# PRODUCT ENVIRONMENTAL PROFILE

# Environmental Product Declaration

## FD 3300

## March 2026

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|---|---|
| REGISTRATION NUMBER<br>ABBG-00787-V01.01-EN | IN COMPLIANCE WITH PCR-ED4-EN-2021 09 06<br>SUPPLEMENTED BY PSR-0005-ED3.1-EN-2023 12 08 |
| VERIFIER ACCREDITATION NUMBER<br>VH50 | INFORMATION AND REFERENCE DOCUMENTS<br>www.pep-ecopassport.org |
| DATE OF ISSUE<br>03-2026 | VALIDITY PERIOD<br>5 years |
| INDEPENDENT VERIFICATION OF THE DECLARATION AND DATA, IN COMPLIANCE WITH ISO 14025: 2006 | |
| INTERNAL ☐ EXTERNAL ☒ | |
| THE PCR REVIEW WAS CONDUCTED BY A PANEL OF EXPERTS CHAIRED BY JULIE ORGELET (DDEMAIN) | |
| PEPS ARE COMPLIANT WITH XP C08-100-1:2016 AND EN 50693:2019 OR NF E38-500 :2022<br>THE ELEMENTS OF THE PRESENT PEP CANNOT BE COMPARED WITH ELEMENTS FROM ANOTHER PROGRAM. | |
| DOCUMENT IN COMPLIANCE WITH ISO 14025: 2006 « ENVIRONMENTAL LABELS AND DECLARATIONS. TYPE III ENVIRONMENTAL DECLARATIONS » | |

| | |
|---|---|
| **PEP Owner** | ABB Electrification Sweden AB, Kabeldon<br>BOX 531, SE-441 15 Alingsås, Sweden<br>www.abb.com |
| **Manufacturer name and address** | ABB Electrification Sweden AB, Kabeldon<br>BOX 531, SE-441 15 Alingsås, Sweden |
| **Company contacts** | EPD_ELSP@in.abb.com |
| **Reference product** | FD 3300 |
| **Description of the product** | Kabeldon FD 3300 is intended for single pole breaking and dis-connecting a connected cable from the busbar system. The busbar system can be disconnected with two disconnectors without stopping the current from the incoming cable passing through. Utilization category according to IEC 60947-3. |
| **Functional unit** | The functional unit to this study is a single unit of the FD 3300 able to turn off all or part of an installation by separating the installation or part of the installation of all electrical energy or earth, for safety reasons with a rated voltage U, and rated current $I_n$ ensuring isolation characterized by a rated voltage $U_i$, and if applicable the specific specifications, according to the appropriate use scenario, and during the reference service life of the product of 20 years.<br><br>The specifications parameters are:<br><br>- U= 400 V<br>- $I_n$= 400 A<br>- $U_i$= 690 V<br>- IP2X |
| **Other products covered** | None |
| **Reference lifetime** | 20 years |
| **Product category** | Electrical, Electronic and HVAC-R Products (Disconnectors) |
| **Use Scenario** | The use phase has been modeled based on the sales mix data (2024), and the corresponding low voltage electricity countries mix |
| **Geographical representativeness** | Raw materials & Manufacturing: [Europe / Global]<br>Assembly: [Sweden]<br>Distribution / Use: [Global] specific sales mix<br>EoL: [Global] |
| **Technological representativeness** | Materials and processes data are specific to the production of the FD 3300 |
| **LCA Study** | This study is based on the LCA study described in the LCA report 2CGD001935 |
| **PEP type** | Unitary product declaration |
| **PEP scope** | “Cradle to grave” |
| **Year of reported primary data** | 2024 |
| **Reference LCA standards** | ISO 14040, ISO 14044 and ISO 14025 |
| **LCA software** | SimaPro 10.3 (2025) |
| **LCI database** | Ecoinvent v3.11 (2025) & Carbon Minds cm.chemicals database v2.02 (June 2025) |
| **LCIA methodology** | EN 15804:2012+A2:2019/EF3.1 with (-1/+1) approach for GWP-biogenic |

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# ABB Purpose & Embedding Sustainability

ABB is a leading global technology company that energizes the transformation of society and industry to achieve a more productive, sustainable future. By connecting software to its electrification, automation and motion portfolio, ABB pushes the boundaries of technology to drive performance to new levels. With a history of excellence stretching back more than 130 years, ABB's success is driven by about 105 thousand talented employees in over 100 countries.

ABB's Electrification business offers a wide-ranging portfolio of products, digital solutions and services, from substation to socket, enabling safe, smart and sustainable electrification. Offerings encompass digital and connected innovations for low voltage and medium voltage, including EV infrastructure, solar inverters, modular substations, distribution automation, power protection, wiring accessories, switchgear, enclosures, cabling, sensing and control.

ABB is committed to continually promoting and embedding sustainability across its operations and value chain, aspiring to become a role model for others to follow. With its ABB Purpose, ABB is focusing on reducing harmful emissions, preserving natural resources and championing ethical and humane behaviours.

# General Information

ABB Switches and Fusegears operates in Alingsås in Sweden. ABB Provides a complete low voltage distribution system consisting of cabinets, busbars, switching devices, connectors and wide range of accessories that support a great variety of customer applications.

- ABB products comply with following EC directive: "Low-Voltage Directives" (LVD) no. 2014/35/EU
- ISO 9001 for quality management
- ISO 14001 for environmental management
- ISO 45001 for the management of the health and safety of employees in the workplace
- ISO 50001 for energy management

Different products produced in ABB Switches an Fusegears are

- SLD & SLE Fuse Switch Disconnectors
- CDC Cabinets
- Connectors
- Switches and Moulded Case Circuit breakers

Each brand are specific systems which is developed according to standards for different country distribution systems. The primary scope is to deliver a system with high level of safety, simplicity and reliability. Every installer and surrounding environments should be safe during the 40 years of the products lifetime. The products are critical parts of public infrastructure, and continuous operation needs to be secured.

# Constituent Materials

## FD 3300

FD 3300 weighs 3.22 kg including its paper documentation and packaging.

*Table 1: weight of materials of the FD 3300 including its packaging*

| Material Type | Material Class | Material Code | [g] | Weight % |
|---|---|---|---|---|
| Metals | Cu and Cu Alloys | M-121 | 1736.3 | 53.9 % |
| | Al and Al Alloys | M-120 | 375.5 | 11.7 % |
| | Steel | M-119 | 107.8 | 3.4 % |
| Plastics | Unsaturated Polyester | M-301 | 600.0 | 18.6 % |
| | Polypropylene | M-202 | 185.0 | 5.8 % |
| | Polyamide | M-208/M-258 | 24.0 | 0.8 % |
| | Polycarbonate | M-204/M-254 | 17.5 | 0.6 % |
| | ABS | M-256 | 6.8 | 0.2 % |
| | Others | N/A | 15.2 | <0.5% |
| Others | Paper/Cardboard | M-341 | 161.9 | 5.0 % |
| **Total** | | | **3218.2** | |

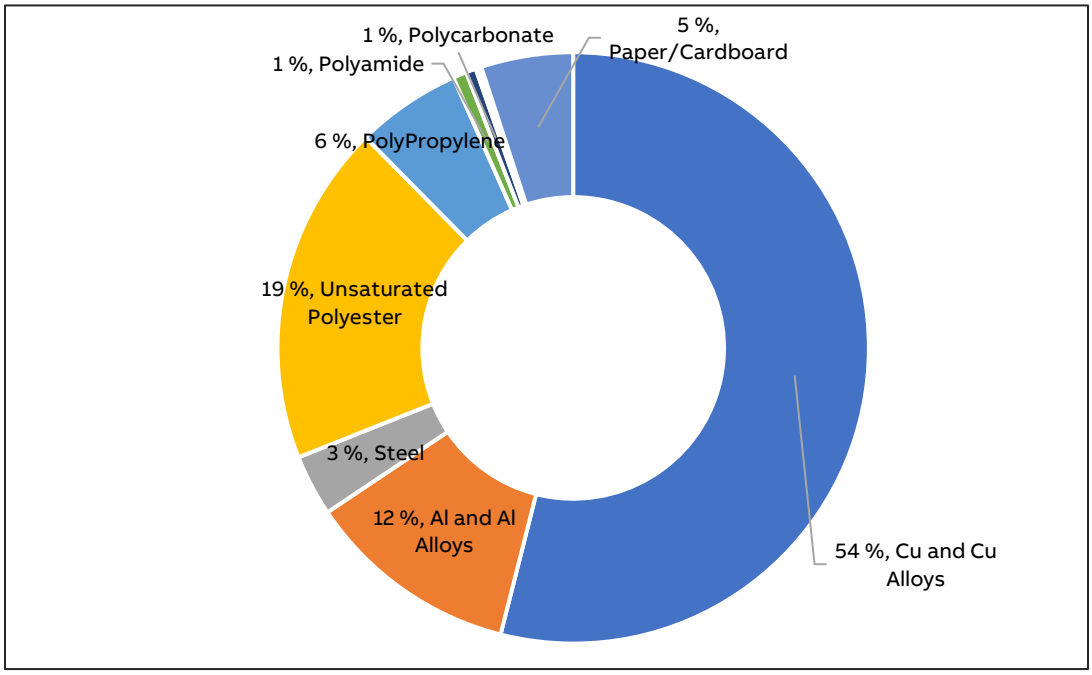


*Figure 1: material composition of the FD 3300 and its packaging*

In the table below the material used for packaging are listed for the reference product.

*Table 2: packaging weight of the FD 3300 Disconnector*

| Material | Weight (g) |
|---|---|
| Corrugated Cardboard | 142 |

# LCA background information

## Functional unit and reference flow

The functional unit is the reference unit used to quantify the performance of the service delivered by a product to the user. The main purpose of the functional unit is to provide a reference to which inputs and outputs are related in the LCA.

The functional unit to this study is a single unit of the FD 3300 able to turn off all or part of an installation by separating the installation or part of the installation of all electrical energy or earth, for safety reasons with a rated voltage U, and rated current In ensuring isolation characterised by a rated voltage Ui, and if applicable the specific specifications, according to the appropriate use scenario, and during the reference service life of the product of 20 years.
The specifications parameters are:

- U= 400 V
- In= 400 A
- Ui= 690 V

The technical characteristics are listed below.

*Table 3: technical characteristics of FD 3300*
*(Refer Technical catalogue for complete details)*

| | FD 3300 Disconnector |
|---|---|
| H = Height (mm) | 355 |
| L = Width (mm) | 87.5 |
| P = Depth (mm) | 139 |
| X = Total number of Cabinets | 1 |
| IP = Degree of Ingress protection | IP2X |

The reference flow of the study is a single FD 3300 (including its packaging and accessories) with mass described in table 3.

## System boundaries and life cycle stages

The life cycle of the FD 3300, is a “from cradle to grave” analysis and covers the following main life cycle stages: manufacturing, including the relevant acquisition of raw material, preparation of semi-finished goods, etc. and processing steps; distribution; installation, including the relevant steps for the preparation of the product for use; use including the required maintenance steps within the RSL (reference service life of the product); end-of-life stage, including the necessary steps until final disposal or recovery of the product system.

The following table shows the stages of the product life cycle and the information stages according to EN 50693:2019 [1] for the evaluation of electronic and electrical products and systems.

As indicated in the PCR [2] capital goods such as buildings, machinery, tools and infrastructure, the packaging for internal transport which cannot be allocated directly to the production of the reference product, may be excluded from the system boundary.

In this study, infrastructures are excluded, except when present in the Ecoinvent [3] database.

*Table 4: phases for the evaluation of construction products according to EN50693:2019 [1].*

| Manufacturing | Distribution | Installation | Use | End-of-Life (EoL) |
|---|---|---|---|---|
| Acquisition of raw materials<br>Transport to manufacturing site<br>Components/parts manufacturing<br>Assembly<br>Packaging<br>EoL treatment of generated waste | Transport to distributor/ logistic center<br>Transport to place of use | Installation<br>EoL treatment of generated waste (packaging) | Usage<br>Maintenance | Deinstallation<br>Collection and transport<br>EoL treatment |

## Temporal and geographical boundaries

The ABB Kabeldon component suppliers are based in Europe. The reference year of the study is 2024. The geographical representativeness of the study is global, since the raw materials are sourced in different countries and the product is sold all over the world. Secondary data are taken from Ecoinvent 3.11 [3] and Carbon Minds v.2.02 [4] databases: the selected Ecoinvent and Carbon Minds processes in the LCA model have a regional representativeness, in absence of specific regional dataset, European, RoW or global datasets had been chosen. In this way, a conservative approach has been adopted.

## Data quality

In this LCA, both primary and secondary data are used. Site specific foreground data have been provided by ABB. Main data sources are the bill of materials & drawings which are available on the ERP (SAP) & Windchill. For all processes for which primary data are not available, generic data originating from the Ecoinvent database [3] (allocation cut-off by classification), and Carbon Minds [4], are used.

## Environmental impact indicators

The information obtained from the inventory analysis is aggregated according to the effects related to the various environmental issues. According to PCR [2] and EN 50693 [1] the environmental impact indicators must be determined using the characterization factors and impact assessment methods specified in EN 15804:2012+A2:2019 [5].

PCR [2] and the EN 50693:2019 [1] standard establish four indicators for climate change: Climate change (total) which includes all greenhouse gases; Climate change (fossil fuels); Climate change (biogenic) which includes the emissions and absorption of biogenic carbon dioxide and biogenic carbon stored in the product; Climate change (land use) - land use and land use transformation. Other indicators as per the PCR [2].

## Allocation rules

An allocation key is used for consumption related to the manufacturing process in the production site, as well for company waste. Allocation coefficients are based on the production line's occupancy area for electricity, gas, water and waste generated.

## Limitations and simplifications

Raw materials life cycle stage includes the extraction of raw materials as well as the transport distances to the manufacturing suppliers. These distances were assumed to be 100 km assuming no specific data available PCR [2]. This distance was added to the one already included in the market processes used for the model, to adopt a conservative approach.

## Energy Models

*Table 5: energy models used in each LCA stage*

| LCA Stage | EN 15804:2012 +A2:2019 module | Energy model | Notes |
|---|---|---|---|
| Manufacturing | A1-A2 | Electricity, {RER}\| market group for \| Cut-off | Based on materials and supplier's locations |
| | A3 | Electricity, {SE}\| market for \| Cut-off | |
| Use Stage | B6 | Electricity, [country]x \| market for \| Cut-off, S ** | Low voltage, based on 2024 country sales mix |
| EoL | C1-C4 | Electricity, {GLO}\| market group for \| Cut-off | |

# Inventory analysis

In this LCA, both primary and secondary data are used. Site specific foreground data have been provided by ABB. For data collection, Bills of Material (BOM) extracted from ABB's internal SAP software were used. They are a list of all the components and assemblies that constitute the finished product, organized by level. Each item is matched with its code, quantity, weight and supplier. The BOMs were then processed, adding material, surface area and other weight data, taken from technical drawings. Finally, the manufacturing process and surface treatment were assigned, according to information provided by R&D personnel. Road distances between the suppliers and ABB were calculated using Google Maps, and marine distances using Distances & Time (Searates).

All primary data collected from ABB are from 2024, which was a representative production year. The ecoinvent cut-off by classification system processes [3] and Carbon Minds database [4] were used to represent the LCA model. Carbon Minds database which is developed for plastics granules, is used for the modelling of thermoset and thermoplastics. Primary data from ABB suppliers are, as well, utilized when available.

## Manufacturing stage

The FD 3300 is composed of a multitude of components, all of which are made from of numerous materials. Most of the inputs to the products' manufacturing stage are already produced component parts.

The single use packaging as well as paper documentation are also included in the analysis in the manufacturing stage. In absence of primary information, an average raw material packaging content of 5% of the mass of reference equipment has been considered as per PSR [6].

The entire supplier's network has been modelled considering each transportation stage, from the first manufacturing supplier to the next.

All the specific distances from the last subassembly suppliers' factories up to the ABB manufacturing facility have been calculated.

The electric energy mix used for the production phase is chosen from the SE Country mix from the Ecoinvent database [3], representative of ABB Kabeldon production.

## Distribution

The transport distances from ABB manufacturing plant to the distribution centers (regional distribution centers / local sales organizations) have been calculated considering the specific 2024 sales mix data for cluster (SAP ERP sales data as a source). An additional 1000km distance (by land) is considered as per the PCR [2], to take into account the transport from RDC to the final customer.

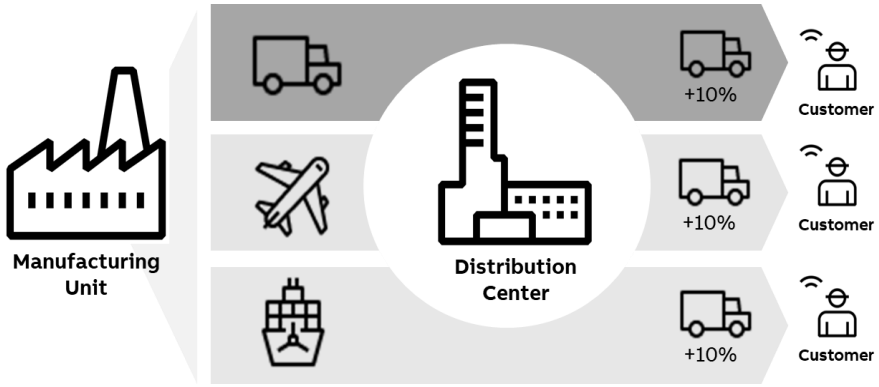


*Figure 2: distribution methodology.*

## Installation

The installation phase only implies manual activities, and no energy is consumed. This phase also includes the disposal of the packaging of the product.

The actual packaging disposal site is unknown and is managed by the customer, so the disposal scenario of the packaging was calculated based on the values reported in the PSR [6] and, for countries other than EU, 100% incineration without energy recovery has been considered. A transport distance of 100 km to the disposal site (according to PSR [6]) was assumed.

## Use

Use and maintenance are modelled according to the PCR [2].

During the use phase, Coils dissipate some electricity due to power losses. They are calculated according to the data provided in the catalogue of the circuit breaker and following the PCR [2] and PSR [6] rules, specific for the disconnectors family:

*Table 6: use phase parameters*

| **Parameters** | | |
|---|---|---|
| Load rate | [%] | 50 |
| h/year | [h] | 8760 |
| RSL | [years] | 20 |
| Use Time rate (α) | [%] | 30 |

The formula for the calculation of the electricity consumed is shown below and it is described as follows, where $P_{use}$ is the power consumed by the switch at a given value of voltage:

$$E_{use}\ [kWh] = \frac{P_{use} * 8760 * RSL * \alpha}{1000}$$

The energy model used for this phase has been modeled based on the 2024 actual sales mix data (SAP ERP sales data as a source). From Ecoinvent database, the low voltage electricity country mix for each country has been selected with its respective percentage on the total sales mix (Electricity, low voltage [Country]x | market for | Cut-off, S).

## End of life

The end-of-life stage and the percentages for end-of-life treatments is modelled according to PCR [2] and PSR-005 [7].

Since no specific data is available, the transport distances from the place of use to the place of disposal are assumed to be 1000 km (local/domestic transport by lorry, according to PSR [2]).

## Benefits

Module D refers to the contribution from the life cycle of the product to the circular economy. The module is an optional one, but it can be registered in PEP Ecopassport on a voluntary basis. The assessment of benefits is carried according to the end-of-life scenarios and does NOT consider the wastes and co-products resulting in Modules A1-A3.

The parameters and formula used to calculate module D results can be observed below:

$$Module\ D\ = \sum (+ R1_i \times M_i \times EPM_i - R2_i \times M_i \times EPM_i * - R3_i \times M_i \times ESE)_i$$

$R1_i$= Recycled content of the material from primary data
$R2_i$= Recyclability potential of the material according to table 7 -PEP-PCR-ED4-EN-2021_09_06 [1]
$R3_i$= Energy recovery potential of the material according to table 7 -PEP-PCR-ED4-EN-2021_09_06
$M_i$= mass of the material in the study from the constituent table
$EPM_i$ = environmental impact of 1kg of primary material production
$EPM_i$*= environmental impact of 1kg of primary material production (for another product)
ESE= inputs and outputs (by analysis unit) that would have resulted from the specific energy source substituted by the quantity of recovered material i, intended for energy recovery (heat or electricity).
The LHV values to calculate the ESE is considered from Ecoinvent. The scope of module D includes the modules from A4-C4. The point of substitution is considered after the EOL of the product i.e. after C3 and C4 modules according to PEP-PCR-ED4-EN-2021_09_06

# Environmental impacts

## Environmental impacts of the FD 3300

The following table shows the environmental impact indicators of the life cycle of a FD 3300 as indicated by PCR [2] and EN 50693:2019 [1]. The indicators are divided into the contribution

of the processes to the different stages (manufacturing, distribution, installation, use and end-of-life).

*Table 7: environmental impact indicators for the FD3300*

| Impact category | Unit | Total | Manufacturing | Distribution | Installation | Use | End of Life | Benefits |
|---|---|---|---|---|---|---|---|---|
| GWP-total | kg CO2 eq | 1.13E+02 | 3.42E+01 | 1.61E+00 | 1.26E-01 | 7.47E+01 | 2.26E+00 | -1.42E+01 |
| GWP-fossil | kg CO2 eq | 1.08E+02 | 3.40E+01 | 1.60E+00 | 6.95E-02 | 7.03E+01 | 2.24E+00 | -1.42E+01 |
| GWP-biogenic | kg CO2 eq | 3.18E+00 | 1.17E-01 | 4.80E-04 | 5.67E-02 | 2.99E+00 | 1.69E-02 | 1.15E-01 |
| GWP-luluc | kg CO2 eq | 1.48E+00 | 7.97E-02 | 2.60E-04 | 1.09E-04 | 1.40E+00 | 1.16E-03 | -3.34E-02 |
| ODP | kg CFC11-eq | 2.02E-06 | 4.18E-07 | 2.73E-08 | 3.75E-09 | 1.54E-06 | 2.53E-08 | -1.22E-07 |
| AP | mol H+ eq | 1.75E+00 | 1.27E+00 | 6.25E-03 | 2.54E-04 | 4.64E-01 | 5.09E-03 | -7.37E-01 |
| EP-freshwater | kg P eq | 1.76E-01 | 1.01E-01 | 5.08E-05 | 2.16E-05 | 7.35E-02 | 6.57E-04 | -5.86E-02 |
| EP-marine | kg N eq | 1.72E-01 | 8.08E-02 | 2.43E-03 | 9.16E-05 | 8.71E-02 | 1.99E-03 | -4.09E-02 |
| EP-terrestrial | mol N eq | 2.04E+00 | 1.04E+00 | 2.66E-02 | 7.18E-04 | 9.63E-01 | 1.29E-02 | -5.50E-01 |
| POCP | kg NMVOC eq | 5.53E-01 | 3.05E-01 | 9.22E-03 | 2.08E-04 | 2.33E-01 | 4.49E-03 | -1.57E-01 |
| ADP-m&m | kg Sb eq | 1.85E-02 | 1.61E-02 | 1.57E-06 | 1.71E-07 | 2.44E-03 | 3.68E-05 | -9.02E-03 |
| ADP-fossil | MJ | 2.34E+03 | 4.59E+02 | 2.19E+01 | 1.66E+00 | 1.84E+03 | 2.15E+01 | -1.70E+02 |
| WDP | m3 of equiv. depriv. | 2.93E+01 | 2.15E+01 | 5.21E-02 | 5.28E-02 | 7.25E+00 | 4.51E-01 | -1.10E+01 |
| PENRE | MJ | 2.32E+03 | 4.41E+02 | 2.19E+01 | 1.66E+00 | 1.84E+03 | 2.15E+01 | -1.70E+02 |
| PENRM | MJ | 1.85E+01 | 1.85E+01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| PENRT | MJ | 2.34E+03 | 4.59E+02 | 2.19E+01 | 1.66E+00 | 1.84E+03 | 2.15E+01 | -1.70E+02 |
| PERE | MJ | 2.06E+03 | 8.29E+01 | 1.57E-01 | 1.44E-01 | 1.98E+03 | 1.65E+00 | -3.89E+01 |
| PERM | MJ | 2.43E+00 | 2.43E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| PERT | MJ | 2.06E+03 | 8.53E+01 | 1.57E-01 | 1.44E-01 | 1.98E+03 | 1.65E+00 | -3.89E+01 |
| SM | kg | 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 |
| NRSF | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| PET | MJ | 4.41E+03 | 5.44E+02 | 2.21E+01 | 1.81E+00 | 3.82E+03 | 2.32E+01 | -2.09E+02 |
| FW | m3 | 5.52E+00 | 5.77E-01 | 1.65E-03 | 1.78E-03 | 4.93E+00 | 1.42E-02 | -2.81E-01 |
| HWD | kg | 1.85E-02 | 1.06E-02 | 1.50E-04 | 7.60E-06 | 5.95E-03 | 1.83E-03 | -7.45E-04 |
| N-HWD | kg | 2.71E+01 | 8.28E+00 | 6.07E-01 | 1.32E-01 | 1.56E+01 | 2.45E+00 | -2.44E+00 |
| RWD | kg | 1.89E-02 | 9.97E-04 | 2.90E-06 | 3.13E-06 | 1.78E-02 | 4.46E-05 | -2.78E-04 |
| CfR | kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| MfR | kg | 1.58E+00 | 2.20E-02 | 0.00E+00 | 1.16E-01 | 0.00E+00 | 1.45E+00 | 0.00E+00 |
| MfER | kg | 1.03E-02 | 1.03E-02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| EN | MJ by energy vector | 4.97E+00 | 0.00E+00 | 0.00E+00 | 6.50E-02 | 0.00E+00 | 4.90E+00 | 0.00E+00 |
| PM | disease inc. | 7.35E-06 | 4.32E-06 | 5.87E-08 | 1.70E-09 | 2.90E-06 | 6.17E-08 | -2.23E-06 |
| IRP | kBq U-235 eq | 8.63E+01 | 4.02E+00 | 1.18E-02 | 1.22E-02 | 8.20E+01 | 1.74E-01 | -1.08E+00 |
| ETP-fw | CTUe | 2.07E+03 | 1.66E+03 | 1.45E+00 | 8.87E-01 | 3.65E+02 | 3.78E+01 | -7.99E+02 |
| HTP-c | CTUh | 1.79E-07 | 1.37E-07 | 1.47E-10 | 1.87E-11 | 4.09E-08 | 1.06E-09 | -7.52E-08 |
| HTP-nc | CTUh | 1.49E-05 | 1.25E-05 | 1.59E-08 | 6.71E-10 | 2.37E-06 | 5.68E-08 | -7.33E-06 |
| SQP | Pt | 2.03E+03 | 4.87E+02 | 7.93E+00 | 3.81E-01 | 1.52E+03 | 8.93E+00 | -2.45E+02 |

*Table 8: inventory flow other indicators*

| Impact category | Unit | FD3300 |
|---|---|---|
| Biogenic Carbon content of the product | kg | 4.65E-02 |
| Biogenic Carbon content of the associated packaging | kg | 6.04E+00 |

*Table 9: list of abbreviations for environmental impact and inventory flow indicators*

| | |
|---|---|
| **Environmental impact indicators** | |
| GWP-total | Global Warming Potential total (Climate change) |
| GWP-fossil | Global Warming Potential fossil |
| 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 |
| EP-freshwater | Eutrophication potential - freshwater 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-m&m | Abiotic Depletion for non-fossil resources potential |
| ADP-fossil | Abiotic Depletion for fossil resources potential |
| WDP | Water deprivation potential |
| **Resource use indicators** | |
| PERE | Use of renewable primary energy excluding renewable primary energy resources used as raw material |
| PERM | Use of renewable primary energy resources used as raw material |
| PERT | Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) |
| PENRE | Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw material |
| PNERM | Use of non-renewable primary energy resources used as raw material |
| PENRT | Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) |
| PET | Total use of primary energy in the lifecycle |
| **Secondary materials. water and energy resources** | |
| SM | Use of secondary materials |
| RSF | Use of renewable secondary fuels |
| NRSF | Use of non-renewable secondary fuels |
| FW | FW: Net use of fresh water |
| **Waste category indicators** | |
| HWD | Hazardous waste disposed |
| N-HWD | Non-hazardous waste disposed |
| RWD | Radioactive waste disposed |
| **Output flow indicators** | |
| CfR | Components for reuse |
| MfR | Materials for recycling |
| MfER | Materials for energy recovery |
| EN | Exported energy |
| **Other indicators** | |
| PM | Emissions of Fine particles |
| IRP | Ionizing radiation. human health |
| ETP-fw | Ecotoxicity. freshwater |
| HTP- c | Human toxicity. carcinogenic effects |
| HTP- nc | Human toxicity. non-carcinogenic effects |
| SQP | Impact related to Land use / soil quality |

# Additional environmental information

As additional environmental information. the potential recyclability rate of the total product mass has been calculated. This is consistent with the rates reported in the technical report IEC/TR 62635 Edition 1.0 [7] Table D.6. based on which the recyclability potentials were determined.

The recyclability potential has been calculated considering the product weight only (excluding packaging). It should be noted that this value represents theoretical potential and does not reflect a real-case scenario. Therefore. these percentages have not been used in the calculation of the environmental impact indicators.

*Table 10: recyclability potential of FD 3300.*

| | Percentage |
|---|---|
| Recyclability potential | 72.73% |

# References


[1] European Norm. *EN 50693:2019 - Product category rules for life cycle assessments of electronic and electrical products and systems.* Bruxelles. Belgium. 2019.

[2] PEP Ecopassport. *PCR "PEP-PCR-ed4-EN-2021_09_06" - Product Category Rules for Electrical. Electronic and HVAC-R Products.* 2021.

[3] *Ecoinvent v. 3.11.* Zurich. Switzerland. 2025.

[4] *Carbon Minds database v.2.02.* Cologne. Germany. 2025.

[5] European Norm. *EN 15804:2012+A2:2019/AC:2021 - Sustainability of construction works – Environmental product declarations - Core rules for the product category of construction products.* Bruxelles. Belgium. 2021.

[6] PEP Ecopassport. PSR "PSR-0005-ed3.1-EN-2023 12 08" - SPECIFIC RULES FOR Electrical switchgear and control gear Solutions. 2023.

[7] International Electrotechnical Commission. *IEC/TR 62635 - Guidelines for end-of-life information provided by manufacturers and recyclers and for recyclability rate calculation of electrical and electronic equipment edition 1.0.* Geneve. Switzerland. 2012.

[8] International Organization for Standardization. *ISO 14040:2006/Amd 1:2020 - Environmental management - Life cycle assessment - Principles and framework.* Geneve. Switzerland. 2021.

[9] International Organization for Standardization. *ISO 14044:2006/Amd:1:2017/Amd2:2020 - Environmental management - Life cycle as-sessment - Requirements and guidelines.* Geneve. Switzerland. 2020.