# Product Environmental Profile

## MINIATURE CIRCUIT BREAKER 277V 20A

## General information

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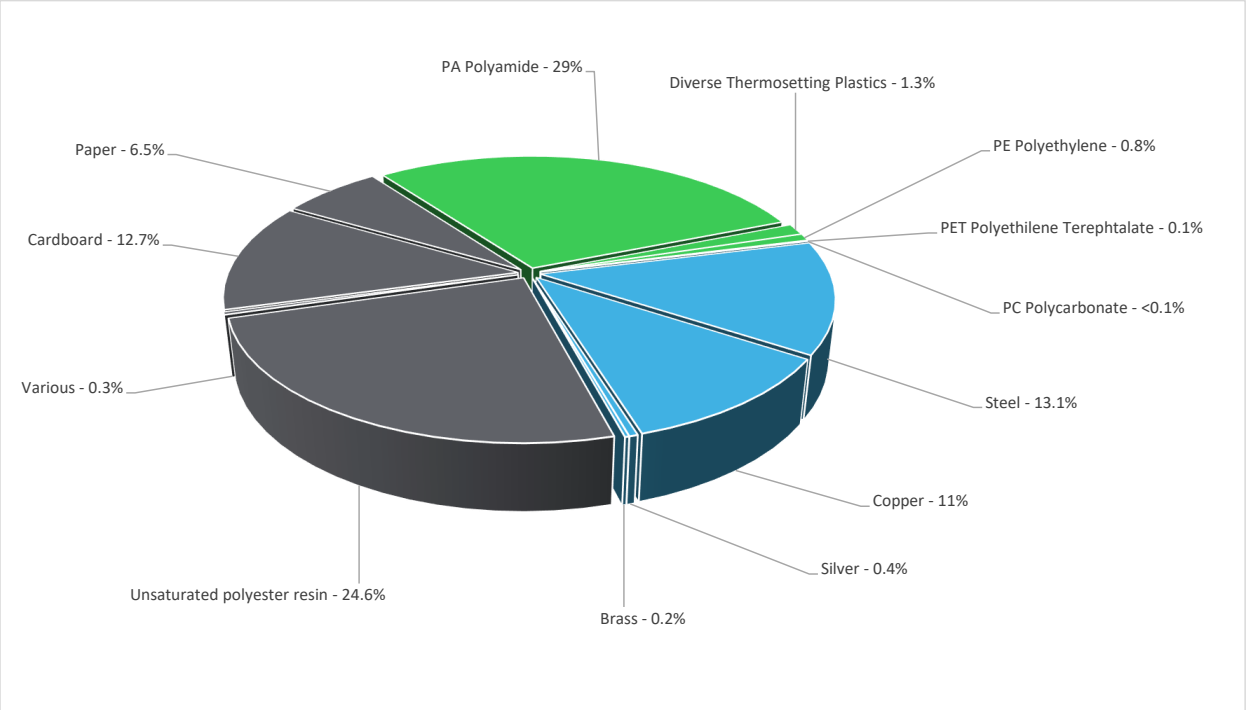
|---|---|
| **Reference product** | MINIATURE CIRCUIT BREAKER 277V 20A - EDB14020 |
| **Description of the product** | E-Frame Breakers are lighting panelboard circuit breakers that are proven to be effective and reliable,offering a wide variety of robust features specifically designed for use in Square D NF Panelboards. This range of breakers is ideally engineered to provide superior overload and short-circuit protection. All E-Frame breakers include a thermal-magnetic trip unit and a signal indicator that displays when a trip has occurred. |
| **Description of the range** | Single product |
| **Functional unit** | Protect the installation from overloads and short circuits in a circuit with rated voltage Ue, rated current In, with Np poles, a rated breaking capacity Icn, and the tripping curve Cd if applicable, and, if applicable, the specific specifications, in the Household/Commercial application area, according to the appropriate use scenario, and during the reference service life of the product of 20 years. |
| **Specifications are:** | Ue,Rated operating voltage (V) = 480Y / 277 V AC<br>In,Rated current (A) = 20 A<br>Np,Number of poles / number of protected poles = 1 Pole<br>Icn: Rated breaking capacity (A) = 240 V: 25 kA<br>480Y / 277 V: 18 kA<br>600Y / 347 V: 14 kA<br>Cd,Tripping curve = D<br>Voltage range = 120–480 V AC<br>Current type = AC |

## Constituent materials

| | | |
|---|---|---|
| **Reference product mass** | 595 g | including the product and packaging |




| | | |
|---|---|---|
| | Others | 44.1% |
| | Plastics | 31.2% |
| | Metals | 24.7% |

## Substance assessment

Details of ROHS and REACH substances information are available on the Schneider-Electric website
https://www.se.com

## Additional environmental information

| | | | |
|---|---|---|---|
| **End Of Life** | Recyclability potential: | **30%** | The recyclability rate was calculated from the recycling rates of each material making up the product based on REEECY'LAB tool developed by Ecosystem, for components/materials not covered by the tool, data from the EIME database and the related PSR was taken. If no data was found a conservative assumption was used (0% recyclability). |

## Environmental impacts

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|---|---|
| **Reference service life time** | 20 years |
| **Product category** | Circuit-breakers - Household / Commercial |
| **Life cycle of the product** | The manufacturing, the distribution, the installation, the use and the end of life were taken into consideration in this study |
| **Electricity consumption** | The electricity consumed during manufacturing processes is considered for each part of the product individually, the final assembly generates a negligible consumption |
| **Installation elements** | The product installation requires little to no energy. The disposal of packaging materials is also accounted during the installation phase, including transport to disposal.<br>The material constituents of the packaging are Cardboard (66.04%) and Paper (33.96%). |
| **Use scenario** | Load rate = 15% In<br>Use rate = 30% RLT |
| **Time representativeness** | The collected data are representative of the year 2024 |
| **Technological representativeness** | The Modules of Technologies such as material production, manufacturing processes and transport technology used in the PEP analysis (LCA EIME in the case) are similar and representative of the actual type of technologies used to make the product. |

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|---|---|---|---|---|
| **Geographical representativeness** | **Final assembly site** | **Use phase** | | **End-of-life** |
| | Tlaxcala Plant 1,Mexico | United State, Canada and Mexico | | United State, Canada and Mexico |
| **Energy model used** | **[A1 - A3]** | **[A5]** | **[B6]** | **[C1 - C4]** |
| | Electricity Mix; RER<br>Electricity Mix; Mexico, MX<br>Electricity Mix; GLO | Electricity Mix; RER | Electricity Mix; Low voltage; 2020; United States, US<br>Electricity Mix; Low voltage; 2020; Canada, CA<br>Electricity Mix; Low voltage; 2020; Mexico, MX | Global, European and French datasets are used. |

Detailed results of the optional indicators mentioned in PCRed4 are available in the LCA report and on demand in a digital format - Country Customer Care Centre - http://www.se.com/contact

| Mandatory Indicators | | E-Frame Brkr 20A, 1P, 277V, 18/25kA, Bolt-on Mnt - EDB14020 | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Impact indicators** | **Unit** | **Total (without Module D)** | **[A1 - A3] - Manufacturing** | **[A4] - Distribution** | **[A5] - Installation** | **[B1 - B7] - Use** | **[C1 - C4] - End of life** | **[D] - Benefits and loads** |
| Contribution to climate change | kg CO2 eq | 7.01E+00 | 4.26E+00 | 1.91E-01 | 2.25E-01 | 1.40E+00 | 9.29E-01 | -4.53E-01 |
| Contribution to climate change-fossil | kg CO2 eq | 6.92E+00 | 4.48E+00 | 1.91E-01 | 4.02E-02 | 1.40E+00 | 8.13E-01 | -4.26E-01 |
| Contribution to climate change-biogenic | kg CO2 eq | 9.26E-02 | 0* | 0* | 1.85E-01 | 6.77E-03 | 1.17E-01 | -2.78E-02 |
| Contribution to climate change-land use and land use change | kg CO2 eq | 1.34E-06 | 9.06E-07 | 3.59E-07 | 4.00E-10 | 0* | 7.54E-08 | 0.00E+00 |
| Contribution to ozone depletion | kg CFC-11 eq | 2.86E-07 | 2.69E-07 | 2.77E-09 | 1.44E-09 | 5.03E-09 | 7.90E-09 | -8.63E-08 |
| Contribution to acidification | mol H+ eq | 3.76E-02 | 2.91E-02 | 3.30E-04 | 2.43E-04 | 6.09E-03 | 1.78E-03 | -1.25E-02 |
| Contribution to eutrophication, freshwater | kg P eq | 7.56E-05 | 6.63E-05 | 7.27E-07 | 4.75E-08 | 2.35E-06 | 6.23E-06 | -5.50E-07 |
| Contribution to eutrophication, marine | kg N eq | 4.50E-03 | 3.12E-03 | 6.17E-05 | 6.11E-05 | 7.78E-04 | 4.84E-04 | -3.19E-04 |
| Contribution to eutrophication, terrestrial | mol N eq | 4.64E-02 | 3.01E-02 | 6.77E-04 | 8.05E-04 | 9.33E-03 | 5.48E-03 | -3.75E-03 |
| Contribution to photochemical ozone formation - human health | kg COVNM eq | 1.54E-02 | 1.11E-02 | 2.18E-04 | 1.71E-04 | 2.57E-03 | 1.40E-03 | -1.87E-03 |
| Contribution to resource use, minerals and metals | kg Sb eq | 9.39E-03 | 9.39E-03 | 0* | 0* | 0* | 0* | -2.03E-04 |
| Contribution to resource use, fossils | MJ | 1.23E+02 | 8.35E+01 | 3.50E+00 | 7.45E-01 | 3.04E+01 | 4.53E+00 | -9.25E+00 |
| Contribution to water use | m3 eq | 1.66E+00 | 1.49E+00 | 7.99E-03 | 2.31E-03 | 8.28E-02 | 8.11E-02 | -6.44E-01 |

| Inventory flows Indicators | | E-Frame Brkr 20A, 1P, 277V, 18/25kA, Bolt-on Mnt - EDB14020 | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Inventory flows | Unit | Total (without Module D) | [A1 - A3] - Manufacturing | [A4] - Distribution | [A5] - Installation | [B1 - B7] - Use | [C1 - C4] - End of life | [D] - Benefits and loads |
| Contribution to renewable primary energy used as energy | MJ | 9.07E+00 | 3.13E+00 | 1.33E-02 | 6.40E-02 | 5.64E+00 | 2.27E-01 | -3.31E-01 |
| Contribution to renewable primary energy used as raw material | MJ | 1.04E+00 | 1.04E+00 | 0* | 0* | 0* | 0* | 1.44E-01 |
| Contribution to total renewable primary energy | MJ | 1.01E+01 | 4.17E+00 | 1.33E-02 | 6.40E-02 | 5.64E+00 | 2.27E-01 | -1.87E-01 |
| Contribution to non renewable primary energy used as energy | MJ | 1.12E+02 | 7.25E+01 | 3.50E+00 | 7.45E-01 | 3.04E+01 | 4.53E+00 | -9.25E+00 |
| Contribution to non renewable primary energy used as raw material | MJ | 1.10E+01 | 1.10E+01 | 0* | 0* | 0* | 0* | 0.00E+00 |
| Contribution to total non renewable primary energy | MJ | 1.23E+02 | 8.35E+01 | 3.50E+00 | 7.45E-01 | 3.04E+01 | 4.53E+00 | -9.25E+00 |
| Contribution to use of secondary material | kg | 7.22E-02 | 7.22E-02 | 0* | 0* | 0* | 0* | 0.00E+00 |
| Contribution to use of renewable secondary fuels | MJ | 0.00E+00 | 0* | 0* | 0* | 0* | 0* | 0.00E+00 |
| Contribution to use of non renewable secondary fuels | MJ | 0.00E+00 | 0* | 0* | 0* | 0* | 0* | 0.00E+00 |
| Contribution to net use of fresh water | $m^3$ | 3.89E-02 | 3.46E-02 | 1.86E-04 | 5.30E-05 | 1.93E-03 | 2.13E-03 | -1.50E-02 |
| Contribution to hazardous waste disposed | kg | 2.48E+01 | 2.47E+01 | 0* | 4.38E-02 | 2.40E-02 | 0* | -1.59E+01 |
| Contribution to non hazardous waste disposed | kg | 1.96E+00 | 1.18E+00 | 2.20E-02 | 5.31E-03 | 2.26E-01 | 5.17E-01 | -2.61E-01 |
| Contribution to radioactive waste disposed | kg | 4.85E-04 | 3.96E-04 | 1.74E-05 | 2.21E-06 | 5.26E-05 | 1.70E-05 | -1.23E-04 |
| Contribution to components for reuse | kg | 0.00E+00 | 0* | 0* | 0* | 0* | 0* | 0.00E+00 |
| Contribution to materials for recycling | kg | 1.76E-01 | 2.71E-02 | 0* | 0* | 0* | 1.49E-01 | 0.00E+00 |
| Contribution to materials for energy recovery | kg | 0.00E+00 | 0* | 0* | 0* | 0* | 0* | 0.00E+00 |
| Contribution to exported energy | MJ | 0.00E+00 | 0* | 0* | 0* | 0* | 0* | 0.00E+00 |

* represents less than 0.01% of the total life cycle of the reference flow

| | | |
|---|---|---|
| Contribution to biogenic carbon content of the product | kg of C | 0.00E+00 |
| Contribution to biogenic carbon content of the associated packaging | kg of C | 3.70E-02 |

** The calculation of the biogenic carbon is based on the Ademe for the Cardboard (28%), EN16485 for Wood (39,52%), and APESA/RECORD for Paper (37,8%)*

| Mandatory Indicators | | E-Frame Brkr 20A, 1P, 277V, 18/25kA, Bolt-on Mnt - EDB14020 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Impact indicators | Unit | [B1 - B7] - Use | [B1] | [B2] | [B3] | [B4] | [B5] | [B6] | [B7] |
| Contribution to climate change | kg CO2 eq | 1.40E+00 | 0* | 0* | 0* | 0* | 0* | 1.40E+00 | 0* |
| Contribution to climate change-fossil | kg CO2 eq | 1.40E+00 | 0* | 0* | 0* | 0* | 0* | 1.40E+00 | 0* |
| Contribution to climate change-biogenic | kg CO2 eq | 6.77E-03 | 0* | 0* | 0* | 0* | 0* | 6.77E-03 | 0* |
| Contribution to climate change-land use and land use change | kg CO2 eq | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* |
| Contribution to ozone depletion | kg CFC-11 eq | 5.03E-09 | 0* | 0* | 0* | 0* | 0* | 5.03E-09 | 0* |
| Contribution to acidification | mol H+ eq | 6.09E-03 | 0* | 0* | 0* | 0* | 0* | 6.09E-03 | 0* |
| Contribution to eutrophication, freshwater | kg P eq | 2.35E-06 | 0* | 0* | 0* | 0* | 0* | 2.35E-06 | 0* |
| Contribution to eutrophication marine | kg N eq | 7.78E-04 | 0* | 0* | 0* | 0* | 0* | 7.78E-04 | 0* |
| Contribution to eutrophication, terrestrial | mol N eq | 9.33E-03 | 0* | 0* | 0* | 0* | 0* | 9.33E-03 | 0* |
| Contribution to photochemical ozone formation - human health | kg COVNM eq | 2.57E-03 | 0* | 0* | 0* | 0* | 0* | 2.57E-03 | 0* |
| Contribution to resource use, minerals and metals | kg Sb eq | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* |
| Contribution to resource use, fossils | MJ | 3.04E+01 | 0* | 0* | 0* | 0* | 0* | 3.04E+01 | 0* |
| Contribution to water use | m3 eq | 8.28E-02 | 0* | 0* | 0* | 0* | 0* | 8.28E-02 | 0* |

| Inventory flows Indicators | | E-Frame Brkr 20A, 1P, 277V, 18/25kA, Bolt-on Mnt - EDB14020 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Inventory flows | Unit | [B1 - B7] - Use | [B1] | [B2] | [B3] | [B4] | [B5] | [B6] | [B7] |
| Contribution to use of renewable primary energy excluding renewable primary energy used as raw material | MJ | 5.64E+00 | 0* | 0* | 0* | 0* | 0* | 5.64E+00 | 0* |
| Contribution to use of renewable primary energy resources used as raw material | MJ | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* |
| Contribution to total use of renewable primary energy resources | MJ | 5.64E+00 | 0* | 0* | 0* | 0* | 0* | 5.64E+00 | 0* |
| Contribution to use of non renewable primary energy excluding non renewable primary energy used as raw material | MJ | 3.04E+01 | 0* | 0* | 0* | 0* | 0* | 3.04E+01 | 0* |
| Contribution to use of non renewable primary energy resources used as raw material | MJ | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* |
| Contribution to total use of non-renewable primary energy resources | MJ | 3.04E+01 | 0* | 0* | 0* | 0* | 0* | 3.04E+01 | 0* |
| Contribution to use of secondary material | kg | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* |
| Contribution to use of renewable secondary fuels | MJ | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* |
| Contribution to use of non renewable secondary fuels | MJ | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* |
| Contribution to net use of freshwater | $m^3$ | 1.93E-03 | 0* | 0* | 0* | 0* | 0* | 1.93E-03 | 0* |
| Contribution to hazardous waste disposed | kg | 2.40E-02 | 0* | 0* | 0* | 0* | 0* | 2.40E-02 | 0* |
| Contribution to non hazardous waste disposed | kg | 2.26E-01 | 0* | 0* | 0* | 0* | 0* | 2.26E-01 | 0* |
| Contribution to radioactive waste disposed | kg | 5.26E-05 | 0* | 0* | 0* | 0* | 0* | 5.26E-05 | 0* |
| Contribution to components for reuse | kg | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* |
| Contribution to materials for recycling | kg | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* |
| Contribution to materials for energy recovery | kg | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* |
| Contribution to exported energy | MJ | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* |

** represents less than 0.01% of the total life cycle of the reference flow*

*Life cycle assessment performed with EIME version v6.2.5-6, database version 2024-01 in compliance with ISO14044, EF3.1 method is applied, for biogenic carbon storage, assessment methodology -1/1 is used*

*Please note that the values given above are only valid within the context specified and cannot be used directly to draw up the environmental assessment of an installation.*

| | | | |
|---|---|---|---|
| *Registration number :* | ENVPEP2510013_V1-EN | *Drafting rules* | PEP-PCR-ed4-2021 09 06 |
| *Validity period* | 5 years | *Supplemented by* | PSR-0005-ed3.1-EN-2023 12 08 |
| *Date of issue* | 11-2025 | *Information and reference documents* | www.pep-ecopassport.org |

*Independent verification of the declaration and data, in compliance with ISO 14021 : 2016*

Internal X 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*

*The components of the present PEP may not be compared with components from any other program.*

*Document complies with ISO 14021:2016 "Environmental labels and declarations. Type II environmental declarations"*

*Schneider Electric Industries SAS*
*Country Customer Care Center*
*http://www.se.com/contact*
*Head Office*
*35, rue Joseph Monier*
*CS 30323*
*F- 92500 Rueil Malmaison Cedex*
*RCS Nanterre 954 503 439*
*Capital social 928 298 512 €*


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