Powering Business Worldwide	**Product Environmental Profile**	PEP ecopassport®

NS3 Molded Case Switch with integrated short-circuit protection (UL) and STD Technology

Representative product	NS3-600-NA (Y7-102688) Product Category: Switches
Description of the product	Eaton's moeller series NS3 Molded Case Switch with integrated short-circuit protection with integrated short-circuit protection are designed to Establish and cut off the supply of an electrical circuit. These Molded Case Switch with integrated short-circuit protection switches have total 3 poles with current rating 600A.
Homogeneous Environmental Families Covered	The PEP concerns following product offerings from Eaton Moeller series NZM switch as mentioned below: • Series: NS • Frame size: 3, up to 630A • Rated Current: 600A, 400A • No. of Poles: 3 • Region of usage: NA (North America)
Functional unit	'Establish, support and interrupt the rated current 600 A and rated voltage 690 V AC, with rated short-circuit making capacity of 74 kA at 690 V and IP20 degree of protection for an enclosure / cabinet installation, in the Industrial application areas, according to the appropriate use scenario, and for the reference service life of the product of 20 years'
Company information	Eaton Electro Productie s.r.l, Independentei 8, Sarbi, Romania, 437157 Email: productstewardship-es@eaton.com

Constituent Materials			
Reference product mass	6.53E+00 Kg (With packaging)		
Category PEP Material	**Material constituent**	**Mass (kg)**	**% Contribution**
Metal	Steel	1.44E+00	22.1%
Metal	Copper	1.41E+00	21.7%
Plastic	Unsaturated Polyester	1.24E+00	19.1%
Plastic	Polycarbonate	8.83E-01	13.5%
Metal	Stainless Steel	5.77E-01	8.8%
Others	Cardboard	4.08E-01	6.3%
Plastic	Polyamide 66	3.47E-01	5.3%
Others	Wood	1.17E-01	1.8%
Metal	Silver	2.82E-02	0.4%
Plastic	Polybutylene terephthalate (PBT)	2.20E-02	0.3%
Others	Paper	1.90E-02	0.3%
Plastic	Polyetherimide	9.00E-03	0.1%
Others	Label	5.73E-03	0.1%
Others	Styrene-butadiene rubber (SBR)	4.00E-03	0.1%
Others	Polyurethane flexible foam (PU)	3.00E-03	<0.1%
Others	Miscellaneous	2.39E-03	<0.1%
Total		6.53E+00	100.0%

Substance Assessment
The representative product is compliant with the EU-RoHS Directive (2011/65/EU) with exemption and the product does contain Lead and Perfluoro butane sulfonic acid (PFBS) and its salts as substance listed as Substance-of-Very-High-Concern (SVHC) on the Candidate List of the EU-REACH Regulation (1907/2006/EC).

Additional Environmental Information	
Manufacturing	The reference product is assembled at an Eaton plant Sarbi, Romania holding management system certifications according to ISO 14001 standards.
Distribution	Eaton is committed to minimizing weight and volume of product and packaging with focus to optimize transport efficiency.
Installation	The installation process does not require any energy consumption and there is no waste other than the obsolete product packaging generated during this step.
Use	The product requires energy consumption during operation.
End of life	The Product is having 100% incineration without energy recovery as per as per (PSR-0005-ed3.1-EN-2023 12 08)

Environmental Impacts
The calculation of the environmental impacts is the result of the Product's Life Cycle Analysis in accordance with ISO 14040/44, covering the entire lifecycle, i.e., "Cradle-to-Grave" including the following life cycle phases: production, distribution, installation, use and end of life. System modelling was carried out using the commercial LCA software EIME v6.2.4-11 with database version (CODDE-2024-04 - updated on 2024-06-04)

Indicators Set: PEF EF 3.1 (Compliance: PEP ed.4, EN15804+A2) v2.0	
Manufacturing Phase	The product is assembled as well as packed at Eaton facility Eaton Electro Productie s.r.l, Independentei 8, Sarbi, Romania plant. Energy model used: Romania
Distribution Phase	Distribution of the product in its packaging from the Eaton's last logistics platform to the installation place in North America, United States is considered as per PSR rules.
Installation Phase	Product is installed in North America, United States. Installation of product and treatment of packaging waste are considered in this phase. There is no energy consumption for reference product.
Use Phase	Reference lifetime: 20 Years Usage profile: The product has power loss of 108 W at full load condition. For Industrial applications considering 50% of the loading rate and 30% of the use time rate, total losses are 1419.12 kWh over the 20 years. Product do not require any maintenance/replacement during useful life. Industrial application is considered as per section 3.7.2. PSR-0005-ed3.1-EN-2023 12 08. Energy model used: United States
End of life Phase	The product is assumed to be disposed with 100% incineration without energy recovery.
Module-D	Module D is calculated according to PCR-ed4-EN-2021 09 06 based on the materials recycled and the modelled end-of-life scenario. It expresses the net benefits and loads beyond the boundaries of the system and are not to be included in the life cycle totals.

Environmental Impact Indicators: Mandatory

Mandatory environmental impact indicators	Units	Sum	A1-A3 - Manufacturing	A4 - Distribution	A5 - Installation	B1-B7 - Use	C1-C4 - End of life	B2 - Maintenance	B6 - Operational energy use	D - Benefits and loads beyond the system boundaries
Climate change - total	kg CO2 eq.	7.26E+02	3.99E+01	2.08E+00	1.04E+00	6.80E+02	2.93E+00	0.00E+00	6.80E+02	0.00E+00
Climate change - fossil fuels	kg CO2 eq.	7.24E+02	4.00E+01	2.08E+00	1.96E-01	6.79E+02	2.93E+00	0.00E+00	6.79E+02	0.00E+00
Climate change - biogenics	kg CO2 eq.	1.71E+00	-1.22E-01	0.00E+00	8.48E-01	9.72E-01	8.32E-03	0.00E+00	9.72E-01	0.00E+00
Climate change - land use and land use transformation	kg CO2 eq.	1.23E-03	1.23E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ozone depletion	kg eq. CFC-11	6.84E-06	3.86E-06	2.73E-09	6.87E-09	2.70E-06	2.72E-07	0.00E+00	2.70E-06	0.00E+00
Acidification (AP)	mole of H+ eq.	3.68E+00	5.03E-01	6.90E-02	1.17E-03	3.09E+00	2.19E-02	0.00E+00	3.09E+00	0.00E+00
Freshwater eutrophication	kg P eq.	4.89E-03	3.67E-03	7.19E-07	1.55E-07	1.22E-03	2.99E-06	0.00E+00	1.22E-03	0.00E+00
Marine aquatic eutrophication	kg of N eq.	4.48E-01	3.34E-02	1.64E-02	2.82E-04	3.92E-01	5.67E-03	0.00E+00	3.92E-01	0.00E+00
Terrestrial eutrophication	mole of N eq.	5.33E+00	3.97E-01	1.80E-01	3.71E-03	4.67E+00	7.30E-02	0.00E+00	4.67E+00	0.00E+00
Photochemical ozone formation	kg of NMVOC eq.	1.49E+00	1.38E-01	4.64E-02	7.96E-04	1.29E+00	1.62E-02	0.00E+00	1.29E+00	0.00E+00
Depletion of abiotic resources - elements	kg eq. Sb	4.26E-02	4.25E-02	7.47E-08	1.41E-08	9.08E-05	2.13E-07	0.00E+00	9.08E-05	0.00E+00

Mandatory environmental impact indicators	Units	Sum	A1-A3 - Manufacturing	A4 - Distribution	A5 - Installation	B1-B7 - Use	C1-C4 - End of life	B2 - Maintenance	B6 - Operational energy use		D - Benefits and loads beyond the system boundaries
Depletion of abiotic resources - fossil fuels	MJ	1.63E+04	1.08E+03	2.65E+01	3.64E+00	1.51E+04	5.31E+01	0.00E+00	1.51E+04		0.00E+00
Water scarcity	m3 of eq.. deprivation worldwide	6.30E+01	3.09E+01	6.90E-03	8.24E-03	3.18E+01	2.83E-01	0.00E+00	3.18E+01		0.00E+00

Inventory Flow Indicators: Mandatory

Inventory flow indicators	Units	Sum	A1-A3 - Manufacturing	A4 - Distribution	A5 - Installation	B1-B7 - Use	C1-C4 - End of life	B2 - Maintenance	B6 - Operational energy use		D - Benefits and loads beyond the system boundaries
Use of renewable primary energy, excluding renewable primary energy resources used as raw materials	MJ	1.69E+03	4.63E+01	3.39E-02	2.75E-01	1.64E+03	3.06E+00	0.00E+00	1.64E+03		0.00E+00
Use of renewable primary energy resources used as raw materials	MJ	1.05E+01	1.05E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	1.70E+03	5.67E+01	3.39E-02	2.75E-01	1.64E+03	3.06E+00	0.00E+00	1.64E+03		0.00E+00
Use of non-renewable primary energy, excluding non-renewable primary energy resources used as raw materials	MJ	1.62E+04	1.01E+03	2.65E+01	3.64E+00	1.51E+04	5.31E+01	0.00E+00	1.51E+04		0.00E+00
Use of non-renewable primary energy resources used as raw materials	MJ	7.22E+01	7.22E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	1.63E+04	1.08E+03	2.65E+01	3.64E+00	1.51E+04	5.31E+01	0.00E+00	1.51E+04		0.00E+00
Use of secondary materials	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00
Use of renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00

Inventory flow indicators	Units	Sum	A1-A3 - Manufacturing	A4 - Distribution	A5 - Installation	B1-B7 - Use	C1-C4 - End of life	B2 - Maintenance	B6 - Operational energy use		D - Benefits and loads beyond the system boundaries
Use of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00
Net use of fresh water	m3	1.47E+00	7.20E-01	1.61E-04	3.22E-04	7.42E-01	7.99E-03	0.00E+00	7.42E-01		0.00E+00
Hazardous waste disposed of	kg	4.00E+02	3.75E+02	0.00E+00	2.05E-01	1.47E+01	9.96E+00	0.00E+00	1.47E+01		0.00E+00
Non-hazardous waste disposed of	kg	1.19E+02	1.71E+01	6.40E-02	2.84E-02	1.01E+02	4.09E-01	0.00E+00	1.01E+02		0.00E+00
Radioactive waste disposed of	kg	3.05E-02	6.14E-03	4.45E-05	1.17E-05	2.42E-02	1.96E-04	0.00E+00	2.42E-02		0.00E+00
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00
Materials for recycling	kg	1.67E+00	1.67E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00
Materials for energy recovery	kg	4.34E-03	4.34E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00
Exported energy	MJ by energy vector	3.14E-05	3.14E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00
Biogenic carbon content of the product	kg of C.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00
Biogenic carbon content of the associated packaging	kg of C.	2.31E-01	2.31E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00

Environmental Impact Indicators: Optional

Optional Environmental impact indicators	Units	Sum	A1-A3 - Manufacturing	A4 - Distribution	A5 - Installation	B1-B7 - Use	C1-C4 - End of life	B2 - Maintenance	B6 - Operational energy use		D - Benefits and loads beyond the system boundaries
Emission of fine particles	incidence of diseases	2.74E-05	4.34E-06	3.66E-07	8.10E-09	2.26E-05	1.48E-07	0.00E+00	2.26E-05		0.00E+00
Ionizing radiation, human health	kBq of U235 eq.	1.21E+03	5.42E+02	4.34E-03	8.21E-02	6.66E+02	1.05E+00	0.00E+00	6.66E+02		0.00E+00
Ecotoxicity, fresh water	CTUe	7.15E+03	6.12E+03	1.25E+00	4.70E+00	9.32E+02	9.03E+01	0.00E+00	9.32E+02		0.00E+00
Human toxicity, cancer effects	CTUh	7.93E-06	7.85E-06	3.12E-11	3.43E-11	7.99E-08	9.28E-10	0.00E+00	7.99E-08		0.00E+00
Human toxicity, non-cancer effects	CTUh	7.66E-06	5.55E-06	6.91E-10	1.41E-09	2.07E-06	4.22E-08	0.00E+00	2.07E-06		0.00E+00
Impacts related to land use/soil quality	-	2.62E+01	1.36E+01	0.00E+00	3.82E-03	1.25E+01	7.89E-02	0.00E+00	1.25E+01		0.00E+00
Total use of primary energy during the life cycle	MJ	1.80E+04	1.14E+03	2.65E+01	3.91E+00	1.68E+04	5.62E+01	0.00E+00	1.68E+04		0.00E+00

To evaluate the environmental impact of other product covered by this PEP, multiply the impact figures by-

Factors for Manufacturing, Distribution, Installation, End-of-Life Phase:

Part Number	Product Description	Extrapolation Factors for Manufacturing, distribution, installation and End of Life phase
Y7-102688 (Reference)	NS3-600-NA (Reference)	1.00
Y7-102686	NS3-400-NA	1.00

Multiplying Factors for Use Phase:

Part Number	Product Description	Use Phase Extrapolation Factors
Y7-102688 (Reference)	NS3-600-NA (Reference)	1.00
Y7-102686	NS3-400-NA	0.44

Disclaimer
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Date of issue	12-2024	*Information and reference documents*	www.pep-ecopassport.org
		Validity period	5 years
Independent verification of the declaration and data, in compliance with ISO 14025: 2006			
Internal	X	External	
The PCR review was conducted by a panel of experts chaired by Julie Orgelet (DDemain)			
PEPs are compliant with XP C08-100-1:2016 and EN 50693:2019 *The components of the present PEP may not be compared with components from any other program.*			
Document complies with ISO 14025: 2006 « Environmental labels and declarations. Type III environmental declarations »			