epd-norway
Global Program Operator

ECO PLATFORM EPD VERIFIED

# Environmental Product Declaration

In accordance with ISO14025:2006 and EN15804:2012+A2:2019

## CSE-A 24250-02

Owner of the declaration:
NKT A/S

Product name:
CSE-A 24250-02

Declared unit:
1 set (consisting of 3 pieces) of premoulded separable connectors CSE-A 24250-02 including packaging.

Product category /PCR:
CEN Standard EN15084:2012+A2:2019 and NPCR Part A for Construction products and services serves as core PCRs.

Program holder and publisher:
The Norwegian EPD foundation

Declaration number:
NEPD-9937-9882

Registration number:
NEPD-9937-9882

Issue date: 05.05.2025

Valid to: 05.05.2030

The Norwegian
EPD Foundation

# General information

## Product:
CSE-A 24250-02

## Program operator:
The Norwegian EPD Foundation
Post Box 5250 Majorstuen, 0303 Oslo, Norway
Tlf: +47 23 08 80 00
e-mail: post@epd-norge.no

## Declaration number:
NEPD-9937-9882

## This declaration is based on Product Category Rules:
CEN Standard EN15084:2012+A2:2019 and NPCR Part A:2021 for Construction products and services serves as core PCRs. EN 50693:2019 was used as a guiding document.

## 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, life cycle assessment data and evidence.

## Declared unit:
1 set (consisting of 3 pieces) of premoulded separable connector CSE-A 24250-02 including packaging.

## Declared unit with options:
1 set of medium voltage premoulded separable connector, installed at the cable end to connect other device which matches the characteristic impedance of the line with 100% use rate for the duration of 40 years, including waste treatment at end-of-life.

## Verification:
Independent verification of the declaration and data, according to ISO14025:2010

Internal ☐ External ☒

Mie Vold, LCA.no AS
Independent verifier approved by EPD Norway

## Owner of the declaration:
NKT A/S
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## Manufacturer:
NKT HV Cables AB
Sävelundsgatan 2, 441 38 Alingsås, Sweden
Phone: +46 322 774 00
e-mail: info.kabeldon@nkt.com

## Place of production:
NKT HV Cables AB
Sävelundsgatan 2, 441 38 Alingsås, Sweden
Phone: +46 322 774 00
e-mail: info.kabeldon@nkt.com

## Management system:
ISO 9001, ISO 14001, ISO 45001.

## Organization no:
559079-0290

## Issue date:
05.05.2025

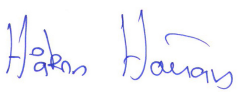
## Valid to:
05.05.2030

## Year of study:
2023

## Comparability:
EPD of construction products may not be able to compare if they do not comply with EN 15804 and are seen in a building context.

## The EPD has been worked out by:
Rajaguru VRR, Guntipalli Jaswanth, and Mahamad Shareef, NKT A/S

Approved



Manager of EPD Norway

# Product

## Product description:

CSE-A 24250-02 is an indoor and outdoor Premoulded separable connectors made of EPDM for XLPE and EPR-insulated cables up to 24 kV up to 95mm2, produced at NKT HV Cables AB, Alingsås, Sweden.

Product specification:

Max cross-section: 95 mm2
Insulation diameter: max 25.5 mm
Core type: single core/Three core
Max. operating voltage (Ur): 24kV
Application: outdoor & indoor termination
DIN norms: HD 629.1 S2, EN 50181
Site condition: rain and dust protected
Installation temperature: -5 to +50°C
Max current rating: Same as the cable

| Product materials | Weight (kg) | Percentage (%) |
|---|---|---|
| Plastic – Rubber | 1.792 | 76.7 |
| Plastic – Others | 0.087 | 3.7 |
| Metal – Copper | 0.249 | 10.7 |
| Metal – Steel | 0.057 | 2.4 |
| Metal – Aluminium | 0.153 | 6.5 |
| **Total** | **2.338** | **100** |

| Packaging materials | Weight (kg) | Percentage (%) |
|---|---|---|
| Cardboard | 0.250 | 72.5 |
| Paper | 0.017 | 4.9 |
| Other plastic | 0.078 | 22.6 |
| Total packaging | **0.345** | **100** |

## Market:

Europe.

## Reference service life, product:

40 Years.

## Reference service life, building:

40 Years.

# LCA: Calculation rules

## Declared unit with options:

1 set (consisting of 3 pieces) of premoulded separable connector CSE-A 24250-02 including packaging.

## Cut-off criteria:

All major raw materials and all the essential energy were included.

Due to a lack of data, the following processes were excluded:

- Colour, and other additives in plastic materials (except carbon black).
- All the activities and energy use related to the offices and personnel.
- Infrastructure and machinery used in the plant.
- Internal transportation.

In accordance with EN 15804, no cut-off criteria were applied to hazardous materials and substances.

## Allocation:

The allocation is made in accordance with the provisions of CEN Standard EN 15084:2012+A2:2019. Incoming energy, water, and waste production in-house are allocated equally among all products through mass allocation. for the applicable products.

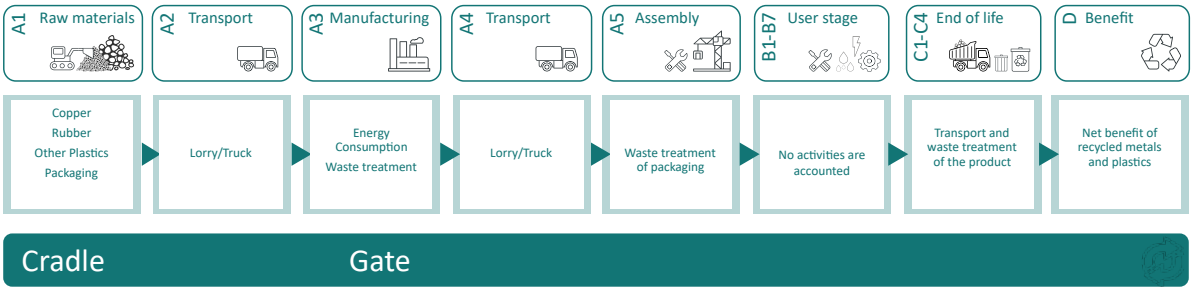
## Data quality:

Primary data is provided by NKT. Background data is a combination of specific LCA datasets provided by key suppliers as well as datasets sourced from the Ecoinvent database.

| Materials | Source | Data quality | Dataset year |
|---|---|---|---|
| Plastic – Rubber | Ecoinvent version 3.10 | Very good | 2023 |
| Plastic – Others | Ecoinvent version 3.10 | Very good | 2023 |
| Metal – Copper | Ecoinvent version 3.10 | Very good | 2023 |
| Cardboard | Ecoinvent version 3.10 | Very good | 2023 |
| Paper | Ecoinvent version 3.10 | Very good | 2023 |
| Plastic bag | Ecoinvent version 3.10 | Very good | 2023 |

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

| Product stage | | | Assembly stage | | Use stage | | | | | | | End of life stage | | | | Benefits & loads beyond system boundary |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Raw materials | Transport | Manufacturing | Transport | Assembly | Use | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | De-construction | 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 | X | X | X | X | X | X | X |



# LCA: Scenarios and additional technical information

The following information describe the scenarios beyond cradle to gate in the different modules of the EPD.

-Module A4 = Europe is considered as a market for the product, an average distance of 3500 km is applied according to EN 50693.
-Modules A5 = Waste generated during the installation and their end of life were included in the life cycle according to EN 50693.
-Modules B1-B7 = no significant activities during the use phase are reported. The electricity losses associated with the cable termination when compared to cables, are deemed insignificant and excluded from this scenario.
-Module C1 = For both buildings and construction work, cable accessories will be taken out as part of a larger demolition. The energy used for accessories removal compared to other heavier materials is assumed to be low. This module was consequently included with zero impact.
-Module C2 = An average distance of 1000 km is considered between the market and the waste treatment facility as per PSR-0001-ed3-EN-2015 10 16.
Modules C3 and C4 = The product's waste treatment follows the default values provided in EN 50693, table G.4. This table specified how different types of raw materials used in A1 will likely be treated during the product's end-of-life. Waste treatments in C3 include material recycling and incineration with and without energy recovery. Disposal in C4 consists of landfilling of different waste fractions.
-Module D = The recyclability of metals and plastics allows the producers credit for the net scrap that is produced at the end of a product's life. The benefits of recycling net scrap are described in the formula from EN 15804:2012+A2:2019. Substitution of heat and electricity generated by the incineration with energy recovery of rubber, plastic insulation and other parts is also calculated in module D.

## Transport from production place to assembly/user (A4)

| Transport from production place to assembly/user (A4) | Capacity utilisation (incl. return) % | Distance (km) | Fuel/Energy consumption | Unit | Value (liter/tonne) |
|---|---|---|---|---|---|
| Transport, freight, lorry 16-32 metric ton, EURO5 \| EN15804, S | 36.7% | 3500 | 0.0446 | l/tkm | 156.1 |

## Assembly (A5)

| | Unit | Value |
|---|---|---|
| Transport, freight, lorry 16-32 metric ton, EURO5 {RER}\| transport, freight, lorry 16-32 metric ton, EURO5 \| EN15804, S (incineration) | kg.km | 306.07 |
| Transport, freight, lorry 16-32 metric ton, EURO5 {RER}\| transport, freight, lorry 16-32 metric ton, EURO5 \| EN15804, S (landfill) | kg.km | 39.07 |
| Paper for recycling | kg | 0.267 |
| Waste plastic, mixture to incineration | kg | 0.03907 |
| Waste plastic, mixture to landfill | kg | 0.03907 |

## Transport to waste processing (C2)

| Transport from production place to assembly/user (C2) | Capacity utilisation (incl. return) % | Distance (km) | Fuel/Energy consumption | Unit | Value |
|---|---|---|---|---|---|
| Transport, freight, lorry 16-32 metric ton, EURO5 \| EN15804, S | 36.7% | 1000 | 0.0446 | l/tkm | 44.6 |

## End of Life (C3)

| | Unit | Value |
|---|---|---|
| Aluminium to recycling | 0.1071 | kg |
| Copper to recycling | 0.1494 | kg |
| Steel to recycling | 0.0456 | kg |
| Waste plastic, mixture {GLO}\| treatment of waste plastic, mixture, municipal incineration \| EN15804, S | 0.0433 | kg |
| Waste rubber, unspecified {Europe without Switzerland}\| treatment of waste rubber, unspecified, municipal incineration \| EN15804, S | 0.8959 | kg |

## End of Life (C4)

| | Unit | Value |
|---|---|---|
| Transport, freight, lorry 16-32 metric ton, EURO5 {RER}\| transport, freight, lorry 16-32 metric ton, EURO5 \| EN15804, S | kg.km | 1096.1 |
| Waste aluminium {RoW}\| treatment of waste aluminium, sanitary landfill \| EN15804, S | kg | 0.0459 |
| Copper slag {GLO}\| treatment of copper slag, residual material landfill \| EN15804, S | kg | 0.0996 |
| Bottom ash, MSWI, scrap steel {Europe without Switzerland}\| treatment of bottom ash, MSWI, scrap steel, slag compartment \| EN15804, S | kg | 0.0114 |
| Residues, MSWI, waste rubber, unspecified {Europe without Switzerland}\| treatment of residues, MSWI, waste rubber, unspecified, residual material landfill \| EN15804, S | kg | 0.8959 |
| Waste plastic, mixture {RoW}\| treatment of waste plastic, mixture, sanitary landfill \| EN15804, S | kg | 0.0433 |

## Benefits and loads beyond the system boundaries (D)

| | Unit | Value |
|---|---|---|
| electricity substitute {RER} for module D | KWh | 3.235 |
| country mix for heat from Incineration {CSE A-02} | KWh | 6.333 |
| Substitution of primary Aluminium | kg | 0.1071 |
| Substitution of primary cardboard | kg | 0.250 |
| Substitution of primary Copper with net scrap | kg | 0.1494 |
| Substitution of primary paper | kg | 0.027 |
| Substitution of primary steel | kg | 0.0456 |

# LCA: Results

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

## Core environmental impact indicators

| Indicator | Unit | A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 |
|---|---|---|---|---|---|---|---|---|---|
| GWP - total | kg CO2 eq | 1.07E+01 | 2.99E-01 | 2.78E+00 | 1.82E+00 | 1.63E-01 | 0 | 0 | 0 |
| GWP - fossil | kg CO2 eq | 1.07E+01 | 2.99E-01 | 2.69E+00 | 1.82E+00 | 1.63E-01 | 0 | 0 | 0 |
| GWP - biogenic | kg CO2 eq | -4.71E-02 | 1.99E-04 | 9.18E-02 | 1.22E-03 | 5.45E-05 | 0 | 0 | 0 |
| GWP - luluc | kg CO2 eq | 4.63E-02 | 9.78E-05 | 2.85E-04 | 5.97E-04 | 2.27E-05 | 0 | 0 | 0 |
| ODP | kg CFC11 eq | 2.59E-07 | 5.94E-09 | 2.92E-07 | 3.62E-08 | 1.37E-09 | 0 | 0 | 0 |
| AP | molc H+ eq | 2.00E-01 | 9.35E-04 | 2.96E-03 | 5.70E-03 | 2.33E-04 | 0 | 0 | 0 |
| EP- freshwater | kg P eq | 1.54E-02 | 1.99E-05 | 2.96E-04 | 1.22E-04 | 4.80E-06 | 0 | 0 | 0 |
| EP -marine | kg N eq | 1.74E-02 | 3.15E-04 | 1.84E-03 | 1.92E-03 | 1.65E-04 | 0 | 0 | 0 |
| EP - terrestrial | molc N eq | 1.80E-01 | 3.43E-03 | 1.23E-02 | 2.09E-02 | 8.82E-04 | 0 | 0 | 0 |
| POCP | kg NMVOC eq | 7.20E-02 | 1.46E-03 | 4.78E-03 | 8.93E-03 | 3.58E-04 | 0 | 0 | 0 |
| ADP-M&M2 | kg Sb-Eq | 2.18E-03 | 9.54E-07 | 2.25E-06 | 5.81E-06 | 2.19E-07 | 0 | 0 | 0 |
| ADP-fossil2 | MJ | 2.25E+02 | 4.20E+00 | 4.37E+01 | 2.56E+01 | 9.66E-01 | 0 | 0 | 0 |
| WDP2 | m3 | 9.19E+00 | 2.34E-02 | 0.00E+00 | 1.43E-01 | 3.51E-03 | 0 | 0 | 0 |

| Indicator | Unit | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|
| GWP - total | kg CO2 eq | 0 | 0 | 0 | 0 | 0 | 4.53E-01 | 2.93E+00 | 5.26E-01 | -2.57E+00 |
| GWP - fossil | kg CO2 eq | 0 | 0 | 0 | 0 | 0 | 4.52E-01 | 2.93E+00 | 5.21E-01 | -2.60E+00 |
| GWP - biogenic | kg CO2 eq | 0 | 0 | 0 | 0 | 0 | 3.02E-04 | 3.51E-04 | 4.73E-03 | 5.50E-02 |
| GWP - luluc | kg CO2 eq | 0 | 0 | 0 | 0 | 0 | 1.48E-04 | 1.29E-05 | 1.43E-04 | -3.09E-02 |
| ODP | kg CFC11 eq | 0 | 0 | 0 | 0 | 0 | 8.99E-09 | 8.90E-10 | 6.08E-09 | -3.64E-08 |
| AP | molc H+ eq | 0 | 0 | 0 | 0 | 0 | 1.42E-03 | 4.15E-04 | 1.45E-03 | -9.24E-02 |
| EP- freshwater | kg P eq | 0 | 0 | 0 | 0 | 0 | 3.02E-05 | 7.66E-06 | 1.03E-04 | -7.49E-03 |
| EP -marine | kg N eq | 0 | 0 | 0 | 0 | 0 | 4.77E-04 | 1.70E-04 | 5.54E-04 | -5.88E-03 |
| EP - terrestrial | molc N eq | 0 | 0 | 0 | 0 | 0 | 5.19E-03 | 1.81E-03 | 5.12E-03 | -7.25E-02 |
| POCP | kg NMVOC eq | 0 | 0 | 0 | 0 | 0 | 2.22E-03 | 4.68E-04 | 1.86E-03 | -2.15E-02 |
| ADP-M&M[2] | kg Sb-Eq | 0 | 0 | 0 | 0 | 0 | 1.44E-06 | 1.16E-07 | 1.06E-06 | -1.09E-03 |
| ADP-fossil[2] | MJ | 0 | 0 | 0 | 0 | 0 | 6.35E+00 | 4.32E-01 | 4.77E+00 | -3.79E+01 |
| WDP[2] | m3 | 0 | 0 | 0 | 0 | 0 | 3.54E-02 | 1.21E-01 | 5.12E-02 | -1.53E+01 |

***GWP-total:*** *Global Warming Potential;* ***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; See "additional Norwegian requirements" for indicator given as PO4 eq.* ***EP-marine:*** *Eutrophication potential, fraction of nutrients reaching freshwater end compartment;* ***EP-terrestrial:*** *Eutrophication potential, Accumulated Exceedance;* ***POCP****: Formation potential of tropospheric ozone;* ***ADP-M&M****: Abiotic depletion potential for non-fossil resources (minerals and metals);* ***ADP-fossil:*** *Abiotic depletion potential for fossil resources;* ***WDP:*** *Water deprivation potential, deprivation weighted water consumption*

Reading example: 9,0 E-03 = 9,0*10-3 = 0,009

## Additional environmental impact indicators

| Indicator | Unit | A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 |
|---|---|---|---|---|---|---|---|---|---|
| PM | Disease incidence | 9.10E-07 | 2.35E-08 | 3.18E-08 | 1.43E-07 | 5.43E-09 | 0 | 0 | 0 |
| IRP[1] | kgBq U235 -eq | 1.52E+00 | 5.38E-03 | 2.37E-02 | 3.28E-02 | 1.25E-03 | 0 | 0 | 0 |
| ETP-fw[2] | CTUe | 2.39E+02 | 1.13E+00 | 6.85E+00 | 6.87E+00 | 5.75E-01 | 0 | 0 | 0 |
| HTP-c[2] | CTUh | 6.89E-08 | 2.09E-09 | 1.00E-08 | 1.27E-08 | 4.91E-10 | 0 | 0 | 0 |
| HTP-nc[2] | CTUh | 1.78E-06 | 2.70E-09 | 1.59E-08 | 1.64E-08 | 9.69E-10 | 0 | 0 | 0 |
| SQP[2] | dimensionless | 9.76E+01 | 2.50E+00 | 1.27E+00 | 1.52E+01 | 5.86E-01 | 0 | 0 | 0 |

| Indicator | Unit | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|
| PM | Disease incidence | 0 | 0 | 0 | 0 | 0 | 3.55E-08 | 2.11E-09 | 2.45E-08 | -2.85E-07 |
| IRP[1] | kgBq U235 -eq | 0 | 0 | 0 | 0 | 0 | 8.15E-03 | 1.62E-03 | 1.35E-02 | -5.42E-01 |
| ETP-fw[2] | CTUe | 0 | 0 | 0 | 0 | 0 | 1.71E+00 | 4.95E+00 | 3.17E+01 | -1.05E+02 |
| HTP-c[2] | CTUh | 0 | 0 | 0 | 0 | 0 | 3.16E-09 | 3.11E-10 | 1.97E-09 | -2.66E-08 |
| HTP-nc[2] | CTUh | 0 | 0 | 0 | 0 | 0 | 4.08E-09 | 1.13E-09 | 6.25E-09 | -8.97E-07 |
| SQP[2] | dimensionless | 0 | 0 | 0 | 0 | 0 | 3.78E+00 | 1.41E-01 | 3.76E+00 | -4.08E+01 |

***PM:*** *Particulate matter emissions;* ***IRP:*** *Ionising radiation, human health;* ***ETP-fw:*** *Ecotoxicity (freshwater);* ***ETP-c:*** *Human toxicity, cancer effects;* ***HTP-nc:*** *Human toxicity, non-cancer effects;* ***SQP:*** *Land use related impacts / soil quality*

[1] 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.

[2] 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

## Resource use, waste & outflow indicators

| Indicator | Unit | A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 |
|---|---|---|---|---|---|---|---|---|---|
| RPEE | MJ | 3.01E+01 | 7.11E-02 | 1.36E+02 | 4.34E-01 | 1.68E-02 | 0 | 0 | 0 |
| RPEM | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0 | 0 | 0 |
| PERT | MJ | 3.01E+01 | 7.11E-02 | 1.36E+02 | 4.34E-01 | 1.68E-02 | 0 | 0 | 0 |
| NRPE | MJ | 1.74E+02 | 4.20E+00 | 4.37E+01 | 2.56E+01 | 3.96E+00 | 0 | 0 | 0 |
| NRPM | MJ | 5.11E+01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | -2.99E+00 | 0 | 0 | 0 |
| PENRT | MJ | 2.26E+02 | 4.20E+00 | 4.37E+01 | 2.56E+01 | 9.66E-01 | 0 | 0 | 0 |
| SM | kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0 | 0 | 0 |
| RSF | MJ | 5.37E-02 | 2.42E-05 | 2.14E-05 | 1.48E-04 | 6.03E-06 | 0 | 0 | 0 |
| NRSF | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0 | 0 | 0 |
| W | m3 | 2.25E-01 | 5.76E-04 | 1.77E-02 | 3.51E-03 | 8.93E-05 | 0 | 0 | 0 |
| HW | kg | 1.75E+00 | 6.04E-03 | 3.53E-01 | 3.68E-02 | 2.97E-03 | 0 | 0 | 0 |
| NHW | kg | 7.45E+01 | 1.28E-01 | 3.94E+01 | 7.78E-01 | 2.66E-01 | 0 | 0 | 0 |
| RW | kg | 7.90E-04 | 1.34E-06 | 5.73E-06 | 8.15E-06 | 3.10E-07 | 0 | 0 | 0 |
| CR | kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0 | 0 | 0 |
| MR | kg | 8.82E-02 | 3.15E-05 | 1.28E-03 | 1.92E-04 | 7.40E-06 | 0 | 0 | 0 |
| MER | kg | 2.88E-05 | 2.66E-07 | 7.79E-07 | 1.62E-06 | 6.25E-08 | 0 | 0 | 0 |
| EEE | MJ | 1.42E-01 | 7.14E-04 | 3.67E-03 | 4.35E-03 | 1.64E-04 | 0 | 0 | 0 |
| ETE | MJ | 2.48E-01 | 1.03E-03 | 4.77E-03 | 6.31E-03 | 2.40E-04 | 0 | 0 | 0 |

| Indicator | Unit | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| RPEE | MJ | 0 | 0 | 0 | 0 | 0 | 1.08E-01 | 2.41E-02 | 1.49E-01 | -1.29E+01 |
| RPEM | MJ | 0 | 0 | 0 | 0 | 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| PERT | MJ | 0 | 0 | 0 | 0 | 0 | 1.08E-01 | 2.41E-02 | 1.49E-01 | -1.29E+01 |
| NRPE | MJ | 0 | 0 | 0 | 0 | 0 | 6.35E+00 | 4.85E+01 | 4.77E+00 | -3.80E+01 |
| NRPM | MJ | 0 | 0 | 0 | 0 | 0 | 0.00E+00 | -4.81E+01 | 0.00E+00 | 0.00E+00 |
| PENRT | MJ | 0 | 0 | 0 | 0 | 0 | 6.35E+00 | 4.32E-01 | 4.77E+00 | -3.80E+01 |
| SM | kg | 0 | 0 | 0 | 0 | 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RSF | MJ | 0 | 0 | 0 | 0 | 0 | 3.67E-05 | 1.46E-05 | 2.50E-05 | -2.36E-02 |
| NRSF | MJ | 0 | 0 | 0 | 0 | 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| W | m3 | 0 | 0 | 0 | 0 | 0 | 8.72E-04 | 2.84E-03 | 1.25E-03 | -3.60E-01 |
| HW | kg | 0 | 0 | 0 | 0 | 0 | 9.15E-03 | 8.95E-02 | 2.80E+00 | -8.43E-01 |
| NHW | kg | 0 | 0 | 0 | 0 | 0 | 1.93E-01 | 1.07E+00 | 7.55E-01 | -2.94E+01 |
| RW | kg | 0 | 0 | 0 | 0 | 0 | 2.02E-06 | 4.24E-07 | 3.42E-06 | -1.41E-04 |
| CR | kg | 0 | 0 | 0 | 0 | 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| MR | kg | 0 | 0 | 0 | 0 | 0 | 4.77E-05 | 3.02E-01 | 4.62E-05 | -3.40E-02 |
| MER | kg | 0 | 0 | 0 | 0 | 0 | 4.03E-07 | 2.71E-08 | 2.80E-07 | -1.08E-05 |
| EEE | MJ | 0 | 0 | 0 | 0 | 0 | 1.08E-03 | 3.97E-04 | 2.10E-03 | -4.08E-02 |
| ETE | MJ | 0 | 0 | 0 | 0 | 0 | 1.57E-03 | 3.77E-04 | 5.04E-03 | -6.35E+00 |

***RPEE*** *Renewable primary energy resources used as energy carrier;* ***RPEM*** *Renewable primary energy resources used as raw materials;* ***PERT*** *Total use of renewable primary energy resources;* ***NRPE*** *Nonrenewable primary energy resources used as energy carrier;* ***NRPM*** *Nonrenewable primary energy resources used as 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;* ***W*** *Use of net fresh water.*
***HW*** *Hazardous waste disposed;* ***NHW*** *Non-hazardous waste disposed;* ***RW*** *Radioactive waste disposed.*
***CR*** *Components for reuse;* ***MR*** *Materials for recycling;* ***MER*** *Materials for energy recovery;* ***EEE*** *Exported electric energy;* ***ETE*** *Exported thermal energy.*

### Information describing the biogenic carbon content at the factory gate

| Biogenic carbon content | Unit | Value |
|---|---|---|
| Biogenic carbon content in product | kg C | 0 |
| Biogenic carbon content in the accompanying packaging | kg C | 1.11E-01 |

# Additional requirements

## Guarantees of origin from the use of electricity in the manufacturing phase

Where guarantees of origin is applied instead of national production mix – the electricity for the manufacturing process (A3) shall be stated clearly in the EPD per functional unit.

| Electricity source | Foreground / core [kWh] | $GWP_{total}$ [kg CO2 -eq/kWh] | SUM [kgCO2 -eq] |
|---|---|---|---|
| Hydro Electricity, renewable with guarantee of origin, low voltage, Sweden (kWh) - NKT | 34.8307 | 0.00453 | 0.15 |
| Electricity, low voltage {SE}\| electricity, low voltage, residual mix \| EN15804, S | 34.8307 | 0.0657 | 2.28 |

The guarantee of origin utilized in this EPD is provided by ACT Commodities BV for the period of 2023-01-01/2023-12-31 for electricity constituted of 100% hydropower. The residual mix is calculated based on statistics from AIB (2023) following the methodology of Grexel (2020).

## Additional environmental impact indicators required for construction products

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.

| Parameter | Unit | A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 |
|---|---|---|---|---|---|---|---|---|---|---|
| GWP-IOBC | kg | 10.72 | 0.30 | 2.69 | 1.82 | 0.16 | 0 | 0 | 0 | 0 |

| Parameter | Unit | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| GWP-IOBC | kg | 0 | 0 | 0 | 0 | 0.45 | 2.93 | 0.52 | -2.63 |

***GWP-IOBC*** *Global warming potential calculated according to the principle of instantaneous oxidation.*

## Hazardous substances

The declaration is based upon reference to threshold values and/or test results and/or material safety data sheets provided to EPD verifiers. Documentation available upon request to EPD owner.

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

## Indoor environment

The product meets the specific requirements described in standard HD 629.1 and EN 50181, and results in low emissions.

## Carbon footprint

While a carbon footprint analysis has not been conducted for the product separately, the results section does include an evaluation of Global Warming Potential (GWP) with such an analysis. The GWP total results presented in this EPD document represents the carbon footprint of the product studied.

# 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 | Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products |
| ISO 21930:2017 | Sustainability in building construction - Environmental declaration of building products |
| EN 50693:2019 | Product category rules for life cycle assessments of electronic and electrical products and systems |
| AC-25-007 | CSE-A 24250-02 LCA report |
| HD 629.1 | Test requirements on accessories for use on power cables |
| EN 50181 | Mechanical interface dimensions requirement of high-voltage electrical bushings |



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