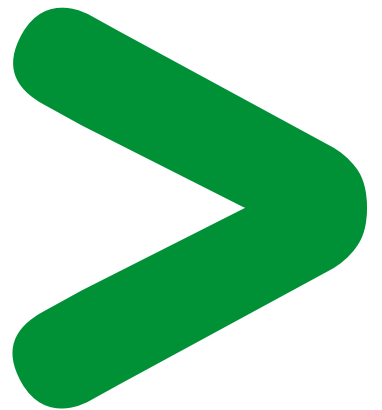


Product Environmental Profile

D'clix XE circuit breakers



Product Environmental Profile - PEP

Product Overview

The main purpose of the D'clik XE range of circuit breakers is to protect low voltage electrical installations against overloads and short-circuits. They can withstand and interrupt the current under normal conditions. Under abnormal conditions, they can withstand and interrupt currents such as short-circuit currents for a specified period.

This range consists of plug-in circuit breakers rated at 2 to 32 A with a breaking capacity of 3000 A.

The representative product used for the analysis is the D'clik XE (1P+N) 16 A curve C circuit breaker, reference 16726. It is representative of the D'clik XE circuit breaker range.

The environmental impacts of this referenced product are representative of the impacts of the other products in the range for which the same technology is used.

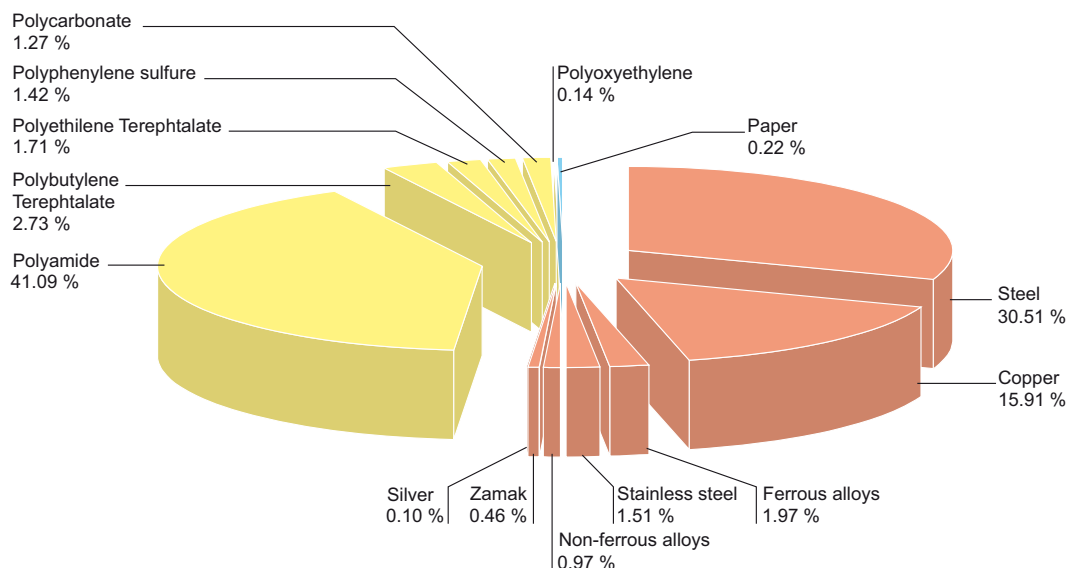
The environmental analysis was performed in conformity with ISO 14040 "Environmental Management: Life cycle assessment – Principle and framework".

This analysis takes the stages in the life cycle of the product into account.

Constituent materials

The mass of the products in the range is from 100 g to 109 g, not including the packaging. It is 105 g for the D'clik XE 16 A circuit breaker analysed.

The constituent materials are distributed as follows:



The products in the D'clik XE circuit breaker range are designed in compliance with the requirements of the RoHS directive (directive 2002/95/EC of 27 January 2003) and do not contain levels of lead, mercury, cadmium, hexavalent chromium or flame retardants (polybrominated biphenyls PBB, polybrominated diphenyl ethers PBDE) above the permissible thresholds mentioned in the directive.

Manufacturing

The D'clik XE circuit breaker range is manufactured at a Schneider Electric production site on which an ISO 14001 certified environmental management system has been established.

Distribution

The weight and volume of the packaging have been reduced in compliance with the European Union's packaging directive. The weight of the packaging of the 16 A D'clik XE is 6.5 g. It is made of 100 % cardboard. The product distribution flows have been optimised by setting up local distribution centres close to the market areas.

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Utilization

The products in the D'clac XE range of circuit breakers do not generate any environmental pollution requiring special precautionary measures (noise, emissions, etc.).

The dissipated power depends on the conditions under which the product is implemented and used.

This dissipated power ranges between 2 W and 4.4 W (loss of wattage due to the Joule effect) for the circuit breakers in the D'clac XE range.

For a utilisation rate of 30 % on the basis of 7 h/day and 5 % for 17 h/day, it is 3.3 W for the D'clac XE 16 A circuit breaker referenced.

The heat dissipation accounts for less than 0.09 % of the power passing through the product.

End of life

At end of life, the products in the D'clac XE circuit breaker range can either be dismantled or crushed to facilitate the recovery of the various constituent materials.

The recycling potential is more than 86 %. This percentage includes the metallic and thermoplastic materials in compliance with the RoHS directive.

Environmental impacts

The EIME (Environmental Impact and Management Explorer) software, version 2.4, and its database, version 5.4, were used for the Life Cycle Assessment (LCA).

The assumed service life of the product is 20 years, the utilisation rate of the installation is 30 % for 7 h/day and 5 % for 17 h/day and the European electrical power model is used.

The analysis focused on a D'clac XE 16 A circuit breaker.

The environmental impacts were analysed for the Manufacturing (M) phase, including the processing of raw materials, and for the Distribution (D) and Utilisation (U) phases.

Presentation of product environmental impacts:

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

Indicator	Unit	For a 16 A curve C D'clac XE			
		S = M+D+U	M	D	U
Raw Material Depletion	Y-1	1.06 10 ⁻¹⁴	1.05 10 ⁻¹⁴	3.00 10 ⁻¹⁹	1.55 10 ⁻¹⁶
Energy consumption	MJ	1.85 10 ²	1.06 10 ¹	2.16 10 ⁻¹	1.74 10 ²
Water Depletion	dm ³	3.10 10 ¹	8.40 10	2.09 10 ⁻²	2.29 10 ¹
Global Warming	g≈CO ₂	1.13 10 ⁴	4.23 10 ²	1.88 10	1.09 10 ⁴
Ozone Depletion	g≈CFC-11	1.45 10 ⁻³	9.37 10 ⁻⁵	1.23 10 ⁻⁵	1.35 10 ⁻³
Photochemical Ozone Creation	g≈C ₂ H ₄	4.03 10	1.65 10 ⁻¹	2.35 10 ⁻²	3.84 10
Air Acidification	g≈H ⁺	2.03 10	1.75 10 ⁻¹	4.46 10 ⁻³	1.85 10
Hazardous Waste Production	kg	1.60 10 ⁻¹	4.42 10 ³	6.66 10 ⁻⁶	1.56 10 ⁻¹

The life cycle analysis showed that the Manufacturing phase (phase M) has the greatest impact on all the environmental indicators and the environmental parameters of this phase were optimised at the design stage.

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System approach

The D'clac XE product range is used to protect electrical installations against overloads or short-circuits. In the event of an overload or short-circuit, the electrical installation may be damaged, destroyed or become dangerous (fire hazard): it will then have to be replaced.

The D'clac XE product range is designed to provide optimum protection for such installations.

As the products in the range were designed in conformity with the RoHS directive (2002/95/EC of 27 January 2003), they can be integrated unrestrictedly in a device or installation directly governed by these regulations.

NB: the environmental impacts of the product depend on the conditions under which it is installed and used.

The environmental impact data given in the above table is only valid within the specified context and cannot be used directly in the environmental report on the 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 dm³.

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 CO₂.

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.

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 methane (C₂H₄).

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⁺.

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.



We are committed to safeguarding our planet by "Combining innovation and continuous improvement to meet the new environmental challenges".

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