

# Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

## WINDMASTIC TOPCOAT AQ 2



# WINDMASTIC TOPCOAT AQ 2



The Norwegian EPD Foundation

**Owner of the declaration:**

Carboline Norge AS

**Product:**

WINDMASTIC TOPCOAT AQ 2

**Declared unit:**

1 kg

**This declaration is based on Product Category Rules:**

CEN Standard EN 15804:2012+A2:2019 serves as core PCR

IBU PCR Part B for coatings with organic binders

**Program operator:**

The Norwegian EPD Foundation

**Declaration number:**

NEPD-6510-5771-EN

**Registration number:**

NEPD-6510-5771-EN

**Issue date:** 30.04.2024

**Valid to:** 30.04.2029

**EPD software:**

LCAno EPD generator ID: 327678

## General information

### Product

WINDMASTIC TOPCOAT AQ 2

### Program operator:

The Norwegian EPD Foundation  
Post Box 5250 Majorstuen, 0303 Oslo, Norway  
Phone: +47 977 22 020  
web: [www.epd-norge.no](http://www.epd-norge.no)

### Declaration number:

NEPD-6510-5771-EN

### This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core PCR  
IBU PCR Part B for coatings with organic binders

### Statement of liability:

The owner of the declaration shall be liable for the underlying information and evidence. EPD Norway shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

### Declared unit:

1 kg WINDMASTIC TOPCOAT AQ 2

### Declared unit with option:

A1,A2,A3,A4,C1,C2,C3,C4,D

### Functional unit:

### General information on verification of EPD from EPD tools:

Independent verification of data, other environmental information and the declaration according to ISO 14025:2010, § 8.1.3 and § 8.1.4. Verification of each EPD is made according to EPD-Norway's guidelines for verification and approval requiring that tools are i) integrated into the company's environmental management system, ii) the procedures for use of the EPD tool are approved by EPD-Norway, and iii) the process is reviewed annually by an independent third party verifier. See Appendix G of EPD-Norway's General Programme Instructions for further information on EPD tools

### Verification of EPD tool:

Independent third party verification of the EPD tool, background data and test-EPD in accordance with EPDNorway's procedures and guidelines for verification and approval of EPD tools.

Third party verifier:

Elisabet Amat, GREENIZE projects

(no signature required)

### Owner of the declaration:

Carboline Norge AS  
Contact person: Malgorzata Tarka-Ruda  
Phone: +47 32 85 73 00  
e-mail: [EPD.Norway@carboline.com](mailto:EPD.Norway@carboline.com)

### Manufacturer:

Carboline Norge AS

### Place of production:

Carboline Norge AS  
Husebysletta 7  
3414 Lierstranda, Norway

### Management system:

ISO 9001:2015 and ISO 14001:2015

### Organisation no:

980 488 683

### Issue date:

30.04.2024

### Valid to:

30.04.2029

### Year of study:

2022

### Comparability:

EPD of construction products may not be comparable if they not comply with EN 15804 and seen in a building context.

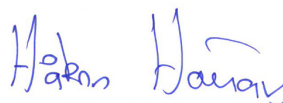
### Development and verification of EPD:

The declaration is created using EPD tool lca.tools ver EPD2022.03, developed by LCA.no. The EPD tool is integrated in the company's management system, and has been approved by EPD Norway.

Developer of EPD: Malgorzata Tarka

Reviewer of company-specific input data and EPD: Anders Øverby

### Approved:



Håkon Hauan  
Managing Director of EPD-Norway

## Product

### Product description:

Windmastic Topcoat AQ 2 is a waterborne aliphatic polyurethane topcoat having very good erosion and weather resistance for use on wind turbine rotor blades.

### Product specification

- Durable topcoat for long service life
- Very good erosion resistance
- Applicable with spray or roller
- Fast curing

| Materials | Value    | Unit |
|-----------|----------|------|
| Binder    | > 50     | %    |
| Pigments  | 10 - 25  | %    |
| Solvents  | 10 - 25  | %    |
| Additives | 2,5 - 10 | %    |
| Fillers   | 2,5 - 10 | %    |
| Packing   | < 1      | %    |

### Technical data:

Dry Film Thickness:

50 - 80 microns per coat

Solid(s) Content By volume: 52±2%

VOC Values As Supplied: 80-100 g/l (9.7 - 12.2 oz/gal)

Ratio: 2.5 : 1 (A to B) by volume

Shelf Life:

Part A: 24 months at 75 °F (24 °C)

Part B: 18 months at 75 °F (24 °C)

Part B is moisture sensitive and only full kit should be used.

### Market:

Europe

### Reference service life, product

The reference service life of the product is highly dependent on the condition of use.

### Reference service life, building or construction works

The coated object is not declared in this EPD.

## LCA: Calculation rules

### Declared unit:

1 kg WINDMASTIC TOPCOAT AQ 2

### Cut-off criteria:

All major raw materials and all the essential energy is included. The production processes for raw materials and energy flows with very small amounts (less than 1%) are not included. These cut-off criteria do not apply for hazardous materials and substances.

### Allocation:

The allocation is made in accordance with the provisions of EN 15804. Incoming energy and water and waste production in-house is allocated equally among all products through mass allocation. Effects of primary production of recycled materials is allocated to the main product in which the material was used. The recycling process and transportation of the material is allocated to this analysis.

### Data quality:

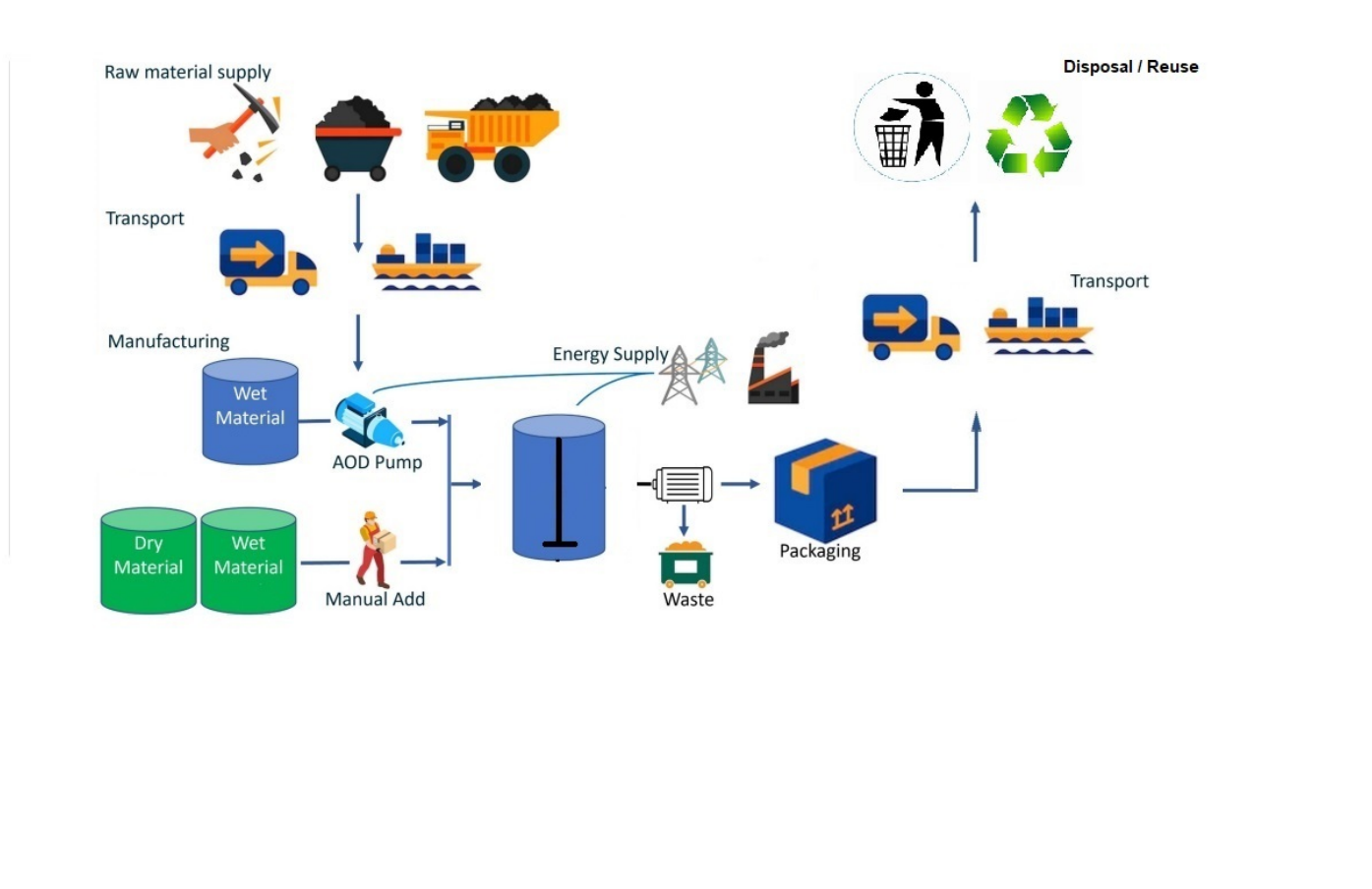
Specific data for the product composition are provided by the manufacturer. The data represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on EPDs according to EN 15804 and different LCA databases. The data quality of the raw materials in A1 is presented in the table below.

| Materials            | Source                 | Data quality | Year |
|----------------------|------------------------|--------------|------|
| Additives            | CEPE RM Database v3.0  | Database     | 2016 |
| Binders and Resins   | CEPE RM Database v3.0  | Database     | 2016 |
| Binders and Resins   | ecoinvent 3.6          | Database     | 2019 |
| Binders and Resins   | Modified ecoinvent 3.6 | Database     | 2019 |
| Packaging            | ecoinvent 3.6          | Database     | 2019 |
| Packaging - Pallet   | Modified ecoinvent 3.6 | Database     | 2019 |
| Packaging - Plastic  | ecoinvent 3.6          | Database     | 2019 |
| Pigments and Fillers | CEPE RM Database v3.0  | Database     | 2016 |
| Unverified data      | CEPE RM Database v3.0  | Database     | 2016 |
| Water                | ecoinvent 3.6          | Database     | 2019 |

**System boundaries (X=included, MND=module not declared, MNR=module not relevant)**

| Product stage |           |               | Construction installation stage |          | Use stage |             |        |             |               |                        |                       | End of life stage          |           |                  |          | Beyond the system boundaries       |
|---------------|-----------|---------------|---------------------------------|----------|-----------|-------------|--------|-------------|---------------|------------------------|-----------------------|----------------------------|-----------|------------------|----------|------------------------------------|
| Raw materials | Transport | Manufacturing | Transport                       | Assembly | Use       | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | De-construction demolition | Transport | Waste processing | Disposal | Reuse-Recovery-Recycling-potential |
| A1            | A2        | A3            | A4                              | A5       | B1        | B2          | B3     | B4          | B5            | B6                     | B7                    | C1                         | C2        | C3               | C4       | D                                  |
| X             | X         | X             | X                               | MND      | MND       | MND         | MND    | MND         | MND           | MND                    | MND                   | X                          | X         | X                | X        | X                                  |

**System boundary:**



**Additional technical information:**

For more information please refer to Product Data Sheet and Safety Data Sheet.

## LCA: Scenarios and additional technical information

The following information describe the scenarios in the different modules of the EPD.

This EPD is prepared for declaring the production process (A1-A3) of 1 kg of packed 'ready-to-use' product. Transport to the client (A4) and end life stage (C modules) and potential environmental benefits (D module) are also included.

Module A4 describes an average distance from the manufacturing site to where the product is being sold to the client.

This declaration covers end-of-life stage (C module) of a coated construction where dried/cured paint is not removed from the surface during demolition.

Module C1 is declared as zero due to the negligible consumption of energy and natural resources for disassembling, since paint is a part of another product that ends its life.

Module C2 is estimated for delivery of paint residues to the closest waste treatment facility and is assumed as 50 km.

Module C3 has a zero impact since dried paint is not recycled or reused.














Module C4 is declared for dried paint, after solvents' evaporation.

Module D is declared for zero since drier or cured paint is non-recyclable nor reusable.

| Transport from production place to user (A4)              | Capacity utilisation (incl. return) % | Distance (km) | Fuel/Energy Consumption | Unit  | Value (Liter/tonne) |
|---|---------------------------------------|---------------|-------------------------|-------|---------------------|
| Truck, over 32 tonnes, EURO 6 (kgkm)                      | 53,3 %                                | 300           | 0,023                   | l/tkm | 6,90                |
| De-construction demolition (C1)                           |                                       | Unit          | Value                   |       |                     |
| Energy use during decommissioning                         |                                       | kWh/DU        | 0,00                    |       |                     |
| Transport to waste processing (C2)                        | Capacity utilisation (incl. return) % | Distance (km) | Fuel/Energy Consumption | Unit  | Value (Liter/tonne) |
| Truck, over 32 tonnes, EURO 6 (kgkm)                      | 53,3 %                                | 50            | 0,023                   | l/tkm | 1,15                |
| Waste processing (C3)                                     |                                       | Unit          | Value                   |       |                     |
| Waste treatment per kg Paint, municipal incineration (kg) |                                       | kg/DU         | 0,00                    |       |                     |
| Disposal (C4)   |                                       | Unit          | Value                   |       |                     |
| Waste, paint, to landfill (kg)                            |                                       | kg/DU         | 0,65                    |       |                     |
| Benefits and loads beyond the system boundaries (D)       |                                       | Unit          | Value                   |       |                     |
| Substitution of raw materials (kg)                        |                                       | kg/DU         | 0,00                    |       |                     |

## LCA: Results

The LCA results are presented below for the declared unit defined on page 2 of the EPD document.

| Environmental impact   |                        |          |          |          |          |          |          |          |          |          |  |
|--|------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|--|
| Indicator  | Unit                   | A1       | A2       | A3       | A4       | C1       | C2       | C3       | C4       | D        |  |
|  GWP-total                        | kg CO <sub>2</sub> -eq | 3,59E+00 | 1,87E-01 | 7,47E-02 | 3,19E-02 | 0,00E+00 | 5,32E-03 | 0,00E+00 | 7,60E-02 | 0,00E+00 |  |
|  GWP-fossil                       | kg CO <sub>2</sub> -eq | 3,57E+00 | 1,87E-01 | 7,32E-02 | 3,19E-02 | 0,00E+00 | 5,32E-03 | 0,00E+00 | 7,60E-02 | 0,00E+00 |  |
|  GWP-biogenic                     | kg CO <sub>2</sub> -eq | 1,13E-02 | 7,42E-05 | 1,39E-03 | 1,37E-05 | 0,00E+00 | 2,28E-06 | 0,00E+00 | 6,35E-06 | 0,00E+00 |  |
|  GWP-luluc                        | kg CO <sub>2</sub> -eq | 1,16E-03 | 7,01E-05 | 8,85E-05 | 9,72E-06 | 0,00E+00 | 1,62E-06 | 0,00E+00 | 1,33E-06 | 0,00E+00 |  |
|  ODP                              | kg CFC11 -eq           | 2,32E-06 | 4,22E-08 | 9,95E-09 | 7,69E-09 | 0,00E+00 | 1,28E-09 | 0,00E+00 | 2,02E-09 | 0,00E+00 |  |
|  AP                               | mol H+ -eq             | 2,72E-02 | 1,20E-03 | 4,61E-04 | 1,03E-04 | 0,00E+00 | 1,71E-05 | 0,00E+00 | 4,75E-05 | 0,00E+00 |  |
|  EP-FreshWater                    | kg P -eq               | 4,34E-04 | 1,41E-06 | 1,57E-06 | 2,54E-07 | 0,00E+00 | 4,23E-08 | 0,00E+00 | 6,13E-08 | 0,00E+00 |  |
|  EP-Marine                        | kg N -eq               | 4,02E-03 | 3,33E-04 | 1,65E-04 | 2,25E-05 | 0,00E+00 | 3,75E-06 | 0,00E+00 | 1,76E-05 | 0,00E+00 |  |
|  EP-Terrestrial                   | mol N -eq              | 3,72E-02 | 3,69E-03 | 1,81E-03 | 2,51E-04 | 0,00E+00 | 4,18E-05 | 0,00E+00 | 1,95E-04 | 0,00E+00 |  |
|  POCP                             | kg NMVOC -eq           | 1,27E-02 | 1,06E-03 | 5,06E-04 | 9,85E-05 | 0,00E+00 | 1,64E-05 | 0,00E+00 | 7,22E-05 | 0,00E+00 |  |
|  ADP-minerals&metals <sup>1</sup> | kg Sb-eq               | 6,76E-05 | 4,75E-06 | 9,85E-07 | 5,68E-07 | 0,00E+00 | 9,47E-08 | 0,00E+00 | 4,82E-08 | 0,00E+00 |  |
|  ADP-fossil <sup>1</sup>          | MJ                     | 5,30E+01 | 2,78E+00 | 7,19E-01 | 5,18E-01 | 0,00E+00 | 8,64E-02 | 0,00E+00 | 1,47E-01 | 0,00E+00 |  |
|  WDP <sup>1</sup>                 | m <sup>3</sup>         | 5,82E+01 | 2,51E+00 | 2,63E+01 | 3,97E-01 | 0,00E+00 | 6,62E-02 | 0,00E+00 | 9,54E-01 | 0,00E+00 |  |







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 = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

"Reading example: 9,0 E-03 = 9,0\*10<sup>-3</sup> = 0,009"

\*INA Indicator Not Assessed

1. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator

## Remarks to environmental impacts

| Additional environmental impact indicators  |                   |          |          |          |          |          |          |          |          |          |  |
|---|-------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|--|
| Indicator   | Unit              | A1       | A2       | A3       | A4       | C1       | C2       | C3       | C4       | D        |  |
|  PM                  | Disease incidence | 2,82E-07 | 1,28E-08 | 9,91E-09 | 2,93E-09 | 0,00E+00 | 4,88E-10 | 0,00E+00 | 1,01E-09 | 0,00E+00 |  |
|  IRP <sup>2</sup>    | kgBq U235 -eq     | 4,30E+02 | 1,22E-02 | 5,03E-03 | 2,26E-03 | 0,00E+00 | 3,77E-04 | 0,00E+00 | 6,77E-04 | 0,00E+00 |  |
|  ETP-fw <sup>1</sup> | CTUe              | 5,98E+01 | 2,02E+00 | 1,44E+00 | 3,79E-01 | 0,00E+00 | 6,31E-02 | 0,00E+00 | 9,14E-02 | 0,00E+00 |  |
|  HTP-c <sup>1</sup>  | CTUh              | 2,17E-08 | 0,00E+00 | 8,00E-11 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 8,00E-12 | 0,00E+00 |  |
|  HTP-nc <sup>1</sup> | CTUh              | 4,68E-07 | 2,19E-09 | 1,33E-09 | 3,66E-10 | 0,00E+00 | 6,10E-11 | 0,00E+00 | 8,30E-11 | 0,00E+00 |  |
|  SQP <sup>1</sup>    | dimensionless     | 1,45E+01 | 1,81E+00 | 2,96E-01 | 5,94E-01 | 0,00E+00 | 9,90E-02 | 0,00E+00 | 5,65E-01 | 0,00E+00 |  |











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 = Potential Soil Quality Index (dimensionless)

"Reading example: 9,0 E-03 = 9,0\*10<sup>-3</sup> = 0,009"

\*INA Indicator Not Assessed

1. The results of this environmental impact 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  |                |          |          |          |          |          |          |          |          |          |  |
|---|----------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|--|
| Indicator   | Unit           | A1       | A2       | A3       | A4       | C1       | C2       | C3       | C4       | D        |  |
|  PERE  | MJ             | 4,33E+00 | 3,78E-02 | 1,93E+00 | 6,52E-03 | 0,00E+00 | 1,09E-03 | 0,00E+00 | 5,48E-03 | 0,00E+00 |  |
|  PERM  | 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 |  |
|  PERT  | MJ             | 4,33E+00 | 3,78E-02 | 1,93E+00 | 6,52E-03 | 0,00E+00 | 1,09E-03 | 0,00E+00 | 5,48E-03 | 0,00E+00 |  |
|  PENRE | MJ             | 6,05E+01 | 2,78E+00 | 7,19E-01 | 5,18E-01 | 0,00E+00 | 8,64E-02 | 0,00E+00 | 1,47E-01 | 0,00E+00 |  |
|  PENRM | MJ             | 1,05E+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 |  |
|  PENRT | MJ             | 6,16E+01 | 2,78E+00 | 7,19E-01 | 5,18E-01 | 0,00E+00 | 8,64E-02 | 0,00E+00 | 1,47E-01 | 0,00E+00 |  |
|  SM    | kg             | 2,78E-02 | 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             | 5,63E-02 | 1,35E-03 | 2,01E-03 | 2,28E-04 | 0,00E+00 | 3,80E-05 | 0,00E+00 | 1,14E-04 | 0,00E+00 |  |
|  NRSF  | MJ             | 1,47E-01 | 4,68E-03 | 8,28E-03 | 7,64E-04 | 0,00E+00 | 1,27E-04 | 0,00E+00 | 2,35E-04 | 0,00E+00 |  |
|  FW    | m <sup>3</sup> | 7,85E-02 | 2,83E-04 | 1,61E-02 | 5,90E-05 | 0,00E+00 | 9,83E-06 | 0,00E+00 | 1,81E-04 | 0,00E+00 |  |

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 materials; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water

"Reading example: 9,0 E-03 = 9,0\*10<sup>-3</sup> = 0,009"






\*INA Indicator Not Assessed

| End of life - Waste   |      |    |          |          |          |          |          |          |          |          |          |
|---|------|----|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Indicator   | Unit | A1 | A2       | A3       | A4       | C1       | C2       | C3       | C4       | D        |          |
|  | HWD  | kg | 1,96E-02 | 1,40E-04 | 2,11E-02 | 2,83E-05 | 0,00E+00 | 4,72E-06 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
|  | NHWD | kg | 1,68E+00 | 1,24E-01 | 3,58E-02 | 4,50E-02 | 0,00E+00 | 7,51E-03 | 0,00E+00 | 6,50E-01 | 0,00E+00 |
|  | RWD  | kg | 1,04E-04 | 1,90E-05 | 4,90E-06 | 3,54E-06 | 0,00E+00 | 5,90E-07 | 0,00E+00 | 0,00E+00 | 0,00E+00 |

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed

\*Reading example: 9,0 E-03 = 9,0\*10<sup>-3</sup> = 0,009"

\*INA Indicator Not Assessed

| End of life - Output flow   |      |    |          |          |          |          |          |          |          |          |          |
|---|------|----|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Indicator   | Unit | A1 | A2       | A3       | A4       | C1       | C2       | C3       | C4       | D        |          |
|  | 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 |
|  | MFR  | kg | 0,00E+00 | 0,00E+00 | 3,38E-02 | 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 | 2,34E-02 | 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 | 1,09E-02 | 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 | 1,65E-01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |

CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported energy electrical; EET = Exported energy thermal

\*Reading example: 9,0 E-03 = 9,0\*10<sup>-3</sup> = 0,009"

\*INA Indicator Not Assessed

| Biogenic Carbon Content                           |      |                     |
|---|------|---------------------|
| Indicator   | 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 CO<sub>2</sub>

## Additional requirements

### Greenhouse gas emissions from the use of electricity in the manufacturing phase

National production mix from import, low voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing process (A3).

| Electricity mix           | Data source   | Amount | Unit                      |
|---------------------------|---------------|--------|---------------------------|
| Electricity, Norway (kWh) | ecoinvent 3.6 | 24,33  | g CO <sub>2</sub> -eq/kWh |

### Dangerous substances

The product contains no substances given by the REACH Candidate list.

### Indoor environment

Not relevant.






## Additional Environmental Information

| Additional environmental impact indicators required in NPCR Part A for construction products |                        |          |          |          |          |          |          |          |          |          |
|--|------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Indicator  | Unit                   | A1       | A2       | A3       | A4       | C1       | C2       | C3       | C4       | D        |
| GWPIOBC  | kg CO <sub>2</sub> -eq | 3,60E+00 | 1,87E-01 | 7,04E-02 | 3,19E-02 | 0,00E+00 | 5,32E-03 | 0,00E+00 | 7,60E-02 | 0,00E+00 |

GWPIOBC: Global warming potential calculated according to the principle of instantaneous oxidation. In order to increase the transparency of biogenic carbon contribution to climate impact, the indicator GWP-IOBC is required as it declares climate impacts calculated according to the principle of instantaneous oxidation. GWP-IOBC is also referred to as GWP-GHG in context to Swedish public procurement legislation.

## Bibliography

ISO 14025:2010 Environmental labels and declarations - Type III environmental declarations - Principles and procedures.  
 ISO 14044:2006 Environmental management - Life cycle assessment - Requirements and guidelines.  
 EN 15804:2012+A2:2019 Environmental product declaration - Core rules for the product category of construction products.  
 ISO 21930:2017 Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products.  
 ecoinvent v3, Allocation, cut-off by classification, Swiss Centre of Life Cycle Inventories.  
 Iversen et al., (2021) eEPD v2021.09 Background information for EPD generator tool system verification, LCA.no Report number: 07.21  
 Ruud and Iversen (2023) EPD generator for PCR IBU Part B: Requirements on the EPD for Coatings with organic binders, LCA.no report number: 13.23  
 NPCR Part A: Construction products and services. Ver. 2.0. April 2021, EPD-Norge.  
 IBU PCR Part B: Requirements on the EPD for Coatings with organic binders, version 4, 2023, IBU - Institut Bauen und Umwelt e.V.

|  |   |   |
|--|---|---|
|  <p><b>epd-norway</b><br/>Global Program Operator</p> | <p><b>Program operator and publisher</b><br/>The Norwegian EPD Foundation<br/>Post Box 5250 Majorstuen, 0303 Oslo, Norway</p> | <p>Phone: +47 977 22 020<br/>e-mail: <a href="mailto:post@epd-norge.no">post@epd-norge.no</a><br/>web: <a href="http://www.epd-norge.no">www.epd-norge.no</a></p>                           |
|   | <p><b>Owner of the declaration:</b><br/>Carboline Norge AS<br/>Husebysletta 7, 3414 Lierstranda</p>                           | <p>Phone: +47 32 85 73 00<br/>e-mail: <a href="mailto:EPD.Norway@carboline.com">EPD.Norway@carboline.com</a><br/>web: <a href="https://www.carboline.no/">https://www.carboline.no/</a></p> |
|   | <p><b>Author of the Life Cycle Assessment</b><br/>LCA.no AS<br/>Dokka 6B, 1671</p>  | <p>Phone: +47 916 50 916<br/>e-mail: <a href="mailto:post@lca.no">post@lca.no</a><br/>web: <a href="http://www.lca.no">www.lca.no</a></p>   |
|   | <p><b>Developer of EPD generator</b><br/>LCA.no AS<br/>Dokka 6B,1671 Kråkerøy</p>   | <p>Phone: +47 916 50 916<br/>e-mail: <a href="mailto:post@lca.no">post@lca.no</a><br/>web: <a href="http://www.lca.no">www.lca.no</a></p>   |
|    | <p>ECO Platform<br/>ECO Portal</p>  | <p>web: <a href="http://www.eco-platform.org">www.eco-platform.org</a><br/>web: ECO Portal</p>  |