Product Environmental Profile

XUX0ARCTT16 Photoelectric Sensor

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Sensors
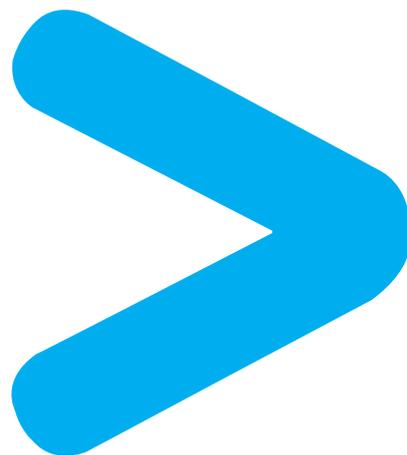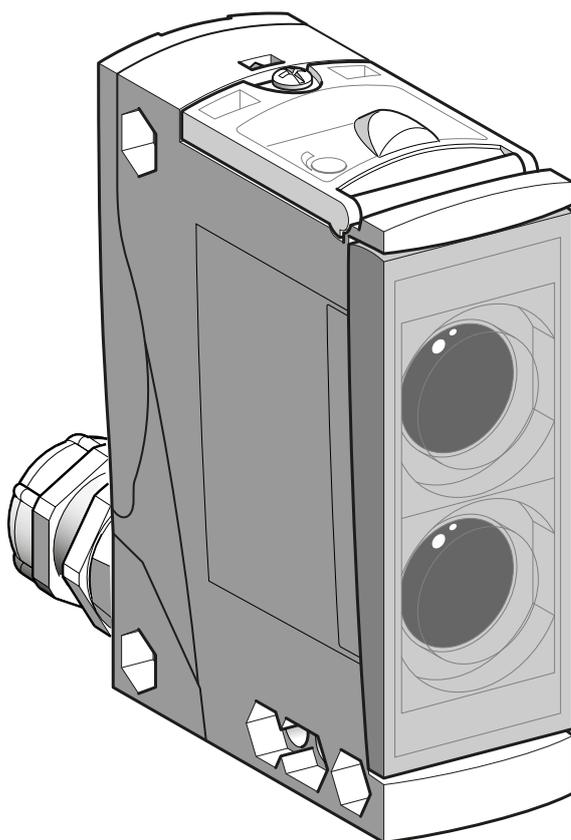
Product Environmental Profile - PEP

Product overview

The main purpose of XUX0ARCTT16 and more generally of any photoelectric sensor, installed in automated installations, is to transmit to the information system the information of presence or absence.

This range consists of parallelepipedic photoelectric sensors XUX*.

The representative product used for the analysis is XUX0ARCTT16.

The environmental impacts of this referenced product are representative of the impacts of the other products of the range which are developed with a similar technology.

The environmental analysis was performed in conformity with ISO 14040.

For more information please contact us at: global-green-sensors@schneider-electric.com

Constituent materials

The mass of the product range is about 200 g including packaging. It is 210 g for XUX0ARCTT16.
The constituent materials are distributed as follows:

Elastomer 0.6%
Paper 4.0%
Steel 1.6%
Stainless steel 0.3%
Cardboard 11.4%
Electronic circuit 13.7%
PA Polyamide 3.5%
PET Polyethylene Terephtalate 0.2%
PMMA Polymethyl Methacrylate 3.9%
PC Polycarbonate 4.7%
PBT Polybutylene Terephtalate 56.3%
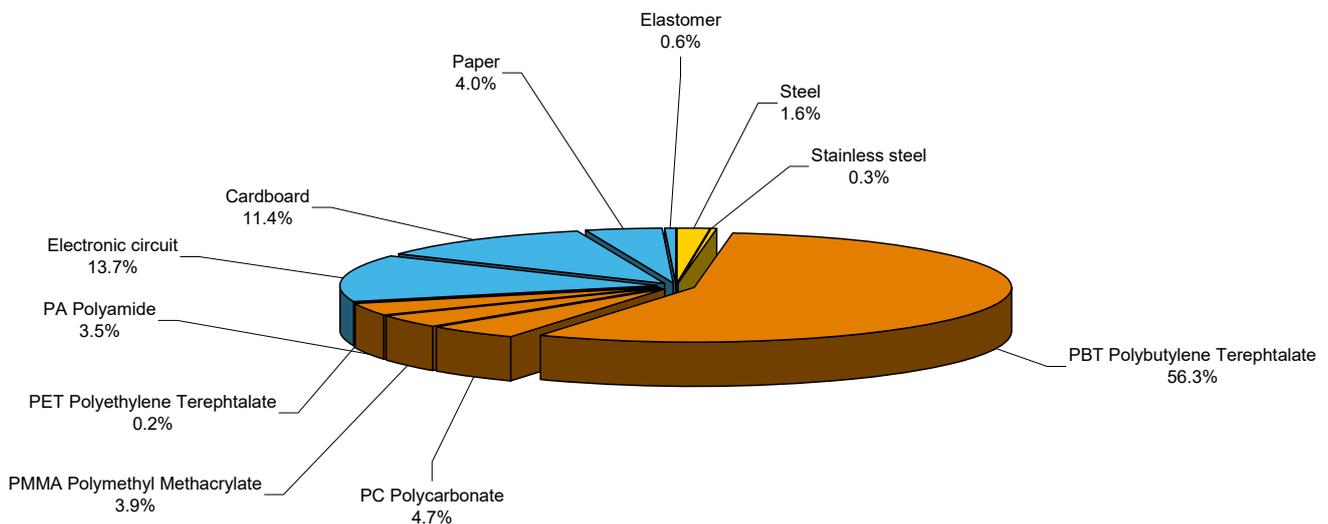
Substance assessment

The representative product of this range XUX0ARCTT16 is designed in conformity with the requirements of the RoHS directive (European Directive 2002/95/EC of 27 January 2003) and does not contain, or only contains in the authorised proportions, lead, mercury, cadmium, hexavalent chromium or flame retardants (polybrominated biphenyls - PBB, polybrominated diphenyl ethers - PBDE) as mentioned in the Directive.

Manufacturing

XUX0ARCTT16 product 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, based on the European Union's packaging directive.
XUX0ARCTT16 packaging weight is 32 g. It consists of cardboard, paper and polyethylene.

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

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Use

The photoelectric sensors do not generate environmental pollution (noise, emissions) requiring special precautionary measures in standard use and do not need special maintenance operation.

The electrical power consumption depends on the conditions under which the product is implemented and used. The electrical power consumed by XUX0ARCTT16 product is between 0.84 W in idle mode and 2 W in active mode. For the purpose of the present modelization it is considered to be in idle mode 90% of the time and in active mode 10% of the time.

End of life

At end of life, the parallelepipedic photoelectric sensors XUX* have been optimized to decrease the amount of waste and allow recovery of the product components and materials.

This product range contains plastic parts and electronic circuits 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.

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: 6%.

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 XUX0ARCTT16
- product packaging: is included
- installation components: no special components included
- scenario for the Use phase: this product range is included in the category of the "energy consuming products" (assumed service life is 10 years and use scenario is: 10% of the time in active mode with a 2 W consumed power and 90% of the time in idle mode with a 0.84 W consumed power).

The representative geographical area for the assessment is Europe and the electrical power model used for calculation is European model.

End of life impacts are based on a worst case transport distance to the recycling plant (1,000km) and the here-after mentioned environmental impacts are valid for a product sold in the European area.

Presentation of the product environmental impacts

Environmental indicators	Unit	For XUX0ARCTT16					
		S = M + D + I + U + E	M	D	I	U	E
Raw Material Depletion	Y^{-1}	9.69E-14	9.58E-14	9.52E-19	0.00E+00	1.09E-15	4.28E-19
Energy Depletion	MJ	1.00E+03	4.28E+01	6.98E-01	0.00E+00	9.59E+02	3.14E-01
Water depletion	dm^3	1.54E+02	1.51E+01	6.63E-02	0.00E+00	1.39E+02	2.98E-02
Global Warming	$g{\approx}CO_2$	5.07E+04	2.26E+03	5.53E+01	0.00E+00	4.84E+04	2.49E+01
Ozone Depletion	$g{\approx}CFC\text{-}11$	3.08E-03	3.92E-04	3.91E-05	0.00E+00	2.63E-03	1.76E-05
Air Toxicity	m^3	8.66E+06	6.18E+05	1.04E+04	0.00E+00	8.03E+06	4.69E+03
Photochemical Ozone Creation	$g{\approx}C_2H_4$	1.80E+01	1.56E+00	4.73E-02	0.00E+00	1.64E+01	2.13E-02
Air acidification	$g{\approx}H^+$	6.98E+00	4.39E-01	7.05E-03	0.00E+00	6.53E+00	3.17E-03
Water Toxicity	dm^3	1.46E+04	8.27E+02	6.91E+00	0.00E+00	1.38E+04	3.11E+00
Water Eutrophication	$g{\approx}PO_4$	3.64E-01	2.49E-01	9.19E-04	0.00E+00	1.14E-01	4.13E-04
Hazardous waste production	kg	8.64E-01	6.10E-02	2.06E-05	0.00E+00	8.03E-01	9.25E-06

Life cycle assessment has been performed with the EIME software (Environmental Impact and Management Explorer), version 4.1, and with its database version 11.

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The manufacturing and the use phases are the life cycle phases which have the greatest impacts on the environmental indicators as indicated in the table hereafter showing the contribution of each phase to the environmental indicators.

Environmental indicators	Unit	Weight of each phase				
		M	D	I	U	E
Raw Material Depletion	Y-1	**99%**	0%	0%	1%	0%
Energy Depletion	MJ	4%	0%	0%	**96%**	0%
Water depletion	dm^3	10%	0%	0%	**90%**	0%
Global Warming	$g{\approx}CO_2$	4%	0%	0%	**95%**	0%
Ozone Depletion	$g{\approx}CFC\text{-}11$	13%	1%	0%	**85%**	1%
Air Toxicity	m^3	7%	0%	0%	**93%**	0%
Photochemical Ozone Creation	$g{\approx}C_2H_4$	9%	0%	0%	**91%**	0%
Air acidification	$g{\approx}H^+$	6%	0%	0%	**94%**	0%
Water Toxicity	dm^3	6%	0%	0%	**94%**	0%
Water Eutrophication	$g{\approx}PO_4$	**68%**	0%	0%	31%	0%
Hazardous waste production	kg	7%	0%	0%	**93%**	0%

System approach

As almost all 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.

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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.

Independant verification of the declaration and data Internal X External	
The elements of the present PEP cannot be compared with elements form another program. Documents in compliance with ISO 14021:2016 "Environmental labels and declarations – Self-declared environmental claims (Type II environmental labelling)"	