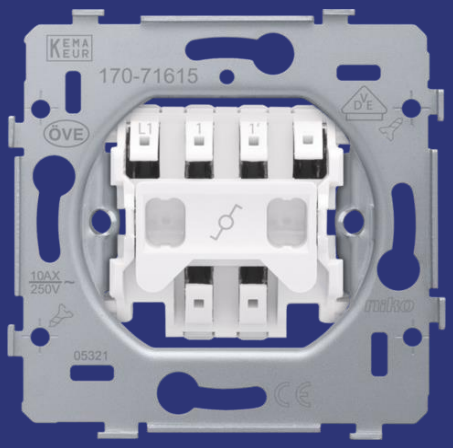
Environmental
Product
Declaration

According to EN15804+A2 (+indicators A1)

This declaration is for:
Two-way switch 10AX/250 Vac, mechanism with plug-in terminals and screw fixing, finishing set and cover plate
Provided by:
Niko NV



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COMPANY INFORMATION

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MRPI® REGISTRATION

1.1.00813.2025

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SCOPE OF DECLARATION

This MRPI®-EPD certificate is verified by Ulbert Hofstra, SGS Intron. The LCA study has been done by An Janssen, Enperas NV. The certificate is based on an LCA-dossier according to EN15804+A2 (+indicators A1). It is verified according to the 'MRPI®-EPD verification protocol November 2020.v4.0'. EPDs of construction products may not be comparable if they do not comply with EN15804+A2. Declaration of SVHC that are listed on the 'Candidate list of Substances of Very High Concern for authorisation' when content exceeds the limits for registration with ECHA.

PROGRAM OPERATOR

Stichting MRPI®

Kingsfordweg 151

1043 GR

Amsterdam

PRODUCT

Two-way switch 10AX/250 Vac, mechanism with plug-in terminals and screw fixing, finishing set and cover plate

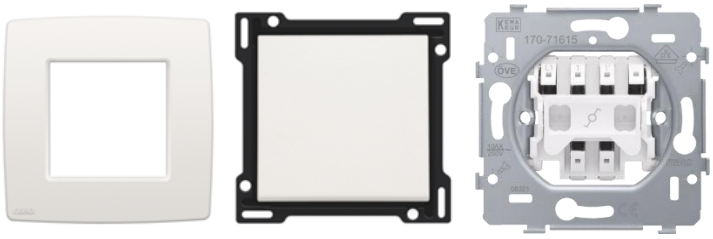
DECLARED UNIT / FUNCTIONAL UNIT

1 Piece

DESCRIPTION OF PRODUCT

The product is a two-way switch 10AX/250 Vac, consisting of a central plate, a cover plate and a mechanism with plug-in terminals and screw fixing

VISUAL PRODUCT



MORE INFORMATION

www.niko.eu/nl

Ing. L. L. Oosterveen MSc. MBA Managing Director MRPI	DEMONSTRATION OF VERIFICATION
	CEN standard EN15804 serves as the core PCR [1]
	Independent verification of the declaration an data according to EN15804+A2 (+indicators A1) Internal: External: X
	Third party verifier: Ulbert Hofstra, SGS Intron
	[1] PCR = Product Category Rules

DETAILED PRODUCT DESCRIPTION

The product is a two-way switch 10AX/250 Vac with a mechanism with plug-in terminals and screw fixing, a finishing set or central plate and a faceplate or cover plate. It has a flush-mounting depth of less than 32 mm.

In this EPD, 13 switch variants, all representative for the Dutch market, are considered (see table below). The results given in the EPD are the results for the reference switch. The environmental impact of the 12 variant switches all fall within +/-20% against the results for the reference switch, as is required by the NMD Bepalingsmethode (2025).

The Niko switches are designed and installed in the fixed installation to deliver power to appliances within a residential and similar environment with an on and off function. General purpose switches can be used for controlling the motors of roll-down shutters, garage ports, venetian blinds and awnings, to operate lighting equipment from two, three or more different locations and to switch lighting equipment connected in parallel on and off.

Overview of the 13 switch variants considered in this EPD. The reference switch is indicated in bold.
170-71615 - 101-61105 - 101-76100
170-70015 - 101-61105 - 101-76100
170-71115 - 101-61105 - 101-76100
170-71315 - 101-61105 - 101-76100
170-71515 - 101-61505 - 101-76100
170-71671 - 101-61105 - 101-76100
170-71715 - 101-61105 - 101-76100
170-73015 - 101-61105 - 101-76100
170-75915 - 101-65905 - 101-76100
170-77115 - 101-60005 - 101-76100
170-77615 - 101-60005 - 101-76100
170-85915 - 101-65914 - 101-76100
170-95915 - 101-65918 - 101-76100

Production process:
The manufacturing process for switches in the Niko factory at Sint-Niklaas, Belgium, consists of two steps. In a first step, the raw materials are put into shape. This is done by pressing metal bands and sheets into the right dimensions and by injection moulding of plastic grains into the different needed parts. In a second step, subassemblies are automatically or manually assembled and combined into one end product. At the end, the final product is packed so that it is ready for transport to the customers.

Reference service life:
The reference service life (RSL) of a switch is estimated at 20 years. These 20 years are based on the reference service life, taken into account in the specific rules for electrical switch gear and control gear solutions of the French PEP ecopassport® programme (PSR 0005, 2023), which also serve as a guideline for this EPD.

Installation:
The switches are simply mounted in a flush-mounting box using screws. The screws are included in the flush-mounting box. The electrical wiring is inserted into the plug-in terminals of the switch. The installation can be done manually using a manual screwdriver or by using an electric machine.

Technical data/Physical characteristics:
The most important technical properties of a two-way switch 10AX/250 Vac with a mechanism with plug-in terminals and screw fixing, shutters and cover plates are given in the table below. More specific information (e.g. technical sheets) on each of the switch components considered in the EPD can be found on the manufacturer's website (www.niko.eu).

Technical property	Value	Unit
flush-mounting depth	<32	mm
current	10	A
voltage	250	Vac
protection degree of the combination of a mechanism, a central plate and a faceplate	IP41	-
impact resistance of the combination of a mechanism, a central plate and a faceplate	IK06	-

Composition:
The switches consist of three parts: a mechanism, a finishing set or central plate and a faceplate or cover plate. The general composition of the reference switch is given in following table. The variant switches only slightly differ in composition and weight of the mechanism and the central plate. The cover plate is the same for all variants. The differences in weight are within 10%.

Component (> 1%)	(kg / %)
mechanism	0,053
central plate	0,012
cover plate	0,014
steel	41%
brass	3%
silver	<1%
plastics	56,0%

SCOPE AND TYPE

This is a specific EPD for a two-way switch 10AX/250 Vac, with a mechanism with plug-in terminals and screw fixing, a finishing set and a cover plate, produced by Niko NV in Sint-Niklaas, Belgium. The switch is installed in The Netherlands and at its end-of-life waste is treated according to the Dutch end-of-life scenarios. As a result, the EPD is representative for the Dutch market.

Company-specific data for the product stage have been collected by Niko NV and were provided to Enperas NV through a data collection questionnaire. Enperas NV uses publicly available generic data for all background processes, such as the production of electricity, transportation by means of a specific truck, etc. Primary data is used for modules A1, A2, A3 and A5. The rest of the study is based on scenarios (module A4, modules C1-C4 and module D).

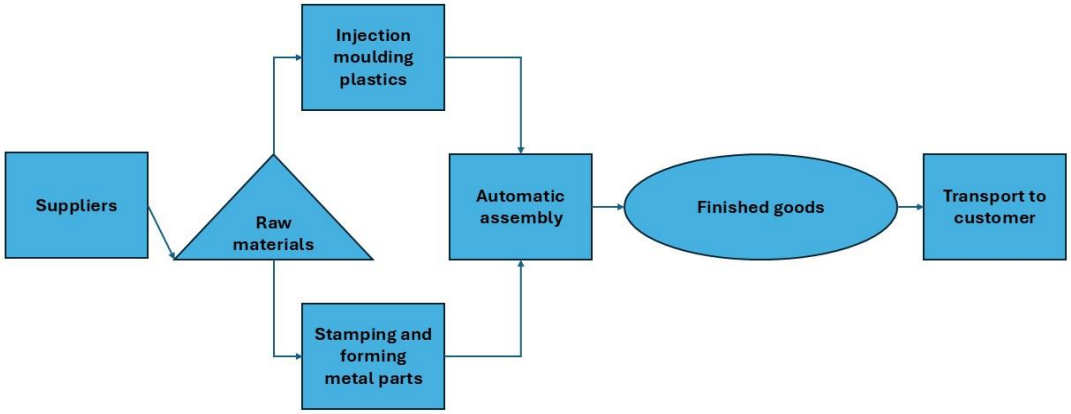
The main LCI sources used in this EPD are the Ecoinvent v3.6 Cut-off database for calculation of the set 1 indicators and the Ecoinvent v3.9.1 Cut-off database for the calculation of the set 2 indicators, as is required by the NMD Bepalingsmethode (2025).

For the calculation of the LCA results, the software program SimaPro 9.6.0.1 (PRé Consultants, 2024) has been used, as well as the Enperas Quadrant LCA tool for Niko socket-outlets and switches (Enperas, 2025). The EF3.1 characterisation factors from EC-JRC were applied where relevant.

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM
Raw material supply	Transport	Manufacturing	Transport gate to site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse - Recovery - Recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
x	x	x	x	x	x	x	x	x	x	ND	ND	x	x	x	x	x

X = Modules Assessed

ND = Not Declared



REPRESENTATIVENESS

The data used for the LCA are representative for the production of a two-way switch 10AX/250 Vac, with a mechanism with plug-in terminals and screw fixing, a finishing set and a cover plate, produced by Niko NV in Sint-Niklaas, Belgium, and installed in The Netherlands.

13 variants of this type of switches have been considered and the environmental impacts declared in this EPD correspond to the reference switch. The impacts of the variant switches fall within +/-20% in comparison to the reference switch, as is required by the NMD Bepalingsmethode (2025).

ENVIRONMENTAL IMPACT per functional unit or declared unit (indicators A1)

	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
ADPE	kg Sb eq.	2,06E-04	1,49E-08	5,71E-07	2,07E-04	3,87E-09	5,24E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	2,01E-09	9,53E-09	1,27E-08	-6,90E-05
ADPF	MJ	7,77E+00	1,12E-01	1,93E+00	9,81E+00	3,15E-02	8,85E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	1,64E-02	8,86E-03	5,47E-02	-1,18E+00
GWP	kg CO2 eq.	5,40E-01	7,46E-03	1,26E-01	6,73E-01	2,06E-03	9,77E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	1,07E-03	6,57E-04	8,67E-02	-7,76E-02
ODP	kg CFC11 eq.	2,39E-08	1,37E-09	2,68E-08	5,20E-08	3,83E-10	8,82E-11	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	1,99E-10	7,81E-11	7,09E-10	-5,36E-09
POCP	kg ethene eq.	4,08E-04	3,71E-06	4,14E-05	4,53E-04	1,24E-06	5,20E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	6,43E-07	6,04E-07	2,72E-06	-9,79E-05
AP	kg SO2 eq.	2,89E-03	1,77E-05	2,88E-04	3,19E-03	8,88E-06	3,47E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	4,61E-06	6,94E-06	2,75E-05	-5,73E-04
EP	kg (PO4) 3 eq.	3,67E-04	2,75E-06	5,59E-05	4,25E-04	1,77E-06	7,14E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	9,21E-07	8,54E-07	5,68E-06	-1,13E-04

Toxicity indicators and ECI (Dutch market)

HTP	kg DCB eq.	1,15E+00	2,99E-03	3,00E-02	1,18E+00	8,83E-04	8,50E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	4,58E-04	8,73E-04	6,77E-03	-4,47E-02
FAETP	kg DCB eq.	9,21E-03	8,26E-05	1,82E-03	1,11E-02	2,59E-05	6,43E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	1,34E-05	1,59E-05	2,13E-04	-1,68E-03
MAETP	kg DCB eq.	5,30E+01	3,17E-01	2,72E+00	5,60E+01	9,24E-02	1,74E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	4,80E-02	7,00E-02	8,80E-01	-2,75E+01
TETP	kg DCB eq.	2,89E-03	1,07E-05	1,09E-03	3,99E-03	3,13E-06	2,01E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	1,62E-06	2,69E-06	1,16E-05	1,28E-03
ECI	euro	1,53E-01	7,88E-04	1,13E-02	1,65E-01	2,49E-04	6,06E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	1,29E-04	1,56E-04	5,21E-03	-1,42E-02
ADPF	kg Sb eq.	3,74E-03	5,39E-05	9,29E-04	4,72E-03	1,52E-05	4,26E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	7,87E-06	4,26E-06	2,63E-05	-5,68E-04

ADPE = Abiotic Depletion Potential for non-fossil resources
ADPF = Abiotic Depletion Potential for fossil resources
GWP = Global Warming Potential
ODP = Depletion potential of the stratospheric ozone layer
POCP = Formation potential of tropospheric ozone photochemical oxidants
AP = Acidification Potential of land and water
EP = Eutrophication Potential
HTP = Human Toxicity Potential
FAETP = Fresh water aquatic ecotoxicity potential
MAETP = Marine aquatic ecotoxicity potential
TETP = Terrestrial ecotoxicity potential
ECI = Environmental Cost Indicator
ADPF = Abiotic Depletion Potential for fossil resources

ENVIRONMENTAL IMPACT per functional unit or declared unit (core indicators A2)

	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO2 eq.	4,61E-01	8,51E-03	8,81E-02	5,58E-01	2,35E-03	4,33E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	1,22E-03	6,97E-04	8,68E-02	-1,09E-01
GWP-fossil	kg CO2 eq.	4,60E-01	8,50E-03	1,18E-01	5,87E-01	2,35E-03	9,77E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	1,22E-03	6,94E-04	8,68E-02	-1,09E-01
GWP-biogenic	kg CO2 eq.	7,18E-04	2,74E-06	-3,17E-02	-3,09E-02	7,78E-07	3,35E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	4,04E-07	2,36E-06	9,00E-06	0,00E+00
GWP-luluc	kg CO2 eq.	4,08E-04	4,20E-06	1,50E-03	1,92E-03	1,15E-06	7,07E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	5,96E-07	8,39E-07	6,41E-06	-6,16E-05
ODP	kg CFC11 eq.	1,68E-08	1,85E-10	4,89E-09	2,19E-08	5,15E-11	2,94E-11	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	2,68E-11	1,09E-11	5,13E-10	-4,15E-09
AP	mol H+ eq.	3,28E-03	1,86E-05	3,74E-04	3,67E-03	1,10E-05	4,43E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	5,69E-06	8,38E-06	3,52E-05	-6,06E-04
EP-fresh water	kg PO4 eq.	9,58E-05	2,11E-07	5,05E-05	1,47E-04	5,91E-08	5,88E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	3,07E-08	1,08E-07	5,33E-07	-2,81E-05
EP-marine	kg N eq.	5,36E-04	4,58E-06	1,14E-04	6,54E-04	4,32E-06	1,64E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	2,24E-06	1,82E-06	1,26E-05	-1,53E-04
EP-terrestrial	mol N eq.	6,35E-03	4,77E-05	9,06E-04	7,31E-03	4,66E-05	1,82E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	2,42E-05	2,09E-05	1,27E-04	-1,96E-03
POCP	kg NMVOC eq.	2,23E-03	2,89E-05	3,20E-04	2,57E-03	1,63E-05	5,54E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	8,46E-06	6,20E-06	3,44E-05	-5,91E-04
ADP-minerals & metals	kg Sb eq.	2,05E-04	2,78E-08	1,82E-06	2,07E-04	7,32E-09	5,35E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	3,80E-09	4,90E-08	3,50E-08	-5,94E-05
ADP-fossil	MJ, net calorific value	7,31E+00	1,21E-01	3,36E+00	1,08E+01	3,39E-02	8,95E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	1,76E-02	9,36E-03	4,84E-02	-1,57E+00
WDP	m3 world eq. Deprived	2,18E-01	4,98E-04	4,86E-02	2,67E-01	1,48E-04	1,29E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	7,67E-05	1,23E-04	1,30E-03	-4,19E-02

GWP-total	=	Global Warming Potential total
GWP-fossil	=	Global Warming Potential fossil fuels
GWP-biogenic	=	Global Warming Potential biogenictotal
GWP-luluc	=	Global Warming Potential land use and land use change
ODP	=	Depletion potential of the stratospheric ozone layer
AP	=	Acidification Potential, Accumulated Exceedence
EP-freshwater	=	Eutrophication Potential, fraction of nutrients reaching freshwater end compartment
EP-marine	=	Eutrophication Potential, fraction of nutrients reaching marine end compartment
EP-terrestrial	=	Eutrophication Potential, Accumulated Exceedence
POCP	=	Formation potential of tropospheric ozone photochemical oxidants
ADP-minerals & metals	=	Abiotic Depletion Potential for non-fossil resources [1]
ADP-fossil	=	Abiotic Depletion for fossil resources potential [1]
WDP	=	Water (user) deprivation potential, deprivation-weighted water consumption [1]

Disclaimer [1]:

- The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

ENVIRONMENTAL IMPACT per functional unit or declared unit (additional indicators A2)

	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PM	Disease inci-dence	2,72E-08	6,31E-10	3,19E-09	3,11E-08	2,31E-10	5,72E-11	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	1,20E-10	1,12E-10	2,88E-10	-4,12E-09
IRP	kBq U235 eq.	1,50E-02	6,12E-05	2,87E-02	4,38E-02	1,76E-05	1,70E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	9,11E-06	2,81E-05	1,68E-04	-1,18E-03
ETP-fw	CTUe	1,28E+01	5,97E-02	5,97E-01	1,35E+01	1,67E-02	1,16E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	8,67E-03	7,46E-03	2,24E-01	-2,69E+00
HTP-c	CTUh	1,94E-09	3,88E-12	5,78E-11	2,00E-09	1,27E-12	2,43E-12	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	6,56E-13	1,16E-12	1,76E-11	2,16E-10
HTP-nc	CTUh	2,51E-08	8,57E-11	2,03E-09	2,72E-08	2,63E-11	2,14E-11	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	1,37E-11	5,38E-11	2,00E-10	-6,81E-10
SQP	-	2,09E+00	7,30E-02	1,43E+00	3,59E+00	2,55E-02	5,25E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	1,32E-02	1,81E-02	2,15E-02	-3,15E+00

PM = Potential incidence of disease due to PM emissions

IRP = Potential Human exposure efficiency relative to U235 [1]

ETP-fw = Potential Comparative Toxic Unit for ecosystems [2]

HTP-c = Potential Comparative Toxic Unit for humans [2]

HTP-nc = Potential Comparative Toxic Unit for humans, non-cancer [2]

SQP = Potential soil quality index [2]

Disclaimer [1]:

- This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste.

Disclaimer [2]:

- The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

OUTPUT FLOWS AND WASTE CATEGORIES per functional unit or declared unit (A1 en A2)

	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	6,94E-05	7,68E-07	1,27E-05	8,29E-05	2,14E-07	5,73E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	1,11E-07	5,08E-08	1,07E-07	-1,44E-05
NHWD	kg	1,05E-01	6,00E-03	1,46E-02	1,26E-01	2,15E-03	9,94E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	1,11E-03	2,41E-04	1,29E-02	-5,39E-03
RWD	kg	8,12E-06	3,97E-08	2,44E-05	3,25E-05	1,14E-08	1,25E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	5,92E-09	2,15E-08	3,57E-08	-1,08E-06
CRU	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	0,00E+00	0,00E+00	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	0,00E+00	0,00E+00	3,18E-02	3,18E-02	0,00E+00	2,27E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	0,00E+00	3,09E-02	0,00E+00	0,00E+00
MER	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	0,00E+00	0,00E+00	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	MJ	0,00E+00	0,00E+00	4,73E-03	4,73E-03	0,00E+00	1,08E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	0,00E+00	0,00E+00	1,97E-01	0,00E+00
ETE	MJ	0,00E+00	0,00E+00	8,15E-03	8,15E-03	0,00E+00	1,85E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	0,00E+00	0,00E+00	3,40E-01	0,00E+00

HWD = Hazardous Waste Disposed
NHWD = Non Hazardous Waste Disposed
RWD = Radioactive Waste Disposed
CRU = Components for reuse
MFR = Materials for recycling
MER = Materials for energy recovery
EEE = Exported Electrical Energy
ETE = Exported Thermal Energy

RESOURCE USE per functional unit or declared unit (A1 and A2)

	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	5,02E-01	1,87E-03	7,69E-01	1,27E+00	5,28E-04	3,00E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	2,74E-04	1,59E-03	1,84E-03	-7,89E-01
PERM	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	0,00E+00	0,00E+00	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	5,02E-01	1,87E-03	7,69E-01	1,27E+00	5,28E-04	3,00E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	2,74E-04	1,59E-03	1,84E-03	-7,89E-01
PENRE	MJ	5,65E+00	1,21E-01	3,36E+00	9,13E+00	3,39E-02	3,85E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	1,76E-02	9,36E-03	1,97E-02	-1,74E+00
PENRM	MJ	1,22E+00	0,00E+00	0,00E+00	1,22E+00	0,00E+00	3,06E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,78E-01
PENRT	MJ	6,86E+00	1,21E-01	3,36E+00	1,03E+01	3,39E-02	3,88E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	1,76E-02	9,36E-03	1,97E-02	-7,64E-01
SM	kg	1,27E-02	0,00E+00	0,00E+00	1,27E-02	0,00E+00	3,18E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,12E-02
RSF	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	0,00E+00	0,00E+00	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NSRF	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	0,00E+00	0,00E+00	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m3	9,57E-03	1,63E-05	1,48E-03	1,11E-02	4,79E-06	6,79E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	2,49E-06	4,78E-06	3,96E-05	-3,62E-04

PERE = Use of renewable energy excluding renewable primary energy resources
PERM = Use of renewable energy resources used as raw materials
PERT = Total use of renewable primary energy resources
PENRE = Use of non-renewable primary energy resources excluding non-renewable energy resources used as raw materials
PENRM = Use of non-renewable primary energy resources used as raw materials
PENRT = Total use of non-renewable primary energy resources
SM = Use of secondary materials
RSF = Use of renewable secondary fuels
NSRF = Use of non-renewable secondary fuels
FW = Use of net fresh water

BIOGENIC CARBON CONTENT per functional unit or declared unit (A1 and A2)

	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
BBCpr	kg 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	0,00E+00	0,00E+00	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
BCCpa	kg C	1,88E-04	0,00E+00	8,69E-03	8,88E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

BCCpr = Biogenic carbon content in product
BCCpa = Biogenic carbon content in packaging

CALCULATION RULES

Allocation:
At Niko NV, different products (i.e. socket-outlets and switches) are produced. Only facility level data were available for the use of electricity, natural gas, water and ancillary materials. The facility level data have been allocated to the analysed product using their respective annual production volume, expressed in kg (physical relationship), therefore mass allocation is applied. Finally, the amounts were recalculated regarding the weight of the in this EPD considered switches.

Considered to be below cut-off:
The following processes/materials are not considered in this LCA study due to missing data and/or low volumes or weights of the materials:
Transport of packaging of raw materials to the Niko factory in module A1 (no data available and considered to be below cut-off);
Infrastructure and land use in module A3 (no data available);
Transport of ancillary materials in module A3 (considered using Ecoinvent v3.6/v3.9.1 market processes or considered to be below cut-off);
Environmental impacts caused by the personnel of the production plants, e.g. waste from the cafeteria and sanitary installations, accidental pollution caused by human mistakes or environmental effects caused by commuter traffic.
In all cases, it is assumed that the cut-off criteria of EN 15804 are met.

Manufacturer specific data have been collected for the year 2023.

SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION

A1 – RAW MATERIAL SUPPLY
This module takes into account the extraction and processing of all raw materials and energy which occur upstream to the studied manufacturing process.

A2 – TRANSPORT TO THE MANUFACTURER
The raw materials are transported to the manufacturing site of the switches by truck (freight, lorry, 16-32 ton, EURO 6). EURO 6 trucks are the most used in Belgium (Statbel, 2023).

A3 – MANUFACTURING
This module takes into account the production process of the switches. In a first step, the raw materials are put into shape. This is done by pressing metal bands and sheets into the right dimensions and by injection moulding of plastic grains into the different needed parts. In a second step, subassemblies are automatically or manually assembled and combined into one end product. At the end, the final product is packed, so that it is ready for transport to the customers. All inputs (e.g. energy use, water consumption, ancillary materials, packaging of final product) and outputs (e.g. emissions, production waste and waste from packaging of raw materials) are taken into account. The waste treatment of the packaging of the raw materials is modelled according to the default end-of-life scenarios in Belgium.

A4 – TRANSPORT TO THE BUILDING SITE
The final product is for 100% transported from the factory in Sint-Niklaas to the installation site in The Netherlands (Utrecht) over a distance of 155 km by a truck, unspecified, according to the requirements within the Dutch NMD Bepalingsmethode.

A5 - INSTALLATION IN THE BUILDING
The switches are simply mounted in a flush-mounting box with screws, which is not taken into account in this EPD. The screws are included in the flush-mounting box. The installation can be done manually using a manual screwdriver or by using an electric machine. In this EPD, manual application without any energy consumption is considered. Furthermore, packaging materials are released. The waste treatment of the packaging is modelled according to the default end-of-life scenarios of the Dutch NMD Bepalingsmethode. Additionally, 0,025% material losses are taken into account.

B1 - USE PHASE
The switches do not have any impact during their entire use phase. Consequently, there are no environmental impacts related to this module.

B2 - MAINTENANCE
The switches do not require any maintenance during their entire service life. Consequently, there are no environmental impacts related to this module.

B3 - REPAIR
The switches do not require any repair during their entire service life. Consequently, there are no environmental impacts related to this module.

B4 - REPLACEMENT
The switches do not require any replacement during their entire service life. Consequently, there are no environmental impacts related to this module.

B5 - REFURBISHMENT
The switches do not require any refurbishment during their entire service life. Consequently, there are no environmental impacts related to this module.

C1-C4: END-OF-LIFE
The default end-of-life (EOL) scenarios of the Dutch NMD Bepalingsmethode have been applied to the different components of the switches, i.e. steel parts, brass parts, silver parts and plastic parts.
C1: It is assumed that no impacts are related to the demolition of the product, since the different parts can be easily dismantled manually.
C2: Transport of final product components to sorting, landfill and incineration according to the Dutch default scenarios.
C3-C4: EOL of final product components according to the Dutch default scenarios: steel, brass and silver parts are 90% recycled, 5% incinerated and 5% landfilled and plastic parts are 80% incinerated and 20% landfilled.

MODULE D - LOADS AND BENEFITS BEYOND THE SYSTEM BOUNDARIES
In module D, the following waste streams originating from the final product and its packaging are considered to be recycled after their End-of-Waste point: cardboard packaging (of which 90% is recycled), plastic packaging films (of which 49% is recycled), steel parts of the switch (of which 90% is recycled), brass parts of the switch (of which 90% is recycled) and silver parts of the switch (of which 90% is recycled). Furthermore, module D contains energy recovery through the process of incineration of the following waste from packaging materials disposed of during the installation phase (A5) and some parts of the switch at its end-of-life (C4): cardboard packaging (of which 9% is incinerated), plastic packaging films (of which 46% is incinerated) and plastic parts of the switch (of which 80% is incinerated). The EOL waste treatments are according to the Dutch default scenarios within the NMD Bepalingsmethode for the different waste materials of the switch and to the Eurostat (2021) data for packaging waste treatment in The Netherlands.

DECLARATION OF SVHC

The product does not contain materials listed in the “Candidate list of Substances of Very High Concern for authorisation”

REFERENCES

ISO 14025:2006: Environmental labels and Declarations-Type III Environmental Declarations-Principles and procedures.

ISO 14040:2006: Environmental Management-Life Cycle Assessment-Principles and framework.

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Pré Consultants, 2024, SimaPro 9.6.0.1 [Computer Software]. Amersfoort, The Netherlands

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REMARKS

Set 1 indicators have been calculated using Ecoinvent v3.6 Cut-off by classification database, while set 2 indicators have been calculated using Ecoinvent v3.9.1 Cut-off by classification database.