Product Environmental Profile

Homeline™ Miniature Circuit Breakers

PEP ecoPASSPORT®

Schneider Electric

PEP EcoPassport SCHN-2013-033-V0

Product Environmental Profile - PEP

Product overview

The main purpose of the Homeline Circuit Breaker product range is to ensure protection of low voltage electrical installations.

Homeline Miniature Circuit Breakers comply with UL® 489 or CSA® no 22.2 with an available offer:

- rated 15A to 200A
- short circuit current breaking capacity of 10kA based on reference number
- 1 and 2 pole configurations

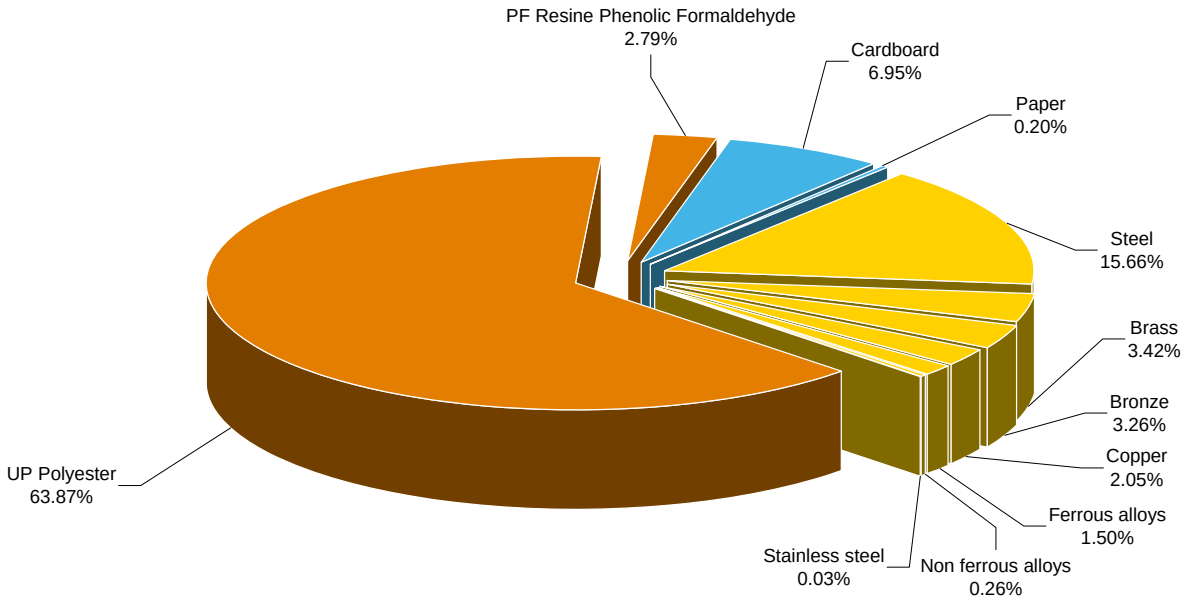
The representative product used for the analysis is the HOM120 1 Pole 20A 120V circuit breaker.

The environmental impacts of the referenced products are representative of the impacts of the other products of the circuit breaker range as these products are designed and manufactured with the same technology and constructed with similar component parts.

The environmental analysis was performed in conformity with ISO 14040.

Constituent materials

The mass of the product range is from .30 lbs (136 g) to .84 lbs (381 g) including packaging. It is 0.30 lbs (136 g) for the HOM120 Miniature Circuit Breaker analysed. The constituent materials are distributed as follows:



Substance assessment

Products of this range are 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

Details of ROHS and REACH substances information are available on the Schneider-Electric Green Premium website . (http://www2.schneider-electric.com/sites/corporate/en/products-services/green-premium/green-premium.page)

Manufacturing

The Homline Miniature Circuit Breaker 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. The Homeline Miniature Circuit Breaker packaging weight is 0.010 lbs (4.88 g) and consists of corrugated carton.

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

Use

The products of the Homeline Miniature Circuit Breaker range do not generate environmental pollution (noise, emissions) requiring special precautionary measures in standard use.

The dissipated power depends on the conditions under which the product is implemented and used. This dissipated power is between 1.58 W and 15.8 W for the Homeline Miniature Circuit Breaker range. It is 1.58 W for the referenced HOM120 Miniature Circuit Breaker at 100% rated current.

This thermal dissipation represents less than 0.1% of the power which passes through the product.

The product range does not require special maintenance operations.

End of life

At end of life, the products in the Homeline Miniature Circuit Breaker range have been optimized to decrease the amount of waste and allow recovery of the product components and materials.

This product range doesn’t need any special end-of-life treatment. According to countries’ practices this product can enter the usual end-of-life treatment process.

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: 24%.

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 HOM120 Miniature Circuit Breaker.
- Product packaging: Included.
- Installation components: No special components included.
- Scenario for the Use phase: this product range is included in the category Energy Passing Product with an assumed service life of 20 years. The use scenario is: product dissipation is 1.58 W, loading rate is 30% and service uptime of 100%.
- The geographical representative area for the assessment is the United States, and the electrical power model used for calculation is the American model.

End of life impacts are based on a worst case transport distance to the recycling plant 621 miles (1000km).

Presentation of the product environmental impacts

Data calculated for product use for a period of 20 years.

Environmental indicators	Unit	For a HOM120					
		S = M + D + I + U + E	M	D	I	U	E
Raw Material Depletion	**Y-1**	$1.17\ 10^{-14}$	$1.15\ 10^{-14}$	$4.69\ 10^{-19}$	0	$2.50\ 10^{-16}$	$2.79\ 10^{-19}$
Energy Depletion	**MJ**	$2.88\ 10^{2}$	$1.14\ 10^{1}$	$3.44\ 10^{-1}$	0	$2.76\ 10^{2}$	$2.04\ 10^{-1}$
Water depletion	**dm^3**	$3.89\ 10^{1}$	7.25	$3.26\ 10^{-2}$	0	$3.16\ 10^{1}$	$1.94\ 10^{-2}$
Global Warming	**g≈CO_2**	$1.87\ 10^{4}$	$5.70\ 10^{2}$	$2.72\ 10^{1}$	0	$1.81\ 10^{4}$	$1.62\ 10^{1}$
Ozone Depletion	**g≈CFC-11**	$7.40\ 10^{-4}$	$1.17\ 10^{-4}$	$1.92\ 10^{-5}$	0	$5.92\ 10^{-4}$	$1.14\ 10^{-5}$
Air Toxicity	**m^3**	$4.35\ 10^{6}$	$3.20\ 10^{5}$	$5.13\ 10^{3}$	0	$4.02\ 10^{6}$	$3.05\ 10^{3}$
Photochemical Ozone Creation	**g≈C_2H_4**	4.02	$2.92\ 10^{-1}$	$2.33\ 10^{-2}$	0	3.69	$1.38\ 10^{-2}$
Air acidification	**g≈H^+**	3.61	$1.94\ 10^{-1}$	$3.47\ 10^{-3}$	0	3.41	$2.06\ 10^{-3}$
Water Toxicity	**dm^3**	$2.08\ 10^{3}$	$3.52\ 10^{2}$	3.40	0	$1.72\ 10^{3}$	2.02
Water Eutrophication	**g≈PO_4**	$1.40\ 10^{-1}$	$9.72\ 10^{-2}$	$4.52\ 10^{-4}$	0	$4.16\ 10^{-2}$	$2.69\ 10^{-4}$
Hazardous waste production	**kg**	$4.15\ 10^{-1}$	$1.93\ 10^{-2}$	$1.01\ 10^{-5}$	0	$3.96\ 10\text{-}^{1}$	$6.02\ 10^{-6}$

Life cycle assessment has been performed with the EIME software (Environmental Impact and Management Explorer), version 4.0, and with its database version 11.0.

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: Depending on the impact analysis, the environmental indicators of other products in this family may be proportionaly extrapolated by the mass and energy consumption of the Miniature Circuit Breaker.

System approach

As the products of the range are 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

Raw Material Depletion (RMD)
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.

Energy Depletion (ED)
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.

Water Depletion (WD)
This indicator calculates the volume of water consumed, including drinking water and water from industrial sources. It is expressed in dm^3.

Global Warming (GW)
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_2.

Ozone Depletion (OD)
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.

Air Toxicity (AT)
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.

Photochemical Ozone Creation (POC)
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_2H_4).

Air Acidification (AA)
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^+.

Water Toxicity (WT)
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.

Hazardous Waste Production (HWP)
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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Date of issue: 09-2013				Period of validity: 4 years
Independent verification of the declaration and data, according to ISO 14025:2006				
Internal	X	External		
In compliance with ISO 14025:2006 type III environmental declarations				
PCR review was conducted by an expert panel chaired by J. Chevalier (CSTB).				
The elements of the actual PEP cannot be compared with elements from another program.				

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