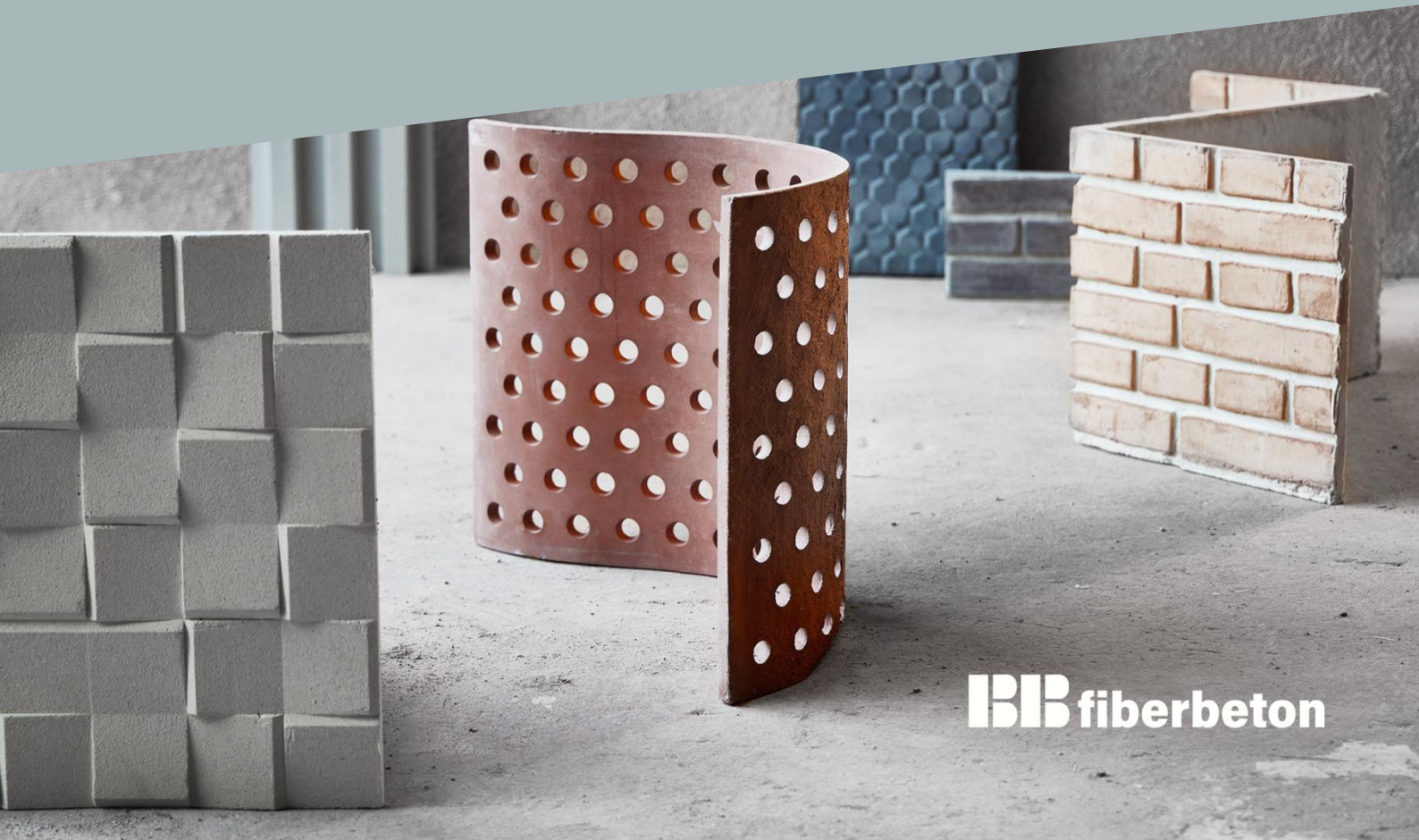


Owner: BB Fiberbeton
No.: MD-25141-EN
Issued: 20-08-2025
Valid to: 20-08-2030

3rd PARTY VERIFIED

EPD

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | ISO 14025 & EN 15804



Owner of declaration

BB fiberbeton A/S
Hjørnegårdsvej 10,
4623 Lille Skensved
72251113
<https://www.bbfiberbeton.dk/>


Issued:

20-08-2025

Valid to:

20-08-2030

Programme

EPD Danmark
www.epddanmark.dk



☐ Industry EPD

☒ Product EPD

☒ Product specific

☐ Average

☐ Worst Case

Declared product(s)

Glassfibre reinforced concrete element in white and pale colours
Glassfibre reinforced concrete element in darker colours
Stainless-steel mounting system
Galvanized steel mounting system

Number of declared datasets/product variations: 4

Production site

Hjørnegårdsvej 10, 4623 Lille Skensved
Denmark

Use of Guarantees of Origin

☐ No certificates used

☒ Electricity covered by GoO

☐ Biogas covered by GoO

Declared/ functional unit

1 ton of GRC-Pale
1 ton of GRC-Dark
1 ton of SS-mounting system
1 ton of GS-mounting system

Year of production site data (A3)

2024

EPD version

Version 1

Basis of calculation

This EPD is developed and verified in accordance with the European standard EN 15804+A2.

Comparability

EPDs of construction products may not be comparable if they do not comply with the requirements in EN 15804. EPD data may not be comparable if the datasets used are not developed in accordance with EN 15804 and if the background systems are not based on the same database.

Validity

This EPD has been verified in accordance with ISO 14025 and is valid for 5 years from the date of issue.

Use

The intended use of an EPD is to communicate scientifically based environmental information for construction products, for the purpose of assessing the environmental performance of buildings.

EPD type

☐ Cradle-to-gate with modules C1-C4 and D

☒ Cradle-to-gate with options, modules C1-C4 and D

☐ Cradle-to-grave and module D

☐ Cradle-to-gate

☐ Cradle-to-gate with options

CEN standard EN 15804 serves as the core PCR

Independent verification of the declaration and data,
according to EN ISO 14025

☐ internal

☒ external

Third party verifier:

Mie Ostenfeldt
Ostenfeldt Consulting

Martha Katrine Sørensen
EPD Danmark

Life cycle stages and modules (ND = not declared)

Product			Construction process		Use							End of life				Beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport	Installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Re-use, recovery and recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	ND	ND	X	X	X	X	X	X	X	X	X	X	X	X

Product information

Product description

Glassfibre reinforced concrete (GRC) from BB fiberbeton A/S provides versatile design possibilities, allowing for both hyper-modern and classic, even antique, expressions – delivering aesthetic flexibility for any architectural vision.

BB fiberbeton A/S primarily produce façade and rainscreen elements, but also offer production of ornamental elements, interior cladding and more.

The GRC elements from BB fiberbeton A/S are thin and lightweight, offering high strength and a design life of up to 100 years. All elements are crafted by a team of experts and require no technical maintenance after installation. The GRC elements can be used to renovate old facades or to reinvent the limits of architectural design, while offering the opportunity for direct reuse (e.g. during future renovations) and can be recycled after use (e.g. for road filling).

The team at BB fiberbeton A/S are experts in GRC, with decades of experience, having produced high-quality GRC since the late 70's, and they can assist in developing ideas from a very early project stage. As manufacturers, BB fiberbeton A/S are Full Members of GRCA and undergo yearly third-party quality audits.

The main product components of GRC elements from BB fiberbeton A/S are shown in table 1 for GRC-Pale, and table 2 for GRC-Dark. Values are shown in ranges for confidentiality reasons.

Mounting systems are either stainless steel or mainly galvanized steel. The main product components of Stainless steel and Galvanized steel mounting systems are shown in table 3 and 4. The amount used will vary based on the specifications and static design of each individual project

It should be noted that the values include only the parts of the mounting principles that are cast into the GRC elements. Design choices and receiver brackets in the mounting design can influence the amount needed. The team at BB fiberbeton A/S can advise on this to ensure the optimal solution is found.

Regarding the tables below, please note that most projects will include only one type of GRC (pale or dark) and one type of mounting system (stainless steel or galvanized steel). However, several mounting principles can be used on the same project to ensure easy and hidden installation.

Table 1 GRC-Pale

Material	Weight-% of declared product
Cement – CEM II	30-45
Aggregate	40-55
Water	10-15
Acrylic co-polymer emulsion	<5,5
Glassfibre	<5,5
Other	<5

Table 2 GRC-Dark

Material	Weight-% of declared product
Cement – CEM II	30-45
Aggregate	40-55
Water	10-15
Acrylic co-polymer emulsion	<5.5
Glassfibre	<5.5
Other	<5

Table 3 SS-mounting system

Material	Weight-% of declared product
Stainless steel	100

Table 4 GS-mounting systems

Material	Weight-% of declared product
Galvanized steel	97
Stainless steel	3

Product packaging:

The composition of the sales- and transport packaging of the product is shown in the table below.

Material	Weight of packaging material (kg/DU)	Weight-% of packaging
Shrink film	3,5	58
EUR-pallets	2,5	2
Total	6	100

Representativity

This declaration, including data collection and the modeled foreground system including results, represents the production of the declared products on the production site located in Lille Skensved, Denmark. Product specific data are based on average values collected in 2024. Background data are based on Ecoinvent 3.10 and Managed LCA Content and are less than 10 years old. Generally, the used background datasets are of high quality, and the majority of the datasets are only a couple of years old.

Hazardous substances

The declared products do not contain substances listed on the "Candidate List of Substances of Very High Concern for authorisation"

Product(s) use

The concrete elements are primarily used for bespoke façade and rainscreen cladding.

Essential characteristics

The glassfibre reinforced concrete (GRC) are produced in accordance with the standard EN 1169, which is not a harmonized standard. Furthermore, the GRC elements are produced in accordance with the specification for GRC from the International Glassfibre Reinforced Concrete Association (GRCA). A declaration of conformity is available for all declared product variations.

Further technical information can be obtained by contacting BB fiberbeton directly or by visiting their website:

<https://www.bbfiberbeton.dk>

Reference Service Life (RSL)

The reference is declared as 50 years in accordance with Annex A in *EN 16757:2022 - Environmental product declarations - Product Category Rules for concrete and concrete elements*

Picture of product(s)



Picture 1 GRC Pale with GS-mounting system



Picture 2 GRC Dark with SS-mounting system



Picture 3 GRC-Pale with SS-mounting system



Picture 4 GRC-Pale with GS-mounting system

LCA background

Declared unit

The LCI and LCIA results in this EPD relate to 1 ton of the included products.

Name	Value	Unit
Declared unit	1	ton

Functional unit

Not defined.

Material properties

The table below presents the density of the declared products in kg/m³.

Name	Density (kg/m ³)
GRC-Pale	1.950
GRC-Dark	1.950
SS-mounting system	8.000
GS-mounting system	7.850

With the 4 declared products in this EPD it is possible to calculate results for 1 m² of mounted GRC by combining the declared products with different mounting principles for GRC. The table below defines typical product combinations for different mounting principles for GRC façade panels with a thickness of 12 mm and a weight of 30 kg/m².

Mounting principle	Kg GRC Pale and Dark per m ²	Kg steel per m ² GRC
Recessed holes with plugs	30	0
Embedded inserts	30	2 SS
Embedded brackets	30	40 SS
SS Stud-frame	30	310 SS
GS Stud-frame with SS anchors and bolts	30	300 GS +10 SS

These product combinations for different mounting principles may be used as guidance values, but the values may be different based on the specifications and static design in each individual project.

PCR

This EPD is developed according to the core rules for the product category of construction products in EN 15804, and DS/EN 16757:2022 Product Category Rules for concrete and concrete elements.

Energy modelling principles

Foreground system:

The product is produced using wind energy with GOs in production. Remaining energy processes include thermal energy from natural gas in Denmark.

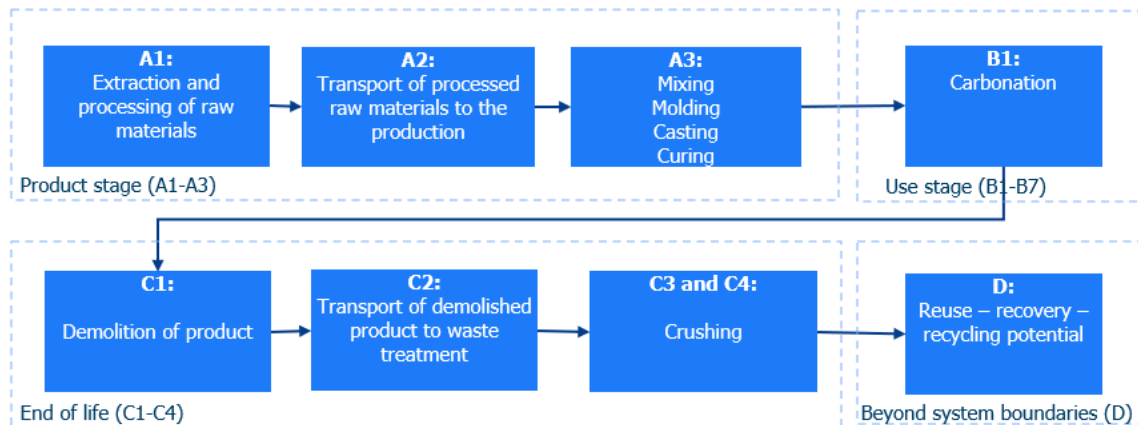
Information about the energy mix in the foreground system:

Energy mix	EF	Unit
Electricity from wind	0,02	kg CO ₂ e/kWh
Natural gas	0,07	kg CO ₂ e/MJ

Background system:

Upstream and downstream processes are modeled with the electricity sources on which the used dataset is based. This will most often be the national average electricity mix.

Flowdiagram



System boundary

This EPD is based on a cradle-to-gate LCA, in which 100 weight-% has been accounted for and all relevant processes are included.

The general rules for the exclusion of inputs and outputs follows the requirements in EN 15804, 6.3.5, where the total of neglected input flows per module shall be a maximum of 5 % of energy usage and mass and 1 % of energy usage and mass for unit processes.

Product stage (A1-A3) includes:

A1 – Extraction and processing of raw materials

A2 – Transport to the production site

A3 – Manufacturing processes

The product stage comprises the acquisition of all raw materials, products and energy, transport to the production site, packaging and waste processing up to the “end-of-waste” state or final disposal. Production takes place in BB fiberbeton’s production in Lille Skensved, Denmark. The production processes include mixing materials, molding, drying as well as packaging.

The LCA results are declared in aggregated form for the product stage, which means that the sub-modules A1, A2 and A3 are declared as one module A1-A3.

Use stage (B1-B7) includes:

There is no consumption of materials during use, no maintenance, cleaning or repair/replacements needed for the normal use the concrete façade elements, which are very strong and durable. Therefore, the only environmental impacts related to the use stage is the carbonation process. The CO₂ uptake has been declared in B1 as GWP-fossil in accordance with DS/EN 16757:2022. “The CO₂ uptake by carbonation is based on the use of the concrete elements in an outdoor environment with exposure to rain.”

End of Life (C1-C4) includes:

The de-construction of the products is usually carried out with a medium excavator. The mounting systems can be uninstalled using only manpower. 50km truck transport is assumed from the demolition site to waste treatment.

Once transported to waste treatment, the GRC-Dark and GRC-Pale are crushed and recycled into road fillings. For the mounting systems, it is

assumed that 85% is recycled and 15% is landfilled.

Re-use, recovery and recycling potential (D) includes:

A recycling efficiency of 95% has been assumed while avoided materials were only considered for primary materials.

LCA results

ENVIRONMENTAL IMPACTS PER TON GRC-PALE											
Parameter	Unit	A1	A2	A3	A1-A3	B1-B7	C1	C2	C3	C4	D
GWP-total	[kg CO ₂ eq.]	5,97E+02	5,20E+01	1,40E+02	7,88E+02	-1,64E+02	1,96E-02	9,51E+00	2,57E-01	0,00E+00	-1,77E+01
GWP-fossil	[kg CO ₂ eq.]	5,95E+02	5,19E+01	1,44E+02	7,91E+02	-1,64E+02	2,04E-02	9,50E+00	2,47E-01	0,00E+00	-1,77E+01
GWP-biogenic	[kg CO ₂ eq.]	5,17E-01	3,65E-02	-3,70E+00	-3,15E+00	0,00E+00	-9,11E-04	6,58E-03	8,73E-03	0,00E+00	-2,23E-02
GWP-luluc	[kg CO ₂ eq.]	3,61E-02	1,78E-02	4,72E-02	1,01E-01	0,00E+00	1,58E-04	3,15E-03	7,26E-04	0,00E+00	-1,28E-02
ODP	[kg CFC 11 eq.]	5,04E-06	1,54E-06	6,04E-06	1,26E-05	0,00E+00	6,52E-15	1,89E-07	4,14E-09	0,00E+00	-1,93E-07
AP	[mol H ⁺ eq.]	4,22E+01	1,75E-01	1,94E-01	4,26E+01	0,00E+00	1,76E-04	1,98E-02	1,24E-03	0,00E+00	-1,10E-01
EP-freshwater	[kg P eq.]	2,15E-03	3,71E-03	8,37E-03	1,42E-02	0,00E+00	7,06E-08	6,44E-04	2,12E-04	0,00E+00	-3,89E-03
EP-marine	[kg N eq.]	1,89E+01	3,88E-02	5,47E-02	1,90E+01	0,00E+00	8,82E-05	4,75E-03	2,19E-04	0,00E+00	-3,06E-02
EP-terrestrial	[mol N eq.]	2,65E+01	4,25E-01	5,83E-01	2,75E+01	0,00E+00	9,57E-04	5,13E-02	1,93E-03	0,00E+00	-3,51E-01
POCP	[kg NMVOC eq.]	5,39E+01	2,12E-01	3,26E-01	5,45E+01	0,00E+00	2,36E-04	3,29E-02	6,53E-04	0,00E+00	-1,07E-01
ADPm ¹	[kg Sb eq.]	1,33E-03	1,60E-04	6,71E-04	2,16E-03	0,00E+00	3,64E-09	3,09E-05	5,90E-07	0,00E+00	-8,31E-05
ADPf ¹	[MJ]	5,69E+03	9,82E+01	1,43E+02	5,93E+03	0,00E+00	4,10E-01	1,11E+01	4,06E+00	0,00E+00	-7,83E+01
WDP ¹	[m ³ world eq. deprived]	6,23E+01	3,13E+00	1,90E+01	8,45E+01	0,00E+00	3,12E-04	5,55E-01	6,45E-02	0,00E+00	-1,46E+01
Caption	GWP-total = Globale Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water depletion potential The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*10² or 195, while 1,12E-11 is the same as 1,12*10⁻¹¹ or 0,0000000000112.										
Disclaimer	¹ The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.										

ADDITIONAL ENVIRONMENTAL IMPACTS PER TON GRC-PALE											
Parameter	Unit	A1	A2	A3	A1-A3	B1-B7	C1	C2	C3	C4	D
PM	[Disease incidence]	2,37E-05	3,70E-06	1,54E-06	2,90E-05	0,00E+00	1,50E-09	7,00E-07	5,66E-09	0,00E+00	-1,64E-06
IRP ²	[kBq U235 eq.]	5,77E+01	1,15E+00	1,83E+00	6,07E+01	0,00E+00	1,15E-04	1,73E-01	1,54E-01	0,00E+00	-1,09E+00
ETP-fw ¹	[CTUe]	6,44E+03	1,58E+02	2,14E+02	6,81E+03	0,00E+00	4,03E-01	2,92E+01	7,38E-01	0,00E+00	-6,15E+01
HTP-c ¹	[CTUh]	1,13E-06	3,49E-07	4,38E-07	1,92E-06	0,00E+00	6,28E-12	6,74E-08	1,91E-09	0,00E+00	-1,34E-07
HTP-nc ¹	[CTUh]	4,59E-05	4,46E-07	6,92E-07	4,70E-05	0,00E+00	2,64E-10	8,39E-08	3,94E-09	0,00E+00	-1,45E-07
SQP ¹	-	4,06E+02	4,24E+02	5,38E+02	1,37E+03	0,00E+00	1,15E-01	8,07E+01	9,76E-01	0,00E+00	-1,76E+02
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless) The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*10² or 195, while 1,12E-11 is the same as 1,12*10⁻¹¹ or 0,0000000000112.										
Disclaimers	¹ The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. ² This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.										

RESOURCE USE PER TON GRC-PALE											
Parameter	Unit	A1	A2	A3	A1-A3	B1-B7	C1	C2	C3	C4	D
PERE	[MJ]	9,65E+01	9,97E+00	8,43E+02	9,50E+02	0,00E+00	2,33E-02	1,78E+00	1,10E+00	0,00E+00	-1,11E+01
PERM	[MJ]	4,88E-02	2,86E+00	8,10E+01	8,39E+01	0,00E+00	2,33E-02	5,22E-01	1,85E-01	0,00E+00	-2,58E+00
PERT	[MJ]	9,98E+01	1,28E+01	9,19E+02	1,03E+03	0,00E+00	0,00E+00	2,30E+00	1,29E+00	0,00E+00	-1,36E+01
PENRE	[MJ]	5,69E+03	0,00E+00	5,01E+01	5,74E+03	0,00E+00	4,10E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRM	[MJ]	9,94E-01	0,00E+00	4,45E+01	4,55E+01	0,00E+00	4,10E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	[MJ]	5,69E+03	9,82E+01	9,89E+01	5,89E+03	0,00E+00	0,00E+00	1,11E+01	4,06E+00	0,00E+00	-7,83E+01
SM	[kg]	1,90E+01	0,00E+00	3,50E-04	1,90E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	[MJ]	2,14E+02	0,00E+00	6,36E-05	2,14E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	[MJ]	0,00E+00	0,00E+00	4,49E-07	4,49E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	[m ³]	5,25E-01	1,04E-01	3,19E-01	9,48E-01	0,00E+00	1,70E-05	1,85E-02	4,64E-03	0,00E+00	-3,62E-01
Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials; PENRM = Use of non renewable primary energy resources used as raw materials; PENRT = Total use of non renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Net use of fresh water The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*10² or 195, while 1,12E-11 is the same as 1,12*10⁻¹¹ or 0,0000000000112.										

WASTE CATEGORIES AND OUTPUT FLOWS PER TON GRC-PALE											
Parameter	Unit	A1	A2	A3	A1-A3	B1-B7	C1	C2	C3	C4	D
HWD	[kg]	2,83E-01	4,68E-03	3,24E-02	3,20E-01	0,00E+00	4,46E-11	9,00E-04	9,54E-06	0,00E+00	-1,62E-03
NHWD	[kg]	1,18E+01	3,34E+01	7,76E+00	5,30E+01	0,00E+00	4,89E-05	6,45E+00	1,23E-02	0,00E+00	-6,63E+00
RWD	[kg]	2,37E-01	4,88E-04	1,06E-02	2,48E-01	0,00E+00	1,12E-06	4,31E-05	3,95E-05	0,00E+00	-2,65E-04
CRU	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	[kg]	7,20E+00	0,00E+00	6,66E-03	7,21E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	[kg]	6,75E+01	0,00E+00	5,64E-04	6,75E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Caption	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*10² or 195, while 1,12E-11 is the same as 1,12*10⁻¹¹ or 0,0000000000112.										

BIOGENIC CARBON CONTENT PER TON GRC-PALE		
Parameter	Unit	At the factory gate
Biogenic carbon content in product	[kg C]	0,00E+00
Biogenic carbon content in accompanying packaging	[kg C]	3,68E+00
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO ₂	

ENVIRONMENTAL IMPACTS PER TON GRC-DARK											
Parameter	Unit	A1	A2	A3	A1-A3	B1-B7	C1	C2	C3	C4	D
GWP-total	[kg CO ₂ eq.]	4,53E+02	5,20E+01	1,40E+02	6,45E+02	-1,64E+02	1,96E-02	9,51E+00	2,57E-01	0,00E+00	-1,77E+01
GWP-fossil	[kg CO ₂ eq.]	4,53E+02	5,19E+01	1,44E+02	6,48E+02	-1,64E+02	2,04E-02	9,50E+00	2,47E-01	0,00E+00	-1,77E+01
GWP-biogenic	[kg CO ₂ eq.]	5,55E-01	3,65E-02	-3,70E+00	-3,11E+00	0,00E+00	-9,11E-04	6,58E-03	8,73E-03	0,00E+00	-2,23E-02
GWP-luluc	[kg CO ₂ eq.]	2,84E-02	1,78E-02	4,72E-02	9,34E-02	0,00E+00	1,58E-04	3,15E-03	7,26E-04	0,00E+00	-1,28E-02
ODP	[kg CFC 11 eq.]	8,86E-07	1,54E-06	6,04E-06	8,46E-06	0,00E+00	6,52E-15	1,89E-07	4,14E-09	0,00E+00	-1,93E-07
AP	[mol H ⁺ eq.]	4,18E+01	1,75E-01	1,94E-01	4,22E+01	0,00E+00	1,76E-04	1,98E-02	1,24E-03	0,00E+00	-1,10E-01
EP-freshwater	[kg P eq.]	1,02E-02	3,71E-03	8,37E-03	2,22E-02	0,00E+00	7,06E-08	6,44E-04	2,12E-04	0,00E+00	-3,89E-03
EP-marine	[kg N eq.]	1,89E+01	3,88E-02	5,47E-02	1,90E+01	0,00E+00	8,82E-05	4,75E-03	2,19E-04	0,00E+00	-3,06E-02
EP-terrestrial	[mol N eq.]	2,56E+01	4,25E-01	5,83E-01	2,66E+01	0,00E+00	9,57E-04	5,13E-02	1,93E-03	0,00E+00	-3,51E-01
POCP	[kg NMVOC eq.]	5,33E+01	2,12E-01	3,26E-01	5,39E+01	0,00E+00	2,36E-04	3,29E-02	6,53E-04	0,00E+00	-1,07E-01
ADPm ¹	[kg Sb eq.]	1,95E-03	1,60E-04	6,71E-04	2,78E-03	0,00E+00	3,64E-09	3,09E-05	5,90E-07	0,00E+00	-8,31E-05
ADPf ¹	[MJ]	2,87E+03	9,82E+01	1,43E+02	3,11E+03	0,00E+00	4,10E-01	1,11E+01	4,06E+00	0,00E+00	-7,83E+01
WDP ¹	[m ³ world eq. deprived]	7,06E+01	3,13E+00	1,90E+01	9,28E+01	0,00E+00	3,12E-04	5,55E-01	6,45E-02	0,00E+00	-1,46E+01
Caption	GWP-total = Globale Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water depletion potential The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*10² or 195, while 1,12E-11 is the same as 1,12*10⁻¹¹ or 0,0000000000112.										
Disclaimer	¹ The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.										

ADDITIONAL ENVIRONMENTAL IMPACTS PER TON GRC-DARK											
Parameter	Unit	A1	A2	A3	A1-A3	B1-B7	C1	C2	C3	C4	D
PM	[Disease incidence]	1,89E-05	3,70E-06	1,54E-06	2,41E-05	0,00E+00	1,50E-09	7,00E-07	5,66E-09	0,00E+00	-1,64E-06
IRP ²	[kBq U235 eq.]	7,57E+01	1,15E+00	1,83E+00	7,87E+01	0,00E+00	1,15E-04	1,73E-01	1,54E-01	0,00E+00	-1,09E+00
ETP-fw ¹	[CTUe]	3,89E+02	1,58E+02	2,14E+02	7,60E+02	0,00E+00	4,03E-01	2,92E+01	7,38E-01	0,00E+00	-6,15E+01
HTP-c ¹	[CTUh]	7,92E-07	3,49E-07	4,38E-07	1,58E-06	0,00E+00	6,28E-12	6,74E-08	1,91E-09	0,00E+00	-1,34E-07
HTP-nc ¹	[CTUh]	3,90E-05	4,46E-07	6,92E-07	4,02E-05	0,00E+00	2,64E-10	8,39E-08	3,94E-09	0,00E+00	-1,45E-07
SQP ¹	-	3,77E+02	4,24E+02	5,38E+02	1,34E+03	0,00E+00	1,15E-01	8,07E+01	9,76E-01	0,00E+00	-1,76E+02
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless) The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*10² or 195, while 1,12E-11 is the same as 1,12*10⁻¹¹ or 0,0000000000112.										
Disclaimers	¹ The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. ² This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.										

RESOURCE USE PER TON GRC-DARK											
Parameter	Unit	A1	A2	A3	A1-A3	B1-B7	C1	C2	C3	C4	D
PERE	[MJ]	1,09E+02	9,97E+00	8,43E+02	9,62E+02	0,00E+00	2,33E-02	1,78E+00	1,10E+00	0,00E+00	-1,11E+01
PERM	[MJ]	4,88E-02	2,86E+00	8,10E+01	8,39E+01	0,00E+00	2,33E-02	5,22E-01	1,85E-01	0,00E+00	-2,58E+00
PERT	[MJ]	1,13E+02	1,28E+01	9,19E+02	1,04E+03	0,00E+00	0,00E+00	2,30E+00	1,29E+00	0,00E+00	-1,36E+01
PENRE	[MJ]	2,87E+03	0,00E+00	5,01E+01	2,92E+03	0,00E+00	4,10E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRM	[MJ]	9,94E-01	0,00E+00	4,45E+01	4,55E+01	0,00E+00	4,10E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	[MJ]	2,87E+03	9,82E+01	9,89E+01	3,07E+03	0,00E+00	0,00E+00	1,11E+01	4,06E+00	0,00E+00	-7,83E+01
SM	[kg]	1,26E+02	0,00E+00	3,50E-04	1,26E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	[MJ]	1,05E+03	0,00E+00	6,36E-05	1,05E+03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	[MJ]	8,66E+02	0,00E+00	4,49E-07	8,66E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	[m³]	1,09E+02	9,97E+00	8,43E+02	9,62E+02	0,00E+00	1,70E-05	1,85E-02	4,64E-03	0,00E+00	-3,62E-01
Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials; PENRM = Use of non renewable primary energy resources used as raw materials; PENRT = Total use of non renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Net use of fresh water The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*10 ² or 195, while 1,12E-11 is the same as 1,12*10 ⁻¹¹ or 0,0000000000112.										

WASTE CATEGORIES AND OUTPUT FLOWS PER TON GRC-DARK											
Parameter	Unit	A1	A2	A3	A1-A3	B1-B7	C1	C2	C3	C4	D
HWD	[kg]	2,69E-01	4,68E-03	3,24E-02	3,06E-01	0,00E+00	4,46E-11	9,00E-04	9,54E-06	0,00E+00	-1,62E-03
NHWD	[kg]	2,08E+01	3,34E+01	7,76E+00	6,19E+01	0,00E+00	4,89E-05	6,45E+00	1,23E-02	0,00E+00	-6,63E+00
RWD	[kg]	2,40E-01	4,88E-04	1,06E-02	2,51E-01	0,00E+00	1,12E-06	4,31E-05	3,95E-05	0,00E+00	-2,65E-04
CRU	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	[kg]	2,16E+00	0,00E+00	6,66E-03	2,17E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	[kg]	6,58E+01	0,00E+00	5,64E-04	6,58E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Caption	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*10 ² or 195, while 1,12E-11 is the same as 1,12*10 ⁻¹¹ or 0,0000000000112.										

BIOGENIC CARBON CONTENT PER TON GRC-DARK		
Parameter	Unit	At the factory gate
Biogenic carbon content in product	[kg C]	0,00E+00
Biogenic carbon content in accompanying packaging	[kg C]	3,68E+00
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO ₂	

ENVIRONMENTAL IMPACTS PER TON SS-MOUNTING SYSTEM

Parameter	Unit	A1	A2	A3	A1-A3	B1-B7	C1	C2	C3	C4	D
GWP-total	[kg CO ₂ eq.]	2,19E+03	1,66E+02	0,00E+00	2,36E+03	0,00E+00	0,00E+00	9,51E+00	5,04E-01	2,24E+00	-7,13E+01
GWP-fossil	[kg CO ₂ eq.]	2,18E+03	1,66E+02	0,00E+00	2,35E+03	0,00E+00	0,00E+00	9,50E+00	4,93E-01	2,24E+00	-7,11E+01
GWP-biogenic	[kg CO ₂ eq.]	7,79E+00	1,15E-01	0,00E+00	7,91E+00	0,00E+00	0,00E+00	6,58E-03	1,08E-02	-1,55E-02	-8,75E-02
GWP-luluc	[kg CO ₂ eq.]	1,12E+00	5,52E-02	0,00E+00	1,18E+00	0,00E+00	0,00E+00	3,15E-03	8,36E-04	1,35E-02	-2,57E-02
ODP	[kg CFC 11 eq.]	2,34E-04	3,31E-06	0,00E+00	2,37E-04	0,00E+00	0,00E+00	1,89E-07	6,70E-09	6,05E-12	-3,74E-07
AP	[mol H ⁺ eq.]	1,85E+01	3,46E-01	0,00E+00	1,88E+01	0,00E+00	0,00E+00	1,98E-02	1,88E-03	1,59E-02	-2,84E-01
EP-freshwater	[kg P eq.]	9,45E-01	1,13E-02	0,00E+00	9,56E-01	0,00E+00	0,00E+00	6,44E-04	2,97E-04	5,10E-06	-3,22E-02
EP-marine	[kg N eq.]	2,34E+00	8,32E-02	0,00E+00	2,42E+00	0,00E+00	0,00E+00	4,75E-03	3,81E-04	4,10E-03	-6,28E-02
EP-terrestrial	[mol N eq.]	2,47E+01	8,98E-01	0,00E+00	2,56E+01	0,00E+00	0,00E+00	5,13E-02	3,73E-03	4,52E-02	-6,77E-01
POCP	[kg NMVOC eq.]	1,92E+01	5,75E-01	0,00E+00	1,98E+01	0,00E+00	0,00E+00	3,29E-02	1,27E-03	1,26E-02	-2,28E-01
ADPm ¹	[kg Sb eq.]	2,42E-02	5,41E-04	0,00E+00	2,47E-02	0,00E+00	0,00E+00	3,09E-05	1,11E-06	1,45E-07	-5,78E-04
ADPf ¹	[MJ]	2,44E+01	1,94E+02	0,00E+00	2,19E+02	0,00E+00	0,00E+00	1,11E+01	4,84E+00	2,96E+01	-5,46E+02
WDP ¹	[m ³ world eq. deprived]	1,67E+00	9,71E+00	0,00E+00	1,14E+01	0,00E+00	0,00E+00	5,55E-01	3,66E-01	2,57E-01	-1,36E+01
Caption	GWP-total = Globale Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water depletion potential The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*10² or 195, while 1,12E-11 is the same as 1,12*10⁻¹¹ or 0,0000000000112.										
Disclaimer	¹ The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.										

ADDITIONAL ENVIRONMENTAL IMPACTS PER TON SS-MOUNTING SYSTEM

Parameter	Unit	A1	A2	A3	A1-A3	B1-B7	C1	C2	C3	C4	D
PM	[Disease incidence]	1,72E-04	1,22E-05	0,00E+00	1,84E-04	0,00E+00	0,00E+00	7,00E-07	1,80E-08	2,00E-07	-5,30E-06
IRP ²	[kBq U235 eq.]	1,43E+02	3,03E+00	0,00E+00	1,46E+02	0,00E+00	0,00E+00	1,73E-01	1,72E-01	3,59E-02	-2,35E+00
ETP-fw ¹	[CTUe]	6,03E+01	5,10E+02	0,00E+00	5,71E+02	0,00E+00	0,00E+00	2,92E+01	1,15E+00	1,97E+01	-4,23E+03
HTP-c ¹	[CTUh]	2,07E-05	1,18E-06	0,00E+00	2,19E-05	0,00E+00	0,00E+00	6,74E-08	3,34E-09	4,03E-10	-1,60E-05
HTP-nc ¹	[CTUh]	5,08E-05	1,47E-06	0,00E+00	5,23E-05	0,00E+00	0,00E+00	8,39E-08	7,29E-09	1,56E-08	-6,54E-07
SQP ¹	-	7,56E+00	1,41E+03	0,00E+00	1,42E+03	0,00E+00	0,00E+00	8,07E+01	1,81E+00	8,15E+00	-2,25E+02
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless) The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*10² or 195, while 1,12E-11 is the same as 1,12*10⁻¹¹ or 0,0000000000112.										
Disclaimers	¹ The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. ² This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.										

RESOURCE USE PER TON SS-MOUNTING SYSTEM											
Parameter	Unit	A1	A2	A3	A1-A3	B1-B7	C1	C2	C3	C4	D
PERE	[MJ]	2,45E+00	3,11E+01	0,00E+00	3,36E+01	0,00E+00	0,00E+00	1,78E+00	1,26E+00	0,00E+00	-5,90E+01
PERM	[MJ]	2,51E+01	9,14E+00	0,00E+00	3,42E+01	0,00E+00	0,00E+00	5,22E-01	2,30E-01	5,16E+00	-1,49E+01
PERT	[MJ]	2,48E+00	4,03E+01	0,00E+00	4,27E+01	0,00E+00	0,00E+00	2,30E+00	1,49E+00	5,16E+00	-7,39E+01
PENRE	[MJ]	1,10E+01	0,00E+00	0,00E+00	1,10E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,96E+01	0,00E+00
PENRM	[MJ]	3,81E+02	0,00E+00	0,00E+00	3,81E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	[MJ]	1,14E+01	1,94E+02	0,00E+00	2,06E+02	0,00E+00	0,00E+00	1,11E+01	4,84E+00	2,96E+01	-5,46E+02
SM	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	[m ³]	2,44E+01	3,24E-01	0,00E+00	2,47E+01	0,00E+00	0,00E+00	1,85E-02	1,21E-02	7,85E-03	-4,19E-01
Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials; PENRM = Use of non renewable primary energy resources used as raw materials; PENRT = Total use of non renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Net use of fresh water The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*10 ² or 195, while 1,12E-11 is the same as 1,12*10 ⁻¹¹ or 0,0000000000112.										

WASTE CATEGORIES AND OUTPUT FLOWS PER TON SS-MOUNTING SYSTEM											
Parameter	Unit	A1	A2	A3	A1-A3	B1-B7	C1	C2	C3	C4	D
HWD	[kg]	4,88E-01	1,58E-02	0,00E+00	5,04E-01	0,00E+00	0,00E+00	9,00E-04	1,65E-05	7,37E-09	-6,19E-03
NHWD	[kg]	1,17E+03	1,13E+02	0,00E+00	1,28E+03	0,00E+00	0,00E+00	6,45E+00	3,20E-02	1,50E+02	-3,42E+00
RWD	[kg]	0,00E+00	7,54E-04	0,00E+00	7,54E-04	0,00E+00	0,00E+00	4,31E-05	4,41E-05	3,10E-04	-5,94E-04
CRU	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	[kg]	4,65E+01	0,00E+00	0,00E+00	4,65E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Caption	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*10 ² or 195, while 1,12E-11 is the same as 1,12*10 ⁻¹¹ or 0,0000000000112.										

BIOGENIC CARBON CONTENT PER TON SS-MOUNTING SYSTEM		
Parameter	Unit	At the factory gate
Biogenic carbon content in product	[kg C]	0,00E+00
Biogenic carbon content in accompanying packaging	[kg C]	0,00E+00
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO ₂	

ENVIRONMENTAL IMPACTS PER TON GS-MOUNTING SYSTEM

Parameter	Unit	A1	A2	A3	A1-A3	B1-B7	C1	C2	C3	C4	D
GWP-total	[kg CO ₂ eq.]	2,27E+03	1,66E+02	0,00E+00	2,44E+03	0,00E+00	0,00E+00	9,51E+00	5,04E-01	2,24E+00	-7,13E+01
GWP-fossil	[kg CO ₂ eq.]	2,27E+03	1,66E+02	0,00E+00	2,43E+03	0,00E+00	0,00E+00	9,50E+00	4,93E-01	2,24E+00	-7,11E+01
GWP-biogenic	[kg CO ₂ eq.]	1,48E+00	1,15E-01	0,00E+00	1,60E+00	0,00E+00	0,00E+00	6,58E-03	1,08E-02	-1,55E-02	-8,75E-02
GWP-luluc	[kg CO ₂ eq.]	1,64E+00	5,52E-02	0,00E+00	1,70E+00	0,00E+00	0,00E+00	3,15E-03	8,36E-04	1,35E-02	-2,57E-02
ODP	[kg CFC 11 eq.]	1,18E-04	3,31E-06	0,00E+00	1,21E-04	0,00E+00	0,00E+00	1,89E-07	6,70E-09	6,05E-12	-3,74E-07
AP	[mol H ⁺ eq.]	8,86E+01	3,46E-01	0,00E+00	8,89E+01	0,00E+00	0,00E+00	1,98E-02	1,88E-03	1,59E-02	-2,84E-01
EP-freshwater	[kg P eq.]	9,93E+02	1,13E-02	0,00E+00	9,93E+02	0,00E+00	0,00E+00	6,44E-04	2,97E-04	5,10E-06	-3,22E-02
EP-marine	[kg N eq.]	2,10E+03	8,32E-02	0,00E+00	2,10E+03	0,00E+00	0,00E+00	4,75E-03	3,81E-04	4,10E-03	-6,28E-02
EP-terrestrial	[mol N eq.]	2,28E+01	8,98E-01	0,00E+00	2,37E+01	0,00E+00	0,00E+00	5,13E-02	3,73E-03	4,52E-02	-6,77E-01
POCP	[kg NMVOC eq.]	1,49E+01	5,75E-01	0,00E+00	1,54E+01	0,00E+00	0,00E+00	3,29E-02	1,27E-03	1,26E-02	-2,28E-01
ADPm ¹	[kg Sb eq.]	3,37E-02	5,41E-04	0,00E+00	3,42E-02	0,00E+00	0,00E+00	3,09E-05	1,11E-06	1,45E-07	-5,78E-04
ADPf ¹	[MJ]	2,33E+04	1,94E+02	0,00E+00	2,35E+04	0,00E+00	0,00E+00	1,11E+01	4,84E+00	2,96E+01	-5,46E+02
WDP ¹	[m ³ world eq. deprived]	8,67E+02	9,71E+00	0,00E+00	8,76E+02	0,00E+00	0,00E+00	5,55E-01	3,66E-01	2,57E-01	-1,36E+01
Caption	GWP-total = Globale Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water depletion potential The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*10² or 195, while 1,12E-11 is the same as 1,12*10⁻¹¹ or 0,0000000000112.										
Disclaimer	¹ The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.										

ADDITIONAL ENVIRONMENTAL IMPACTS PER TON GS-MOUNTING SYSTEM

Parameter	Unit	A1	A2	A3	A1-A3	B1-B7	C1	C2	C3	C4	D
PM	[Disease incidence]	2,65E-04	1,22E-05	0,00E+00	2,78E-04	0,00E+00	0,00E+00	7,00E-07	1,80E-08	2,00E-07	-5,30E-06
IRP ²	[kBq U235 eq.]	2,32E+01	3,03E+00	0,00E+00	2,63E+01	0,00E+00	0,00E+00	1,73E-01	1,72E-01	3,59E-02	-2,35E+00
ETP-fw ¹	[CTUe]	3,55E+03	5,10E+02	0,00E+00	4,06E+03	0,00E+00	0,00E+00	2,92E+01	1,15E+00	1,97E+01	-4,23E+03
HTP-c ¹	[CTUh]	1,61E-06	1,18E-06	0,00E+00	2,79E-06	0,00E+00	0,00E+00	6,74E-08	3,34E-09	4,03E-10	-1,60E-05
HTP-nc ¹	[CTUh]	5,96E-06	1,47E-06	0,00E+00	7,42E-06	0,00E+00	0,00E+00	8,39E-08	7,29E-09	1,56E-08	-6,54E-07
SQP ¹	-	1,44E+03	1,41E+03	0,00E+00	2,85E+03	0,00E+00	0,00E+00	8,07E+01	1,81E+00	8,15E+00	-2,25E+02
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless) The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*10² or 195, while 1,12E-11 is the same as 1,12*10⁻¹¹ or 0,0000000000112.										
Disclaimers	¹ The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. ² This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.										

RESOURCE USE PER TON GS-MOUNTING SYSTEM

Parameter	Unit	A1	A2	A3	A1-A3	B1-B7	C1	C2	C3	C4	D
PERE	[MJ]	3,25E+03	3,11E+01	0,00E+00	3,28E+03	0,00E+00	0,00E+00	1,78E+00	1,26E+00	0,00E+00	-5,90E+01
PERM	[MJ]	7,53E-01	9,14E+00	0,00E+00	9,89E+00	0,00E+00	0,00E+00	5,22E-01	2,30E-01	5,16E+00	-1,49E+01
PERT	[MJ]	3,25E+03	4,03E+01	0,00E+00	3,29E+03	0,00E+00	0,00E+00	2,30E+00	1,49E+00	5,16E+00	-7,39E+01
PENRE	[MJ]	2,81E+04	0,00E+00	0,00E+00	2,81E+04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,96E+01	0,00E+00
PENRM	[MJ]	1,14E+01	0,00E+00	0,00E+00	1,14E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	[MJ]	2,80E+04	1,94E+02	0,00E+00	2,82E+04	0,00E+00	0,00E+00	1,11E+01	4,84E+00	2,96E+01	-5,46E+02
SM	[kg]	4,23E+02	0,00E+00	0,00E+00	4,23E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	[m ³]	4,60E+01	3,24E-01	0,00E+00	4,64E+01	0,00E+00	0,00E+00	1,85E-02	1,21E-02	7,85E-03	-4,19E-01
Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials; PENRM = Use of non renewable primary energy resources used as raw materials; PENRT = Total use of non renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Net use of fresh water The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*10² or 195, while 1,12E-11 is the same as 1,12*10⁻¹¹ or 0,0000000000112.										

WASTE CATEGORIES AND OUTPUT FLOWS PER TON GS-MOUNTING SYSTEM

Parameter	Unit	A1	A2	A3	A1-A3	B1-B7	C1	C2	C3	C4	D
HWD	[kg]	1,13E+02	1,58E-02	0,00E+00	1,13E+02	0,00E+00	0,00E+00	9,00E-04	1,65E-05	7,37E-09	-6,19E-03
NHWD	[kg]	6,79E+02	1,13E+02	0,00E+00	7,92E+02	0,00E+00	0,00E+00	6,45E+00	3,20E-02	1,50E+02	-3,42E+00
RWD	[kg]	5,71E-01	7,54E-04	0,00E+00	5,72E-01	0,00E+00	0,00E+00	4,31E-05	4,41E-05	3,10E-04	-5,94E-04
CRU	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	[kg]	7,28E+00	0,00E+00	0,00E+00	7,28E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Caption	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*10² or 195, while 1,12E-11 is the same as 1,12*10⁻¹¹ or 0,0000000000112.										

BIOGENIC CARBON CONTENT PER TON GS-MOUNTING SYSTEM

Parameter	Unit	At the factory gate
Biogenic carbon content in product	[kg C]	0,00E+00
Biogenic carbon content in accompanying packaging	[kg C]	0,00E+00
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO ₂	

Additional information

LCA interpretation

The raw material extraction (A1) is a major contributor to the environmental impact for almost all the impact categories, across all the declared products in this LCA. For the GRC-Pale and GRC-dark, the cement and drysand effects the environmental impact significantly. This is mainly due to the fact that a lot of cement and drysand is used per ton produced product. For the mounting systems, the production of stainless steel and galvanized steel respectively contributes to the most to the results. This, however, makes sense as no utility consumption (e.g., electricity, natural gas, diesel etc.) has been allocated to the mounting systems, but instead to the concrete products.

Technical information on scenarios

Reference service life

RSL Information	GRC-Pale	GRC-Dark	SS-mounting system	GS-mounting system	Unit
Reference service Life	50	50	50	50	Years

Use (B1-B7)

Scenario information	GRC-Pale	GRC-Dark	SS-mounting system	GS-mounting system	Unit
B1 – Carbonation	-298	-262	0	0	kg CO2 eq

End of life (C1-C4)

Scenario information	GRC-Pale	GRC-Dark	SS-mounting system	GS-mounting system	Unit
Collected separately	1000	1000	1000	1000	kg
Collected with mixed waste	0	0	0	0	kg
For reuse	0	0	0	0	kg
For recycling	1000	1000	850	850	kg
For energy recovery	0	0	0	0	kg
For final disposal	0	0	150	150	kg

Re-use, recovery and recycling potential (D)

Scenario information/Material	GRC-pale	GRC-Dark	SS-mounting system	GS-mounting system	Unit
Displaced virgin steel	0	0	32,3	32,3	kg
Displaced gravel	950	950	0	0	

Indoor air

The EPD does not give information on release of dangerous substances to indoor air because the horizontal standards on the relevant measurements are not available. Read more in EN15804+A1 chapter 7.4.1.

Soil and water

The EPD does not give information on release of dangerous substances to soil and water because the horizontal standards on the relevant measurements are not available. Read more in EN15804+A1 chapter 7.4.2.

References

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LCA-practitioner	Jonatan Bohr Dimitrios Lergios FORCE Technology Park Allé 345 2605 Brøndby www.forcetechnology.com 
LCA software / background data	<i>Simapro vers 10.96</i> <i>Managed LCA Content v2024.1</i> <i>(www.sphera.com)</i> <i>Ecoinvent v3.10 (www.ecoinvent.org)</i> <i>EN 15804 reference package 3.1</i>
3rd party verifier	Mie Ostenfeldt Ostenfeldt Consulting https://ostenfeldtconsulting.dk  Verified according to Verification Checklist 1 v. 2.8

General programme instructions

General Programme Instructions, version 2.0, spring 2020

www.epddanmark.dk

EN 15804

DS/EN 15804 + A2:2019 - "Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products"

DS/EN 16757:2022

Sustainability of construction works - Environmental product declarations - Product Category Rules for concrete and concrete elements

EN 15942

DS/EN 15942:2011 – "Sustainability of construction works – Environmental product declarations – Communication format business-to-business"

ISO 14025

DS/EN ISO 14025:2010 – "Environmental labels and declarations – Type III environmental declarations – Principles and procedures"

ISO 14040

DS/EN ISO 14040:2008 – "Environmental management – Life cycle assessment – Principles and framework"

ISO 14044

DS/EN ISO 14044:2008 – "Environmental management – Life cycle assessment – Requirements and guidelines"