B-EPD .BE

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Niko

Socket-outlet 2P with pin earthing Type E, 250V~16A with shutters and cover plates

niko

ISSUED 13.03.2025
VALID UNTIL 13.03.2030

THIRD PARTY VERIFIED
in accordance with ISO 14025, EN 15804+A2 and B-EPD-PCR (Version 18.10.2022)

FUNCTIONAL UNIT AND MODULES DECLARED

(cradle-to-gate with options)

One socket-outlet, connecting/disconnecting during 20 years the plug of a load consuming 16 A (In) under a voltage (U) of 250 Vac, while protecting the user from direct contact with live parts, and with a protection class 21-D (IP) and an impact resistance of 0,6 (IK)

A123	A4	A5	B	C	D
•	•	•	**MND**	•	•

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1 PRODUCT DESCRIPTION

1.1 Product name

Socket-outlet 2P with pin earthing type E, 250V~16A with shutters and cover plates

1.2 Product description and intended use

The product considered in the B-EPD is a socket-outlet 2P with pin earthing type E, 250V~16A with shutters and cover plates. It has a flush-mounting depth of 28,5 mm and consists of three parts: a mechanism, a finishing set or central plate and a faceplate or cover plate. Two variants of mechanism are available for this type of socket-outlet: a mechanism with screw-type terminals and a mechanism with plug-in terminals.

It concerns a finished product, ready for installation in a building.

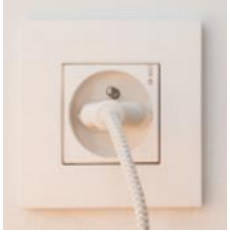
The EPD is valid for two variants of one specific product, produced by one single company in one single factory in Belgium.

The Niko socket-outlets are designed and installed in the fixed installation to provide power to appliances within a residential environment.

1.3 Reference flow / declared unit

The functional unit is defined as:

One socket-outlet, connecting/disconnecting during 20 years the plug of a load consuming 16 A (In) under a voltage (U) of 250 Vac, while protecting the user from direct contact with live parts, and with a protection class 21-D (IP) and an impact resistance of 0,6 (IK).



Packaging of the raw materials and the finished product is included.

The weight of the product is 94,816 g per piece (a socket-outlet with a mechanism with screw-type terminals is taken as a reference).

1.4 Installation

Both socket-outlet variants are simply mounted in a flush-mounting box with grip surfaces with claws that rotate open using screws with a combination screwhead. The screws are part of the socket-outlet. In the socket-outlet with a mechanism with screw-type terminals, the electrical wiring is connected to the screw-type terminals using screws, while in the socket-outlet with a mechanism with plug-in terminals, the electrical wiring is inserted into the plug-in terminals without screws. The installation can be done using a manual screwdriver or an electric machine.

1.5 Composition and content

The socket-outlet 2P with pin earthing type E, 250V~16A with shutters and cover plates consists of three separate parts:

- the mechanism, either with screw-type terminals or with plug-in terminals, composed of a base in white coloured ureumformaldehyde (UF) with high heat resistance and a flush-mounting frame of 1 mm thick galvanised metal with 4 grooves with a screw hole of 7 mm and 4 screw holes of 3 mm for mounting on panels;
- a finishing set or central plate, made of in mass coloured rigid polycarbonate (PC) and acrylo-nitril-styrene-acrylate (ASA);
- a faceplate or cover plate, consisting of in mass coloured rigid polycarbonate (PC) and acrylo-nitril-styrene-acrylate (ASA).

Components	Composition / content / ingredients	Quantity
Product	- mechanism - central plate - cover plate - steel - brass - plastics (UF, PA, PBT, PC/ASA)	1 piece (0,065 kg) 1 piece (0,015 kg) 1 piece (0,014 kg) 40% 9% 51%
Fixation materials	screws, included in the product	6 pieces
Jointing materials	NA	/
Treatments	NA	/
Packaging	- carton coverage - polypropylene foil	0,021 kg 0,001 kg

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

1.6 Reference service life

The reference service life (RSL) is estimated at 20 years.

The RSL is based on the specific rules for electrical switch gear and control gear solutions of the French PEP Ecopassport® programme.

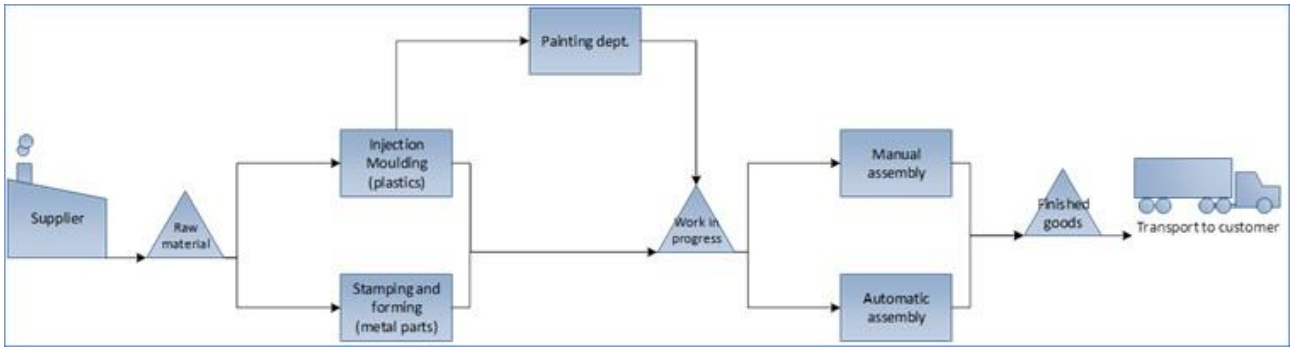
The RSL is valid under normal conditions of use.

1.7 Description of geographical representativity

The EPD is representative for the Belgian market.

1.8 Description of the production process and technology

The manufacturing process for socket-outlets 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.



2 TECHNICAL DATA / PHYSICAL CHARACTERISTICS

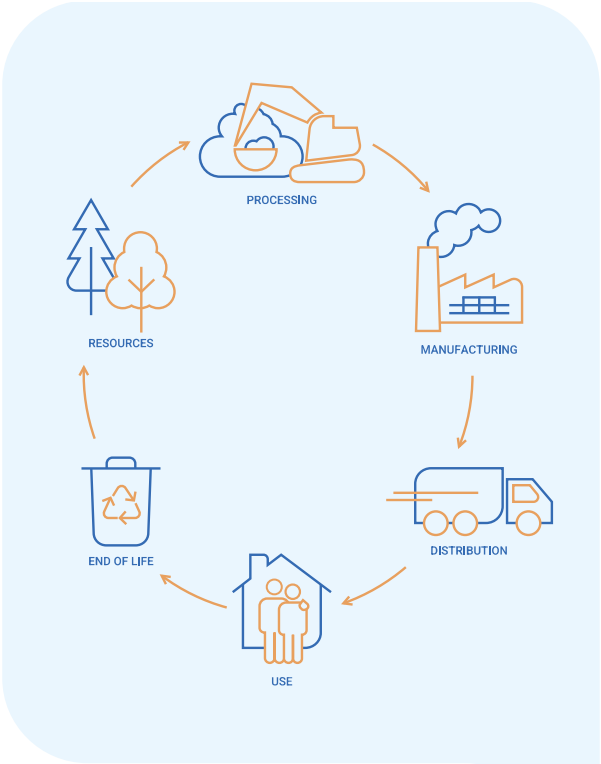
The technical characteristics of the socket-outlet considered in this EPD are given in the following table.

Technical property	Standard	Value	Unit	Comment
Voltage		250	Vac	
Current		16	A	
Protection degree (IP)		21-D		Valid for the combination of a mechanism, a central plate and a cover plate
Impact resistance (IK)		06		Valid for the combination of a mechanism, a central plate and a cover plate
Flush-mounting depth		21	mm	For socket-outlet with mechanism with screw-type terminals
		28,5	mm	For socket-outlet with mechanism with plug-in terminals

3 LCA-STUDY

3.1 Date of LCA-study

February 2025



3.2 Software

For the calculation of the LCA results, the software programme SimaPro 9.6.0.1 (Pré consultants, 2024) has been used.

3.3 Information on 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 socket-outlet.

3.4 Information on cut-off

The following processes are considered to be below cut-off:

- transport of the packaging of the raw materials to the factory
- transport of the ancillary materials

3.5 Information on excluded processes

Following processes were excluded from the inventory:

- infrastructure and land use of the factory
- accidental pollutions
- environmental impacts caused by the personnel of the production plants
- heating or cooling of the plant in order to ensure a comfortable indoor climate for the personnel

3.6 Information on biogenic carbon modelling

The socket-outlet does not contain any biogenic carbon. However, the accompanying packaging of both the raw materials and the final product (i.e. wooden pallets and cardboard) does contain biogenic carbon.

Biogenic carbon content	(kg C / FU)
Biogenic carbon content in product (at the gate)	0,000E+00
Biogenic carbon content in accompanying packaging (at the gate)	9,425E-03

3.7 Information on carbon offsetting

Carbon offsetting is not allowed in the EN 15804 and hence not taken into account in the calculations.

3.8 Additional or deviating characterisation factors

For the characterisation factors, the package 'EN 15804+A2 based on EF3.1 from the EC-JRC website' has been used. No additional or deviating characterisation factors were used.

3.9 Specificity

The data used for the LCA are specific for this product, which is manufactured by a single manufacturer in a single production site.

3.10 Period of data collection

Manufacturer specific data have been collected for the year 2021.

3.11 Information on data collection

The life cycle inventory for this study was performed by Niko NV according to the ISO 14040 and ISO 14044 (data inventory) standards. The LCI data has been checked by the EPD verifier (Ramses Sterckx, Vinçotte). Specific data have been collected for the processes under operational control of Niko (manufacturing phase). Generic data have been used for the processes Niko cannot influence (raw materials supply, raw materials transport, transport to installation site, installation, waste transport, EOL treatment). Enperas NV uses publicly available data for all background processes, such as the production of electricity, transportation by means of a specific truck, etc.

3.12 Database used for background data

The upstream and downstream processes are modelled using the Ecoinvent v3.9.1 Cut-off database or the Industry Data 2.0 database.

3.13 Energy mix

The Belgian residual electricity mix has been used to model life cycle stage A3, while the Belgian electricity mix (consumption mix + import) has been used to model electricity use in life cycle stages A5, C3, C4 and D. The used data records are the Ecoinvent v3.9.1 data record '*Electricity, medium voltage {BE}| electricity, medium voltage, residual mix | Cut-off, U*' for stage A3 and the Ecoinvent v3.9.1 data record '*Electricity, low voltage {BE}| market for | Cut-off, U*' for stages A5, C3, C4 and D (Wernet et al., 2016). For the other energy sources, European data from the Ecoinvent v3.9.1 Cut-off database have been used.

4 PRODUCTION SITES

The production site is located at Industriepark West 40, BE-9100 Sint-Niklaas, Belgium.

5 SYSTEM BOUNDARIES

Product stage			Construction installation stage		Use stage							End of life stage				Beyond the system boundaries
Raw materials	Transport	Manufacturing	Transport	Construction installation stage	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 = included in the EPD
☐ = module not declared

NIKO uses metals with recycled content to produce the metallic parts of the socket-outlet. This recycled content is taken into account in the calculations.

It is assumed that the socket-outlet follows the Belgian default end-of-life scenarios for its composing materials after its deconstruction (partly landfilling, partly incineration and partly recycling). The end-of-waste point is not reached in case of landfilling and incineration, while the end-of-waste point is reached after the sorting facility in case of recycling.

The production waste and the packaging waste partly go to recycling, incineration and landfill, according to the Belgian default scenarios. For these materials, the end-of-waste point is reached after the sorting facility in case of recycling. In case of incineration and landfill, the end-of-waste point is not reached.

6 POTENTIAL ENVIRONMENTAL IMPACTS PER REFERENCE FLOW

The results in the following table are calculated for 1 socket-outlet 2P with pin earthing type E, 250V~16A with shutters and cover plates and with a mechanism with screw-type terminals. The reference flow is 94,816 g per piece. The results are also valid for the variant socket-outlet with a mechanism with plug-in terminals.

	Production			Construction process stage		Use stage							End-of-life stage				
	A1 Raw material	A2 Transport	A3 manufacturing	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
GWP total (kg CO2 equiv/FU)	3,94E-01	1,21E-02	8,14E-02	2,46E-03	3,82E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,38E-03	3,92E-05	9,63E-02	-9,74E-02
GWP fossil (kg CO2 equiv/FU)	3,93E-01	1,21E-02	1,11E-01	2,46E-03	5,75E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,38E-03	3,90E-05	9,63E-02	-6,66E-02
GWP biogenic (kg CO2 equiv/FU)	1,33E-04	3,91E-06	-3,06E-02	8,42E-07	3,24E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	4,38E-07	1,08E-07	2,98E-06	-3,08E-02
GWP luluc (kg CO2 equiv/FU)	3,47E-04	5,98E-06	1,49E-03	1,19E-06	6,35E-07	MND	MND	MND	MND	MND	MND	MND	0,00E+00	6,68E-07	7,89E-08	2,07E-06	-4,65E-05
ODP (kg CFC 11 equiv/FU)	4,52E-08	2,64E-10	5,03E-09	5,37E-11	2,66E-11	MND	MND	MND	MND	MND	MND	MND	0,00E+00	2,99E-11	1,53E-12	5,69E-10	-2,23E-09
AP (mol H+ eq/FU)	4,25E-03	2,65E-05	3,11E-04	7,92E-06	3,04E-06	MND	MND	MND	MND	MND	MND	MND	0,00E+00	4,49E-06	1,43E-07	2,47E-05	-4,59E-04
EP - freshwater (kg P equiv/FU)	2,43E-05	9,84E-08	1,71E-05	2,03E-08	1,37E-08	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,10E-08	7,61E-10	6,34E-08	-3,23E-06
EP - marine (kg N equiv/FU)	4,19E-04	6,52E-06	1,11E-04	2,67E-06	9,03E-07	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,52E-06	3,15E-08	1,05E-05	-5,88E-05
EP - terrestrial (mol N equiv/FU)	5,17E-03	6,79E-05	8,72E-04	2,85E-05	1,00E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,63E-05	3,64E-07	1,13E-04	-7,15E-04
POCP (kg NMVOC equiv/FU)	1,85E-03	4,11E-05	3,02E-04	1,20E-05	3,18E-06	MND	MND	MND	MND	MND	MND	MND	0,00E+00	6,70E-06	1,16E-07	2,97E-05	-3,08E-04
ADP Elements (kg Sb equiv/FU)	4,68E-05	3,96E-08	3,00E-07	7,79E-09	1,31E-08	MND	MND	MND	MND	MND	MND	MND	0,00E+00	4,42E-09	8,06E-10	1,08E-08	-4,32E-06
ADP fossil fuels (MJ/FU)	6,78E+00	1,72E-01	3,90E+00	3,52E-02	7,04E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,95E-02	1,61E-03	2,05E-02	-1,14E+00
WDP (m^3 water eq deprived /FU)	1,89E-01	7,10E-04	4,39E-02	1,51E-04	9,89E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	7,95E-05	1,59E-05	1,05E-03	-1,24E-02

GWP TOTAL = TOTAL GLOBAL WARMING POTENTIAL (CLIMATE CHANGE); GWP-LULUC = GLOBAL WARMING POTENTIAL (CLIMATE CHANGE) LAND USE AND LAND USE CHANGE; ODP = OZONE DEPLETION POTENTIAL; AP = ACIDIFICATION POTENTIAL FOR SOIL AND WATER; EP = EUTROPHICATION POTENTIAL; POCP = PHOTOCHEMICAL OZONE CREATION; ADPE = ABIOTIC DEPLETION POTENTIAL – ELEMENTS; ADPF = ABIOTIC DEPLETION POTENTIAL – FOSSIL FUELS; WDP = WATER USE (WATER (USER) DEPRIVATION POTENTIAL, DEPRIVATION-WEIGHTED WATER CONSUMPTION)

7 RESOURCE USE

The results in the following table are calculated for 1 socket-outlet 2P with pin earthing type E, 250V~16A with shutters and cover plates and with a mechanism with screw-type terminals. The reference flow is 94,816 g per piece. The results are also valid for the variant socket-outlet with a mechanism with plug-in terminals.

	Production			Construction process stage		Use stage							End-of-life stage				
	A1 Raw material	A2 Transport	A3 manufacturing	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
PERE (MJ/FU, net calorific value)	5,62E-01	2,66E-03	-3,29E-02	5,85E-04	1,69E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	2,98E-04	1,96E-04	1,99E-03	-4,57E-01
PERM (MJ/FU, net calorific value)	8,81E-03	0,00E+00	3,23E-01	0,00E+00	-3,32E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT (MJ/FU, net calorific value)	5,70E-01	2,66E-03	2,90E-01	5,85E-04	-3,15E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	2,98E-04	1,96E-04	1,99E-03	-4,57E-01
PENRE (MJ/FU, net calorific value)	5,47E+00	1,72E-01	3,87E+00	3,52E-02	2,63E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,95E-02	1,61E-03	1,28E+00	-1,14E+00
PENRM (MJ/FU, net calorific value)	1,31E+00	0,00E+00	2,81E-02	0,00E+00	-3,05E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	-7,43E-02	-1,26E+00	0,00E+00
PENRT (MJ/FU, net calorific value)	6,78E+00	1,72E-01	3,89E+00	3,52E-02	-4,22E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,95E-02	-7,27E-02	2,05E-02	-1,14E+00
SM (kg/FU)	3,41E-02	0,00E+00	0,00E+00	0,00E+00	8,53E-06	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF (MJ/FU, net calorific value)	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF (MJ/FU, net calorific value)	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW (m^3 water eq/FU)	1,28E-02	2,32E-05	1,10E-03	5,08E-06	5,80E-06	MND	MND	MND	MND	MND	MND	MND	0,00E+00	2,60E-06	4,63E-07	4,29E-05	-5,13E-04

PERE = USE OF RENEWABLE PRIMARY ENERGY EXCLUDING RENEWABLE PRIMARY ENERGY RESOURCES USED AS RAW MATERIALS; PERM = USE OF RENEWABLE PRIMARY ENERGY RESOURCES USED AS RAW MATERIALS; PERT = TOTAL USE OF RENEWABLE PRIMARY ENERGY RESOURCES; PENRE = USE OF NON-RENEWABLE PRIMARY ENERGY EXCLUDING NON-RENEWABLE PRIMARY 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 MATERIAL; RSF = USE OF RENEWABLE SECONDARY FUELS; NRSF = USE OF NON-RENEWABLE SECONDARY FUELS; FW = NET USE OF FRESH WATER

8 WASTE CATEGORIES & OUTPUT FLOWS

The results in the following table are calculated for 1 socket-outlet 2P with pin earthing type E, 250V~16A with shutters and cover plates and with a mechanism with screw-type terminals. The reference flow is 94,816 g per piece. The results are also valid for the variant socket-outlet with a mechanism with plug-in terminals.

	Production			Construction process stage		Use stage							End-of-life stage				
	A1 Raw material	A2 Transport	A3 manufacturing	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
Hazardous waste disposed (kg/FU)	7,01E-05	1,10E-06	6,71E-06	2,22E-07	4,29E-08	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,24E-07	2,98E-09	1,08E-07	-7,97E-06
Non-hazardous waste disposed (kg/FU)	1,22E-01	8,55E-03	1,19E-02	2,14E-03	3,99E-04	MND	MND	MND	MND	MND	MND	MND	0,00E+00	9,53E-04	4,18E-06	1,54E-03	-1,59E-03
Radioactive waste disposed (kg/FU)	9,16E-06	5,66E-08	2,99E-05	1,31E-08	2,02E-08	MND	MND	MND	MND	MND	MND	MND	0,00E+00	6,34E-09	1,54E-08	5,26E-08	-3,31E-06
Components for re-use (kg/FU)	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling (kg/FU)	0,00E+00	0,00E+00	5,05E-04	0,00E+00	2,08E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	4,66E-02	0,00E+00	0,00E+00
Materials for energy recovery (kg/FU)	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy (MJ/FU)	0,00E+00	0,00E+00	1,36E-03	0,00E+00	1,09E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	3,79E-01	0,00E+00

9 IMPACT CATEGORIES ADDITIONAL TO EN 15804

The results in the following table are calculated for 1 socket-outlet 2P with pin earthing type E, 250V~16A with shutters and cover plates and with a mechanism with screw-type terminals. The reference flow is 94,816 g per piece. The results are also valid for the variant socket-outlet with a mechanism with plug-in terminals.

		Production			Construction process stage		Use stage							End-of-life stage				
		A1 Raw material	A2 Transport	A3 manufacturing	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
	PM (disease incidence)	2,40E-08	8,99E-10	2,29E-09	1,99E-10	3,51E-11	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,09E-10	1,34E-12	1,79E-10	-2,89E-09
	IRHH (kg U235 eq/FU)	2,31E-02	8,72E-05	3,68E-02	1,97E-05	2,77E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	9,78E-06	1,81E-05	7,13E-05	-4,22E-03
	ETF (CTUe/FU)	7,24E+00	8,51E-02	4,57E-01	1,76E-02	6,86E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	9,62E-03	1,61E-04	2,42E-01	-6,01E-01
	HTCE (CTUh/FU)	2,58E-09	5,52E-12	3,13E-11	1,08E-12	1,77E-12	MND	MND	MND	MND	MND	MND	MND	0,00E+00	6,25E-13	4,19E-14	1,86E-11	2,97E-10
	HTnCE (CTUh/FU)	4,78E-08	1,22E-10	6,53E-10	2,45E-11	2,07E-11	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,37E-11	8,98E-13	1,32E-10	-4,01E-09
	Land Use Related impacts (dimensionless)	2,11E+00	1,04E-01	1,39E+00	2,55E-02	3,31E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,16E-02	9,69E-04	6,26E-03	-2,86E+00

HTCE = HUMAN TOXICITY – CANCER EFFECTS; HTNCE = HUMAN TOXICITY – NON CANCER EFFECTS; ETF = ECOTOXICITY – FRESHWATER; (POTENTIAL COMPARATIVE TOXIC UNIT)
PM = PARTICULATE MATTER (POTENTIAL INCIDENCE OF DISEASE DUE TO PM EMISSIONS);
IRHH = IONIZING RADIATION – HUMAN HEALTH EFFECTS (POTENTIAL HUMAN EXPOSURE EFFICIENCY RELATIVE TO U235);

9.1 Environmental impact categories explained

 Global Warming Potential	The global warming potential of a gas refers to the total contribution to global warming resulting from the emission of one unit of that gas relative to one unit of the reference gas, carbon dioxide, which is assigned a value of 1. It is split up in 4: – Global Warming Potential total (GWP-total) which is the sum of GWP-fossil, GWP-biogenic and GWP-luluc – Global Warming Potential fossil fuels (GWP-fossil) : The global warming potential related to greenhouse gas (GHG) emissions to any media originating from the oxidation and/or reduction of fossil fuels by means of their transformation or degradation (e.g. combustion, digestion, landfilling, etc). – Global Warming Potential biogenic (GWP-biogenic) : The global warming potential related to carbon emissions to air (CO2, CO and CH4) originating from the oxidation and/or reduction of aboveground biomass by means of its transformation or degradation (e.g. combustion, digestion, composting, landfilling) and CO2 uptake from the atmosphere through photosynthesis during biomass growth - i.e. corresponding to the carbon content of products, biofuels or above ground plant residues such as litter and dead wood. – Global Warming Potential land use and land use change (GWP-luluc): The global warming potential related to carbon uptakes and emissions (CO2, CO and CH4) originating from carbon stock changes caused by land use change and land use. This sub-category includes biogenic carbon exchanges from deforestation, road construction or other soil activities (including soil carbon emissions).
 Ozone Depletion	Destruction of the stratospheric ozone layer which shields the earth from ultraviolet radiation harmful to life. This destruction of ozone is caused by the breakdown of certain chlorine and/or bromine containing compounds (chlorofluorocarbonsor halons), Which break down when they reach the stratosphere and then catalytically destroy ozone molecules.
 Acidification potential	Acid depositions have negative impacts on natural ecosystems and the man-made environment incl. buildings. The main sources for emissions of acidifying substances are agriculture and fossil fuel combustion used for electricity production, heating and transport.
 Eutrophication potential	The potential to cause over-fertilization of water and soil, which can result in increased growth of biomass and following adverse effects. It is split up in 3: – Eutrophication potential - freshwater: The potential to cause over-fertilization of freshwater, which can result in increased growth of biomass and following adverse effects. – Eutrophication potential - marine: The potential to cause over-fertilization of marine water, which can result in increased growth of biomass and following adverse effects. – Eutrophication potential - terrestrial: The potential to cause over-fertilization of soil, which can result in increased growth of biomass and following adverse effects.
 Photochemical ozone creation	Chemical reactions brought about by the light energy of the sun creating photochemical smog. The reaction of nitrogen oxides with hydrocarbons in the presence of sunlight to form ozone is an example of a photochemical reaction.
 Abiotic depletion potential for non-fossil ressources	Consumption of non-renewable resources, thereby lowering their availability for future generations. Expressed in comparison to Antimonium (Sb). 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 experienced with the indicator.
 Abiotic depletion potential for fossil ressources	Measure for the depletion of fossil fuels such as oil, natural gas, and coal. The stock of the fossil fuels is formed by the total amount of fossil fuels, expressed in Megajoules (MJ). 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 experienced with the indicator.

Ecotoxicity for aquatic fresh water	The impacts of chemical substances on ecosystems (freshwater). 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 experienced with the indicator.
Human toxicity (carcinogenic effects)	The impacts of chemical substances on human health via three parts of the environment: air, soil and water. 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 experienced with the indicator.
Human toxicity (non-carcinogenic effects)	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 experienced with the indicator.
Particulate matter	Accounts for the adverse health effects on human health caused by emissions of Particulate Matter (PM) and its precursors (NOx, SOx, NH3)
Resource depletion (water)	Accounts for water use related to local scarcity of water as freshwater is a scarce resource in some regions, while in others it is not. 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 experienced with the indicator.
Ionizing radiation - human health effects	This impact category deals mainly with the eventual impact on human health of low dose ionizing radiation of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.
Land use related impacts	The indicator is the “soil quality index” which is the result of an aggregation of following four aspects: – Biotic production – Erosion resistance – Mechanical filtration – Groundwater The aggregation is done based on a JRC model. The four aspects are quantified through the LANCA model for land use. 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 experienced with the indicator.

10 DETAILS OF THE UNDERLYING SCENARIOS USED TO CALCULATE THE IMPACTS

10.1 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.

10.2 A2 – transport to the manufacturer

The raw materials are transported to the manufacturing site.

10.3 A3 – manufacturing

This module takes into account the production process.

10.4 A4 – transport to the building site

	Truck >32 ton	Truck 7,5-16 ton	Truck 3,5-7,5 ton
Fuel type and consumption of vehicle or vehicle type used for transport	(Ecoinvent v3.9.1 data record: Transport, freight, lorry >32 metric ton, EURO5 {RER}| transport, freight, lorry >32 metric ton, EURO5 | Cut-off, U)	(Ecoinvent v3.9.1 data record: Transport, freight, lorry 7.5-16 metric ton, EURO5 {RER}| transport, freight, lorry 7.5-16 metric ton, EURO5 | Cut-off, U)	(Ecoinvent v3.9.1 data record: Transport, freight, lorry 3.5-7.5 metric ton, EURO5 {RER}| transport, freight, lorry 3.5-7.5 metric ton, EURO5 | Cut-off, U)
Distance	100 km (90% from factory to merchant)	35 km (80%*90% from merchant to installation site) 100 km (10% from factory to installation site)	35 km (20%*90% from merchant to installation site)
Capacity utilisation (including empty returns)	50%	50%	50%
Bulk density of transported products	Ecoinvent v3.9.1	Ecoinvent v3.9.1	Ecoinvent v3.9.1
Volume capacity utilisation factor	Ecoinvent v3.9.1	Ecoinvent v3.9.1	Ecoinvent v3.9.1.

Since specific transport data for socket-outlets produced by Niko NV are not available, the default B-EPD-PCR scenario for finishing products (paints and varnishes) is used.

The following transport steps apply:

- 90% of the final product is transported to a merchant over 100 km with a EURO 5 >32 ton lorry.
  - 80% of these 90% is transported over 35 km from merchant to construction site with a EURO 5 7.5-16 ton lorry.
  - 20% of these 90% is transported over 35 km from merchant to construction site with a EURO 5 3.5-7.5 ton lorry.
- 10% of the final product is directly transported from the factory to the construction site over 100 km with a EURO 5 7.5-16 ton lorry.

Modelling of this transport is done using the Ecoinvent v3.9.1 Cut-off database.

10.5 A5 – installation in the building

At the construction site, packaging materials are released. Also 0,025% material losses have been taken into account.

Parts of the installation	Quantity	Description
Processes necessary for the installation of the product	NA	installation using manual screwdriver
Fixation materials	screws	included in the product
Jointing materials	NA	/
Treatments	NA	/
Material losses	0,025%	
Packaging	carton coverage polypropylene foil	0,021 kg 0,001 kg
Others	flush-mounting box	not considered in this EPD

Ancillary materials for installation (specified by material)		
Waste materials on the building site before waste processing, generated by the product's installation (specified by type)	Packaging waste: 0,021 kg carton	Packaging waste: 0,001 kg PP foil
Output materials (specified by type) as result of waste processing at the building site, e.g. of collection for recycling, for energy recovery, disposal (specified by route)	Landfill: 0% Recycling: 95% Incineration: 5%	Landfill: 5% Recycling: 35% Incineration: 60%

10.6 B – use stage (excluding potential savings)

Module not declared.

10.7 C – end of life

It is assumed that all three parts of the socket-outlet follow the Belgian default scenarios for the composing materials at their end-of-life.

C1: The socket-outlet is manually deconstructed without any energy consumption or use of ancillary materials.

C2: The waste socket-outlet is transported to sorting and partly to landfill and incineration.

Module C2 – Transport to waste processing

Type of vehicle (truck/boat/etc.)	Fuel consumption (litres/km)	Distance (km)	Capacity utilisation (%)	Density of products (kg/m3)	Assumptions
Truck 16-32 ton Euro 5	Eco-invent v3.9.1	30	50	Eco-invent v3.9.1	According to B-EPD-PCR scenarios
Truck 16-32 ton Euro 5	Eco-invent v3.9.1	50	50	Eco-invent v3.9.1	According to B-EPD-PCR scenarios
Truck 16-32 ton Euro 5	Eco-invent v3.9.1	100	50	Eco-invent v3.9.1	According to B-EPD-PCR scenarios

C3: Part of the composing materials of the waste socket-outlet is recycled after its demolition. The materials are first sorted in a sorting facility. The end-of-waste point is considered to be situated at the gate of the sorting facility.

C4: Part of the composing materials of the waste socket-outlet is landfilled and part is incinerated. The materials are first sorted in a sorting facility. Then they go to landfilling or incineration. The end-of-waste point is not reached in this case.

End-of-life modules – C3 and C4

Parameter	Value (kg)
Wastes collected separately	0
Wastes collected as mixed construction waste	0,095
Waste for re-use	0
Waste for recycling	0,047
Waste for energy recovery	0,041
Waste for final disposal	0,007

10.8 D – benefits and loads beyond the system boundaries

The socket-outlet waste is sorted and partly landfilled, partly incinerated and partly recycled at its end-of-life. Consequently, benefits and loads can be reported. The following waste streams are considered for recycling: steel parts in C3 (37,683 g, of which 95% is recycled), brass parts in C3 (8,858 g, of which 95% is recycled) and plastic parts in C3 (48,275 g, of which 5% is recycled). The following waste stream is considered for incineration with energy recovery: plastic parts in C4 (48,275 g, of which 85% is incinerated).

The waste packaging from the final product is sorted and partly sent to landfill, recycling and incineration. Consequently, benefits and loads can be reported. The following waste streams are considered for recycling: cardboard packaging (21,200 g, of which 95% is recycled) and plastic packaging films (1,000 g, of which 35% is recycled). The following waste streams are considered for incineration with energy recovery: cardboard packaging (21,200 g, of which 5% are incinerated) and plastic packaging films (1,000 g, of which 60% is incinerated).

Quantitative description of the loads beyond the system boundaries	Loads represent the transport to recycling done by truck 16-32 metric ton euro 5, as well as the recycling processes for the packaging materials and the final product.
Quantitative description of the benefits beyond the system boundaries	Benefits relate to the energy recovery (heat and electricity) from the incineration of the packaging materials and the final product, as well as to the avoided production of virgin materials for the packaging materials and the final product.

11 RELEASE OF DANGEROUS SUBSTANCES TO INDOOR AIR, SOIL AND WATER DURING THE USE STAGE

11.1 Indoor air

Under normal conditions of use, a Niko socket-outlet does not cause any adverse health effects or release of volatile organic compounds (VOCs) to indoor air.

11.2 Soil and water

Not applicable as this product is not in contact with water and soil.

12 DEMONSTRATION OF VERIFICATION

EN 15804+A2 serves as the core PCR

Independent verification of the environmental declaration and data according to standard EN ISO 14025:2010
Internal ☐ External ☒

Third party verifier:

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13 TECHNICAL INFORMATION FOR SCENARIO DEVELOPMENT AND APPLICATION UNIT

The information in the EPD is given for one specific socket-outlet with two types of mechanism, produced by Niko in its factory at Sint-Niklaas, Belgium.

The environmental impact is proportional to the number of this type of socket-outlets.

The ratio between application unit and reference flow in the EPD equals 1 (same unit in application unit as in EPD).

The NIKO socket-outlets are designed and installed in the fixed installation to provide power to appliances within a residential environment.

The socket-outlet variants are simply mounted in a flush-mounting box with grip surfaces with claws that rotate open using screws with a combination screwhead. The screws are part of the socket-outlet. In the socket-outlet with a mechanism with screw-type terminals, the electrical wiring is connected to the screw-type terminals using screws. In the socket-outlet with a mechanism with plug-in terminals, the electrical wiring is inserted into the plug-in terminals without screws. The installation can be done using a manual screwdriver or an electric device. The flush-mounting box is not included in this EPD, but is necessary to install the socket-outlet correctly into a building element (wall, ceiling, floor). For one socket-outlet, one flush-mounting box is necessary. The characteristics of the flush-mounting box are the following:

- Depth: minimum 40 mm (cabling space included)
- Claw/screw fixing: 60 mm
- Inner diameter box: 60 mm
- Multiple boxes centre distance horizontal : 71 mm
- Multiple boxes centre distance vertical : 60 mm for Belgium and France

14 ADDITIONAL INFORMATION ON REVERSIBILITY

Description	Type of fixing	Level of reversibility	Simplicity of disassembly	Speed of disassembly	Ease of handling (size and weight)	Robustness of material (material resistance to disassembly)	Comment
The socket-outlet is simply mounted in a flush-mounting box	Screws	Reversible fixing	Simple – use of dismantling tools required	Speedy disassembly	Easy to manipulate by hand (small size and limited weight): one worker should be sufficient	The material resists well during disassembly	The table is valid for the two Niko socket-outlet types considered in this EPD (i.e. with a mechanism with screw-type terminals and with a mechanism with plug-in terminals)

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Ramses Sterckx, Vinçotte
Date of verification: 7/02/2025
External independent verification of the declaration and data according to EN ISO 14025 and relevant PCR documents

Comparing EPDs is not possible unless they are conform to the same PCR and taking into account the building context.
The program operator cannot be held responsible for the information supplied by the owner of the EPD nor LCA practitioner.

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