# Product Environmental Profile


**Contactor (DIL Frame 1 DC)**

| | |
|---|---|
| **Representative product** | Y7-276845 DILM12-10 (24V DC)<br>PSR product category: Contactor |
| **Description of the product** | DIL Frame 1 DC contactor is used to switch on/off an electrical power circuit. It is used to control high current and high voltage electrical devices which come under the AC-1, AC-3 and AC-4 utilization category. |
| **Homogeneous Environmental Families Covered** | The PEP concerns all the Contactor offerings coverings-<br>Series: DIL Frame 1 DC<br>No. of poles: 3P<br>Rated current range: 4A (Y7-276344,Y7-276379,Y7-276414), 7A (Y7-276565), 9A (Y7-276705), 12A (Y7-290073), 15.5A (Y7-276985) |
| **Functional unit** | Switch on and off during 20 years electrical power supply of a downstream installation with an electrical and/or mechanical control. The functional unit is characterized by a type 3P+1F, a control circuit voltage 24V DC, a power circuit voltage 400 V and a maximum allowed intensity by the power circuit 12A. |
| **Company information** | Eaton Electro Productie s.r.l.<br>Plant Sarbi, 437157 Sarbi, Str. Independentei 8, Romania.<br>Email: productstewardship-es@eaton.com |

| Constituent Materials | | | |
|---|---|---|---|
| Reference product mass | 2.99E-01 kg (with packaging) | | |
| Category PEP Material | Materials | Mass (kg) | Percentage |
| Metals | Copper | 8.70E-02 | 29.13% |
| Metals | Neodymium | 7.20E-02 | 24.10% |
| Plastics | Polyamide 6 | 7.03E-02 | 23.54% |
| Metals | Stainless steel | 4.65E-02 | 15.57% |
| Others | Cardboard | 1.25E-02 | 4.18% |
| Metals | Zinc | 9.00E-03 | 3.01% |
| Metals | Steel | 7.00E-04 | 0.23% |
| Others | Paper | 5.83E-04 | 0.20% |
| Others | Glue | 7.18E-05 | <0.1% |
| Metals | Silicon | 4.49E-05 | <0.1% |
| Others | Zinc oxide | 4.52E-07 | <0.1% |
| Others | Miscellaneous | 4.85E-08 | <0.1% |
| Others | Lubricant | 3.00E-08 | <0.1% |
| | **Total** | 2.99E-01 | 100% |

## Substance Assessment

The representative product is compliant with the EU-RoHS Directive (2011/65/EU) without any exemption and do not contain any Substance-of-Very-High-Concern (SVHC) on the Candidate List of the EU-REACH Regulation (1907/2006/EC).

| Additional Environmental Information | |
|---|---|
| Manufacturing | The reference product is assembled at an Eaton plant holding management system certifications according to ISO9001 & 14001 standards |
| Distribution | Eaton is committed to minimizing weight and volume of product and packaging with focus to optimize transport efficiency |
| Installation | The installation of the product requires standard tools which do not require any additional energy source and no waste other than the obsolete product packaging is generated during this step |
| Use | The product does not require maintenance during operation. |
| End of life | Recyclability of product is 43.8% based on the method of the IEC 62635. |

| Environmental Impacts | |
|---|---|
| The calculation of the environmental impacts is the result of the Product's Life Cycle Analysis in accordance with ISO 14040/44, covering the entire lifecycle.<br>System modelling was carried out using the commercial LCA software EIME v5.9.3 with database version CODDE-2022-01. | |
| **Manufacturing Phase** | The product is manufactured at Eaton plant located in Sarbi, Romania.<br>Energy model used for product manufacturing: Romania |
| **Distribution Phase** | The shipment of the product contained in its packaging is considered per PCR requirement from the manufacturer's last logistics platform to the installation place. Reference product transported over an average distance of 3,500 km by road to serve the Europe market. |
| **Installation Phase** | Product is installed in Europe.<br>Energy model used for treatment of packaging: Europe |
| **Use Phase** | Reference lifetime: 20 Years<br>Location of use: Europe.<br>Energy model used: Europe<br>Usage profile: The product has an average power loss of 5 W in active mode with 50% of the loading rate. For 50% of the use time rate, total losses are 437.72 kWh over the 20 years. No maintenance is necessary for this product |
| **End of life Phase** | Product disposed with WEEE guidelines.<br>Energy model used: Europe |

### Environmental Impact Indicators: Mandatory

| Indicators | unit | Total | Manufacturing | Distribution | Installation | Use (only B6*) | End of Life |
|---|---|---|---|---|---|---|---|
| Global warming | kg $CO_2$ eq. | 1.76E+02 | 2.93E+00 | 7.37E-02 | 1.85E-03 | 1.73E+02 | 2.19E-01 |
| Ozone depletion | kg $CFC^{-11}$ eq. | 9.19E-07 | 2.31E-07 | 1.49E-10 | 7.57E-12 | 6.86E-07 | 1.96E-09 |
| Acidification of soil and water | kg $SO_2$ eq. | 3.10E-01 | 7.18E-03 | 3.31E-04 | 9.03E-06 | 3.03E-01 | 9.40E-05 |
| Water eutrophication | kg $PO_4^{3-}$ eq. | 5.72E-02 | 1.25E-03 | 7.62E-05 | 5.41E-06 | 5.58E-02 | 6.17E-05 |
| Photochemical Ozone formation | kg ethylene eq. | 2.44E-02 | 6.10E-04 | 2.35E-05 | 6.47E-07 | 2.38E-02 | 8.42E-06 |
| Depletion of abiotic resources - elements | kg antimony eq. | 1.71E-04 | 1.53E-04 | 2.95E-09 | 7.66E-11 | 1.78E-05 | 7.67E-10 |
| Depletion of abiotic resources - fossil fuels | MJ | 2.73E+03 | 3.34E+01 | 1.04E+00 | 2.54E-02 | 2.70E+03 | 2.80E-01 |
| Water pollution | $m^3$ | 6.95E+03 | 8.16E+02 | 1.21E+01 | 2.96E-01 | 6.12E+03 | 7.54E+00 |
| Air pollution | $m^3$ | 1.28E+04 | 8.31E+02 | 3.02E+00 | 1.52E-01 | 1.20E+04 | 3.56E+00 |

*B6 is energy requirements during the use stage. Other sub modules in the use stage (B1-B5, B7) are equal to 0, that's why they are not listed in the table.

## Environmental Impact Indicators: Optional

| Indicators | unit | Total | Manufacturing | Distribution | Installation | Use (only B6*) | End of Life |
|---|---|---|---|---|---|---|---|
| Use of renewable primary energy, excluding renewable primary energy resources used as raw materials | MJ | 8.81E+02 | 3.18E+00 | 1.39E-03 | 1.45E-04 | 8.78E+02 | 3.88E-04 |
| Use of renewable primary energy resources used as raw materials | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) | MJ | 8.81E+02 | 3.18E+00 | 1.39E-03 | 1.45E-04 | 8.78E+02 | 3.88E-04 |
| Use of non-renewable primary energy, excluding non-renewable primary energy resources used as raw materials | MJ | 4.62E+03 | 4.92E+01 | 1.04E+00 | 2.57E-02 | 4.57E+03 | 3.68E-01 |
| Use of non-renewable primary energy resources used as raw materials | MJ | 3.08E+00 | 3.08E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) | MJ | 4.62E+03 | 5.23E+01 | 1.04E+00 | 2.57E-02 | 4.57E+03 | 3.68E-01 |
| Use of secondary materials | kg | 5.71E-02 | 5.71E-02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Net use of fresh water | $m^3$ | 8.12E+00 | 3.42E-01 | 6.60E-06 | 3.43E-07 | 7.78E+00 | 9.94E-05 |
| Hazardous waste disposed of | kg | 1.68E+01 | 1.30E+01 | 0.00E+00 | 2.91E-06 | 3.35E+00 | 4.49E-01 |
| Non-hazardous waste disposed of | kg | 3.31E+01 | 7.30E+00 | 2.62E-03 | 1.32E-02 | 2.58E+01 | 1.19E-03 |
| Radioactive waste disposed of | kg | 7.22E-03 | 1.81E-03 | 1.87E-06 | 9.44E-08 | 5.40E-03 | 1.93E-06 |
| Materials for recycling | kg | 1.25E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.25E-01 |

To evaluate the environmental impact of other product covered by this PEP, multiply the impact figures by –

**Factors for Manufacturing, Distribution and End-of-Life Phase:**

| Contactor | Eaton Article Number | Product name | Multiplying factor |
|---|---|---|---|
| DIL Frame 1 DC | Y7-276845 | DILM12-10(24VDC) | 1 |
| | Y7-276344 | DILA-40(24VDC) | 1 |
| | Y7-276379 | DILA-31(24VDC) | 1 |
| | Y7-276414 | DILA-22(24VDC) | 1 |
| | Y7-276565 | DILM7-10(24VDC) | 1 |
| | Y7-276705 | DILM9-10(24VDC) | 1 |
| | Y7-290073 | DILM15-10(24VDC) | 1 |
| | Y7-276985 | DILMP20(24VDC) | 1 |

**Factors for Use Phase:**

| Contactor | Eaton Article Number | Product name | Energy Consumption (kWh) | Multiplying factor |
|---|---|---|---|---|
| DIL Frame 1 DC | Y7-276845 | DILM12-10(24VDC) | 437.72 | 1 |
| | Y7-276344 | DILA-40(24VDC) | 286.22 | 0.65 |
| | Y7-276379 | DILA-31(24VDC) | 281.41 | 0.64 |
| | Y7-276414 | DILA-22(24VDC) | 281.41 | 0.64 |
| | Y7-276565 | DILM7-10(24VDC) | 277.61 | 0.63 |
| | Y7-276705 | DILM9-10(24VDC) | 418.68 | 0.96 |
| | Y7-290073 | DILM15-10(24VDC) | 466.81 | 1.07 |
| | Y7-276985 | DILMP20(24VDC) | 473.70 | 1.08 |

| Disclaimer |
| --- |
| This Product Environmental Profile and its content is based on information available to us. It refers to the product at the date of issue. We make no express or implied representations or warranties with respect to the information contained herein. |

| | | | |
| --- | --- | --- | --- |
| *Registration N°* | EATO-00024-V01.01-EN | *Drafting rules* | PCR-ed3-EN-2015 04 02 |
| *Verifier accreditation N°* | VH32 | *Supplemented by* | PSR-0005-ed2-EN-2016 03 29 |
| *Date of issue* | 4-2022 | *Information and reference documents* | www.pep-ecopassport.org |
| | | *Validity period* | 5 years |
| Independent verification of the declaration and data, in compliance with ISO 14025: 2010 | | | |
| Internal | | External | X |
| The PCR review was conducted by a panel of experts chaired by chaired by Philippe Osset (SOLINNEN) | | | |
| *The elements of the present PEP cannot be compared with elements from another program.* | | | |
| *Document in compliance with ISO 14025: 2010 « Environmental labels and declarations. Type III environmental declarations »* | | | |