Product Environmental Profile

Automation Platform
Modicon M580

ENVPEP1312016EN_V3 / PEP ecopassport SCHN-2014-147

Product Environmental Profile – PEP

Product overview

Modicon M580 is high-end CPU for Hybrid Automation Systems. It is the world's first ePAC-Ethernet Programmable Automation Controller, with Ethernet built right into its core. It has been developed on the latest technological innovations to meet the needs of today's customers by enabling operational transparency and openness through industry standard technologies.

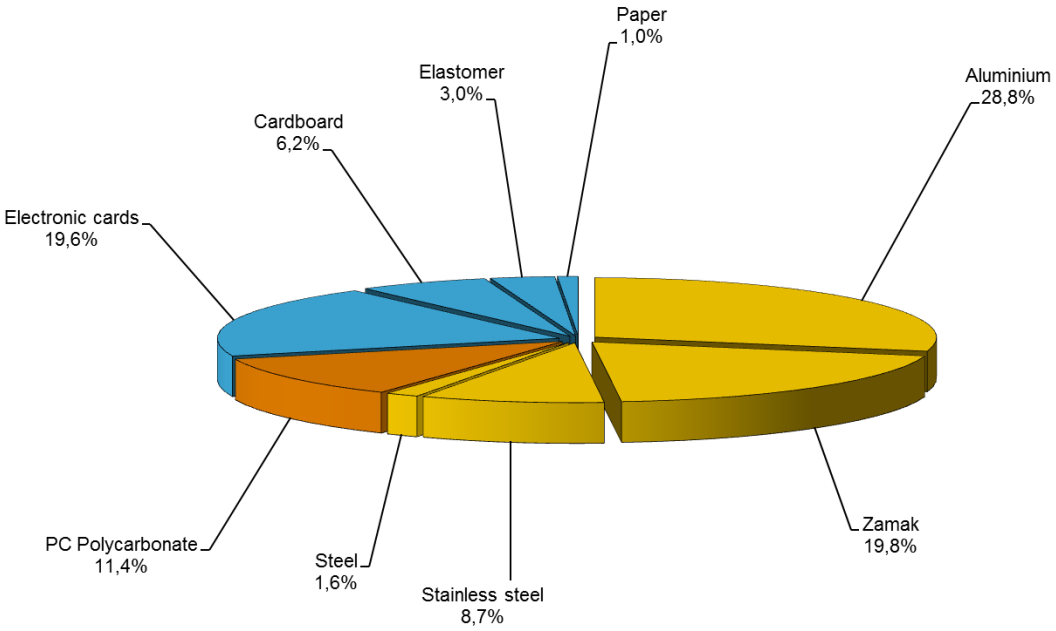
The representative product used for the analysis is BMEP584040.

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.

Constituent materials

The mass of the product range is around 800 g including packaging. It is 795 g for the analysed BMEP584040.
Hardware is the same for every reference. Embedded software makes the difference.
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 only contain in the authorised proportions, lead, mercury, cadmium, hexavalent chromium or flame retardants (polybrominated biphenyls - PBB, polybrominated diphenyl ethers - PBDE) as mentioned in the Directive.

Details of ROHS and REACH substances information are available on the Schneider-Electric Green Premium website . http://www2.schneider-electric.com/sites/corporate/en/products-services/green-premium/green-premium.page

Manufacturing

The M580 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 M580 packaging weight is 57 g. It consists of 8 g of paper and 49 g of cardboard.
The product distribution flows have been optimised by setting up local distribution centres close to the market areas.

Use

The products of the M580 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.
The electrical power consumed by the M580 range has two status mode : 21.6 W in active mode and 0W in off mode for the referenced BMEP584040.

End of life

At end of life, the products in the M580 have been optimized to decrease the amount of waste and allow recovery of the product components and materials.
This product range contains electrolytic capacitors and electronic cards 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: 73.2%.
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 BMEP584040
- product packaging is included
- installation components: no special components included.
- use phase: this product range belongs to the category 2 “energy consuming product”.

Service life is 10 years and consumed power is 21.6 W for 48 % uptime, off mode is 0W for 52% time.
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 (1000km)

Presentation of the product environmental impacts (0* means < 0,01%)

Environmental indicators	Unit	For one unit BMEP584040					
		S = M + D + I + U + E	M	D	I	U	E
Air Acidification	kg H+ eq	7,57E-02	4,86E-03	2,56E-05	0 *	7,08E-02	1,03E-05
Air toxicity	m³	9,36E+07	6,06E+06	3,81E+04	0 *	8,75E+07	1,53E+04
Energy Depletion	MJ	1,08E+04	3,14E+02	1,92E+00	0 *	1,05E+04	7,38E-01
Global Warming Potential	kg CO_2 eq.	5,50E+02	2,24E+01	1,37E-01	0 *	5,28E+02	5,24E-02
Hazardous Waste Production	kg	9,94E+00	1,19E+00	1,69E-07	0 *	8,75E+00	6,48E-08
Ozone Depletion Potential	kg CFC-11 eq.	3,12E-05	2,58E-06	2,58E-10	0 *	2,87E-05	9,92E-11
Photochemical Ozone Creation Potential	kg C_2H_4 eq.	1,91E-01	5,88E-03	3,52E-05	0 *	1,85E-01	1,30E-05
Raw Material Depletion	Y-1	1,88E-13	1,76E-13	2,79E-18	0 *	1,19E-14	1,07E-18
Water Depletion	dm3	1,67E+03	1,61E+02	1,42E-02	0 *	1,51E+03	5,44E-03
Water Eutrophication	kg PO_4^{3-} eq.	2,64E-03	1,40E-03	2,53E-07	0 *	1,24E-03	9,73E-08
Water Toxicity	m³	1,56E+02	4,63E+00	5,83E-02	0 *	1,52E+02	2,24E-02

Life cycle assessment has been performed with the EIME software (Environmental Impact and Management Explorer) version 5.3, and with its database CODDE-2013-02.
The Use phase is the life cycle phase which has the greatest impact on the majority of environmental indicators.

This product range benefits from a high integration of integrated circuits and from last generation of smallest components to decrease the consumption which reduces its impacts on the environment.

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.

Glossary

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^+.
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.
Energy Depletion (ED)	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.
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.
Hazardous Waste Production (HWP)	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.
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 ethylene (C_2H_4).
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.
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.
Water Eutrophication (WE)	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 PO43-(phosphate).
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.

PEP achieved with Schneider-Electric TT01 V9 and TT02 V19 procedures in compliance with ISO14040 series standards

Registration N° : SCHN-2014-147				Applicable PCR : PEP–PCR–ed 2.1-EN-2012 12 11
Verifier accreditation N° : VH08				Program information: www.pep-ecopassport.org
Date of issue: 12-2014				Period of validity: 4 years
Independent verification of the declaration and data, according to ISO 14025:2006				
Internal		External	X	
In compliance with ISO 14025:2006 type III environmental declarations				
PCR review was conducted by an expert panel chaired by J. Chevalier (CSTB).				
The elements of the actual PEP cannot be compared with elements from another program.				

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