

Owner: Skamol Group
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3rd PARTY VERIFIED

EPD

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | ISO 14025 & EN 15804



Owner of declaration

Skamol Group
Hasselager Centervej 1, 8260
Viby, Denmark
VAT no. 41333715


Issued:

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Valid to:

14-04-2028

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.

Declared product(s)

Insulation bricks

Number of declared datasets/product variations: 5

Group	Product name
Group 1	SkamoAlu Hipor
	SkamoCeramic Hipor
Group 2	SkamoAlu Hiporos
Group 3	SkamoAlu Poros
	SkamoCeramic Poros
	SkamoSteel Poros
	SkamoAlu BF-Block
	SkamoAlu BB-Block
Group 4	SkamoAlu Supra
	SkamoCeramic Supra
	SkamoSteel Supra
	SkamoStove Split
Group 5	SkamoAlu M-Bir
	SkamoCeramic M-Extra
	SkamoSteel M-Extra

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

Production site

Blegagervej 3, 7884 Fur, Denmark

Product(s) use

The declared products are insulation bricks used in:
 - Insulation system for industrial applications

Declared/ functional unit

1 ton insulation brick

Year of production site data (A3)

2021

EPD version

Version 1

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:



Kim Christiansen, kimconsult.dk



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

Skamol insulation bricks have the great advantage of being able to withstand repeated heating and cooling and they are offered in a wide range of grades, shapes and sizes.

The bricks are mainly made of moler (clay from Fur) and local supplied sawdust.

The insulation bricks have the following material properties:

- Thermal shock resistant
- Cold Crushing Strength
- Hot Crushing Strength (approx. 2 × CCS at 800 to 850°C)
- Maximum service temperature – up to 1,000°C
- Good thermal properties
- Acid resistance

The material contents declare 100% weight of the products as declared in the table below.

Material	Weight-% of declared product
Moler	72-97
Sawdust	3-19
Limestone	0-10

Product packaging:

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

Material	Weight-% of packaging
PE foil	9.44
Cardboard	5.21
EUR pallet	85.35

Representativity

This EPD is based on weighted average data from Skamol’s production site at Fur. The data is based on 2021 data.

Background data is from EcoInvent 3.8.

Hazardous substances

The products contain no REACH substances listed on the “Candidate List of substances of very High concern for authorisation”.

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

Essential characteristics

Thermal resistance (R-value) is declared in accordance with NPCR 012:2022 Part B for Thermal insulation products version 2.0. The R-value for the products in this EPD has been tested according to ASTM C-182. The table below provides an overview of the R-value of the five products.

Product	Density [kg/m ³]	Width [mm]	R-Value @200C ((m ² ×K)/W)
Group 1	550	152	1.09
Group 2	570	152	1.27
Group 3	625	270	1.69
	650	270	2.08
Group 4	750	250	1.67
Group 5	950	124	0.39

For further information on the R-value for the declared products, contact Skamol A/S.

Reference Service Life (RSL)

The reference service life of the bricks depends on the application of the brick. The lifespan ranges from 18 months to 10 years. For further information regarding RSL, contact Skamol.

Picture of product(s)



LCA background

Declared unit

The LCI and LCIA results in this EPD relates to the declared unit of 1 ton insulation brick.

Name	Product group	Value	Unit
Declared unit	1	1	ton
Density	Group 1	550	kg/m ³
	Group 2	570	
	Group 3	625, 650	
	Group 4	750	
	Group 5	950	
Conversion factor to 1 kg		0,001	

Functional unit

Not declared

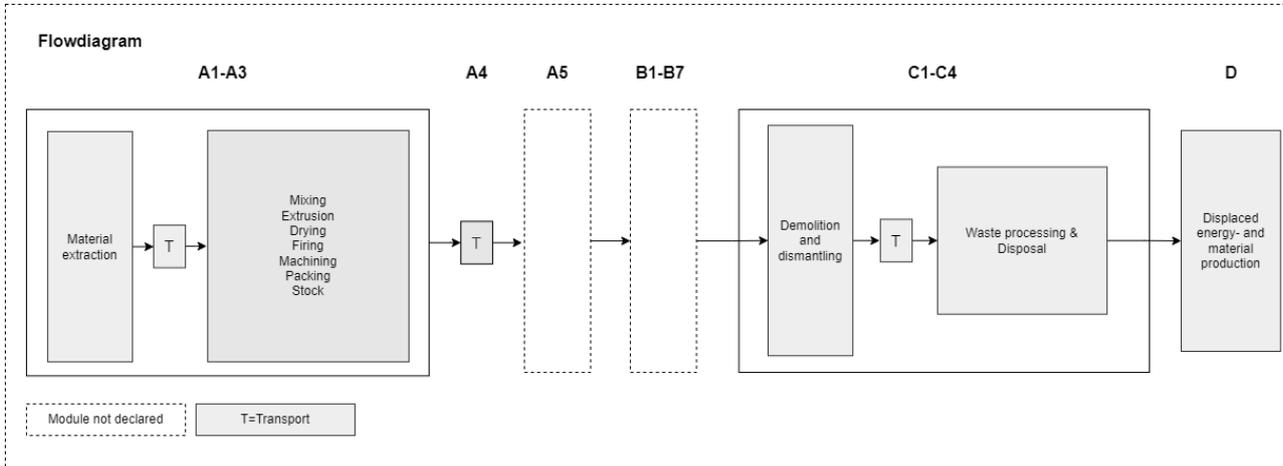
PCR

This EPD is developed according to the core rules for the product category of construction products in EN 15804, and the Norwegian PCR Construction products and services ver. 2, Part A, and the NPCR 012:2022 Part B for Thermal insulation products version 2.0 which is identical to PCR EN16783:2022 thermal insulation products.

Energy data

Electricity has been modelled using the Danish electricity mix from EcoInvent 3.8.

Flowdiagram



System boundary

This EPD is based on a cradle-to-gate LCA with modules A1-A3, C1-C4 and D.

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

This product stage comprises the acquisition of all raw materials included in the products and the packaging.

A2 – Transport to the production site

This product stage includes all transport by road between A1 and A3.

A3 – Manufacturing processes

The manufacturing process at Skamol is divided into 5 steps.

1. Moler, sawdust and limestone are mixed together.
2. The mixture is pushed through a custom die to reach the desired cross-section measures.
3. The bricks are then moved to a drying chamber.
4. The bricks are heated for drying. Moisture in the clay (50-60%) evaporates and sawdust is burned resulting in higher porosity of the bricks.
5. The bricks are machined on all surfaces and packed.

Construction process stage (A4-A5) includes:

Not declared

Use stage (B1-B7) includes:

Not declared

End of Life (C1-C4) includes:

C1 – De-construction demolition

The de-construction process of the bricks is a simple dismantling process and do not require any energy or material use related to the product handling.

C2 – Transport

This product stage include transport from the end user to the disposal facility.

C3 – Waste processing

The insulation bricks do not require any waste processing, but can be transported directly to disposal at landfill.

C4 – Disposal

This product stage includes landfilling of the obsolete product.

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

In this EPD, a conservative approach that 100% of the product end up as landfill, is assumed. This is however not completely representative, since products to some extent are crushed for recycling purpose and used for e.g., construction of roads etc. Since no quantitative data are available, recycling activities are not included.

LCA results

LCA Results for 1 ton Group 1

ENVIRONMENTAL IMPACTS PER TON PRODUCT GROUP 1								
Parameter	Unit	A1	A2	A3	C1	C2	C3	C4
GWP-total	[kg CO ₂ eq.]	-9.10E+01	7.81E+00	1.26E+03	0.00E+00	8.16E+00	0.00E+00	1.06E+01
GWP-fossil	[kg CO ₂ eq.]	3.01E+01	7.79E+00	4.69E+02	0.00E+00	8.14E+00	0.00E+00	1.05E+01
GWP-biogenic	[kg CO ₂ eq.]	-1.21E+02	1.39E-02	7.58E+02	0.00E+00	1.45E-02	0.00E+00	8.98E-02
GWP-luluc	[kg CO ₂ eq.]	1.10E-01	3.12E-03	1.77E-01	0.00E+00	3.26E-03	0.00E+00	1.07E-02
ODP	[kg CFC 11 eq.]	4.11E-06	1.81E-06	4.06E-05	0.00E+00	1.89E-06	0.00E+00	3.20E-06
AP	[mol H ⁺ eq.]	3.09E-01	2.21E-02	1.47E+00	0.00E+00	2.31E-02	0.00E+00	8.87E-02
EP-freshwater	[kg P eq.]	1.04E-02	5.14E-04	1.17E-01	0.00E+00	5.37E-04	0.00E+00	3.06E-03
EP-marine	[kg N eq.]	9.87E-02	4.50E-03	5.14E-01	0.00E+00	4.71E-03	0.00E+00	3.06E-02
EP-terrestrial	[mol N eq.]	1.14E+00	4.90E-02	5.60E+00	0.00E+00	5.12E-02	0.00E+00	3.33E-01
POCP	[kg NMVOC eq.]	2.97E-01	1.83E-02	2.50E+00	0.00E+00	1.91E-02	0.00E+00	9.43E-02
ADPm ¹	[kg Sb eq.]	1.14E-03	2.65E-05	5.65E-04	0.00E+00	2.77E-05	0.00E+00	3.33E-05
ADPf ¹	[MJ]	1.32E+02	9.01E+00	1.01E+03	0.00E+00	9.41E+00	0.00E+00	3.24E+01
WDP ¹	[m ³ world eq. deprived]	9.10E+00	5.74E-01	1.44E+02	0.00E+00	6.00E-01	0.00E+00	1.12E+01
Caption	GWP-total = Global 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, e.g., 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 TON PRODUCT GROUP 1								
Parameter	Unit	A1	A2	A3	C1	C2	C3	C4
PM	[Disease incidence]	2.01E-06	4.93E-07	2.72E-05	0.00E+00	5.15E-07	0.00E+00	1.72E-06
IRP ²	[kBq U235 eq.]	2.36E+00	6.09E-01	2.48E+01	0.00E+00	6.36E-01	0.00E+00	1.16E+00
ETP-fw ¹	[CTUe]	1.56E+01	3.95E+00	2.24E+02	0.00E+00	4.13E+00	0.00E+00	1.88E+00
HTP-c ¹	[CTUh]	6.10E-08	2.51E-09	6.64E-06	0.00E+00	2.63E-09	0.00E+00	6.50E-09
HTP-nc ¹	[CTUh]	2.64E-06	1.47E-07	3.79E-05	0.00E+00	1.53E-07	0.00E+00	2.03E-07
SQP ¹	-	1.72E+02	1.00E+02	3.50E+02	0.00E+00	1.05E+02	0.00E+00	8.85E+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, e.g., 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 TON PRODUCT GROUP 1								
Parameter	Unit	A1	A2	A3	C1	C2	C3	C4
PERE	[MJ]	1.49E+01	1.27E+00	5.39E+02	0.00E+00	1.33E+00	0.00E+00	3.18E+00
PERM	[MJ]	1.39E+03	4.17E-01	2.50E+02	0.00E+00	4.35E-01	0.00E+00	1.04E+00
PERT	[MJ]	1.40E+03	1.69E+00	7.89E+02	0.00E+00	1.76E+00	0.00E+00	4.22E+00
PENRE	[MJ]	1.56E+02	1.15E+01	1.37E+03	0.00E+00	1.20E+01	0.00E+00	3.80E+01
PENRM	[MJ]	2.71E+02	1.07E+02	6.02E+03	0.00E+00	1.12E+02	0.00E+00	2.17E+02
PENRT	[MJ]	4.27E+02	1.19E+02	7.39E+03	0.00E+00	1.24E+02	0.00E+00	2.55E+02
SM	[kg]	6.06E+00	1.21E-01	3.04E+01	0.00E+00	1.26E-01	0.00E+00	3.68E-01
RSF	[MJ]	3.15E-01	3.61E-02	1.69E+01	0.00E+00	3.77E-02	0.00E+00	4.94E-02
NRSF	[MJ]	5.56E-01	1.46E-01	5.18E+00	0.00E+00	1.53E-01	0.00E+00	6.84E-02
FW	[m ³]	2.25E-01	1.37E-02	3.44E+00	0.00E+00	1.43E-02	0.00E+00	2.71E-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 nonrenewable primary energy excluding nonrenewable primary energy resources used as raw materials; PENRM = Use of nonrenewable primary energy resources used as raw materials; PENRT = Total use of nonrenewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of nonrenewable secondary fuels; FW = Net use of fresh water							
	The numbers are declared in scientific notation, e.g., 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 0,000000000112.							

WASTE CATEGORIES AND OUTPUT FLOWS PER TON PRODUCT GROUP 1								
Parameter	Unit	A1	A2	A3	C1	C2	C3	C4
HWD	[kg]	5.69E+01	2.65E+00	3.29E+02	0.00E+00	2.77E+00	0.00E+00	7.48E+00
NHWD	[kg]	9.51E+00	6.13E+00	2.14E+02	0.00E+00	6.41E+00	0.00E+00	1.00E+03
RWD	[kg]	1.64E-02	2.37E-03	2.30E-01	0.00E+00	2.48E-03	0.00E+00	4.71E-03
CRU	[kg]	0.00E+00						
MFR	[kg]	1.56E+00	1.01E-01	2.88E+01	0.00E+00	1.05E-01	0.00E+00	1.55E-01
MER	[kg]	1.12E+00	2.77E-02	5.35E-01	0.00E+00	2.89E-02	0.00E+00	7.01E-02
EEE	[MJ]	0.00E+00						
EET	[MJ]	0.00E+00						
Caption	HWD = Hazardous waste disposed; NHWD = Nonhazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electric energy; EET = Exported thermal energy							
	The numbers are declared in scientific notation, e.g., 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 0,000000000112.							

BIOGENIC CARBON CONTENT PER TON PRODUCT GROUP 1		
Parameter	Unit	At the factory gate
Biogenic carbon content in product	[kg C]	0
Biogenic carbon content in accompanying packaging	[kg C]	1.37
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO ₂	

LCA Results for 1 ton Group 2

ENVIRONMENTAL IMPACTS PER TON PRODUCT GROUP 2								
Parameter	Unit	A1	A2	A3	C1	C2	C3	C4
GWP-total	[kg CO ₂ eq.]	-8.93E+01	8.84E+00	1.23E+03	0.00E+00	8.16E+00	0.00E+00	1.06E+01
GWP-fossil	[kg CO ₂ eq.]	2.75E+01	8.82E+00	4.69E+02	0.00E+00	8.14E+00	0.00E+00	1.05E+01
GWP-biogenic	[kg CO ₂ eq.]	-1.17E+02	1.57E-02	7.30E+02	0.00E+00	1.45E-02	0.00E+00	8.98E-02
GWP-luluc	[kg CO ₂ eq.]	1.05E-01	3.53E-03	1.77E-01	0.00E+00	3.26E-03	0.00E+00	1.07E-02
ODP	[kg CFC 11 eq.]	3.76E-06	2.04E-06	4.06E-05	0.00E+00	1.89E-06	0.00E+00	3.20E-06
AP	[mol H ⁺ eq.]	2.83E-01	2.50E-02	1.44E+00	0.00E+00	2.31E-02	0.00E+00	8.87E-02
EP-freshwater	[kg P eq.]	9.54E-03	5.82E-04	1.15E-01	0.00E+00	5.37E-04	0.00E+00	3.06E-03
EP-marine	[kg N eq.]	9.05E-02	5.10E-03	5.01E-01	0.00E+00	4.71E-03	0.00E+00	3.06E-02
EP-terrestrial	[mol N eq.]	1.05E+00	5.55E-02	5.46E+00	0.00E+00	5.12E-02	0.00E+00	3.33E-01
POCP	[kg NMVOC eq.]	2.73E-01	2.07E-02	2.43E+00	0.00E+00	1.91E-02	0.00E+00	9.43E-02
ADPm ¹	[kg Sb eq.]	1.01E-03	3.00E-05	5.65E-04	0.00E+00	2.77E-05	0.00E+00	3.33E-05
ADPf ¹	[MJ]	1.20E+02	1.02E+01	1.01E+03	0.00E+00	9.41E+00	0.00E+00	3.24E+01
WDP ¹	[m ³ world eq. deprived]	8.70E+00	6.50E-01	1.44E+02	0.00E+00	6.00E-01	0.00E+00	1.12E+01
Caption	GWP-total = Global 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, e.g., 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 TON PRODUCT GROUP 2								
Parameter	Unit	A1	A2	A3	C1	C2	C3	C4
PM	[Disease incidence]	1.91E-06	5.59E-07	2.64E-05	0.00E+00	5.15E-07	0.00E+00	1.72E-06
IRP ²	[kBq U235 eq.]	2.20E+00	6.89E-01	2.48E+01	0.00E+00	6.36E-01	0.00E+00	1.16E+00
ETP-fw ¹	[CTUe]	1.43E+01	4.48E+00	2.18E+02	0.00E+00	4.13E+00	0.00E+00	1.88E+00
HTP-c ¹	[CTUh]	5.51E-08	2.85E-09	6.42E-06	0.00E+00	2.63E-09	0.00E+00	6.50E-09
HTP-nc ¹	[CTUh]	2.36E-06	1.66E-07	3.74E-05	0.00E+00	1.53E-07	0.00E+00	2.03E-07
SQP ¹	-	1.57E+02	1.13E+02	3.50E+02	0.00E+00	1.05E+02	0.00E+00	8.85E+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, e.g., 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 TON PRODUCT GROUP 2								
Parameter	Unit	A1	A2	A3	C1	C2	C3	C4
PERE	[MJ]	1.39E+01	1.44E+00	5.39E+02	0.00E+00	1.33E+00	0.00E+00	3.18E+00
PERM	[MJ]	1.34E+03	4.72E-01	2.50E+02	0.00E+00	4.35E-01	0.00E+00	1.04E+00
PERT	[MJ]	1.35E+03	1.91E+00	7.89E+02	0.00E+00	1.76E+00	0.00E+00	4.22E+00
PENRE	[MJ]	1.42E+02	1.30E+01	1.37E+03	0.00E+00	1.20E+01	0.00E+00	3.80E+01
PENRM	[MJ]	2.49E+02	1.22E+02	6.02E+03	0.00E+00	1.12E+02	0.00E+00	2.17E+02
PENRT	[MJ]	3.91E+02	1.35E+02	7.39E+03	0.00E+00	1.24E+02	0.00E+00	2.55E+02
SM	[kg]	5.74E+00	1.37E-01	3.04E+01	0.00E+00	1.26E-01	0.00E+00	3.68E-01
RSF	[MJ]	3.11E-01	4.08E-02	1.69E+01	0.00E+00	3.77E-02	0.00E+00	4.94E-02
NRSF	[MJ]	5.24E-01	1.66E-01	5.18E+00	0.00E+00	1.53E-01	0.00E+00	6.84E-02
FW	[m ³]	2.15E-01	1.55E-02	3.44E+00	0.00E+00	1.43E-02	0.00E+00	2.71E-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 nonrenewable primary energy excluding nonrenewable primary energy resources used as raw materials; PENRM = Use of nonrenewable primary energy resources used as raw materials; PENRT = Total use of nonrenewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of nonrenewable secondary fuels; FW = Net use of fresh water							
	The numbers are declared in scientific notation, e.g., 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 PRODUCT GROUP 2								
Parameter	Unit	A1	A2	A3	C1	C2	C3	C4
HWD	[kg]	5.14E+01	3.00E+00	3.29E+02	0.00E+00	2.77E+00	0.00E+00	7.48E+00
NHWD	[kg]	8.58E+00	6.94E+00	2.14E+02	0.00E+00	6.41E+00	0.00E+00	1.00E+03
RWD	[kg]	1.55E-02	2.69E-03	2.30E-01	0.00E+00	2.48E-03	0.00E+00	4.71E-03
CRU	[kg]	0.00E+00						
MFR	[kg]	1.46E+00	1.14E-01	2.88E+01	0.00E+00	1.05E-01	0.00E+00	1.55E-01
MER	[kg]	9.94E-01	3.13E-02	5.35E-01	0.00E+00	2.89E-02	0.00E+00	7.01E-02
EEE	[MJ]	0.00E+00						
EET	[MJ]	0.00E+00						
Caption	HWD = Hazardous waste disposed; NHWD = Nonhazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electric energy; EET = Exported thermal energy							
	The numbers are declared in scientific notation, e.g., 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 PRODUCT GROUP 2		
Parameter	Unit	At the factory gate
Biogenic carbon content in product	[kg C]	0
Biogenic carbon content in accompanying packaging	[kg C]	1.37
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO ₂	

LCA Results for 1 ton Group 3

ENVIRONMENTAL IMPACTS PER TON PRODUCT GROUP 3								
Parameter	Unit	A1	A2	A3	C1	C2	C3	C4
GWP-total	[kg CO ₂ eq.]	-5.16E+01	3.54E+00	9.96E+02	0.00E+00	8.16E+00	0.00E+00	1.06E+01
GWP-fossil	[kg CO ₂ eq.]	3.07E+01	3.53E+00	4.64E+02	0.00E+00	8.14E+00	0.00E+00	1.05E+01
GWP-biogenic	[kg CO ₂ eq.]	-8.24E+01	6.29E-03	5.13E+02	0.00E+00	1.45E-02	0.00E+00	8.98E-02
GWP-luluc	[kg CO ₂ eq.]	8.88E-02	1.41E-03	1.77E-01	0.00E+00	3.26E-03	0.00E+00	1.07E-02
ODP	[kg CFC 11 eq.]	4.14E-06	8.19E-07	4.06E-05	0.00E+00	1.89E-06	0.00E+00	3.20E-06
AP	[mol H ⁺ eq.]	3.23E-01	1.00E-02	1.23E+00	0.00E+00	2.31E-02	0.00E+00	8.87E-02
EP-freshwater	[kg P eq.]	1.05E-02	2.33E-04	1.01E-01	0.00E+00	5.37E-04	0.00E+00	3.06E-03
EP-marine	[kg N eq.]	1.03E-01	2.04E-03	3.95E-01	0.00E+00	4.71E-03	0.00E+00	3.06E-02
EP-terrestrial	[mol N eq.]	1.19E+00	2.22E-02	4.29E+00	0.00E+00	5.12E-02	0.00E+00	3.33E-01
POCP	[kg NMVOC eq.]	3.05E-01	8.30E-03	1.86E+00	0.00E+00	1.91E-02	0.00E+00	9.43E-02
ADPm ¹	[kg Sb eq.]	1.22E-03	1.20E-05	5.65E-04	0.00E+00	2.77E-05	0.00E+00	3.33E-05
ADPf ¹	[MJ]	1.36E+02	4.09E+00	1.01E+03	0.00E+00	9.41E+00	0.00E+00	3.24E+01
WDP ¹	[m ³ world eq. deprived]	9.20E+00	2.60E-01	1.44E+02	0.00E+00	6.00E-01	0.00E+00	1.12E+01
Caption	GWP-total = Global 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, e.g., 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 TON PRODUCT GROUP 3								
Parameter	Unit	A1	A2	A3	C1	C2	C3	C4
PM	[Disease incidence]	2.03E-06	2.24E-07	2.03E-05	0.00E+00	5.15E-07	0.00E+00	1.72E-06
IRP ²	[kBq U235 eq.]	2.25E+00	2.76E-01	2.48E+01	0.00E+00	6.36E-01	0.00E+00	1.16E+00
ETP-fw ¹	[CTUe]	1.58E+01	1.79E+00	1.69E+02	0.00E+00	4.13E+00	0.00E+00	1.88E+00
HTP-c ¹	[CTUh]	6.36E-08	1.14E-09	4.68E-06	0.00E+00	2.63E-09	0.00E+00	6.50E-09
HTP-nc ¹	[CTUh]	2.80E-06	6.65E-08	3.38E-05	0.00E+00	1.53E-07	0.00E+00	2.03E-07
SQP ¹	-	1.74E+02	4.54E+01	3.50E+02	0.00E+00	1.05E+02	0.00E+00	8.85E+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, e.g., 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 TON PRODUCT GROUP 3								
Parameter	Unit	A1	A2	A3	C1	C2	C3	C4
PERE	[MJ]	1.46E+01	5.76E-01	5.39E+02	0.00E+00	1.33E+00	0.00E+00	3.18E+00
PERM	[MJ]	9.48E+02	1.89E-01	2.50E+02	0.00E+00	4.35E-01	0.00E+00	1.04E+00
PERT	[MJ]	9.63E+02	7.65E-01	7.89E+02	0.00E+00	1.76E+00	0.00E+00	4.22E+00
PENRE	[MJ]	1.58E+02	5.22E+00	1.37E+03	0.00E+00	1.20E+01	0.00E+00	3.80E+01
PENRM	[MJ]	2.73E+02	4.87E+01	6.02E+03	0.00E+00	1.12E+02	0.00E+00	2.17E+02
PENRT	[MJ]	4.31E+02	5.39E+01	7.39E+03	0.00E+00	1.24E+02	0.00E+00	2.55E+02
SM	[kg]	5.67E+00	5.49E-02	3.04E+01	0.00E+00	1.26E-01	0.00E+00	3.68E-01
RSF	[MJ]	2.78E-01	1.64E-02	1.69E+01	0.00E+00	3.77E-02	0.00E+00	4.94E-02
NRSF	[MJ]	5.18E-01	6.64E-02	5.18E+00	0.00E+00	1.53E-01	0.00E+00	6.84E-02
FW	[m ³]	2.26E-01	6.20E-03	3.44E+00	0.00E+00	1.43E-02	0.00E+00	2.71E-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 nonrenewable primary energy excluding nonrenewable primary energy resources used as raw materials; PENRM = Use of nonrenewable primary energy resources used as raw materials; PENRT = Total use of nonrenewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of nonrenewable secondary fuels; FW = Net use of fresh water							
	The numbers are declared in scientific notation, e.g., 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 PRODUCT GROUP 3								
Parameter	Unit	A1	A2	A3	C1	C2	C3	C4
HWD	[kg]	5.89E+01	1.20E+00	3.29E+02	0.00E+00	2.77E+00	0.00E+00	7.48E+00
NHWD	[kg]	9.67E+00	2.78E+00	2.14E+02	0.00E+00	6.41E+00	0.00E+00	1.00E+03
RWD	[kg]	1.52E-02	1.08E-03	2.30E-01	0.00E+00	2.48E-03	0.00E+00	4.71E-03
CRU	[kg]	0.00E+00						
MFR	[kg]	1.56E+00	4.56E-02	2.88E+01	0.00E+00	1.05E-01	0.00E+00	1.55E-01
MER	[kg]	1.19E+00	1.26E-02	5.35E-01	0.00E+00	2.89E-02	0.00E+00	7.01E-02
EEE	[MJ]	0.00E+00						
EET	[MJ]	0.00E+00						
Caption	HWD = Hazardous waste disposed; NHWD = Nonhazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electric energy; EET = Exported thermal energy							
	The numbers are declared in scientific notation, e.g., 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 PRODUCT GROUP 3		
Parameter	Unit	At the factory gate
Biogenic carbon content in product	[kg C]	0
Biogenic carbon content in accompanying packaging	[kg C]	1.37
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO ₂	

LCA Results for 1 ton Group 4

ENVIRONMENTAL IMPACTS PER TON PRODUCT GROUP 4								
Parameter	Unit	A1	A2	A3	C1	C2	C3	C4
GWP-total	[kg CO ₂ eq.]	-1.35E+01	2.49E+00	7.44E+02	0.00E+00	8.16E+00	0.00E+00	1.06E+01
GWP-fossil	[kg CO ₂ eq.]	3.13E+01	2.49E+00	4.59E+02	0.00E+00	8.14E+00	0.00E+00	1.05E+01
GWP-biogenic	[kg CO ₂ eq.]	-4.49E+01	4.42E-03	2.75E+02	0.00E+00	1.45E-02	0.00E+00	8.98E-02
GWP-luluc	[kg CO ₂ eq.]	6.78E-02	9.96E-04	1.77E-01	0.00E+00	3.26E-03	0.00E+00	1.07E-02
ODP	[kg CFC 11 eq.]	4.16E-06	5.76E-07	4.06E-05	0.00E+00	1.89E-06	0.00E+00	3.20E-06
AP	[mol H ⁺ eq.]	3.37E-01	7.06E-03	9.99E-01	0.00E+00	2.31E-02	0.00E+00	8.87E-02
EP-freshwater	[kg P eq.]	1.06E-02	1.64E-04	8.48E-02	0.00E+00	5.37E-04	0.00E+00	3.06E-03
EP-marine	[kg N eq.]	1.07E-01	1.44E-03	2.79E-01	0.00E+00	4.71E-03	0.00E+00	3.06E-02
EP-terrestrial	[mol N eq.]	1.24E+00	1.56E-02	3.03E+00	0.00E+00	5.12E-02	0.00E+00	3.33E-01
POCP	[kg NMVOC eq.]	3.12E-01	5.84E-03	1.24E+00	0.00E+00	1.91E-02	0.00E+00	9.43E-02
ADPm ¹	[kg Sb eq.]	1.30E-03	8.47E-06	5.65E-04	0.00E+00	2.77E-05	0.00E+00	3.33E-05
ADPf ¹	[MJ]	1.40E+02	2.88E+00	1.01E+03	0.00E+00	9.41E+00	0.00E+00	3.24E+01
WDP ¹	[m ³ world eq. deprived]	9.28E+00	1.83E-01	1.44E+02	0.00E+00	6.00E-01	0.00E+00	1.12E+01
Caption	GWP-total = Global 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, e.g., 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 TON PRODUCT GROUP 4								
Parameter	Unit	A1	A2	A3	C1	C2	C3	C4
PM	[Disease incidence]	2.06E-06	1.57E-07	1.36E-05	0.00E+00	5.15E-07	0.00E+00	1.72E-06
IRP ²	[kBq U235 eq.]	2.15E+00	1.94E-01	2.48E+01	0.00E+00	6.36E-01	0.00E+00	1.16E+00
ETP-fw ¹	[CTUe]	1.60E+01	1.26E+00	1.15E+02	0.00E+00	4.13E+00	0.00E+00	1.88E+00
HTP-c ¹	[CTUh]	6.61E-08	8.02E-10	2.79E-06	0.00E+00	2.63E-09	0.00E+00	6.50E-09
HTP-nc ¹	[CTUh]	2.95E-06	4.68E-08	2.99E-05	0.00E+00	1.53E-07	0.00E+00	2.03E-07
SQP ¹	-	1.77E+02	3.20E+01	3.50E+02	0.00E+00	1.05E+02	0.00E+00	8.85E+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, e.g., 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 TON PRODUCT GROUP 4								
Parameter	Unit	A1	A2	A3	C1	C2	C3	C4
PERE	[MJ]	1.44E+01	4.05E-01	5.39E+02	0.00E+00	1.33E+00	0.00E+00	3.18E+00
PERM	[MJ]	5.25E+02	1.33E-01	2.50E+02	0.00E+00	4.35E-01	0.00E+00	1.04E+00
PERT	[MJ]	5.39E+02	5.38E-01	7.89E+02	0.00E+00	1.76E+00	0.00E+00	4.22E+00
PENRE	[MJ]	1.60E+02	3.67E+00	1.37E+03	0.00E+00	1.20E+01	0.00E+00	3.80E+01
PENRM	[MJ]	2.76E+02	3.43E+01	6.02E+03	0.00E+00	1.12E+02	0.00E+00	2.17E+02
PENRT	[MJ]	4.35E+02	3.79E+01	7.39E+03	0.00E+00	1.24E+02	0.00E+00	2.55E+02
SM	[kg]	5.29E+00	3.86E-02	3.04E+01	0.00E+00	1.26E-01	0.00E+00	3.68E-01
RSF	[MJ]	2.43E-01	1.15E-02	1.69E+01	0.00E+00	3.77E-02	0.00E+00	4.94E-02
NRSF	[MJ]	4.81E-01	4.68E-02	5.18E+00	0.00E+00	1.53E-01	0.00E+00	6.84E-02
FW	[m ³]	2.27E-01	4.36E-03	3.44E+00	0.00E+00	1.43E-02	0.00E+00	2.71E-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 nonrenewable primary energy excluding nonrenewable primary energy resources used as raw materials; PENRM = Use of nonrenewable primary energy resources used as raw materials; PENRT = Total use of nonrenewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of nonrenewable secondary fuels; FW = Net use of fresh water							
	The numbers are declared in scientific notation, e.g., 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 PRODUCT GROUP 4								
Parameter	Unit	A1	A2	A3	C1	C2	C3	C4
HWD	[kg]	6.08E+01	8.46E-01	3.29E+02	0.00E+00	2.77E+00	0.00E+00	7.48E+00
NHWD	[kg]	9.82E+00	1.96E+00	2.14E+02	0.00E+00	6.41E+00	0.00E+00	1.00E+03
RWD	[kg]	1.39E-02	7.57E-04	2.30E-01	0.00E+00	2.48E-03	0.00E+00	4.71E-03
CRU	[kg]	0.00E+00						
MFR	[kg]	1.55E+00	3.21E-02	2.88E+01	0.00E+00	1.05E-01	0.00E+00	1.55E-01
MER	[kg]	1.25E+00	8.84E-03	5.35E-01	0.00E+00	2.89E-02	0.00E+00	7.01E-02
EEE	[MJ]	0.00E+00						
EET	[MJ]	0.00E+00						
Caption	HWD = Hazardous waste disposed; NHWD = Nonhazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electric energy; EET = Exported thermal energy							
	The numbers are declared in scientific notation, e.g., 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 PRODUCT GROUP 4		
Parameter	Unit	At the factory gate
Biogenic carbon content in product	[kg C]	0
Biogenic carbon content in accompanying packaging	[kg C]	1.37
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO ₂	

LCA Results for 1 ton Group 5

ENVIRONMENTAL IMPACTS PER TON PRODUCT GROUP 5								
Parameter	Unit	A1	A2	A3	C1	C2	C3	C4
GWP-total	[kg CO ₂ eq.]	5.61E+00	5.64E+00	6.18E+02	0.00E+00	8.16E+00	0.00E+00	1.06E+01
GWP-fossil	[kg CO ₂ eq.]	3.16E+01	5.63E+00	4.56E+02	0.00E+00	8.14E+00	0.00E+00	1.05E+01
GWP-biogenic	[kg CO ₂ eq.]	-2.61E+01	1.00E-02	1.57E+02	0.00E+00	1.45E-02	0.00E+00	8.98E-02
GWP-luluc	[kg CO ₂ eq.]	5.72E-02	2.25E-03	1.77E-01	0.00E+00	3.26E-03	0.00E+00	1.07E-02
ODP	[kg CFC 11 eq.]	4.18E-06	1.30E-06	4.06E-05	0.00E+00	1.89E-06	0.00E+00	3.20E-06
AP	[mol H ⁺ eq.]	3.44E-01	1.60E-02	8.84E-01	0.00E+00	2.31E-02	0.00E+00	8.87E-02
EP-freshwater	[kg P eq.]	1.07E-02	3.71E-04	7.68E-02	0.00E+00	5.37E-04	0.00E+00	3.06E-03
EP-marine	[kg N eq.]	1.09E-01	3.25E-03	2.21E-01	0.00E+00	4.71E-03	0.00E+00	3.06E-02
EP-terrestrial	[mol N eq.]	1.27E+00	3.54E-02	2.39E+00	0.00E+00	5.12E-02	0.00E+00	3.33E-01
POCP	[kg NMVOC eq.]	3.16E-01	1.32E-02	9.24E-01	0.00E+00	1.91E-02	0.00E+00	9.43E-02
ADPm ¹	[kg Sb eq.]	1.34E-03	1.92E-05	5.65E-04	0.00E+00	2.77E-05	0.00E+00	3.33E-05
ADPf ¹	[MJ]	1.42E+02	6.50E+00	1.01E+03	0.00E+00	9.41E+00	0.00E+00	3.24E+01
WDP ¹	[m ³ world eq. deprived]	9.33E+00	4.15E-01	1.44E+02	0.00E+00	6.00E-01	0.00E+00	1.12E+01
Caption	GWP-total = Global 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, e.g., 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 TON PRODUCT GROUP 5								
Parameter	Unit	A1	A2	A3	C1	C2	C3	C4
PM	[Disease incidence]	2.07E-06	3.56E-07	1.03E-05	0.00E+00	5.15E-07	0.00E+00	1.72E-06
IRP ²	[kBq U235 eq.]	2.10E+00	4.39E-01	2.48E+01	0.00E+00	6.36E-01	0.00E+00	1.16E+00
ETP-fw ¹	[CTUe]	1.61E+01	2.85E+00	8.87E+01	0.00E+00	4.13E+00	0.00E+00	1.88E+00
HTP-c ¹	[CTUh]	6.73E-08	1.82E-09	1.84E-06	0.00E+00	2.63E-09	0.00E+00	6.50E-09
HTP-nc ¹	[CTUh]	3.03E-06	1.06E-07	2.80E-05	0.00E+00	1.53E-07	0.00E+00	2.03E-07
SQP ¹	-	1.78E+02	7.23E+01	3.50E+02	0.00E+00	1.05E+02	0.00E+00	8.85E+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, e.g., 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 TON PRODUCT GROUP 5								
Parameter	Unit	A1	A2	A3	C1	C2	C3	C4
PERE	[MJ]	1.43E+01	9.17E-01	5.39E+02	0.00E+00	1.33E+00	0.00E+00	3.18E+00
PERM	[MJ]	3.13E+02	3.01E-01	2.50E+02	0.00E+00	4.35E-01	0.00E+00	1.04E+00
PERT	[MJ]	3.27E+02	1.22E+00	7.89E+02	0.00E+00	1.76E+00	0.00E+00	4.22E+00
PENRE	[MJ]	1.61E+02	8.31E+00	1.37E+03	0.00E+00	1.20E+01	0.00E+00	3.80E+01
PENRM	[MJ]	2.77E+02	7.75E+01	6.02E+03	0.00E+00	1.12E+02	0.00E+00	2.17E+02
PENRT	[MJ]	4.38E+02	8.58E+01	7.39E+03	0.00E+00	1.24E+02	0.00E+00	2.55E+02
SM	[kg]	5.10E+00	8.74E-02	3.04E+01	0.00E+00	1.26E-01	0.00E+00	3.68E-01
RSF	[MJ]	2.25E-01	2.60E-02	1.69E+01	0.00E+00	3.77E-02	0.00E+00	4.94E-02
NRSF	[MJ]	4.63E-01	1.06E-01	5.18E+00	0.00E+00	1.53E-01	0.00E+00	6.84E-02
FW	[m ³]	2.28E-01	9.87E-03	3.44E+00	0.00E+00	1.43E-02	0.00E+00	2.71E-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 nonrenewable primary energy excluding nonrenewable primary energy resources used as raw materials; PENRM = Use of nonrenewable primary energy resources used as raw materials; PENRT = Total use of nonrenewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of nonrenewable secondary fuels; FW = Net use of fresh water							
	The numbers are declared in scientific notation, e.g., 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 PRODUCT GROUP 5								
Parameter	Unit	A1	A2	A3	C1	C2	C3	C4
HWD	[kg]	6.18E+01	1.91E+00	3.29E+02	0.00E+00	2.77E+00	0.00E+00	7.48E+00
NHWD	[kg]	9.90E+00	4.43E+00	2.14E+02	0.00E+00	6.41E+00	0.00E+00	1.00E+03
RWD	[kg]	1.33E-02	1.71E-03	2.30E-01	0.00E+00	2.48E-03	0.00E+00	4.71E-03
CRU	[kg]	0.00E+00						
MFR	[kg]	1.55E+00	7.26E-02	2.88E+01	0.00E+00	1.05E-01	0.00E+00	1.55E-01
MER	[kg]	1.29E+00	2.00E-02	5.35E-01	0.00E+00	2.89E-02	0.00E+00	7.01E-02
EEE	[MJ]	0.00E+00						
EET	[MJ]	0.00E+00						
Caption	HWD = Hazardous waste disposed; NHWD = Nonhazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electric energy; EET = Exported thermal energy							
	The numbers are declared in scientific notation, e.g., 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 PRODUCT GROUP 5		
Parameter	Unit	At the factory gate
Biogenic carbon content in product	[kg C]	0
Biogenic carbon content in accompanying packaging	[kg C]	1.37
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO ₂	

Additional information

LCA interpretation

The results verify that production is the process with the highest contribution to the impact categories. The production process contributes to over 100% of the total GWP. The reason for this is that the CO₂ absorbed in the sawdust is released during the burning process.

Technical information on scenarios

Reference service life

RSL information		Unit
Reference service Life	1.5-10	Years
Declared product properties	Information regarding usage, installation and further instruction can be found on the manufacture's webpage: https://www.skamol.com/download-centre	
Design application parameters		
Assumed quality of work		
Outdoor environment		
Indoor environment		
Usage conditions		
Maintenance		

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

Publisher	 www.epddanmark.dk
Programme operator	Danish Technological Institute Buildings & Environment Gregersensvej DK-2630 Taastrup www.teknologisk.dk
LCA-practitioner	<i>Tomas Sander Poulsen, Jonatan Hoffmann Bohr</i> Provice ApS Havnevej 45A 4000 Roskilde
LCA software / background data	<i>OpenLCA 1.11.0</i> <i>EcoInvent 3.8</i>
3rd party verifier	<i>Kim Christiansen</i> <i>kimconsult.dk</i> <i>Marienburg Alle 91C</i> <i>2860 Søborg</i>

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"

Product-specific cPCR

NPCR 012:2022 Part B for Thermal insulation products version 2.0

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”

ASTM C182 – 19 (2019)

Standard Test Method for Thermal Conductivity of Insulating Firebrick