

Product Environmental Profile

Miniature Circuit Breakers 3 kA and 6 kA, B and C curve, from 1 to 4 poles



Company information

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A question concerning the Product Environmental Profile:
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References covered

Miniature Circuit Breakers 3 kA and 6 kA, B and C curve, from 1 to 4 poles

Methodology

This PEP has been performed according to the PCR version PEP-PCR-ed 1-FR-2009 12 18 issued by the PEP ecopassport program. For further information, please see the website of the program www.pep-ecopassport.org

Reference product

Reference product identification

Miniature Circuit Breaker 6kA, C curve, 16A, 1 pole

Product category as defined in the PCR

Electric installation devices (Passive product)

Functional unit

Protect circuits against overload current and short circuits during 20 years. The MCB is crossed by 30% of its current range and 30% of the time.

The functional unit is based on the use scenario recommended by the PCR for the category of the reference product.

Materials and substances

All useful measures have been adopted to ensure that the materials used in the composition of the product do not contain any substances banned by the legislation in force at the time of marketing.

Plastics			Metals			Other		
	g	%		g	%		g	%
PA 6	21,75	22,8%	Steel	49,68	52,2%	Cardboard + Paper	4,29	4,5%
PBT	1,05	1,1%	Copper	5,08	5,3%	Talcum	8,24	8,7%
PA 66	0,1	0,1%	Silver	0,05	0,1%	Glass fiber	0,57	0,6%
			Other	0,71	0,7%	Other	3,74	3,9%
Total mass of reference product :			95,22 g					

RoHS

All our products comply, on voluntary basis, with the restrictions on substances specified in the RoHS directive.

REACH

At the date of PEP release, the product doesn't contain, as far as we knew, any substance of the candidate list to authorization of the REACH regulation with a concentration above 0,1% w/w.

Manufacturing

These products are manufactured by a site that has received an environmental certification ISO 14001.

Distribution

The packaging has been designed in accordance with current regulations: European directive 94/62/CE relative to packaging and packaging waste.

The used packaging is 100% recyclable or recoverable.

Packaging and logistic flows are continuously improved in order to reduce their impact.

Installation

Installation processes

The processes to install the product are not considered in this study because of their weak impact compared to the other life cycles steps.

Installation elements (non delivered with the product)

Elements non delivered with the product and needed to install the product are not considered too.

Usage

For the considered scenario, the product has an average power of 0,205 W in active mode during 30% of the time and 0 W in sleep mode during 70% of the time. This corresponds to an energy consumption of 10,77 kWh for the use span of 20 years.

Energy model of the usage phase: Europe

Consumables and maintenance : None

End of life

Considering the complexity and the lack of knowledge of the electric and electronic recycling channel and processes, we considered only a 1000 km transport of the product at end of life, as recommended by the PCR.

The recycling potential of the product is : 55%. The calculus of this rate is based on the Eco'DEEE method developed by BUREAU VERITAS CODDE.

Components that have to be extracted and sent to specific treatment chains as specified by the European directive 2002/96/CE: None

Environmental impacts

Evaluation of the environmental impact covers the following life cycle stages: raw materials + manufacturing (RMM), distribution (D), installation (I), usage (U) and end of life (EoL).

All calculations are done with EIME software version 4.0 with the database version 11.3.

To determin the environmental impact of a product covered by the PEP, environmental indicators must be multiplied by the given factors:

Rating current	0,5	1	2	3	4	6	10	13	20	25	32	40	50	63
Curve	B or C	B	C	B	C	B	C	B or C	B or C	B or C				
Coefficient for Raw Material Depletion and Water Europhication indicators	2,8	2,8	2,8	2,8	2,8	1	1	1	1	1	1	1	1	2,8
Coefficient for other indicators	0,6	0,7	0,7	0,9	1,1	0,7	0,5	1,0	0,7	0,8	0,9	1,2	1,2	1,3

Indicators	Unit	Manufacturing RMM	Distribution D	Installation I	Usage U	End of Life EoL	GLOBAL
Raw Material Depletion	year ⁻¹	4,63E-15	5,14E-19	0	1,23E-16	1,19E-19	4,76E-15
Energy Depletion	MJ	7,23E+00	3,72E-01	0	1,10E+02	8,75E-02	1,17E+02
Water Depletion	dm ³	3,24E+00	3,58E-02	0	1,70E+01	8,31E-03	2,02E+01
Global Warming	g ~ CO ₂	5,14E+02	2,97E+01	0	5,67E+03	6,91E+00	6,22E+03
Ozone Depletion	g ~ CFC ₁₁	4,63E-05	2,11E-05	0	4,82E-04	4,90E-06	5,55E-04
Air Toxicity	m ³	1,18E+05	2,19E+04	0	1,08E+06	1,35E+03	1,22E+06
Photochemical Ozone Creation	g ~ C ₂ H ₄	1,65E-01	3,57E-02	0	1,95E+00	5,92E-03	2,15E+00
Air Acidification	g ~ H ⁺	9,52E-02	1,71E-02	0	8,87E-01	9,15E-04	1,00E+00
Water Toxicity	dm ³	1,22E+02	3,55E+00	0	1,36E+03	8,66E-01	1,49E+03
Water Eutrophication	g ~ PO ₄ ³⁻	6,73E-02	4,22E-04	0	1,60E-02	1,15E-04	8,39E-02
Hazardous Waste Production	kg	5,23E-03	1,20E-05	0	8,94E-02	2,58E-06	9,46E-02

Verification

Registration n° : HAGE-2011-009-V1-EN	Editorial management : PEP-PCR-ed 1-FR-2009 12 18
Verifier n° : VH03	Program information: www.pep-ecopassport.org
Edition date : 13/07/2011	Valid for : 4 ans
Independent verification of the declaration and data, according to ISO 14025:2006 Internal <input checked="" type="checkbox"/> External <input type="checkbox"/>	
Compliant with the standard ISO 14025 : 2006 Type III environmental declarations	
The review of the PCR has been carried out by a panel of experts chaired by J. Chevalier (CSTB)	
The results of this PEP cannot be compared with results from another program	
	

Glossary

Environmental impact	Attribute or aspect of the natural environment, human health or resources allowing the identification of a problematic environmental aspect.
Life Cycle Assessment (LCA)	Compilation and evaluation of input, output and potential environmental impact of a product or system, during its life cycle, "from cradle to grave". This procedure is described by the standard ISO14040 and its complementary standards.
Recycling potential	Percentage of material that can be recycled calculated with Eco'DEEE method. It does not take into account the existence, or not, of recycling plants, which are heavily dependant on the local situation.
EIME (Environmental Information and Management Explorer)	Software modelling the environmental impacts of a product based on the methodology of life cycle assessment.
Energy Depletion	Indicates, in megajoules, the total energy consumption for the whole life cycle of the product.
Global Warming	Indicates for the whole life cycle stages the released quantity of equivalent-grams of CO ₂ . Example of equivalence principle: 1 g of CO ₂ = 1 g~CO ₂ ; 1 g of CH ₄ (methane) is equal to the effect of 64 g~CO ₂ , etc...
Raw Material Depletion	Indicates the depletion of raw materials, considering the quantity of the world's reserves (minerals, fossil fuels, etc.) for these resources and their current level of consumption. It is expressed as a fraction of the reserves that disappears each year.
Water depletion	Indicates, for the whole life cycle of the product, the total water consumption.
Ozone Depletion	Indicates for the whole life cycle stages the released quantity of equivalent-grams of CFC11.
Air Acidification	Indicates the air acidification due to released gases. Expressed in equivalent-grams of H ⁺ .
Hazardous Waste Production	Indicates the weight of hazardous waste produced during the life cycle of the product.
Air pollution	Indicates the volume of clean air needed to dilute the released pollutant gas in order to achieve the mandatory air concentration.
Water pollution	Indicates the volume of clean water needed to dilute the released pollutant substances in order to achieve the mandatory water concentration.
Photochemical Ozone Creation	Indicates for the whole life cycle stages the released quantity of equivalent-grams of C ₂ H ₄ .
Water Eutrophication	Indicates for the whole life cycle stages the released quantity of equivalent-grams of PO ₄ -P.

Nota :

The picture has no contractual value.

All numerical values indicated in this document may vary and depend of many factors such as the tolerance related to materials, the usage and environment conditions of the products, installation characteristics,... Real values for a product in a concrete application may therefore change.

The usage time mentioned in this document is an average duration chosen for the need of the calculations. This value cannot be assimilated to the minimum, average or real life time.

The responsibility of the company, issuing this document, can never be engaged if differences would be noticed between the values given by this document and real ones, whatever the causes and/or consequences would be.