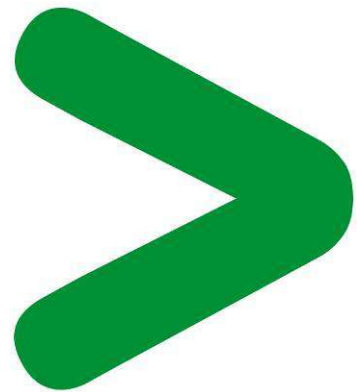


# Product Environmental Profile

**MiCOM Px2x – 30TE cases**  
Standard protection relays



# Product Environmental Profile - PEP

## Product overview

The current document provides the environmental profile for products within the MiCOM Px2x with a 30TE case size (approx 155mm wide), which are intended to fulfil the basic and medium requirements of industrial, utility and building applications providing simplicity and ease of use in a wide range of installations.

The representative product used for this analysis is a MiCOM P127 - feeder management and overcurrent relay

The environmental analysis was performed in conformity with ISO 14040.

## Functional unit & reference flow

MiCOM Px2x are designed to perform the following functional unit:

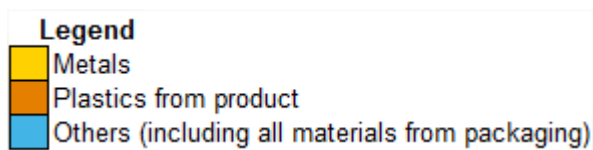
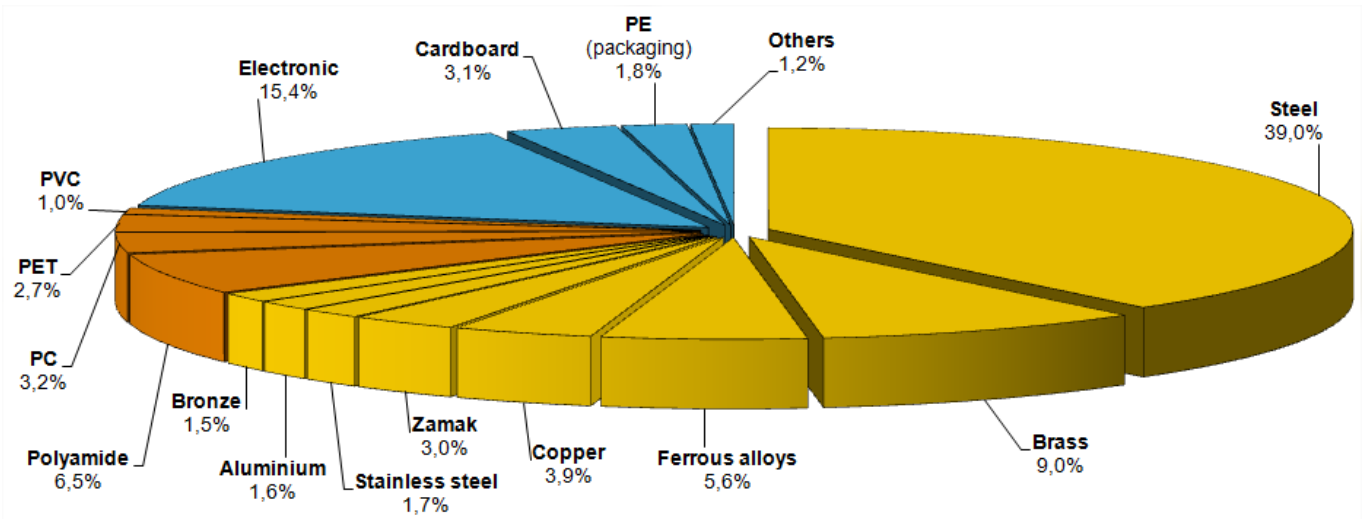
“Being available 24h per day for detection of faults on electrical systems, for 10 years of continuous operations in Europe”.

In the case of MiCOM P127, the electrical system considered is a distribution feeder (i.e. a medium voltage electric line originating at substation), and the reference flow necessary to perform this functional unit is 1 P127, which consist of 1 product and its primary packaging.

## Constituent materials

The weight of the P127 modelled for this study is 4537g, including packaging.

The constituent materials are distributed as follows:



# Product Environmental Profile - PEP

## Substances assessment

Products from the MiCOM range are included in the product category 9i (industrial monitoring & control instruments), and are excluded from the scope of the RoHS directive.

This product contains: lead (0.13%) and traces of hexavalent chromium. These percentages are relative to the total mass of the restricted substances in homogeneous material according to the definition Article 3.19 and Annex II of the European RoHS Directive 2011/65/EU.

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

## Manufacturing

MiCOM Px2x are manufactured at Schneider Electric production sites on which ISO14001 certified environmental management systems have been established.

## Distribution

Weight and volume of packaging have been optimized, based on the European Union's packaging directive. The packaging weighs 242g, consisting mainly in cardboard and polyethylene.

## Use

Products from the MiCOM range do not generate environmental pollution (noise, emissions) requiring special precautionary measures in standard use.

The electrical power consumption depends on the conditions under which the product is implemented and used. For a MiCOM P127, it ranges from 1.7W to 4.8W, depending on the number of activated outputs. Most of the time, the P127 will run at its base burden, which is 1.7W.

The product range does not require special maintenance operations.

## End of life

This product contains PCB assemblies that should be separated from the stream of waste so as to optimize 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 on the Schneider Electric's [Green Premium website](http://www2.schneider-electric.com/sites/corporate/en/products-services/green-premium/green-premium.page). (<http://www2.schneider-electric.com/sites/corporate/en/products-services/green-premium/green-premium.page>).

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: 63%.

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).

Modelling hypothesis and method:

- The calculation was performed on a MiCOM P127.
- Product packaging is included.
- Installation components: no special components included.
- Scenario for the Use phase: This product range is included in the category 2, "Energy consuming products".

According to PSR0005, typical life time is 10 years

Protection relays like P127 are designed to sit in standby mode, and become active only when a fault occurs on the protected feeder, which hardly ever happens on a well managed line. It is thus considered to run 100% of the time at its base consumption of 1.7W.

The electrical power model used for calculation is the European model.

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

# Product Environmental Profile - PEP

## Presentation of the product environmental impacts

Environmental indicators	Unit	MiCOM P127					
		TOTAL	M	D	I	U	E
Air Acidification	g H <sup>+</sup> eq.	3,35E+01	1,43E+01	1,46E-01	0*	1,90E+01	5,87E-02
Air toxicity	m <sup>3</sup>	4,51E+07	2,28E+07	2,18E+05	0*	2,20E+07	8,74E+04
Energy Depletion	MJ	2,65E+03	8,51E+02	1,10E+01	0*	1,78E+03	4,22E+00
Global Warming Potential	g CO <sub>2</sub> eq.	1,47E+05	5,77E+04	7,80E+02	0*	8,80E+04	2,99E+02
Hazardous Waste Production	kg	1,81E+00	1,79E+00	9,64E-07	0*	1,51E-02	3,70E-07
Ozone Depletion Potential	g CFC-11 eq.	3,22E-02	1,22E-02	1,47E-06	0*	2,00E-02	5,67E-07
Photochemical Ozone Creation Potential	g C <sub>2</sub> H <sub>4</sub> eq.	2,44E+01	1,87E+01	2,01E-01	0*	5,44E+00	7,45E-02
Raw Material Depletion	Y <sup>-1</sup>	5,72E-13	5,70E-13	1,59E-17	0*	1,19E-15	6,11E-18
Water Depletion	dm <sup>3</sup>	1,26E+03	1,03E+03	8,08E-02	0*	2,29E+02	3,11E-02
Water Eutrophication	g PO <sub>4</sub> <sup>3-</sup> eq.	5,21E+00	4,38E+00	1,45E-03	0*	8,36E-01	5,56E-04
Water Toxicity	m <sup>3</sup>	5,32E+01	1,36E+01	3,33E-01	0*	3,92E+01	1,28E-01

0\* meaning "represents less than 0.01% of the total life cycle of the reference flow".

Life cycle assessment has been performed with the EIME software (Environmental Impact and Management Explorer), version 5.3, and with its database version 2013-02.

The Manufacturing & Use phases are the life cycle phases which have the greatest impact on the majority of environmental indicators.

## Extrapolation rules

All references in the range are very similar in material constitution, apart from small hardware options, generally negligible (excepted for differential protection relays, see below).

Thus, results calculated for a P127 can be used for any MiCOM Px2x - 30TE size, with the following adjustments:


- Other feeder management relays (P12x) have the same material base, with some options missing. This can translate, for example, by an option board removed, but is overly negligible regarding LCA calculation results
- Motor protection relays (P22x) have the same material base, with a slightly different option board, adapted to motor protection function. Motor protection works with the same principles as for a P12x, but for an electric motor instead of a MV feeder
- Line differential protection relays (P52x) have the same material base, but the option board is replaced by communication board, which draws more current on the power supply. Differential protection works differently than other protection schemes: Two relays are necessary for the scheme to work, one at each end of the protected line.

Model	Functional unit	Reference flow	Use Phase
P12x - Feeder management - 30TE size	Reference		
P22x - Motor protection - 30TE size	Electrical system is an electric motor	1 P22x – 30TE case	Same values
P52x - Line differential protection - 30TE size	Electrical system is an electric line	2 P52x – 30TE case	130% (per relay)

## Glossary

<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>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>Energy Depletion (ED)</b>	This indicator gives the quantity of energy consumed, whether it is from fossil, hydroelectric, nuclear or other sources. It takes into account the energy from the material produced during combustion. It is expressed in MJ.
<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>Hazardous Waste Production (HWP)</b>	This indicator quantifies 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.
<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>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>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>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>Water Eutrophication (WE)</b>	Eutrophication is a natural process defined as the enrichment in mineral salts of marine or lake waters or a process accelerated by human intervention, defined as the enrichment in nutritive elements (phosphorous compounds, nitrogen compounds and organic matter). This indicator represents the water eutrophication of lakes and marine waters by the release of specific substances in the effluents. It is expressed in grams equivalency of PO <sub>4</sub> <sup>3-</sup> (phosphate).
<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.

PEP in compliance with Schneider Electric TT01 v10.3 and TT02 v18 procedures

Registration N° : <b>SCHN-2014-012</b>	Drafting rules: " <b>PEP-PCR-ed 2.1-EN-2012 12 11</b> " <b>supplemented by "PSR0005-ed1-EN-2012 12 11"</b>
Verifier accreditation N° : <b>VH15</b>	Program information: <a href="http://www.pep-ecopassport.org">www.pep-ecopassport.org</a>
Date of issue: 05-2014	Period of validity: <b>4 years</b>
<b>Independent verification of the declaration and data, according to ISO 14025:2006</b>	
Internal <input type="checkbox"/> External <input checked="" type="checkbox"/>	
Compliant with ISO 14025:2006 Type III environmental declarations	
PCR Review was conducted by a panel of experts chaired by J. Chevalier (CSTB)	
PEP data cannot be compared with data taken from another program.	
	

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