

# Product Environmental Profile

**EasyPact MVS 08-40: MVS16N (1600A, 50kA)**



# Product Environmental Profile - PEP

## Product overview

The EasyPact MVS Air Circuit Breaker range is designed to guarantee the protection of electrical distribution systems from 800 A to 4000 A. MVS combined with accessories like XF coil to remotely close the circuit breaker with the spring mechanism in charged condition, MX coil to instantaneously open the circuit breaker when energized & smart ET range of trip system enhance protection for your vital electrical installation under fault conditions.

The Product Environmental Profile (PEP) covers the entire range:

- EasyPact MVS 3-pole or 4-pole, fixed or draw-out circuit breaker/switch with a rating of 800 A to 4000 A
- Motor operated
- Fitted with:
  - ET Range of Trip System
  - XF coil
  - MX coil

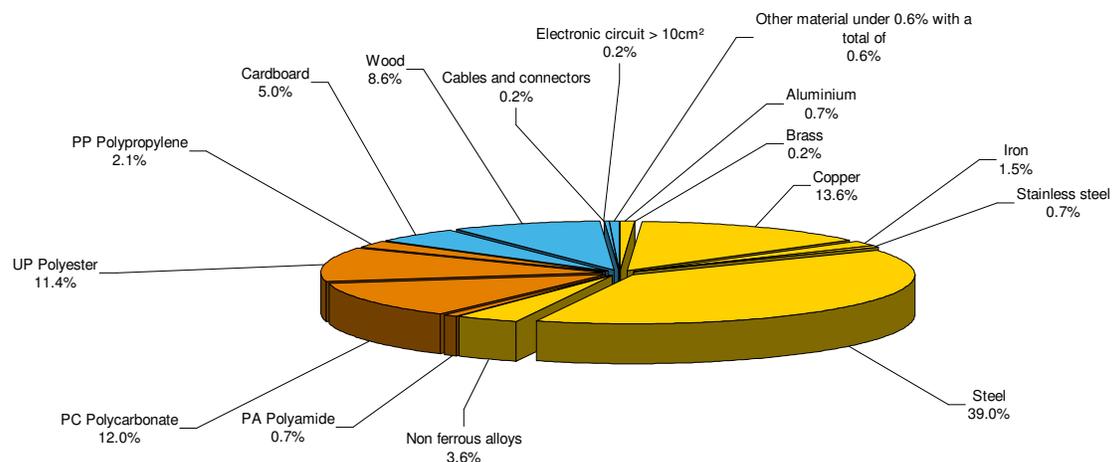
The representative product used for the analysis is the 3P and draw-out circuit breaker MVS16N (1600A, 50kA) with trip unit of ETV6G trip system.

The environmental impacts of this referenced product are representative of the impacts of the other products of the range which are developed with a similar technology.

The environmental analysis was performed in conformity with ISO 14040.

## Constituent materials

The mass of the product range is from 46 kg and 126 kg including packaging. It is 81 kg for the MVS16N (3P/drawout). The constituent materials are distributed as follows:



## Substance assessment

Switch disconnecter version of this product range is designed in conformity with the requirements of the RoHS directive (European Directive 2002/95/EC of 27 January 2003) and do not contain, or only contain in the authorised proportions, lead, mercury, cadmium, hexavalent chromium or flame retardants (polybrominated biphenyls - PBB, polybrominated diphenyl ethers - PBDE) as mentioned in the Directive

## Manufacturing

The EasyPact MVS08-40 product range is manufactured at a Schneider Electric production site on which an ISO14001 certified environmental management system has been established.

## Distribution

The weight and volume of the packaging have been optimized, based on the European Union's packaging directive.

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The EasyPact MVS08-40 packaging weight is from 11kg (3P) to 13kg (4P). It consists of Cardboard (4 kg for 3P and 6 kg for 4P) and wooden support (7 kg).

The product distribution flows have been optimised by setting up local distribution centres close to the market areas.

## Use

The products of the EasyPact MVS08-40 range do not generate environmental pollution (noise, emissions) requiring special precautionary measures in standard use and do not need special maintenance.

The dissipated power depends on the conditions under which the product is implemented and used. This dissipated power is between 42W and 900W for the EasyPact MVS08-40 product range. It is 390 W for the referenced MVS16N (3P/drawout).

This thermal dissipation represents less than 0,2 % of the power which passes through the product.

## End of life

At end of life, the products in the EasyPact MVS08-40 have been optimized to decrease the amount of waste and allow recovery of the product components and materials.

The trip unit part of this product range contains PCBA and a lithium battery that should be separated from the stream of waste in order to optimize the end-of-life treatment by special treatments. The location of these components and other recommendations are given in the End of Life Instruction document which is available for this product range.

The recyclability potential of the products has been evaluated using the "ECO DEEE recyclability and recoverability calculation method" (version V1, 20 Sep. 2008 presented to the French Agency for Environment and Energy Management: ADEME).

According to this method, the potential recyclability ratio is: 70 %.

As described in the recyclability calculation method this ratio includes only metals and plastics which have proven industrial recycling processes.

## Environmental impacts

Life cycle assessment has been performed on the following life cycle phases: Materials and Manufacturing (M), Distribution (D), Installation (I) Use (U), and End of life (E).

Modeling hypothesis and method:

- the calculation was performed on the MVS16N (3P/drawout)
- product packaging: is included
- installation components: no special components included.
- scenario for the Use phase: this product range is included in the category 1 Energy passing product: (assumed service life is 20 years and use scenario is: Product dissipation is 390 W, loading rate is 30% and service uptime 30%.
- Geographical zone representativity is India and electrical power model used for calculation is Indian model.

End of life impacts are based on a worst case transport distance to the recycling plant (1000km)

### Presentation of the product environmental impacts

Environmental indicators	Unit	MVS16N (3P/drawout) Air Circuit Breaker					
		S = M + D + I + U + E	M	D	I	U	E
Raw Material Depletion	Y-1	3.96E-12	3.95E-12	9.07E-17	0.00E+00	1.45E-14	1.65E-16
Energy Depletion	MJ	3.28E+04	7.28E+03	6.65E+01	0.00E+00	2.53E+04	1.21E+02
Water depletion	dm <sup>3</sup>	6.02E+03	3.68E+03	6.31E+00	0.00E+00	2.32E+03	1.15E+01
Global Warming	g≈CO <sub>2</sub>	2.48E+06	4.00E+05	5.27E+03	0.00E+00	2.06E+06	9.58E+03
Ozone Depletion	g≈CFC-11	1.43E-01	5.12E-02	3.72E-03	0.00E+00	8.16E-02	6.77E-03
Air Toxicity	m <sup>3</sup>	7.21E+08	2.12E+08	9.92E+05	0.00E+00	5.07E+08	1.80E+06
Photochemical Ozone Creation	g≈C <sub>2</sub> H <sub>4</sub>	5.65E+02	1.75E+02	4.50E+00	0.00E+00	3.77E+02	8.18E+00
Air acidification	g≈H <sup>+</sup>	5.38E+02	1.05E+02	6.71E-01	0.00E+00	4.32E+02	1.22E+00
Water Toxicity	dm <sup>3</sup>	2.66E+05	1.21E+05	6.58E+02	0.00E+00	1.44E+05	1.20E+03
Water Eutrophication	g≈PO <sub>4</sub>	3.42E+01	2.94E+01	8.76E-02	0.00E+00	4.58E+00	1.59E-01
Hazardous waste production	kg	6.34E+01	1.33E+01	1.96E-03	0.00E+00	5.02E+01	3.56E-03

Life cycle assessment has been performed with the EIME software (Environmental Impact and Management Explorer), version 11, and with its database version 4.0

The use phase is the life cycle phase which has the greatest impact on the majority of environmental indicators.

According to this environmental analysis, proportionality rules may be used to evaluate the impacts of other products of this range:

- for all indicators without RMD and WE, the extrapolation parameter is the power consumption of the product except MVS08 for which extrapolation factor is 40%;
- for RMD, the extrapolation parameter is the mass of the silver;
- for WE, the extrapolation parameter is the mass of the product.

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### System approach

As the switch disconnecter version of this product range is designed in accordance with the RoHS Directive (European Directive 2002/95/EC of 27 January 2003), they can be incorporated without any restriction in an assembly or an installation subject to this Directive. 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.

## Glossary

<b>Raw Material Depletion (RMD)</b>	This indicator quantifies the consumption of raw materials during the life cycle of the product. It is expressed as the fraction of natural resources that disappear each year, with respect to all the annual reserves of the material.
<b>Energy Depletion (ED)</b>	This indicator gives the quantity of energy consumed, whether it be from fossil, hydroelectric, nuclear or other sources. This indicator takes into account the energy from the material produced during combustion. It is expressed in MJ.
<b>Water Depletion (WD)</b>	This indicator calculates the volume of water consumed, including drinking water and water from industrial sources. It is expressed in dm <sup>3</sup> .
<b>Global Warming (GW)</b>	The global warming of the planet is the result of the increase in the greenhouse effect due to the sunlight reflected by the earth's surface being absorbed by certain gases known as "greenhouse-effect" gases. The effect is quantified in gram equivalent of CO <sub>2</sub> .
<b>Ozone Depletion (OD)</b>	This indicator defines the contribution to the phenomenon of the disappearance of the stratospheric ozone layer due to the emission of certain specific gases. The effect is expressed in gram equivalent of CFC-11.
<b>Air Toxicity (AT)</b>	This indicator represents the air toxicity in a human environment. It takes into account the usually accepted concentrations for several gases in the air and the quantity of gas released over the life cycle. The indication given corresponds to the air volume needed to dilute these gases down to acceptable concentrations.
<b>Photochemical Ozone Creation (POC)</b>	This indicator quantifies the contribution to the "smog" phenomenon (the photochemical oxidation of certain gases which generates ozone) and is expressed in gram equivalent of ethylene (C <sub>2</sub> H <sub>4</sub> ).
<b>Air Acidification (AA)</b>	The acid substances present in the atmosphere are carried by rain. A high level of acidity in the rain can cause damage to forests. The contribution of acidification is calculated using the acidification potentials of the substances concerned and is expressed in mode equivalent of H <sup>+</sup> .
<b>Water Toxicity (WT)</b>	This indicator represents the water toxicity. It takes into account the usually accepted concentrations for several substances in water and the quantity of substances released over the life cycle. The indication given corresponds to the water volume needed to dilute these substances down to acceptable concentrations.
<b>Hazardous Waste Production (HWP)</b>	This indicator calculates the quantity of specially treated waste created during all the life cycle phases (manufacturing, distribution and utilization). For example, special industrial waste in the manufacturing phase, waste associated with the production of electrical power, etc. It is expressed in kg.

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### Schneider Electric Industries SAS

35, rue Joseph Monier  
CS 30323  
F- 92506 Rueil Malmaison Cedex  
RCS Nanterre 954 503 439  
Capital social 896 313 776 €

www.schneider-electric.com

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