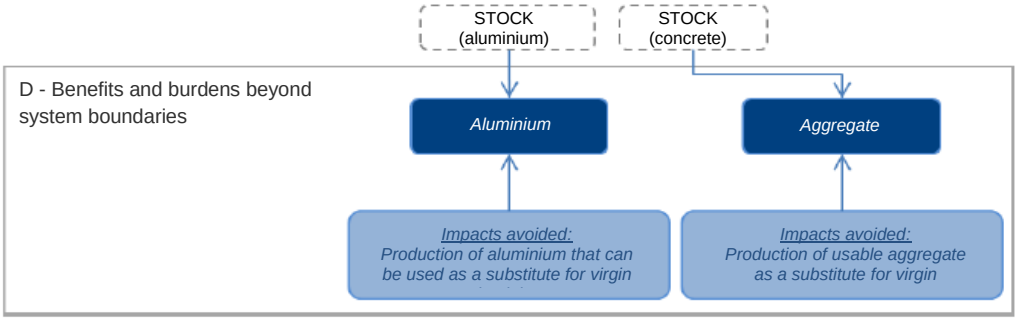
Parameters	Values
Collection process specified by type	Demolition of the product after deconstruction with loading and transport to a sorting or disposal centre
Recovery system specified by type	98% of aluminium (clip) is directed to a sorting centre for material recovery, i.e.: - 0.059 kg of aluminium
Elimination specified by type	30% of concrete waste is disposed of in landfill, 100% of stainless steel and 2% of aluminium, i.e.: - 11.1 kg of concrete - 0.01 kg stainless steel - 0.001 kg of aluminium
Recycling specified by type	70% of concrete waste recycled in landfill and 98% of aluminium, i.e.: - 25.98 kg of concrete - 0.059 kg of aluminium
Assumptions for scenario building (e.g. transport)	Distance of transport of waste: - 30 km for the disposal of concrete, stainless steel and aluminium - 30 km for concrete recycling - 100 km for aluminium recovery
Carbonation process	No carbonation at end of life

3.5. Recycling/reuse/recovery potential: Module D

Materials saved

The material recovery of the fastening system components by sorting and melting down allows recycled aluminium to be made available for use as virgin material and thus avoids the consumption of bauxite and electricity beyond the system's borders. A loss of 2% in the recycling process has been considered.

Recovered materials leaving the system boundaries	Recycling processes beyond the system's boundaries	Materials saved	Associated quantities
Recycled aluminium	Collection, sorting, agglomeration and melting down	Virgin aluminium	0.058 kg
Recycled aggregate	Collection, crushing	Virgin aggregate	25.98 kg



4. Information for the calculation of the Life Cycle Assessment

4.1. PCR used

This declaration is based on the standard NF EN 15804+A1 and its national supplement NF EN 15804/CN. The recommendations of NF EN 16 757:June 2017 PCR for concrete and concrete items are followed.

4.2. System boundaries

This declaration covers the whole life cycle as defined by the standard NF EN 15804+A1 and its national supplement NF EN 15804/CN.

4.3. Assignments

The Ductal® - FClad® cladding panel manufacturing site produces other concrete items. Mass allocations were made for inputs and outputs that could not be separately allocated to the products covered by the EPD. Raw material consumption is specific to the products under consideration and is the main contributor to most environmental impacts.

4.4. Geographical and temporal representativeness

The primary data correspond to the production data collected directly from the site producing the Ductal® - FClad® cladding panels. They correspond to the current processes, stable over time and have been collected over the year 2020.

The Life Cycle Assessment was carried out using Gabi software version 10.6.1.35 and the Ecoinvent 3.6 database for the secondary data for which specific professional data were not available. The environmental data for cement were generated by EPD's digital generator, CarbonClarity, based on actual data collected from the cement manufacturer in Le Teil.

4.5. Variability of results and validity framework

This declaration is of the "individual" type and covers a single product reference manufactured on one production site. There is no variability between the products covered by this EPD.

4.6. Cut-off rule

The requirements of NF EN 15804+A1 and its NS are followed.

All known inputs declared by the producer were taken into account. The packaging of raw materials (plastic drums, wooden pallets) and complementary products (PE film) are not taken into account because the quantity of such packaging does not exceed the 1% threshold in mass and energy. For the steel rack used for the distribution of the panels, its frequent and long-term reuse leads to a very low quantity for the UF. It is therefore ignored.

5. Results of the life cycle assessment

ENVIRONMENTAL IMPACT INDICATORS

	Total A1 - A3 Production stage	Construction stage		Total A4-A5 Construction stage	In-use stage						Total B1-B7 In-use stage	End of life stage				Total C1 - C4 End of life stage	Total life cycle (excluding module D)	D - Reuse, recovery, recycling[1]
		A4 - Transport	A5 - Construction / Installation		B1 - Usage	B2 - Maintenance	B3 - Repair	B4 - Replacement	B5 - Rehabilitation	B6 - Energy usage	B7 - Water usage	C1 - Demolition / Deconstruction	C2 - Transport	C3 - Waste treatment	C4 - Disposal			
Global warming* *kg CO_2 equiv/UF*	2.05E+01	2.80E+00	2.74E+00	5.54E+00	0	3.96E-04	0	0	0	0	0	3.96E-04	1.56E+00	1.83E-01	2.81E-02	5.73E-02	1.82E+00	2.79E+01	-1.59E-01
Ozone depletion *kg CFC-11 equiv/UF*	2.23E-06	5.18E-07	3.76E-07	8.94E-07	0	4.14E-11	0	0	0	0	0	4.14E-11	2.70E-07	3.38E-08	4.96E-09	1.92E-08	3.28E-07	3.46E-06	-2.87E-08
Soil and water acidification *kg SO_2 equiv/UF*	6.30E-02	1.09E-02	1.78E-02	2.87E-02	0	1.94E-06	0	0	0	0	0	1.94E-06	1.17E-02	7.13E-04	1.80E-04	4.22E-04	1.31E-02	1.05E-01	-6.57E-04
Eutrophication *kg PO_4^3- equiv/UF*	3.24E-02	2.70E-03	4.78E-03	7.48E-03	0	1.10E-06	0	0	0	0	0	1.10E-06	2.82E-03	1.76E-04	4.91E-05	9.81E-05	3.14E-03	4.30E-02	-2.27E-04
Photochemical ozone formation *kg C_2H_4 equiv/UF*	7.25E-03	1.08E-03	1.79E-03	2.87E-03	0	1.90E-07	0	0	0	0	0	1.90E-07	1.21E-03	7.03E-05	9.69E-06	4.57E-05	1.34E-03	1.15E-02	-9.59E-05
Depletion of abiotic resources (elements) *kg Sb equiv/UF*	1.62E-04	7.73E-05	2.63E-05	1.04E-04	0	1.12E-08	0	0	0	0	0	1.12E-08	2.41E-06	5.05E-06	2.20E-07	5.37E-07	8.22E-06	2.74E-04	2.22E-06
Depletion of abiotic (fossil) resources *MJ/UF*	2.09E+02	4.24E+01	3.53E+01	7.77E+01	0	5.55E-03	0	0	0	0	0	5.55E-03	2.14E+01	2.77E+00	4.10E-01	1.63E+00	2.63E+01	3.12E+02	-1.99E+00
Water pollution *m^3/UF*	3.96E+01	3.46E+00	7.06E+00	1.05E+01	0	1.41E-03	0	0	0	0	0	1.41E-03	1.19E+00	2.26E-01	1.71E-02	3.28E-01	1.76E+00	5.19E+01	1.03E+01
Air pollution *m^3/UF*	2.02E+03	3.09E+02	4.20E+02	7.29E+02	0	7.72E-02	0	0	0	0	0	7.72E-02	2.01E+02	2.02E+01	1.13E+01	9.59E+00	2.42E+02	2.99E+03	-4.85E+01

[1] For Module D, negative values indicate a benefit, i.e. a reduction in environmental impact

USE OF RESOURCES

	Total A1 - A3 Production stage	Construction stage		Total A4-A5 Construction stage	In-use stage						Total B1-B7 In-use stage	End of life stage				Total C1 - C4 End of life stage	Total life cycle (excluding module D)	D - Reuse, recovery, recycling
		A4 - Transport	A5 - Construction / Installation		B1 - Usage	B2 - Maintenance	B3 - Repair	B4 - Replacement	B5 - Rehabilitation	B6 - Energy usage	B7 - Water usage	C1 - Demolition / Deconstruction	C2 - Transport	C3 - Waste treatment	C4 - Disposal			
Renewable primary Energy usage, excluding renewable primary energy resources used as feedstock - *MJ/UF*	1.68E+01	6.09E-01	3.47E+00	4.08E+00	0	9.32E-04	0	0	0	0	0	9.32E-04	1.17E-01	3.98E-02	1.85E-02	1.34E-02	1.89E-01	2.11E+01	-1.11E+00
Use of renewable primary energy resources as feedstock - *MJ/UF*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total use of renewable primary energy resources (primary energy and primary energy resources used as feedstock) - *MJ/UF*	1.68E+01	6.09E-01	3.47E+00	4.08E+00	0	9.32E-04	0	0	0	0	0	9.32E-04	1.17E-01	3.98E-02	1.85E-02	1.34E-02	1.89E-01	2.11E+01	-1.11E+00
Non-renewable primary Energy usage, excluding non-renewable primary energy resources used as feedstock - *MJ/UF*	2.26E+02	4.33E+01	3.85E+01	8.18E+01	0	7.94E-03	0	0	0	0	0	7.94E-03	2.16E+01	2.83E+00	5.84E-01	1.65E+00	2.66E+01	3.34E+02	-3.46E+00
Use of non-renewable primary energy resources as feedstock - *MJ/UF*	1.92E+01	0.00E+00	1.05E+00	1.05E+00	0	0	0	0	0	0	0	0	0	0	0	0	0	2.03E+01	0
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as feedstock) - *MJ/UF*	2.45E+02	4.33E+01	3.96E+01	8.29E+01	0	7.94E-03	0	0	0	0	0	7.94E-03	2.16E+01	2.83E+00	5.84E-01	1.65E+00	2.66E+01	3.55E+02	-3.46E+00
Secondary material use -kg/UF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.27E-03	0	1.27E-03	1.27E-03	2.60E+01
Use of secondary renewable fuels - *MJ/UF*	5.90E+00	0.00E+00	5.90E-02	5.90E-02	0	0	0	0	0	0	0	0	0	0	0	0	0	5.96E+00	0
Use of non-renewable secondary fuels - *MJ/UF*	1.78E+01	0	1.78E-01	1.78E-01	0	0	0	0	0	0	0	0	0	0	0	0	0	1.80E+01	0
Net fresh water usage - m^3/UF	1.36E-01	4.54E-03	1.98E-02	2.43E-02	0	1.18E-03	0	0	0	0	0	1.18E-03	1.12E-03	2.96E-04	4.39E-04	1.75E-03	3.60E-03	1.65E-01	-7.58E-03

CATEGORY OF WASTE																		
	Total A1 - A3 Production stage	**Construction stage**		**Total A4-A5 Construction stage**	**In-use stage**						**Total B1-B7 In-use stage**	**End of life stage**				**Total C1 - C4 End of life stage**	**Total life cycle (excluding module D)**	**D - Reuse, recovery, recycling**
		A4 - Transport	A5 - Construction / Installation		B1 - Usage	B2 - Maintenance	B3 - Repair	B4 - Replacement	B5 - Rehabilitation	B6 - Energy usage	B7 - Water usage		C1 - Demolition / Deconstruction	C2 - Transport	C3 - Waste treatment	C4 - Disposal			
Hazardous waste disposed of - *kg/UF*	5.00E-01	2.77E-02	2.46E-01	2.474E-01	0	2.19E-05	0	0	0	0	0	2.19E-05	1.37E-02	1.81E-03	2.68E-03	1.03E-03	1.92E-02	7.93E-01	-3.54E-02
Non-hazardous waste disposed of - *kg/UF*	5.67E+00	2.26E+00	7.94E-01	3.06E+00	0	2.17E-04	0	0	0	0	0	2.17E-04	8.42E-02	1.48E-01	3.12E-02	1.11E+01	1.14E+01	2.01E+01	2.87E-02
Radioactive waste disposed of - *kg/UF*	1.17E-03	2.94E-04	2.25E-04	5.19E-04	0	4.06E-08	0	0	0	0	0	4.06E-08	1.51E-04	1.92E-05	4.39E-06	1.08E-05	1.85E-04	1.87E-03	-2.82E-05

OUTGOING FLOWS																		
	Total A1 - A3 Production stage	**Construction stage**		**Total A4-A5 Construction stage**	**In-use stage**							**Total B1-B7 In-use stage**	**End of life stage**				**Total C1 - C4 End of life stage**	**Total life cycle (excluding module D)**	**D - Reuse, recovery, recycling**
		A4 - Transport	A5 - Construction / Installation		B1 - Usage	B2 - Maintenance	B3 - Repair	B4 - Replacement	B5 - Rehabilitation	B6 - Energy usage	B7 - Water usage		C1 - Demolition / Deconstruction	C2 - Transport	C3 - Waste treatment	C4 - Disposal			
Components for reuse - *kg/UF*	6.32E-06	0	6.32E-08	6.32E-08	0	0	0	0	0	0	0	0	0	0	0	0	0	6.38E-06	0
Materials for recycling -kg/UF	2.58E+00	0	1.52E-01	1.52E-01	0	0	0	0	0	0	0	0	0	0	2.60E+01	0	2.60E+01	2.88E+01	-7.61E-03
Materials for energy recovery - *kg/UF*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Electricity supplied externally - *MJ/UF*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Steam energy supplied externally - *MJ/UF*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Externally supplied gas and process energy - *MJ/UF*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

SUMMARY TABLE

	Units	Total Production stage	Total Installation stage	Total In-use stage	Total End of life stage	Total Life cycle (except D)	Module D
Environmental impacts							
Global warming	kg CO_2 eq/UF	2.05E+01	5.54E+00	3.96E-04	1.82E+00	2.79E+01	-1.59E-01
Ozone depletion	kg CFC11eq/UF	2.23E-06	8.94E-07	4.14E-11	3.28E-07	3.46E-06	-2.87E-08
Soil and water acidification	kg SO_2 eq/UF	6.30E-02	2.87E-02	1.94E-06	1.31E-02	1.05E-01	-6.57E-04
Eutrophication	kg PO_{43-} eq/UF_{3-}	3.24E-02	7.48E-03	1.10E-06	3.14E-03	4.30E-02	-2.27E-04
Photochemical ozone formation	kg C_2H_4 eq/UF	7.25E-03	2.87E-03	1.90E-07	1.34E-03	1.15E-02	-9.59E-05
Depletion of abiotic resources (elements)	kg Sb eq/UF	1.62E-04	1.04E-04	1.12E-08	8.22E-06	2.74E-04	2.22E-06
Depletion of abiotic (fossil) resources	MJ/UF	2.09E+02	7.77E+01	5.55E-03	2.63E+01	3.12E+02	-1.99E+00
Water pollution	m_3/UF	3.96E+01	1.05E+01	1.41E-03	1.76E+00	5.19E+01	1.03E+01
Air pollution	m_3/UF	2.02E+03	7.29E+02	7.72E-02	2.42E+02	2.99E+03	-4.85E+01
Use of primary energy resources							
Use of renewable primary energy, excluding renewable primary energy resources used as feedstock	MJ/UF	1.68E+01	4.08E+00	9.32E-04	1.89E-01	2.11E+01	-1.11E+00
Use of renewable primary energy resources as feedstock	MJ/UF	0	0	0	0	0	0
Total use of renewable primary energy resources (primary energy and primary energy resources used as feedstock)	MJ/UF	1.68E+01	4.08E+00	9.32E-04	1.89E-01	2.11E+01	-1.11E+00
Use of non-renewable primary energy, excluding non-renewable primary energy resources used as feedstock	MJ/UF	2.26E+02	8.18E+01	7.94E-03	2.66E+01	3.34E+02	-3.46E+00
Use of non-renewable primary energy resources as feedstock	MJ/UF	1.92E+01	1.05E+00	0	0	2.03E+01	0
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as feedstock)	MJ/UF	2.45E+02	8.29E+01	7.94E-03	2.66E+01	3.55E+02	-3.46E+00
Use of secondary energy and water resources							
Use of secondary material	kg/UF	0	0	0	1.27E-03	1.27E-03	2.60E+01
Use of renewable secondary fuels	MJ/UF	5.90E+00	5.90E-02	0	0	5.96E+00	0
Use of non-renewable secondary fuels	MJ/UF	1.78E+01	1.78E-01	0	0	1.80E+01	0
Net fresh water usage	m3/UF	1.36E-01	2.43E-02	1.18E-03	3.60E-03	1.65E-01	-7.58E-03
Waste categories							
Hazardous waste disposed of	kg/UF	5.00E-01	2.74E-01	2.19E-05	1.92E-02	7.93E-01	-3.54E-02
Non-hazardous waste disposed of	kg/UF	5.67E+00	3.06E+00	2.17E-04	1.14E+01	2.01E+01	2.87E-02
Radioactive waste disposed of	kg/UF	1.17E-03	5.19E-04	4.06E-08	1.85E-04	1.87E-03	-2.82E-05
Outgoing flows							
Components for reuse	kg/UF	6.32E-06	6.32E-08	0	0	6.38E-06	0
Materials for recycling	kg/UF	2.58E+00	1.52E-01	0	2.60E+01	2.88E+01	0
Materials for energy recovery	kg/UF	0	0	0	0	0	0
Electricity supplied externally	MJ/UF	0	0	0	0	0	0
Steam Energy supplied externally	MJ/UF	0	0	0	0	0	0
Externally supplied gas and process energy	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 in-use stage

6.1 Contribution to the health quality of indoor spaces

Natural radioactivity
No specific tests have been conducted on the product.

Emissions of Volatile Organic Compounds (VOCs) and aldehydes
No specific tests have been conducted on the product.

The product covered by the EPD is not in contact with indoor air under normal conditions of use and is not concerned by the regulatory labelling of volatile pollutant emissions for construction and decoration products (decree n°2001-321 of 23 March 2011).

Micro-organisms
No specific tests have been conducted on the product.

Fibres and particles
No specific tests have been conducted on the product.

6.2 Contribution to water quality

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.

No specific tests have been conducted on the product.

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

7.1 Product characteristics involved in creating hygrothermal comfort conditions in the building

No specific tests have been conducted on the product.

The fixing system of the façade elements allows the installation of thermal insulation from the outside.

7.2 Product features involved in creating acoustic comfort conditions in the building

As the airtightness of the external wall is not guaranteed, no precise assessment can be made of the contribution of this cladding to the insulation against noise from the outside space in the absence of tests.

7.3 Product features contributing to the creation of visual comfort conditions in the building

Ductal® - FClad® Cladding Panels are an exterior façade cladding system. They therefore do not contribute to the visual comfort conditions inside the buildings

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

Ductal® - FClad® Cladding Panels are an exterior façade cladding system. They therefore do not contribute to the odour comfort of the building.