

Owner: ZURFACE A/S
No.: MD-23104-EN
Issued: 21-07-2023
Valid to: 21-07-2028

3rd PARTY VERIFIED

EPD

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | ISO 14025 & EN 15804



Owner of declaration
ZURFACE A/S
Rabækkevej 2
3700 Rønne, Denmark
VAT no. DK-34903093



Issued:
21-07-2023

Valid to:
21-07-2028

Programme
EPD Danmark
www.epddanmark.dk



- Industry EPD
- Product EPD

Basis of calculation

This EPD is developed 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

Declared product(s)

Granite/gneiss with flamed, picked, or honed finish.

Number of declared datasets/product variations: 1.

Production site

ZURFACE A/S
Rabækkevej 2
3700 Rønne, Denmark.

The declared product is manufactured using certified green electricity.

Product(s) use

Zurface produces granite/gneiss products for pavements, facades, floors, and interiors. Granite/gneiss products with a picked or flamed finish are most often used for outdoor applications, including steps and tiles. Granite/gneiss products with a honed finish are often used for indoor applications, including tiles and other flooring.

Declared/ functional unit

1 ton of granite/gneiss.

Year of production site data

2021.

EPD version

1st version.

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:


Mirko Miseljic


Martha Katrine Sørensen
EPD Danmark

Life cycle stages and modules (MND = module 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	MND	MND	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X	

Product information

Product description

The main product components are shown in the table below.

Material	Weight-% of declared product
Granite/gneiss	100%

Product packaging

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

Material	Weight-% of packaging
Plastic wrapping	3%
Pallets and wood	97%

Representativity

This declaration, including data collection and the modeled foreground system including results, represents the production of 1 ton of granite/gneiss on the production site located in Rønne, Denmark. Product specific data are based on average values collected in the year 2021. Background data are based on the LCA for Experts database version 2023.1 and EcoInvent 3.8. The background data 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 does not contain substances listed on the "Candidate List of Substances of Very High Concern for authorisation".

(<http://echa.europa.eu/candidate-list-table>)

Essential characteristics

For outdoor application, the granite/gneiss products comply with the following standards: DS/EN 1136, DS/EN 1341, DS/EN 1342, and DS/EN 1343.

For indoor application, the granite/gneiss products comply with the following standards: DS/EN 12057, and DS/EN 12058.

Further technical information can be obtained by contacting the manufacturer or on the manufacturer's website: <http://www.zurface.dk/>

Reference Service Life (RSL)

The reference service life (RSL) of the declared product is +100 years. (Aagaard et al. 2013)

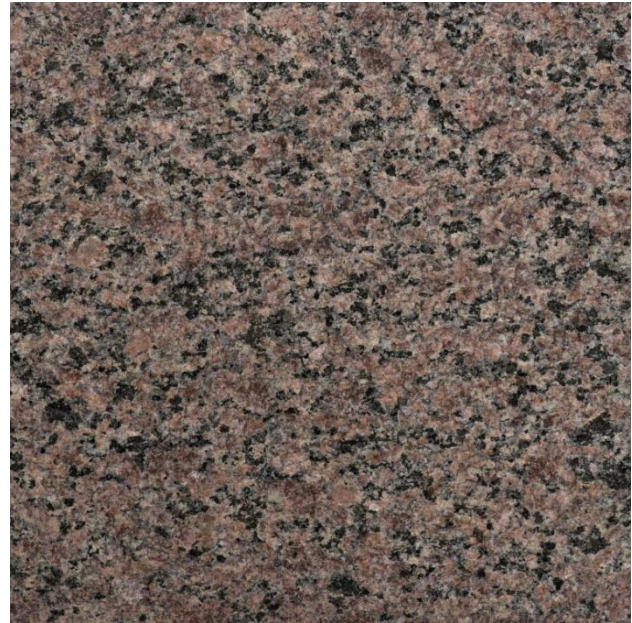
Any demolition/deconstruction of the declared product will most often be due to the surrounding area or remaining construction, for example during renovation.

Picture of product(s)

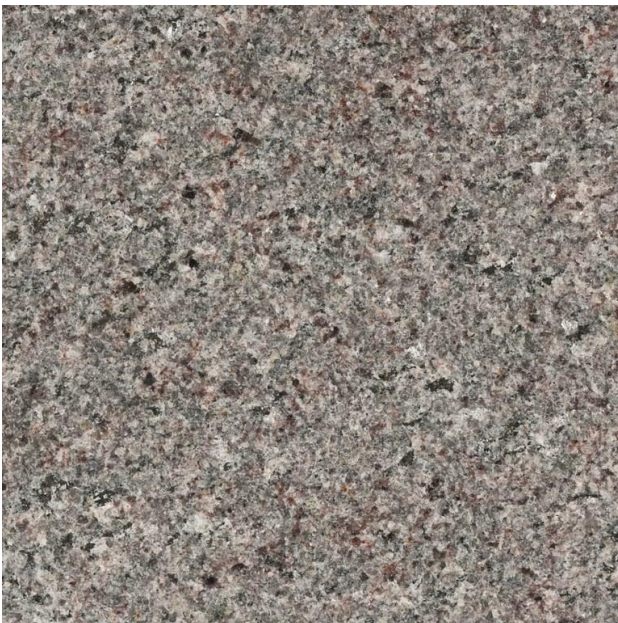
The declared product is manufactured from the following granites *Blå Rønne*, *Moseløkke*, and *Helletsbakke*, and the gneiss *Paradis*, which are quarried from the four remaining Danish quarries on Bornholm. The materials can be seen on the pictures below.



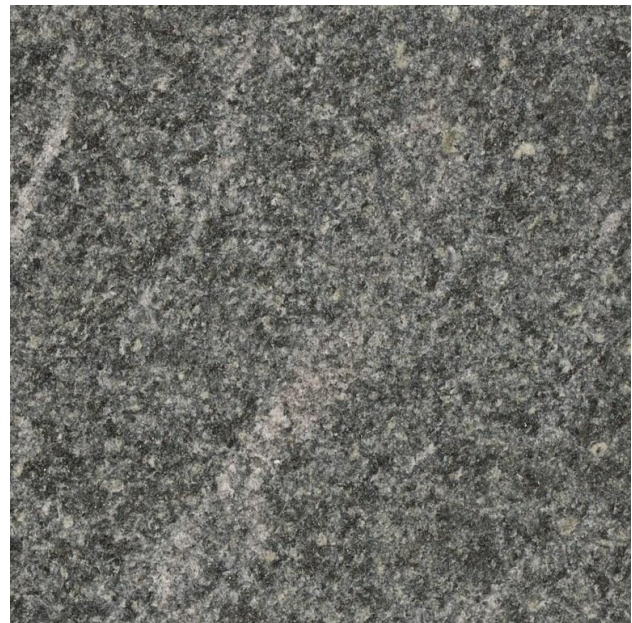
Blå Rønne



Helletsbakke



Moseløkke



Paradis

LCA background

Declared unit

The LCI and LCIA results in this EPD relates to environmental impacts caused by the production and end-of-life of 1 ton of granite/gneiss.

Name	Value	Unit
Declared unit	1	ton
Density	2630-2750	kg/m ³
Conversion factor to 1 kg.	0.001	-

Functional unit

Not defined.

PCR

This EPD is developed according to the core rules for the product category of construction products in EN 15804+A2:2019.

Guarantee of Origin – certificates

Foreground system:

The product is produced using electricity covered by "Guarantee of Origin" certificates and, therefore, modelled using electricity from wind power. Remaining consumption of electricity is modelled using residual grid mix. Consumption of district heating is modelled using processes from the LCA for Experts background database that is based on average data.

Background system:

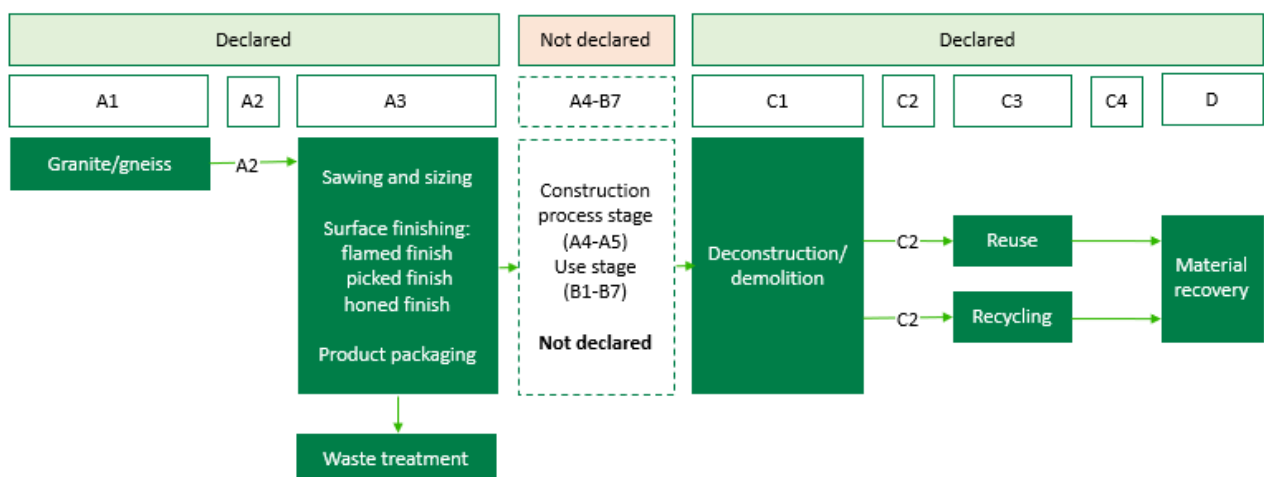
Other processes upstream and downstream from the production is modelled with processes from the LCA for Experts background database that is based on average data.

Key assumptions and estimates

It is assumed that the type of granite/gneiss has no significant influence on the production itself. Therefore, the LCA results for the declared product are both valid for the granites *Blå Rønne*, *Moseløkke* and *Helletsbakke*, as well as the gneiss *Paradis*.

Flow diagram

The flow diagram below presents the main processes included in the life cycle of the declared product:



System boundary

This EPD is based on a cradle-to-gate LCA with modules C1-C4 and D, in which 100 weight-% has been accounted for.

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.

In module A1, allocation of energy, auxiliary materials, and production waste is based on economic values. In module A3, allocation is based on mass, i.e. per kg of product manufactured at the production site in Rønne, Denmark. In accordance with EN 15804+A2:2019, the allocation procedures have been chosen based on the differences in revenue from the co-products in module A1 and A3, respectively.

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. 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.

Extraction of raw materials (A1+A2):

Zurface has the exclusive right to quarry and process the granite and gneiss in the four remaining Danish quarries on Bornholm (A1). The quarrying of granite/gneiss results in granite/gneiss blocks, which subsequently are transported to the production site for further processing (A2).

Surface finishing (A3):

The surface finishing takes place at Zurface’s production site in Rønne, Denmark. The

granite/gneiss blocks are sawn into smaller blocks, and subsequently further adjusted in size, depending on the desired granite/gneiss product. The granite/gneiss are then surface treated by adding one or a combination of the following surface finishes: flamed, picked, and honed. A flamed finish leaves the surface rough and non-slip, a picked finish leaves the surface solid and non-slip, while a honed finish leaves the surface smooth and yet dull.

Finally, the declared product is packaged and transported to Zurface’s sales office and warehouse in Copenhagen, Denmark.

End of Life (C1-C4) includes:

C1 – Deconstruction

C2 – Transport to waste processing

C3 – Waste processing

C4 – Disposal

Two scenarios have been included in the end-of-life stage. One assumes that 100% of the declared product is collected for recycling, and one assumes that 100% is collected and prepared for reuse at Zurface’s own facilities in Copenhagen, Horsens, or Randers.

Both scenarios include excavation (C1) and transport from the construction site to the waste processing facility (C2). A distance of 100 km is assumed for the reuse scenario, while 50 km is assumed for the recycling scenario.

In the reuse scenario, the granite/gneiss products are sorted manually and placed using a loader (C3). In the recycling scenario, the granite/gneiss products are crushed, producing recycled aggregates (C3).

None of these 100% scenarios are likely, but a mix of the two scenarios is considered plausible.

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

Both scenarios include potential benefits from avoided extraction and production of primary materials.

LCA results

ENVIRONMENTAL IMPACTS PER DECLARED UNIT (1 TON)												
Parameter	Unit	A1-A3	Scenario									
			Reuse					Recycling				
			C1	C2	C3	C4	D	C1	C2	C3	C4	D
GWP-total	[kg CO ₂ eq.]	2.57E+02	2.69E-01	8.50E+00	2.69E-01	0.00E+00	-2.44E+02	2.69E-01	4.25E+00	2.60E+00	0.00E+00	-1.90E+00
GWP-fossil	[kg CO ₂ eq.]	2.54E+02	2.66E-01	8.40E+00	2.66E-01	0.00E+00	-2.41E+02	2.66E-01	4.20E+00	2.59E+00	0.00E+00	-1.94E+00
GWP-biogenic	[kg CO ₂ eq.]	1.26E+00	1.04E-03	2.48E-02	1.04E-03	0.00E+00	-1.20E+00	1.04E-03	1.24E-02	3.96E-04	0.00E+00	4.72E-02
GWP-luluc	[kg CO ₂ eq.]	1.89E+00	2.45E-03	7.79E-02	2.45E-03	0.00E+00	-1.79E+00	2.45E-03	3.89E-02	1.25E-02	0.00E+00	-8.29E-03
ODP	[kg CFC 11 eq.]	2.49E-07	3.44E-14	1.09E-12	3.44E-14	0.00E+00	-2.36E-07	3.44E-14	5.47E-13	7.79E-12	0.00E+00	-1.25E-11
AP	[mol H ⁺ eq.]	3.38E+00	3.66E-03	1.24E-02	3.66E-03	0.00E+00	-3.21E+00	3.66E-03	6.20E-03	1.30E-02	0.00E+00	-9.90E-03
EP-freshwater	[kg P eq.]	2.36E-03	9.66E-07	3.07E-05	9.66E-07	0.00E+00	-2.25E-03	9.66E-07	1.54E-05	6.74E-06	0.00E+00	-9.72E-06
EP-marine	[kg N eq.]	1.45E+00	1.66E-03	4.50E-03	1.66E-03	0.00E+00	-1.38E+00	1.66E-03	2.25E-03	6.06E-03	0.00E+00	-3.49E-03
EP-terrestrial	[mol N eq.]	1.67E+01	1.82E-02	5.32E-02	1.82E-02	0.00E+00	-1.59E+01	1.82E-02	2.66E-02	6.68E-02	0.00E+00	-3.86E-02
POCP	[kg NMVOC eq.]	4.29E+00	4.95E-03	1.09E-02	4.95E-03	0.00E+00	-4.07E+00	4.95E-03	5.43E-03	1.63E-02	0.00E+00	-9.50E-03
ADPm ¹	[kg Sb eq.]	1.60E-04	1.74E-08	5.54E-07	1.74E-08	0.00E+00	-1.52E-04	1.74E-08	2.77E-07	2.77E-06	0.00E+00	-2.01E-07
ADPf ¹	[MJ]	3.18E+03	3.60E+00	1.15E+02	3.60E+00	0.00E+00	-3.02E+03	3.60E+00	5.73E+01	4.98E+01	0.00E+00	-3.01E+01
WDP ¹	[m ³ world eq. deprived]	3.42E+01	3.19E-03	1.02E-01	3.19E-03	0.00E+00	-3.25E+01	3.19E-03	5.08E-02	4.52E-01	0.00E+00	-2.06E-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 use 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.											
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 DECLARED UNIT (1 TON)												
Parameter	Unit	A1-A3	Scenario									
			Reuse					Recycling				
			C1	C2	C3	C4	D	C1	C2	C3	C4	D
PM	[Disease incidence]	1.42E-04	1.93E-07	1.07E-07	1.93E-07	0.00E+00	-1.35E-04	1.93E-07	5.34E-08	2.51E-07	0.00E+00	-5.80E-07
IRP ²	[kBq U235 eq.]	1.73E+00	1.01E-03	3.21E-02	1.01E-03	0.00E+00	-1.65E+00	1.01E-03	1.60E-02	4.29E-02	0.00E+00	-3.39E-01
ETP-fw ¹	[CTUe]	3.41E+04	2.56E+00	8.13E+01	2.56E+00	0.00E+00	-3.24E+04	2.56E+00	4.07E+01	3.55E+01	0.00E+00	-1.67E+01
HTP-c ¹	[CTUh]	1.13E-07	5.23E-11	1.66E-09	5.23E-11	0.00E+00	-1.07E-07	5.23E-11	8.32E-10	7.83E-10	0.00E+00	-1.29E-09
HTP-nc ¹	[CTUh]	4.17E-06	4.14E-09	8.87E-08	4.14E-09	0.00E+00	-3.96E-06	4.14E-09	4.44E-08	3.92E-08	0.00E+00	-1.26E-07
SQP ¹	-	4.10E+03	1.50E+00	4.79E+01	1.50E+00	0.00E+00	-3.89E+03	1.50E+00	2.39E+01	1.26E+01	0.00E+00	-1.02E+01
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*10 ² 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 DECLARED UNIT (1 TON)												
Parameter	Unit	A1-A3	Scenario									
			Reuse					Recycling				
			C1	C2	C3	C4	D	C1	C2	C3	C4	D
PERE	[MJ]	2.85E+03	2.62E-01	8.34E+00	2.62E-01	0.00E+00	-2.71E+03	2.62E-01	4.17E+00	5.48E+00	0.00E+00	-9.76E+00
PERM	[MJ]	3.83E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-3.63E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	3.23E+03	2.62E-01	8.34E+00	2.62E-01	0.00E+00	-3.07E+03	2.62E-01	4.17E+00	5.48E+00	0.00E+00	-9.76E+00
PENRE	[MJ]	3.16E+03	3.61E+00	1.15E+02	3.61E+00	0.00E+00	-3.00E+03	3.61E+00	5.75E+01	4.98E+01	0.00E+00	-3.01E+01
PENRM	[MJ]	2.65E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-2.52E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	3.19E+03	3.61E+00	1.15E+02	3.61E+00	0.00E+00	-3.03E+03	3.61E+00	5.75E+01	4.98E+01	0.00E+00	-3.01E+01
SM	[kg]	1.99E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.89E+01	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	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	0.00E+00
FW	[m³]	9.80E-01	2.87E-04	9.13E-03	2.87E-04	0.00E+00	-9.31E-01	2.87E-04	4.56E-03	1.32E-02	0.00E+00	-8.93E-03
Caption	<p>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</p> <p>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.</p>											

WASTE CATEGORIES AND OUTPUT FLOWS PER DECLARED UNIT (1 TON)												
Parameter	Unit	A1-A3	Scenario									
			Reuse					Recycling				
			C1	C2	C3	C4	D	C1	C2	C3	C4	D
HWD	[kg]	-1.53E-06	1.12E-11	3.56E-10	1.12E-11	0.00E+00	1.45E-06	1.12E-11	1.78E-10	-5.33E-10	0.00E+00	7.35E-10
NHWD	[kg]	1.40E+02	5.51E-04	1.75E-02	5.51E-04	0.00E+00	-1.33E+02	5.51E-04	8.76E-03	1.40E-02	0.00E+00	-4.04E+01
RWD	[kg]	1.04E-02	6.76E-06	2.15E-04	6.76E-06	0.00E+00	-9.92E-03	6.76E-06	1.08E-04	4.08E-04	0.00E+00	-2.07E-03
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	9.50E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	[kg]	7.07E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-6.72E+02	0.00E+00	0.00E+00	9.70E+02	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	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	0.00E+00
EET	[MJ]	6.91E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-6.56E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Caption	<p>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</p> <p>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.</p>											

BIOGENIC CARBON CONTENT PER DECLARED UNIT (1 TON)		
Parameter	Unit	At the factory gate
Biogenic carbon content in product	[kg C]	0.00E+00
Biogenic carbon content in accompanying packaging	[kg C]	8.71E+00
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO ₂	

Additional information

LCA interpretation

The tables below show the processes contributing the most to the specific impact categories, and how much they contribute to the given environmental impact category.

The contributions (in percentages) are expressed relative to the total environmental impacts, which is a result of both impacts (positive values) and savings from processes such as energy recovery (negative values). Module D has been excluded from this interpretation.

Maximum contribution to environmental impact categories. Scenario: Reuse.

ENVIRONMENTAL IMPACTS					
Impact Category	Unit	Total	Maximum contribution on category	Percentage of category	Process
Climate Change (total)	kg CO ₂ eq.	2.66E+02	1.59E+02	60%	Combustion of diesel (A1)
Climate Change (fossil)	kg CO ₂ eq.	2.63E+02	1.48E+02	56%	Combustion of diesel (A1)
Climate Change (biogenic C - release)	kg CO ₂ eq.	1.72E+01	1.09E+01	64%	Combustion of diesel (A1)
Climate Change (biogenic C - uptake)	kg CO ₂ eq.	-1.59E+01	-1.02E+01	64%	Production of diesel (A1)
Climate Change (land use change)	kg CO ₂ eq.	1.97E+00	1.62E+00	82%	Production of diesel (A1)
Ozone depletion	kg CFC-11 eq.	2.49E-07	2.44E-07	98%	Blasting (A1)
Acidification terrestrial and freshwater	Mole of H ⁺ eq.	3.40E+00	2.29E+00	67%	Combustion of diesel (A1)
Eutrophication freshwater	kg P eq.	2.40E-03	1.01E-03	42%	Blasting (A1)
Eutrophication marine	kg N eq.	1.46E+00	1.06E+00	73%	Combustion of diesel (A1)
Eutrophication terrestrial	Mole of N eq.	1.68E+01	1.17E+01	69%	Combustion of diesel (A1)
Photochemical ozone formation - human health	kg NMVOC eq.	4.31E+00	3.17E+00	74%	Combustion of diesel (A1)
Resource use, mineral and metals	kg Sb eq.	1.61E-04	6.65E-05	41%	Blasting (A1)
Resource use, energy carriers	MJ	3.30E+03	2.38E+03	72%	Production of diesel (A1)
Water scarcity	m ³ world equiv.	3.43E+01	3.10E+01	90%	Water (A3)

Maximum contribution to environmental impact categories. Scenario: Recycling.

ENVIRONMENTAL IMPACTS					
Impact Category	Unit	Total	Maximum contribution on category	Percentage of category	Process
Climate Change (total)	kg CO ₂ eq.	2.64E+02	1.59E+02	60%	Combustion of diesel (A1)
Climate Change (fossil)	kg CO ₂ eq.	2.61E+02	1.48E+02	57%	Combustion of diesel (A1)
Climate Change (biogenic C - release)	kg CO ₂ eq.	1.72E+01	1.09E+01	64%	Combustion of diesel (A1)
Climate Change (biogenic C - uptake)	kg CO ₂ eq.	-1.59E+01	-1.02E+01	64%	Production of diesel (A1)
Climate Change (land use change)	kg CO ₂ eq.	1.94E+00	1.62E+00	83%	Production of diesel (A1)
Ozone depletion	kg CFC-11 eq.	2.49E-07	2.44E-07	98%	Blasting (A1)
Acidification terrestrial and freshwater	Mole of H ⁺ eq.	3.41E+00	2.29E+00	67%	Combustion of diesel (A1)
Eutrophication freshwater	kg P eq.	2.39E-03	1.01E-03	42%	Blasting (A1)
Eutrophication marine	kg N eq.	1.46E+00	1.06E+00	73%	Combustion of diesel (A1)
Eutrophication terrestrial	Mole of N eq.	1.68E+01	1.17E+01	69%	Combustion of diesel (A1)
Photochemical ozone formation - human health	kg NMVOC eq.	4.31E+00	3.17E+00	74%	Combustion of diesel (A1)
Resource use, mineral and metals	kg Sb eq.	1.63E-04	6.65E-05	41%	Blasting (A1)
Resource use, energy carriers	MJ	3.29E+03	2.38E+03	72%	Production of diesel (A1)
Water scarcity	m ³ world equiv.	3.47E+01	3.10E+01	89%	Water (A3)

Technical information on scenarios

Reference service life

RSL information	Unit
Reference service Life	+100 years
Declared product properties	Technical specifications and guidance can be obtained from the company's website http://www.zurface.dk/ or from direct contact to Zurface at +45 7010 1066 or info@zurface.dk
Design application parameters	
Assumed quality of work	
Outdoor environment	
Indoor environment	
Usage conditions	
Maintenance	

The declared product is particularly long-lasting, being present after several hundred years of use. The RSL of the declared product varies depending on the intended application (Aagaard et al. 2013). Hence, the RSL is determined to +100 years.

End of life (C1-C4)

Scenario information	Reuse	Recycling	Unit
Collected separately	1	1	ton
Collected with mixed waste			ton
For reuse	1		ton
For recycling		1	ton
For energy recovery			ton
For final disposal			ton
Assumptions for scenario development	100% is assumed collected for reuse	100% is assumed collected for recycling	As appropriate

Re-use, recovery and recycling potential (D)

Credits for avoided extraction and production of primary materials beyond the system boundary (D).

Scenario information/Materiel	Reuse	Recycling	Unit
Credit for avoided primary materials	950	970	kg

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+A2 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+A2 chapter 7.4.2.

References

Publisher	 www.epddanmark.dk
Programme operator	Danish Technological Institute Sustainable Construction Gregersensvej 1 DK-2630 Taastrup www.teknologisk.dk
LCA-practitioner	Danish Technological Institute Sustainable Construction Gregersensvej 1 DK-2630 Taastrup www.teknologisk.dk
LCA software / background data	LCA for Experts version 10.7, Database 2023.1 www.gabi-software.com EcoInvent version 3.8 www.ecoinvent.org
3rd party verifier	Mirko Miseljic FORCE Technology Park Allé 345 DK-2605 Brøndby www.forcetechnology.com

Aagaard, N-J, Brandt, E, Aggerholm, S & Haugbølle, K 2013, Levetider af bygningsdele ved vurdering af bæredygtighed og totaløkonomi. SBI, nr. 30, bind 2013, SBI forlag.
http://www.sbi.dk/byggeteknik/kvalitet/levetider-af-bygningsdele-ved-vurdering-af-baeredygtighed-og-totalokonomi-1/sbi-2013-30-rapport/at_download/file

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"

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"