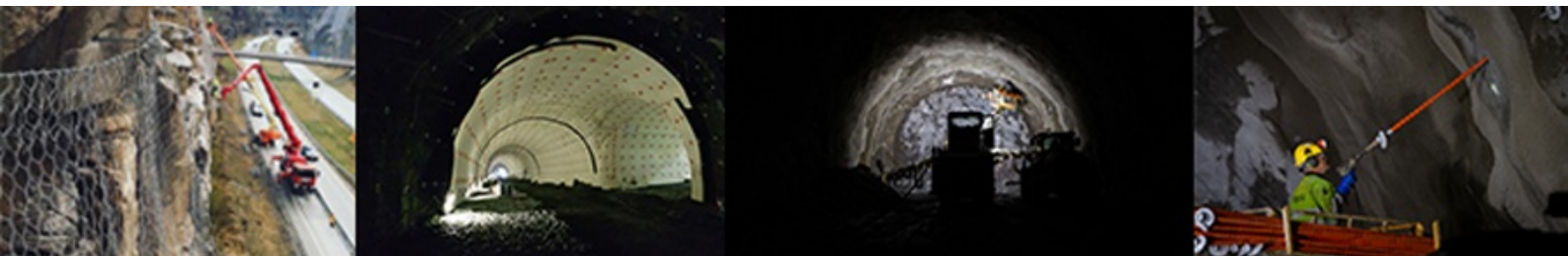


# Environmental product declaration

In accordance with ISO 14025 and EN15804+A2

## Rock tie Pc-Coat®



The Norwegian EPD Foundation

**Owner of the declaration:**

Pretec Norge AS

**Product:**

Rock tie Pc-Coat®

**Declared unit:**

1 kg

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

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

NPCR 013:2021 Part B for Steel and aluminium construction products

**Program operator:**

The Norwegian EPD Foundation

**Declaration number:**

Ref: NEPD-2704-1407

**Registration number:**

Ref: NEPD-2704-1407

**Issue date:**

04.10.2023

**Valid to:**

04.10.2028

**EPD Software:**

LCA.no EPD generator ID: 74950

## General information

### Product

Rock tie Pc-Coat®

### Program operator:

Post Box 5250 Majorstuen, 0303 Oslo, Norway  
The Norwegian EPD Foundation  
Phone: +47 23 08 80 00  
web: [post@epd-norge.no](mailto:post@epd-norge.no)

### Declaration number:

Ref: NEPD-2704-1407

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

CEN Standard EN 15804:2012+A2:2019 serves as core PCR  
NPCR 013:2021 Part B for Steel and aluminium construction products

### 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 Rock tie Pc-Coat®

### Declared unit with option:

A1-A3,A4,A5,C1,C2,C3,C4,D

### Functional unit:

1 kg Rocktie with PC coat. Ø10mm length 2900mm

### 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:

Alexander Borg, Asplan Viak AS  
(no signature required)

### Owner of the declaration:

Pretec Norge AS  
Contact person: Ernad Sarajlija  
Phone: (+47) 69 10 24 60  
e-mail: [post@pretec.no](mailto:post@pretec.no)

### Manufacturer:

Pretec Norge AS  
Kampenesmosen 3  
1739 Borgenhaugen, Norway

### Place of production:

Pretec China  
1-1 1-1 Danmei Road, Haining City  
Zhejiang Province, China

### Management system:

ISO 14001 and ISO 9001, AAA Certification AB, sert no 794 - EN 1090-1, AAA Certification AB, sert no 2296

### Organisation no:

NO 980 429 245 MVA

### Issue date:

04.10.2023

### Valid to:

04.10.2028

### Year of study:

2023

### 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: Ernad Sarajlija

Reviewer of company-specific input data and EPD: Lars Rune Aasberg

### Approved:

## Product

### Product description:

Rock ties for securing of loose and unstable rocks

### Product specification

Pc-Coat® duplex coating. Provides optimum corrosion protection for steel using three different processes

- Hot-dip galvanizing acc to ISO 1461
- Zinc-manganese phosphating
- Powder coating acc to EN 13438

CE marked according to NS EN 1090-1.

| Materials      | kg   | %     |
|----------------|------|-------|
| Powder coating | 0,01 | 1,16  |
| Metal - Steel  | 0,96 | 93,05 |
| Metal - Zinc   | 0,06 | 5,79  |
| Total          | 1,04 |       |

| Packaging             | kg   | %     |
|-----------------------|------|-------|
| Packaging - Pallet    | 0,01 | 90,91 |
| Packaging - Plastic   | 0,00 | 9,09  |
| Total incl. packaging | 1,05 |       |

### Technical data:

Material: Welded rebar Ø10mm. Grade B500NC acc to 3576-3:2012

Weight: 3,7 kg/pc

### Market:

Worldwide

### Reference service life, product

### Reference service life, building or construction works

## LCA: Calculation rules

### Declared unit:

1 kg Rock tie Pc-Coat®

### 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:

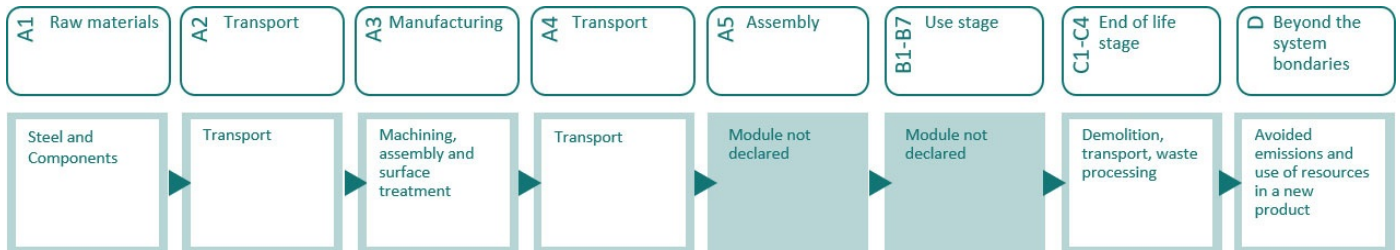
Specific data for the product composition are provided by the manufacturer. The data represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on EPDs according to EN 15804 and different LCA databases. The data quality of the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

| Materials           | Source                 | Data quality | Year |
|---------------------|------------------------|--------------|------|
| Metal - Steel       | ecoinvent 3.6          | Database     | 2019 |
| Metal - Zinc        | ecoinvent 3.6          | Database     | 2019 |
| Packaging - Plastic | ecoinvent 3.6          | Database     | 2019 |
| Powder coating      | Ecoinvent 3.6          | Database     | 2019 |
| Packaging - Pallet  | Modified 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                               | X        |           |             |        |             |               |                        |                       | X                          | X         | X                | X        | X                                   |

### System boundary:



Cradle

Gate

Grave



### Additional technical information:

## LCA: Scenarios and additional technical information

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

| Transport from production place to user (A4)                                                            | Capacity utilisation (incl. return) % | Distance (km) | Fuel/Energy Consumption | Unit  | Value (Liter/tonne) |
|---------------------------------------------------------------------------------------------------------|---------------------------------------|---------------|-------------------------|-------|---------------------|
| Ship, Coastal Barge (km)                                                                                | 71,0 %                                | 110           | 0,011                   | l/tkm | 1,21                |
| Ship, Freight, Transoceanic, 194.000DWT (kgkm)                                                          | 65,0 %                                | 20300         |                         | l/tkm |                     |
| Truck, over 32 tonnes, EURO 4 (kgkm) - Global                                                           | 55,0 %                                | 60            | 0,023                   | l/tkm | 1,38                |
| Truck, over 32 tonnes, EURO 6 (km)                                                                      | 53,3 %                                | 300           | 0,023                   | l/tkm | 6,90                |
| Assembly (A5)                                                                                           | Unit                                  | Value         |                         |       |                     |
| Waste, packaging, pallet, EUR wooden pallet, reusable, average treatment (kg) - A5, inkl. 85 km transp. | kg                                    | 0,01          |                         |       |                     |
| Waste, packaging, plastic film (LDPE), to average treatment (kg) - A5, inkl. 85 km transp.              | kg                                    | 0,00          |                         |       |                     |
| De-construction demolition (C1)                                                                         | Unit                                  | Value         |                         |       |                     |
| Diesel, burned (MJ)                                                                                     | MJ/DU                                 | 0,63          |                         |       |                     |
| Transport to waste processing (C2)                                                                      | Capacity utilisation (incl. return) % | Distance (km) | Fuel/Energy Consumption | Unit  | Value (Liter/tonne) |
| Truck, over 32 tonnes, EURO 6 (km)                                                                      | 53,3 %                                | 300           | 0,023                   | l/tkm | 6,90                |
| Waste processing (C3)                                                                                   | Unit                                  | Value         |                         |       |                     |
| Materials to recycling (kg)                                                                             | kg                                    | 0,70          |                         |       |                     |
| Waste treatment per kg Hazardous waste, incineration (kg) - C3                                          | kg                                    | 0,01          |                         |       |                     |
| Disposal (C4)                                                                                           | Unit                                  | Value         |                         |       |                     |
| Landfilling of ashes from incineration of Hazardous waste, from incineration (kg) - C4                  | kg                                    | 0,00          |                         |       |                     |
| Waste, scrap steel, to landfill (kg)                                                                    | kg                                    | 0,32          |                         |       |                     |
| Benefits and loads beyond the system boundaries (D)                                                     | Unit                                  | Value         |                         |       |                     |
| Substitution of electricity, in Norway (MJ)                                                             | MJ                                    | 0,00          |                         |       |                     |
| Substitution of primary steel with net scrap (kg)                                                       | kg                                    | -0,32         |                         |       |                     |
| Substitution of thermal energy, district heating, in Norway (MJ)                                        | MJ                                    | 0,00          |                         |       |                     |
| Substitution of Zinc (kg)                                                                               | kg                                    | 0,05          |                         |       |                     |

## 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-A3     | A4       | A5       | C1       | C2       | C3       | C4       | D         |
|  | GWP-total                        | kg CO <sub>2</sub> -eq | 1,90E+00  | 1,59E-01 | 1,52E-02 | 5,73E-02 | 2,61E-02 | 2,67E-02 | 2,38E-03 | 1,95E-01  |
|  | GWP-fossil                       | kg CO <sub>2</sub> -eq | 1,90E+00  | 1,58E-01 | 9,27E-05 | 5,73E-02 | 2,61E-02 | 2,66E-02 | 2,38E-03 | 1,97E-01  |
|  | GWP-biogenic                     | kg CO <sub>2</sub> -eq | -9,33E-03 | 6,08E-05 | 1,52E-02 | 1,07E-05 | 1,12E-05 | 6,68E-05 | 1,57E-06 | -1,30E-03 |
|  | GWP-luluc                        | kg CO <sub>2</sub> -eq | 4,01E-03  | 1,44E-04 | 9,53E-09 | 4,52E-06 | 7,96E-06 | 6,71E-06 | 3,68E-07 | -3,56E-04 |
|  | ODP                              | kg CFC11 -eq           | 1,64E-07  | 2,87E-08 | 7,00E-12 | 1,24E-08 | 6,30E-09 | 3,05E-09 | 7,23E-10 | -9,33E-08 |
|  | AP                               | mol H+ -eq             | 9,45E-03  | 4,03E-03 | 2,06E-07 | 6,00E-04 | 8,41E-05 | 3,91E-05 | 1,55E-05 | 2,22E-04  |
|  | EP-FreshWater                    | kg P -eq               | 8,61E-05  | 9,93E-07 | 3,24E-10 | 2,09E-07 | 2,08E-07 | 6,38E-07 | 2,00E-08 | 3,90E-06  |
|  | EP-Marine                        | kg N -eq               | 1,94E-03  | 9,99E-04 | 1,36E-07 | 2,65E-04 | 1,84E-05 | 8,08E-06 | 5,59E-06 | 2,48E-05  |
|  | EP-Terrestrial                   | mol N -eq              | 2,05E-02  | 1,11E-02 | 8,47E-07 | 2,90E-03 | 2,05E-04 | 9,10E-05 | 6,19E-05 | -9,20E-05 |
|  | POCP                             | kg NMVOC -eq           | 6,51E-03  | 2,93E-03 | 2,43E-07 | 7,98E-04 | 8,07E-05 | 2,55E-05 | 1,77E-05 | 8,09E-04  |
|  | ADP-minerals&metals <sup>1</sup> | kg Sb -eq              | 4,66E-03  | 1,94E-06 | 6,40E-10 | 8,80E-08 | 4,66E-07 | 9,29E-08 | 1,40E-08 | -3,95E-03 |
|  | ADP-fossil <sup>1</sup>          | MJ                     | 2,64E+01  | 2,12E+00 | 4,85E-04 | 7,89E-01 | 4,24E-01 | 1,12E-01 | 4,94E-02 | 6,74E-01  |
|  | WDP <sup>1</sup>                 | m <sup>3</sup>         | 1,20E+01  | 8,15E-01 | 1,40E-03 | 1,68E-01 | 3,25E-01 | 4,13E-01 | 2,13E-01 | -2,39E+01 |

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-A3    | A4       | A5       | C1       | C2       | C3       | C4       | D         |
|-------------------------------------------------------------------------------------------------------|-------------------|----------|----------|----------|----------|----------|----------|----------|-----------|
|  PM                  | Disease incidence | 1,51E-07 | 2,99E-09 | 3,00E-12 | 1,59E-08 | 2,40E-09 | 6,00E-10 | 3,03E-10 | 2,30E-08  |
|  IRP <sup>2</sup>    | kgBq U235 -eq     | 9,28E-02 | 9,10E-03 | 2,05E-06 | 3,38E-03 | 1,85E-03 | 5,08E-04 | 2,20E-04 | -1,81E-02 |
|  ETP-fw <sup>1</sup> | CTUe              | 4,25E+01 | 1,42E+00 | 4,92E-04 | 4,31E-01 | 3,10E-01 | 5,41E-01 | 3,56E-02 | 1,15E+01  |
|  HTP-c <sup>1</sup>  | CTUh              | 1,16E-08 | 0,00E+00 | 0,00E+00 | 1,70E-11 | 0,00E+00 | 2,60E-11 | 1,00E-12 | 8,02E-10  |
|  HTP-nc <sup>1</sup> | CTUh              | 3,43E-07 | 3,60E-10 | 1,00E-12 | 3,96E-10 | 3,00E-10 | 1,56E-10 | 3,90E-11 | -6,22E-08 |
|  SQP <sup>1</sup>    | dimensionless     | 6,33E+00 | 8,39E-01 | 6,59E-04 | 1,00E-01 | 4,87E-01 | 4,40E-02 | 1,76E-01 | -8,38E-01 |

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-A3    | A4        | A5        | C1       | C2       | C3        | C4       | D         |
|  | PERE  | MJ             | 1,83E+00 | 2,18E-02  | 1,15E-05  | 4,27E-03 | 5,34E-03 | 2,01E-02  | 1,26E-03 | -6,47E-02 |
|  | PERM  | MJ             | 1,39E-01 | 0,00E+00  | -1,39E-01 | 0,00E+00 | 0,00E+00 | 0,00E+00  | 0,00E+00 | 0,00E+00  |
|  | PERT  | MJ             | 1,97E+00 | 2,18E-02  | -1,39E-01 | 4,27E-03 | 5,34E-03 | 2,01E-02  | 1,26E-03 | -6,47E-02 |
|  | PENRE | MJ             | 2,64E+01 | 2,12E+00  | 4,85E-04  | 7,89E-01 | 4,24E-01 | 1,12E-01  | 4,94E-02 | 6,68E-01  |
|  | PENRM | MJ             | 4,25E-02 | 0,00E+00  | -4,25E-02 | 0,00E+00 | 0,00E+00 | 0,00E+00  | 0,00E+00 | 0,00E+00  |
|  | PENRT | MJ             | 2,65E+01 | 2,12E+00  | -4,20E-02 | 7,89E-01 | 4,24E-01 | 1,12E-01  | 4,94E-02 | 6,68E-01  |
|  | SM    | kg             | 9,70E-01 | 0,00E+00  | 0,00E+00  | 3,87E-04 | 0,00E+00 | 2,61E-05  | 1,24E-05 | -1,67E-01 |
|  | RSF   | MJ             | 2,85E-02 | 6,19E-04  | 3,11E-07  | 1,05E-04 | 1,87E-04 | 4,44E-04  | 2,45E-05 | -2,10E-02 |
|  | NRSF  | MJ             | 1,15E-01 | -4,19E-03 | 1,65E-06  | 1,54E-03 | 6,26E-04 | -2,51E-05 | 1,43E-04 | -3,76E-01 |
|  | FW    | m <sup>3</sup> | 2,23E-02 | 1,82E-04  | 2,88E-07  | 4,06E-05 | 4,83E-05 | 1,03E-04  | 6,16E-05 | -4,10E-03 |

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-A3    | A4       | A5       | C1       | C2       | C3       | C4       | D         |
|----------------------------------------------------------------------------------------|------|----------|----------|----------|----------|----------|----------|----------|-----------|
|  HWD  | kg   | 7,19E-03 | 1,16E-04 | 0,00E+00 | 2,32E-05 | 2,32E-05 | 1,21E-05 | 1,63E-06 | -2,87E-04 |
|  NHWD | kg   | 3,32E-01 | 4,97E-02 | 1,50E-03 | 9,34E-04 | 3,69E-02 | 7,48E-03 | 3,26E-01 | 1,21E-01  |
|  RWD  | kg   | 7,17E-05 | 1,45E-05 | 0,00E+00 | 5,48E-06 | 2,90E-06 | 3,17E-07 | 3,17E-07 | -1,28E-05 |

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

"Reading example: 9,0 E-03 =  $9,0 \cdot 10^{-3}$  = 0,009"

\*INA Indicator Not Assessed

### End of life - Output flow

| Indicator                                                                             | Unit | A1-A3    | A4       | A5       | C1       | C2       | C3       | C4       | D         |
|---------------------------------------------------------------------------------------|------|----------|----------|----------|----------|----------|----------|----------|-----------|
|  CRU | kg   | 0,00E+00 | 0,00E+00 | 9,50E-03 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00  |
|  MFR | kg   | 1,08E+00 | 0,00E+00 | 5,10E-04 | 3,80E-04 | 0,00E+00 | 7,00E-01 | 1,12E-05 | -1,67E-01 |
|  MER | kg   | 3,19E-03 | 0,00E+00 | 4,96E-04 | 1,18E-06 | 0,00E+00 | 6,00E-03 | 1,95E-07 | -1,50E-04 |
|  EEE | MJ   | 3,38E-03 | 0,00E+00 | 3,45E-04 | 4,04E-06 | 0,00E+00 | 1,19E-05 | 2,43E-06 | -1,78E-03 |
|  EET | MJ   | 5,12E-02 | 0,00E+00 | 5,22E-03 | 6,12E-05 | 0,00E+00 | 1,80E-04 | 3,68E-05 | -2,70E-02 |

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 =  $9,0 \cdot 10^{-3}$  = 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 | 4,13E-03            |

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, China, Zhejiang, high voltage (kWh) | ecoinvent 3.6 | 865,26 | g CO <sub>2</sub> -eq/kWh |

### Dangerous substances

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

### Indoor environment

Kun for bruk utendørs

## Additional Environmental Information

| Additional environmental impact indicators required in NPCR Part A for construction products |                        |          |          |          |          |          |          |          |          |
|----------------------------------------------------------------------------------------------|------------------------|----------|----------|----------|----------|----------|----------|----------|----------|
| Indicator                                                                                    | Unit                   | A1-A3    | A4       | A5       | C1       | C2       | C3       | C4       | D        |
| GWPIOBC                                                                                      | kg CO <sub>2</sub> -eq | 1,77E+00 | 1,59E-01 | 1,35E-05 | 5,67E-02 | 2,61E-02 | 2,67E-02 | 9,92E-04 | 3,69E-01 |

GWPI-IOBC: 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

Graafland and Iversen, (2022) EPD generator for EPD generator for NPCR 013 Part B for Steel and Aluminum, Background information for EPD generator application and LCA data, LCA.no report number: 08.22

NPCR Part A: Construction products and services. Ver. 2.0. April 2021, EPD-Norge.

NPCR 013 Part B for Steel and Aluminium Construction Products , Ver. 4.0, 06.10.2021, EPD Norway.

|                                                                                    |                                                                                                                      |                                                                                                                                                           |
|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
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