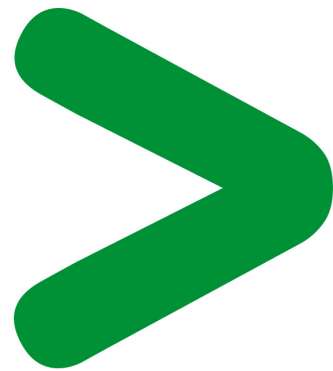# Product Environmental Profile

Power cords

Product Environmental Profile - PEP

Product overview

The main purpose of the power cords is to convey electrical power from a power source to an electronic device.

This range consists of: Power cords with various input/output connectors, different lengths (0.25M to 3.7M) and for use at different voltages (100V, 120V, 230V). The representative product used for the analysis is the AP9870 Power Cord, C13 to C14, 2.5m. The environmental impacts of this referenced product are representative of the impacts of the other products of the range
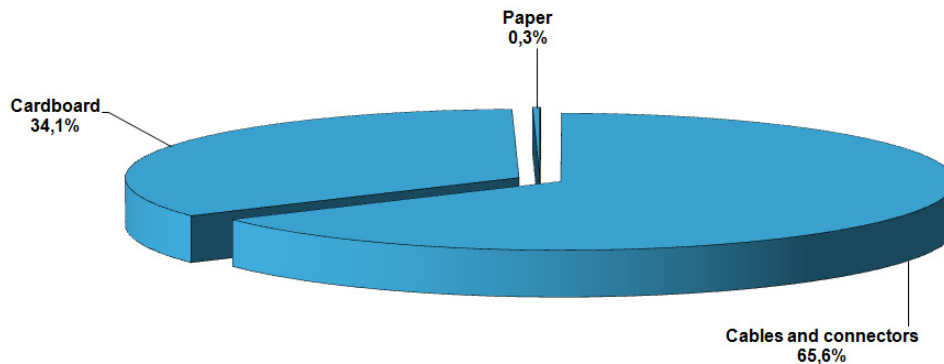
Products	Power Cords – AP987X, AP988X, AP989X, AP87XX, DELLXX

which are developed with a similar technology.

The environmental analysis was performed in conformity with ISO 14040.

Constituent materials

The mass of the product range is from 264 g and 3065 g including packaging. It is 346 g for the AP9870 Power cord.
The constituent materials are distributed as follows:

Paper 0,3%
Cardboard 34,1%
Cables and connectors 65,6%

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 only contain in the authorized proportions, lead, mercury, cadmium, hexavalent chromium or flame retardants (polybrominated biphenyls - PBB, polybrominated diphenyl ethers - PBDE) as mentioned in the Directive

Manufacturing

The power cords product range 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.
The AP9870 Power cord packaging weight is *119 g*. It consists of cardboard and paper based labels.

Use

The products of the Power cords range do not generate environmental pollution (noise, emissions) requiring special precautionary measures in standard use.
The dissipated power depends on the conditions under which the product is implemented and used. This dissipated power for the range is:

Product	I MAX (A)	Load	Losses (W)	Annual electricity consumption (kWh)	Unit
AP9870 (Reference)	10	0.3	1.187	1.64	W
Worst case	16	0.3	0.542	4.75	W
Best case	20	0.3	0.149	1.30	W

This thermal dissipation represents less than 1% of the power which passes through the product.

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End of life

At end of life, the products in the Power cords range have been optimized to decrease the amount of waste and allow recovery of the product components and materials.

External cables should be separated from the stream of waste so as to optimize end-of-life treatment by special treatments.

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: 22%.

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 the AP9870 Power cord
- product packaging: is included
- Installation components: no special components included.
- scenario for the Use phase: this product range is included in the category 1: Energy passing product
  Assumed service life is 10 years corresponding to the lifespan of the system
  Use scenario is: Dissipation is 1.187 W, loading rate is 30% and service uptime percentage is 100%.
  The electrical power model used for calculation is the average European model.
- End of life impacts are based on a worst case transport distance to the recycling plant (1000km)

Presentation of the product environmental impacts

Environmental indicators	Unit	For AP9870 Power cord					
		S = M + D + I + U + E	M	D	I	U	E
Raw Material Depletion	Y^{-1}	3.02E-15	1.67E-15	3.53E-19	0	1.35E-15	7.05E-19
Energy Depletion	MJ	1.22E+03	3.12E+01	2.59E-01	0	1.19E+03	5.17E-01
Water depletion	dm^3	1.84E+02	1.14E+01	2.46E-02	0	1.72E+02	4.91E-02
Global Warming	$g{\approx}CO_2$	6.17E+04	1.52E+03	2.05E+01	0	6.01E+04	4.10E+01
Ozone Depletion	$g{\approx}CFC\text{-}11$	3.66E-03	3.49E-04	1.45E-05	0	3.26E-03	2.90E-05
Air Toxicity	m^3	1.07E+07	7.24E+05	3.86E+03	0	9.97E+06	7.72E+03
Photochemical Ozone Creation	$g{\approx}C_2H_4$	2.23E+01	1.88E+00	1.75E-02	0	2.03E+01	3.50E-02
Air acidification	$g{\approx}H^+$	8.73E+00	6.08E-01	2.61E-03	0	8.11E+00	5.22E-03
Water Toxicity	dm^3	1.73E+04	1.95E+02	2.56E+00	0	1.71E+04	5.12E+00
Water Eutrophication	$g{\approx}PO_4$	1.65E-01	2.30E-02	3.40E-04	0	1.41E-01	6.81E-04
Hazardous waste production	kg	1.01E+00	1.26E-02	7.62E-06	0	9.97E-01	1.52E-05

Life cycle assessment has been performed with the EIME software (Environmental Impact and Management Explorer), version 4, and with its database version 11.0.

The use phase is the life cycle phase which has the greatest impact on the majority of environmental indicators except for the raw material depletion for which the manufacturing phase contribute significantly to the impacts due to the production of the copper.

According to this environmental analysis, proportionality rules may be used to evaluate the impacts of other products of this range: The environmental impacts of the manufacturing, the distribution and the end of life phase are proportional to the mass of the product. The impacts of the use phase will vary according to size of the cable and to the technical specifications of the complete system.

System approach

As the 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.

Product Environmental Profile - PEP

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.

APC by Schneider Electric has achieved compliance status and the accuracy of data in this PEP document is based on our best knowledge as of the date of its publication.

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Accreditation No. of verifier:: VH05	Programme information: www.pep-ecopassport.org	
Date of issue: 11-2011	Period of validity: 4 years	
Independent verification of the declaration and data, in compliance with ISO 14025:2006		
Internal		External	X	
In compliance with the ISO 14025:2006 type III environmental declaration standard.		PEP eco PASS PORT®
The critical review of the PCR was conducted by a panel of experts chaired by. J. Chevalier (CSTB).		
The information in the present PEP cannot be compared with information from another programme.		

For more information please go to: http://www.apc.com/recycle/

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