epddanmark

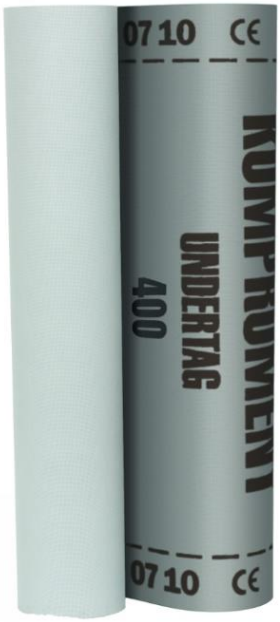
ECO PLATFORM EPD VERIFIED

Owner: Kompro ment
No.: MD-22140-EN
Issued: 24-02-2023
Valid to: 24-02-2028

3rd PARTY **VERIFIED**

# EPD

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | **ISO 14025 & EN 15804**




KOMPROMENT
First Impressions Last

**Owner of declaration**
Komproment
Jellingvej 11, DK9230 Svenstrup,
Denmark
25043499

**Program**
EPD Danmark
www.epddanmark.dk

☐ Industry EPD
☒ Product EPD

**Declared product(s)**
Viking 400

Number of declared datasets/product variations: 1

**Production site**
Building Product Design, Plymouth Avenue, Pinxton, United Kingdom

Certificates of green electricity or biogas are not used in module A3

**Product(s) use**
Vapour permeable roof tile underlay

**Declared/ functional unit**
1 $m^2$

**Year of production site data (A3)**
2021

**EPD version**
1st version, 21.02.2023

**Issued:** 24-02-2023
**Valid to:** 24-02-2028

**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

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:

*Ninkie Bendtsen*

*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 | MND | MND | MND | MND | MND | MND | MND | C1 | C2 | C3 | C4 | D |
| X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |

# Product information

### Product description

The main product components are shown in the table below.

| Material | Weight-% of declared product |
|---|---|
| 80 foil | 48 |
| Polypropylene spunbond | 20 |
| Polypropylene grid | 16 |
| Microporous polypropylene film | 11 |
| Ink | <1 |
| Hot melt adhesive | 5 |

### Product packaging:

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

| Material | Weight-% of packaging |
|---|---|
| Polyethylene LDPE | 6 |
| Cardboard core | 27 |
| Wooden pellet | 66 |
| Roll label | 1 |

### Representativity

This declaration, including data collection and the modeled foreground system including results, represents the production of Viking 400 on the production site located in Pinxton, United Kingdom. Product specific data are based on average values collected for the year 2021. Background data are based on GaBi Professional 2022 and Ecoinvent v3.8 and are mostly less than 3 years old. All background processes is bases on reference data from 2018 or newer, or review to be valid. Generally, the used background datasets are of high quality.

### Hazardous substances

Viking 400 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

Vapour permeable underlay for use in roof and wall constructions.

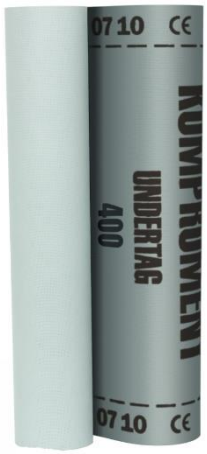
Viking 400 is covered by harmonised technical specification EN 13859-1. Declaration of performance according to EU regulation 305/2011 is available for all declared product variations.

Further technical information can be obtained by contacting the manufacturer or on the manufacturers website: www.komproment.dk

### Reference Service Life (RSL)

The reference service life is not declared, since module B is not included.

### Picture of product(s)



# LCA background

### Declared unit

The LCI and LCIA results in this EPD relates to 1 $m^2$ of Viking 400.

| Name | Value | Unit |
|---|---|---|
| Declared unit | 1 | $m^2$ |
| Density | 0.255 | $kg/m^2$ |
| Conversion factor to 1 kg. | 3.9 | - |

### Functional unit

Only the declared unit is used.

### 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 grid mix for United Kingdom. No guarantees of origin (GO) are applied.

Background system:

Upstream and downstream processes are modelled using electricity grid mix.

### System boundary

This EPD is based on a cradle-to-gate with options LCA, 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.

**Product stage (A1-A3) includes**:

A1 – Extraction and processing of raw materials

A2 – Transport to the production site

A3 – Manufacturing processes

The modules A1-A3 are aggregated and comprise the acquisition of all raw materials, products and energy, transport to the production site, packaging and waste processing of both waste from manufacturing and treatment of raw material packaging waste up to the "end-of-waste" state or final disposal. The production waste from manufacturing is sent to landfill.

### Flowdiagram

The manufacturing process consists of 4 main steps: an adhesive lamination process, where the single layers of raw materials are melted into one layer, a printing process, an inkwash and perforation of the 80-foil, and a conversion process where the rolls are finished and ready for packaging.

**Construction process stage (A4-A5) includes:**

The roof underlay is transported to the construction site by truck. A distance of 1526 km from producent to depot and a distance of 300 km from depot to building site in Europe have been used.

5% installation waste is assumed.

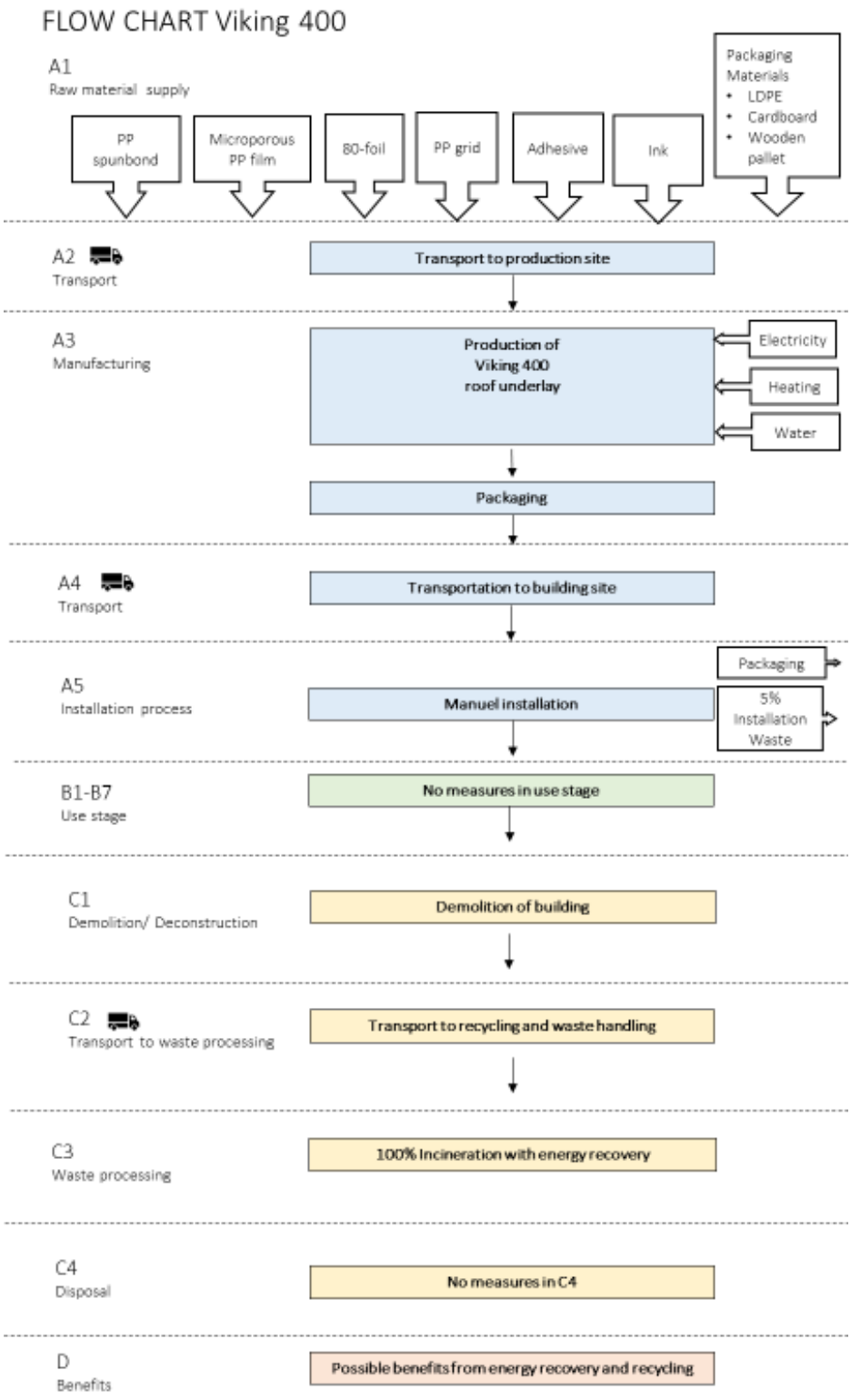
The roof underlay is typically installed manually and does not require energy consumption. The installation phase includes the waste handling of product packaging materials and installation waste. Credits due to recycling or energy recovery is credited in module D.

**End of Life (C1-C4) includes:**

The roof underlay is manually removed from the roof. The roof underlay is transported by truck to a waste management facility in Europe. A 100% waste scenario with incineration have been used, because the layers are glued together. Credits due to energy recovery is credited in module D.

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

Module D includes material credits and thermal and electrical energy credits from recycling of product packaging, installation waste and product waste.


FLOW CHART Viking 400
A1
Raw material supply
PP spunbond
Microporous PP film
80-foil
PP grid
Adhesive
Ink
Packaging Materials
• LDPE
• Cardboard
• Wooden pallet
A2
Transport
Transport to production site
A3
Manufacturing
Production of Viking 400 roof underlay
Electricity
Heating
Water
Packaging
A4
Transport
Transportation to building site
A5
Installation process
Manuel installation
Packaging
5% Installation Waste
B1-B7
Use stage
No measures in use stage
C1
Demolition/ Deconstruction
Demolition of building
C2
Transport to waste processing
Transport to recycling and waste handling
C3
Waste processing
100% Incineration with energy recovery
C4
Disposal
No measures in C4
D
Benefits
Possible benefits from energy recovery and recycling

# LCA results

| ENVIRONMENTAL IMPACTS PER 1 m² Viking 400 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Parameter** | **Unit** | **A1-A3** | **A4** | **A5** | **C1** | **C2** | **C3** | **C4** | **D** |
| GWP-total | [kg $CO_2$ eq.] | 8.51E-01 | 4.31E-02 | 6.09E-03 | 0.00E+00 | 1.23E-03 | 7.44E-01 | 0.00E+00 | -3.51E-01 |
| GWP-fossil | [kg $CO_2$ eq.] | 8.56E-01 | 4.28E-02 | 1.55E-03 | 0.00E+00 | 1.22E-03 | 7.44E-01 | 0.00E+00 | -3.51E-01 |
| GWP-biogenic | [kg $CO_2$ eq.] | -4.54E-03 | 0.00E+00 | 4.54E-03 | 0.00E+00 | 0.00E+00 | 2.59E-05 | 0.00E+00 | -1.29E-04 |
| GWP-luluc | [kg $CO_2$ eq.] | 3.11E-03 | 2.93E-04 | 1.32E-06 | 0.00E+00 | 8.37E-06 | 1.88E-06 | 0.00E+00 | -8.77E-05 |
| ODP | [kg CFC 11 eq.] | 1.60E-08 | 4.27E-15 | 7.15E-16 | 0.00E+00 | 1.22E-16 | 4.47E-14 | 0.00E+00 | -2.62E-10 |
| AP | [mol $H^+$ eq.] | 3.84E-03 | 5.10E-05 | 1.50E-06 | 0.00E+00 | 1.46E-06 | 7.77E-05 | 0.00E+00 | -7.33E-04 |
| EP-freshwater | [kg P eq.] | 1.11E-04 | 1.55E-07 | 8.78E-10 | 0.00E+00 | 4.44E-09 | 1.11E-08 | 0.00E+00 | -6.78E-06 |
| EP-marine | [kg N eq.] | 8.10E-04 | 1.69E-05 | 5.18E-07 | 0.00E+00 | 4.81E-07 | 1.65E-05 | 0.00E+00 | -1.96E-04 |
| EP-terrestrial | [mol N eq.] | 8.51E-03 | 2.01E-04 | 6.72E-06 | 0.00E+00 | 5.74E-06 | 3.56E-04 | 0.00E+00 | -2.02E-03 |
| POCP | [kg NMVOC eq.] | 2.75E-03 | 4.42E-05 | 1.38E-06 | 0.00E+00 | 1.26E-06 | 4.90E-05 | 0.00E+00 | -5.19E-04 |
| ADPm[1] | [kg Sb eq.] | 2.54E-06 | 4.38E-09 | 3.63E-11 | 0.00E+00 | 1.25E-10 | 1.09E-09 | 0.00E+00 | -6.80E-08 |
| ADPf[1] | [MJ] | 2.32E+01 | 5.71E-01 | 4.26E-03 | 0.00E+00 | 1.63E-02 | 1.10E-01 | 0.00E+00 | -5.04E+00 |
| WDP[1] | [$m^3$ world eq. deprived] | 2.16E-01 | 4.87E-04 | 6.73E-04 | 0.00E+00 | 1.39E-05 | 6.93E-02 | 0.00E+00 | -5.83E-02 |
| 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, 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 1 m² Viking 400 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Parameter** | **Unit** | **A1-A3** | **A4** | **A5** | **C1** | **C2** | **C3** | **C4** | **D** |
| PM | [Disease incidence] | 4.11E-08 | 3.40E-10 | 9.44E-12 | 0.00E+00 | 9.72E-12 | 5.38E-10 | 0.00E+00 | -5.96E-09 |
| IRP[2] | [kBq U235 eq.] | 7.42E-02 | 1.61E-04 | 1.49E-05 | 0.00E+00 | 4.59E-06 | 9.44E-04 | 0.00E+00 | -8.12E-02 |
| ETP-fw[1] | [CTUe] | 1.02E+01 | 4.05E-01 | 2.72E-03 | 0.00E+00 | 1.15E-02 | 6.06E-02 | 0.00E+00 | -1.89E+00 |
| HTP-c[1] | [CTUh] | 3.31E-10 | 8.34E-12 | 8.98E-14 | 0.00E+00 | 2.38E-13 | 5.95E-12 | 0.00E+00 | -6.35E-11 |
| HTP-nc[1] | [CTUh] | 1.04E-08 | 4.55E-10 | 5.35E-12 | 0.00E+00 | 1.30E-11 | 4.05E-10 | 0.00E+00 | -2.99E-09 |
| SQP[1] | - | 4.89E+00 | 2.42E-01 | 1.54E-03 | 0.00E+00 | 6.90E-03 | 3.17E-02 | 0.00E+00 | -5.80E+00 |
| 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 1 m² Viking 400 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Parameter** | **Unit** | **A1-A3** | **A4** | **A5** | **C1** | **C2** | **C3** | **C4** | **D** |
| PERE | [MJ] | 2.48E+00 | 3.96E-02 | 5.87E-04 | 0.00E+00 | 1.13E-03 | 2.68E-02 | 0.00E+00 | -3.15E+00 |
| PERM | [MJ] | 1.89E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| PERT | [MJ] | 2.67E+00 | 3.96E-02 | 5.87E-04 | 0.00E+00 | 1.13E-03 | 2.68E-02 | 0.00E+00 | -3.15E+00 |
| PENRE | [MJ] | 2.32E+01 | 5.73E-01 | 4.27E-03 | 0.00E+00 | 1.64E-02 | 1.10E-01 | 0.00E+00 | -5.04E+00 |
| PENRM | [MJ] | 1.02E+01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| PENRT | [MJ] | 3.34E+01 | 5.73E-01 | 4.27E-03 | 0.00E+00 | 1.64E-02 | 1.10E-01 | 0.00E+00 | -5.04E+00 |
| SM | [kg] | 1.56E-02 | 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 |
| 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 |
| FW | [$m^3$] | 7.81E-03 | 4.57E-05 | 1.60E-05 | 0.00E+00 | 1.30E-06 | 1.62E-03 | 0.00E+00 | -2.14E-03 |
| 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, 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 1 m² Viking 400 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Parameter** | **Unit** | **A1-A3** | **A4** | **A5** | **C1** | **C2** | **C3** | **C4** | **D** |
| HWD | [kg] | 9.26E-10 | 3.03E-12 | 1.81E-13 | 0.00E+00 | 8.66E-14 | 9.99E-12 | 0.00E+00 | -6.90E-10 |
| NHWD | [kg] | 6.49E-02 | 9.34E-05 | 2.31E-04 | 0.00E+00 | 2.67E-06 | 1.18E-02 | 0.00E+00 | -9.50E-03 |
| RWD | [kg] | 2.61E-04 | 1.06E-06 | 9.53E-08 | 0.00E+00 | 3.04E-08 | 6.00E-06 | 0.00E+00 | -4.77E-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 |
| MFR | [kg] | 7.02E-03 | 0.00E+00 | 2.09E-02 | 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 |
| EEE | [MJ] | 0.00E+00 | 0.00E+00 | 9.23E-03 | 0.00E+00 | 0.00E+00 | 1.58E+00 | 0.00E+00 | 0.00E+00 |
| EET | [MJ] | 0.00E+00 | 0.00E+00 | 1.66E-02 | 0.00E+00 | 0.00E+00 | 2.82E+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, 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 1 m² Viking 400 | | |
|---|---|---|
| **Parameter** | **Unit** | **At the factory gate** |
| Biogenic carbon content in product | [kg C] | 0 |
| Biogenic carbon content in accompanying packaging | [kg C] | 0.01 |
| Note: 1 kg biogenic carbon is equivalent to 44/12 kg of $CO_2$ | | |

# Additional information

## LCA interpretation

The results of the current EPD refer to 1 $m^2$ of Viking 400 roof underlay. The calculated environmental impacts show that raw material module A1 has the largest contribution to the total impact in 15 out of the 19 environmental impact categories. In particular, the production of polypropylene spunbond is the process with the highest contribution.

## Technical information on scenarios

**Transport to the building site (A4)**

| Scenario information | Value | Unit |
|---|---|---|
| Fuel type | Diesel | - |
| Vehicle type | EURO 6 | - |
| Transport distance | 1526 + 300 | km |
| Capacity utilisation (including empty runs) | 26 - 28t gross weight / 18.4t payload, utilization factor 55% | % |
| Area density of products transported | 0.255 | $kg/m^2$ |
| Capacity utilisation volume factor | 1 | - |

**Installation of the product in the building (A5)**

| Scenario information | Value | Unit |
|---|---|---|
| Ancillary materials | 0 | kg |
| Water use | 0 | $m^3$ |
| Other resource use | 0 | kg |
| Energy type and consumption | 0 | kWh |
| Waste materials | 0.037 | kg |
| Output materials | 0 | kg |
| Direct emissions to air, soil or water | 0 | kg |

**End of life (C1-C4)**

| Scenario information | Value | Unit |
|---|---|---|
| Collected separately | 0.243 | kg |
| Collected with mixed waste | 0.0 | kg |
| For reuse | 0.0 | kg |
| For recycling | 0.0 | kg |
| For energy recovery through waste incineration | 0.243 | kg |
| For final disposal | 0.0 | kg |

**Re-use, recovery and recycling potential (D)**

| Scenario information/Materiel | Value | Unit |
|---|---|---|
| Materials for recycling | 0.02 | Kg |
| Electricity form energy recovery through waste incineration | 1.59 | MJ |
| Heat form energy recovery through waste incineration | 2.84 | MJ |

### 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** | epddanmark<br>www.epddanmark.dk |
| **Program operator** | Danish Technological Institute<br>Buildings & Environment<br>Gregersensvej<br>DK-2630 Taastrup<br>www.teknologisk.dk |
| **LCA-practitioner** | Rikke Zuwa Kempf Bernberg and Cinzia Giampieri<br>COWI A/S<br>Parallelvej 2<br>2800 Kgs. Lyngby |
| **LCA software /background data** | GaBi Professional 2022 and Ecoinvent v3.8 |
| **3rd party verifier** | Ninkie Bendtsen<br>NIRAS A/S<br>Sortemosevej 19<br>3450 Allerød |

**General program instructions**
General Program 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"