# Product Environmental Profile



## Single phase Uninterruptible Power Supply (9PX HV lithium-ion UPS)

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| **Representative product** | 9PX3000IRT2U-L |
| **Description of the product** | Eaton 9PX lithium-ion UPS is the latest addition to Eaton's 9 series single-phase it is offered in both configuration (rackmount and tower) with extended battery life expectancy of 8 to 10 years. The 9PX lithium-ion UPS has power ratings ranging from 1.5 to 3 kVA, with low and high voltage options and offers up to four optional external battery modules for extra runtime. |
| **Homogeneous Environmental Families Covered** | The PEP concerns the single phase 9PX UPS offerings with 2.2 kVA of product rating |
| **Functional unit** | To protect the load of 2400 Watts against input power failure during 8 years and provide a backup time of 10.5 minutes in case of a power outage |
| **Company information** | Eaton Electrical Ltd.<br>NO.4 LIU FANG RD.,BLOCK 67 BAOAN,SHENZHEN,CHINA<br>Email: productstewardship-es@eaton.com |

| Constituent Materials | | | |
|---|---|---|---|
| Reference product mass | 3.21E+01kg (with unit packaging) | | |
| Category PEP Material | Materials | Masse (kg) | Percentage (%) |
| Metals | Steel | 9.01E+00 | 28.08% |
| Metals | Aluminium | 3.63E+00 | 11.31% |
| Others | Lithium iron | 2.35E+00 | 7.32% |
| Others | Cardboard | 2.06E+00 | 6.42% |
| Plastics | Polyethylene Terephthalate | 1.98E+00 | 6.17% |
| Metals | Copper | 1.97E+00 | 6.14% |
| Others | Wood pellet | 1.66E+00 | 5.17% |
| Others | Raw Materials | 1.41E+00 | 4.39% |
| Plastics | Polyethylene Low Density Granulate | 1.14E+00 | 3.55% |
| Plastics | Acrylonitrile Butadiene Styrene | 8.71E-01 | 2.71% |
| Others | Graphite | 8.21E-01 | 2.56% |
| Plastics | Polyurethane foam | 6.70E-01 | 2.09% |
| Others | Ferrites | 5.00E-01 | 1.56% |
| Metals | Epoxy resin | 4.10E-01 | 1.28% |
| Others | Miscellaneous | 3.61E+00 | 11.25% |
| Total | | 3.21E+01 | 100.00% |

## Substance Assessment

The representative product is compliant with the EU-RoHS Directive (2011/65/EU) by application of exemptions and the product contains lead (Pb) which is listed as Substance-of-Very-High-Concern (SVHC) on the Candidate List of the EU-REACH Regulation (1907/2006/EC).

| Additional Environmental Information | |
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| Manufacturing | The reference product is assembled at 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. Waste generated due to primary packaging is handled at Eaton distribution center. |
| Installation | Product need standard tools which does not require any additional energy source and no waste other than the obsolete product packaging is generated during this step. |
| Use | The reference product features an expanded battery life, so battery replacement is not necessary in this case. Following operations are considered as a part of this impact assessment<br>• Replacement of parts – manufacturing and delivery to the site of use of PSU, capacitor, and fan<br>• Waste collection and treatment of replaced components |
| End of life | Considering the uncertainty and the lack of formal mechanism to track the actual treatment of reference product in Germany, the reference product End-of-life is modelled based on |

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| | the scenario recommended by the Eco'DEEE method.<br>This product was designed to comply with the following recycling directives/standards:<br>Directive 2012/19/EU (WEEE directive),<br>Directive 2004/12/EC (Packaging directive)<br>Directive 2013/56/EU (Batteries directive)<br><br>Recyclability of product is 61% based on the method of the IEC/TR 62635. |

## Environmental Impacts

The calculation of environmental impacts is the result of a Product Life Cycle Analysis in accordance with ISO 14040/44, covering the entire product lifecycle, i.e. "from cradle to grave" including the following life cycle phases: production, distribution, installation, use and end of life.
System modelling was carried out using the commercial LCA software EIME v5.9.1 with database version CODDE-2020-12.

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| **Manufacturing Phase** | The product is manufactured at Eaton Shenzhen, China plant. |
| **Distribution Phase** | Distribution of the product in its packaging from the manufacturer's last logistics platform to the installation place is considered as per PCR rules. |
| **Installation Phase** | Product installed in Germany<br>Energy model used: Europe |
| **Use Phase** | Reference life time: 08 Years<br>Energy model used: Europe<br>Usage profile: The product has an average energy efficiency of 92.8%. The methodology for the calculation of the electricity consumption is based on Uninterruptible Power Supplies (UPSs) PSR. Total energy losses are 8706 kWh over the 08 years. |
| **End of life Phase** | Battery: Waste treatment by Pyrometallurgical process<br>Other Product disposed with landfill treatment and Incineration.<br>Energy model used: Europe |

### Environmental Impact Indicators: Mandatory

| Indicators | unit | Total | Manufacturing | Distribution | Installation | Use | End of Life |
|---|---|---|---|---|---|---|---|
| Global warming | kg $CO_2$ eq. | 5.01E+03 | 5.92E+02 | 1.33E+01 | 2.41E+00 | 4.39E+03 | 1.65E+01 |
| Ozone depletion | kg $CFC^{-11}$ eq. | 8.11E-04 | 5.13E-04 | 2.41E-08 | 5.34E-09 | 2.97E-04 | 8.22E-07 |
| Acidification | kg $SO_2$ eq. | 2.15E+01 | 3.18E+00 | 3.12E-01 | 2.98E-03 | 1.80E+01 | 1.57E-02 |
| Eutrophication | kg $PO_4^{3-}$ eq. | 2.18E+00 | 1.02E+00 | 3.24E-02 | 1.24E-03 | 1.12E+00 | 5.91E-03 |
| Photochemical Ozone formation | kg ethylene eq. | 1.12E+00 | 1.08E-01 | 1.57E-02 | 2.32E-04 | 9.98E-01 | 1.39E-03 |
| Depletion of abiotic resources - elements | kg antimony eq. | 4.08E-02 | 2.93E-02 | 4.74E-07 | 2.92E-08 | 1.15E-02 | 2.62E-06 |
| Depletion of abiotic resources - fossil fuels | MJ | 5.53E+04 | 5.33E+03 | 1.69E+02 | 8.71E+00 | 4.97E+04 | 6.27E+01 |
| Water pollution | $m^3$ | 2.47E+05 | 5.48E+04 | 1.98E+03 | 1.18E+02 | 1.88E+05 | 1.82E+03 |
| Air pollution | $m^3$ | 2.76E+05 | 7.61E+04 | 1.56E+03 | 3.78E+01 | 1.98E+05 | 9.05E+02 |

## Environmental Impact Indicators: Optional

| Indicators | unit | Total | Manufacturing | Distribution | Installation | Use | End of Life |
|---|---|---|---|---|---|---|---|
| Use of renewable primary energy, excluding renewable primary energy resources used as raw materials | MJ | 1.11E+04 | 2.67E+02 | 2.26E-01 | 4.43E-02 | 1.09E+04 | 6.03E-02 |
| Use of renewable primary energy resources used as raw materials | MJ | 4.18E+01 | 4.18E+01 | 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 | 1.12E+04 | 3.09E+02 | 2.26E-01 | 4.43E-02 | 1.09E+04 | 6.03E-02 |
| Use of non-renewable primary energy, excluding non-renewable primary energy resources used as raw materials | MJ | 8.45E+04 | 8.31E+03 | 1.70E+02 | 8.91E+00 | 7.60E+04 | 8.21E+01 |
| Use of non-renewable primary energy resources used as raw materials | MJ | 3.08E+02 | 2.73E+02 | 0.00E+00 | 0.00E+00 | 3.49E+01 | 0.00E+00 |
| Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) | MJ | 8.48E+04 | 8.58E+03 | 1.70E+02 | 8.91E+00 | 7.60E+04 | 8.21E+01 |
| Use of secondary materials | kg | 7.08E+00 | 7.08E+00 | 0.00E+00 | 0.00E+00 | 4.38E-03 | 0.00E+00 |
| Use of renewable secondary fuels | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Use of non-renewable secondary fuels | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Net use of fresh water | m3 | 1.55E+04 | 1.31E+01 | 2.02E-03 | 3.93E-03 | 1.55E+04 | 2.69E-02 |
| Hazardous waste disposed of | kg | 4.60E+03 | 4.47E+03 | 5.91E-05 | 6.11E-04 | 8.49E+01 | 4.98E+01 |
| Non-hazardous waste disposed of | kg | 1.63E+04 | 3.44E+02 | 7.80E-01 | 1.78E+00 | 1.59E+04 | 7.91E+00 |
| Radioactive waste disposed of | kg | 1.09E+01 | 2.37E-01 | 3.00E-04 | 6.21E-05 | 1.06E+01 | 4.79E-04 |
| Components for re-use | kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Materials for recycling | kg | 2.77E+01 | 5.66E+00 | 1.68E+00 | 4.21E+00 | 1.40E+00 | 1.48E+01 |
| Materials for energy recovery | kg | 1.21E-07 | 8.80E-08 | 0.00E+00 | 0.00E+00 | 3.30E-08 | 0.00E+00 |
| Total use of primary energy during the life cycle | MJ | 6.30E-02 | 1.89E-02 | 4.41E-02 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

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

| Product Rating | Manufacturing | Distribution | Installation | Use phase except ADPe | Use phase ADPe | EoI |
|---|---|---|---|---|---|---|
| EU 28/2.2 kVA | 1.0 | 1.00 | 1.00 | 0.92 | 1.00 | 1.00 |

For the products offerings in other regions manufacturing, installation & end of life impacts are same. However, Distribution Phase impacts are depends upon mode of transport and distance from manufacturing location and Use Phase impacts are based upon grid mix emission factors of respective country.

| Disclaimer |
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| 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. |

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| *Registration N°* | EATO-00014-V01.01-EN | *Drafting rules* | PCR-ed3-EN-2015 04 02 |
| *Verifier accreditation N°* | VH18 | *Supplemented by* | PSR-0010-ed1.1-EN-2015 10 16 |
| *Date of issue* | 12-2021 | *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 »* | | | |