Product Environmental Profile

iDPN circuit breaker
iDPNN circuit breaker

PEP ecoPASSPORT®

Schneider Electric

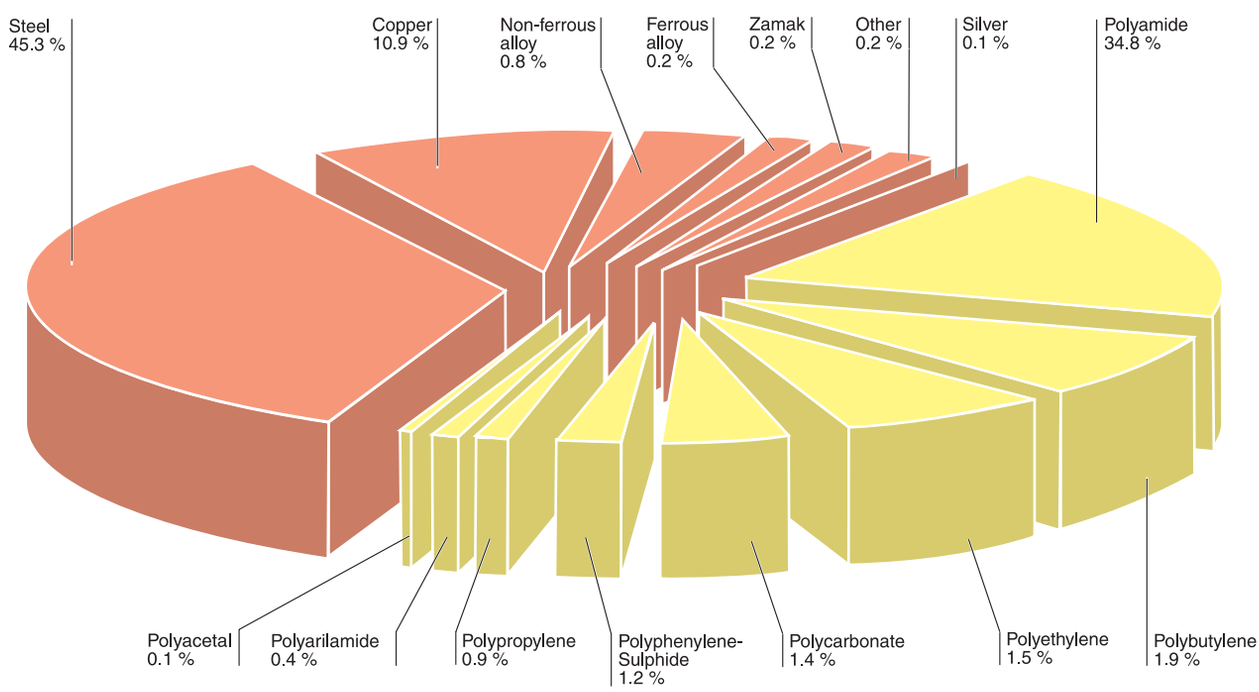
Product Environmental Profile - PEP

Product Overview

The main purpose of the iDPN and iDPNN product range is to provide overcurrent protection in low voltage electrical installations.
This range consists of 1P + N, 3P and 3P + N circuit breakers of between 1 A and 40 A.
The representative product used for the analysis is the iDPN 1P + N 16 A curve C circuit breaker.
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 between 114 g and 351 g.
The weight is 122 g, not including the packaging, for the iDPN 1P + N 16 A curve C 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 in the authorised proportions, lead, mercury, cadmium, chromium hexavalent, flame retardant (polybromobiphenyles PBB, polybromodiphenylthers PBDE) as mentioned in the Directive.

Manufacturing

This 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 94/62/EC.
The weight of the packaging of the iDPN 1P + N 16 A curve C circuit breaker is 3.8 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 this range 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.
It is from 1,79 W to 15,29 W for products in the iDPN and iDPNN range.
It is 3.5 W for iDPN 1P + N 16 A curve C circuit breakers.

The heat dissipation accounts for less than 0.03 % of the power passing through the product.

End of life

At end of life, the products in the iDPN and iDPNN circuit-breaker range can either be dismantled or crushed to facilitate the recovery of the various constituent materials.
The recycling potential is more than 70 %.
This percentage includes the metallic materials conforming to the RoHS directive and the marked plastics.

Environmental impacts

The EIME (Environmental Impact and Management Explorer) software, version 1.6, and its database, version 5.4, were used for the life cycle assessment.
The assumed service life of the product is 20 years, the utilization rate of the installation is 30 % and the European electrical power model is used.
The scope of the analysis was limited to an iDPN 1P + N 16 A curve C circuit breaker.
The environmental impacts were analysed for the Manufacturing (M) phases, including the processing of raw materials, and for the Distribution (D) and utilization (U) phases.

Presentation of product environmental impacts:
Data calculated for product use for a period of 20 years.

Indicator	Unit	For a C16 4.5 kA iDPN circuit breaker			
		S = M+D+U	M	D	U
Raw Material Depletion	**Y-1**	**$1.05\ 10^{-14}$**	$8.78\ 10^{-15}$	$1.45\ 10^{-18}$	$1.73\ 10^{-15}$
Energy consumption	**MJ**	**$1.95\ 10^{3}$**	8.19	1.04	$1.94\ 10^{3}$
Water Depletion	**dm^3**	**$2.56\ 10^{2}$**	3.69	$1.01\ 10^{-1}$	$2.52\ 10^{2}$
Global Warming	**g≈CO_2**	**$1.22\ 10^{5}$**	$5.58\ 10^{2}$	90.8	$1.22\ 10^{5}$
Ozone Depletion	**g≈CFC-11**	**$1.52\ 10^{-2}$**	$6.87\ 10^{-5}$	$5.95\ 10^{-5}$	$1.51\ 10^{-2}$
Photochemical Ozone Creation	**g≈C_2H_4**	**43.2**	$1.75\ 10^{-1}$	$1.13\ 10^{-1}$	42.9
Air Acidification	**g≈H^+**	**20.8**	$1.27\ 10^{-1}$	$2.15\ 10^{-2}$	20.7
Hazardous Waste Production	**kg**	**1.74**	$1.25\ 10^{-3}$	$3.22\ 10^{-5}$	1.74

The utilization phase (phase U) has the greatest impact of all the life cycle phases of the product. It corresponds to the impacts associated with electricity production during this phase. Schneider Electric takes all the necessary measures required to optimise this parameter.

Although the heat dissipation is low with respect to the rated power passing through the product, particular attention is paid to this parameter in order to optimise the impacts on the product or its environment.

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System approach

As the product 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 within an assembly or an installation submitted to this Directive.

N.B.: please note that the environmental impacts of the product depend on the use and installation conditions of the product.
Impacts values given above are only valid within the context specified and cannot be directly used to draw up the environmental assessment of 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 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.

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 (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^+.

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

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