

Environmental Product Declaration



In accordance with ISO 14025 and EN 15804:2012+A2:2019 for:

PVC insulated stranded conductor Building Cables H07V-R (FK, PN)

from

Amo Installationskabel AB



Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-05122
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An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com



General information

Programme information

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	info@environdec.com

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product category rules (PCR): <i>PCR 2019:14 Construction products and construction services, version 1.11</i>
PCR review was conducted by: <i>The Technical Committee of the International EPD® System. Review chair: Claudia A. Peña, University of Concepción, Chile. A full list of members available on www.environdec.com. The review panel may be contacted via info@environdec.com.</i>
Independent third-party verification of the declaration and data, according to ISO 14025:2006: ☐ EPD process certification ☒ EPD verification
Third party verifier: Martin Erlandsson, IVL
Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier: ☒ Yes ☐ No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but from different programmes may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804. For further information about comparability, see EN 15804 and ISO 14025.

Company information

Owner of the EPD:

Amo Installationskabel AB

Contact:

Richard Andersén, richard.andersen@amokabel.com

<https://amokabel.com/>

Description of the organisation:

Amo Installationskabel AB is part of Amokabel, a Scandinavian cable group with four companies that manufacture a wide spectrum of wires, cables and consumer-packaged products. Amokabel manufactures cables for the sectors Subsea; Industry; Power networks; Installation. We are the industry leader when it comes to innovation, customer service and short lead times. With focus on high quality and innovative design of new products with minimal environmental impact.

Our division within Amokabel is specialized in building- and installations-cables varying from single-core wires to larger industrial installations-cables that are rated up to 1kV.

We offer customer-based packaging-solutions and pride ourselves on our speed and flexibility both when it comes to customer service and production-processes. Our customers are mainly based in Sweden, Norway, Finland and Denmark.

Product-related or management system-related certifications:

ISO 14001, ISO 9001 & ISO 45001

Name and location of production site(s):

Alstermo, Sweden

Product information

Product name:

PVC insulated stranded conductor Building Cables H07V-R (FK, PN) in the variations PN 1,5; PN 2,5; and PN 6

Product description:

H07V-R is a 70°C PVC insulated stranded conductor. Suitable for fixed installation. To be installed in conduit or duct systems, or as connection wire to be used in switch cabinets and similar applications.

UN CPC code:

4634

LCA information

Declared unit:

1 km building cable with one electrical core of type H07V-R

Time representativeness:

Data has been collected in 2021 and represents the years 2020 and 2021. The reference year of the EPD is thus set to 2020/2021.

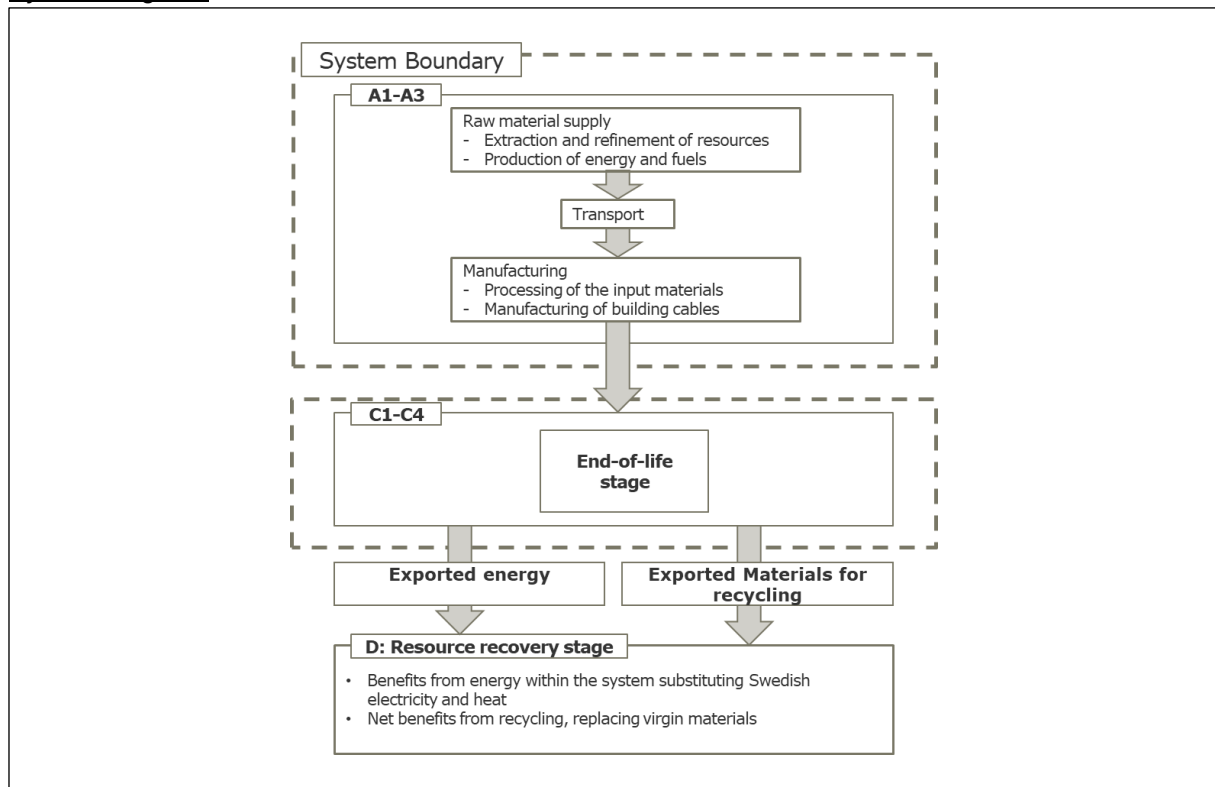
Database(s) and LCA software used:

LCA calculations were performed with the LCA software GaBi (version 10.5), using life cycle inventory (LCI) data from GaBi Professional database 2021, GaBi construction material extension database and ecoinvent 3.7.1.

Description of system boundaries:

The EPD is of the type "Cradle to gate with modules C1-C4 and module D" and thus covers the life cycle modules A1-A3, C and D. The life cycle stages A4-A5 and B1-B7 are thus not included. The system boundaries are described in the system diagram where all instances of the figure are included in the assessment and in the section Additional LCA information. Excluded are thus e.g., inventory flows from infrastructure, construction, production equipment, and tools that are not directly consumed in the production process, travelling by personnel and research and development – all in accordance with the PCR 2019:14 and EN 15804.

System diagram:



Product stage, A1-A3:

The product stage comprises the acquisition of all raw materials, products and energy, transport to the production site, production processes, packaging, and waste processing up to the end-of-waste state or final disposal.

More specifically, this module includes the upstream processes of extraction and processing of raw materials and the transportation of the input materials to the production site in Alstermo. Furthermore, it includes the core processes in Alstermo of manufacturing the final product, including the end-of-life treatment of waste generated during manufacturing, as well as impacts from extraction and processing of fuels and auxiliary materials such as lubricating oils, packaging, fuels, and their transportation to the

production site. The module also includes the production of purchased and on-site generated electricity used at the production site.

To produce the H07V-R cables the respectively sized copper-wire is run through an extrusion-head with tools of differing sizes to form an insulating layer of plastic over the wire. The plastic (PVC) and coloring granulates are melted, mixed, and processed in an extruder and fed continuously into the extrusion-head where it is formed with the tools to exact required measurements while running. The cable is then run through a water-trough to cool down before being spooled on drums. Quality and measurements are controlled throughout the process.

End-of-life stage, C1-C4:

The target market of the cables is Sweden; thus, the end-of-life treatment of the cables is modelled for this region.

In module C1 the deconstruction of the products covered by this study is considered. The deconstructions of the building cables happen manually or in conjunction with the demolition of an entire building, i.e., it does not require special energy or material usage. Therefore, the decommissioning phase was deemed not relevant (of negligible impact). Accordingly, no environmental impact is recorded in this module.

Module C2 includes the transport between an installation site and a waste management plant. There the cable would be shredded, and the materials sorted and treated. Since there are no official figures on average transportation between demolition site and waste management plant, the transport distance is assumed to be 100km with a diesel driven (average EU-28 diesel mix) truck. As large amounts of cables or similar materials are transported in conjunction with the demolition of an entire building a Euro 5 truck-trailer with 26 - 28t gross weight / 18.4t payload capacity was chosen.

Waste processing, module C3, is included up until end-of-waste state (as defined in PCR 2019:14). The cable is assumed to be shredded and sorted before further processing. The shredded and sorted materials in the cable is not classified as hazardous waste. The metal parts reach their end-of-waste state in module C3 and leave the system as "Materials for Recycling". The plastic is incinerated, and the output flows of the incineration are reported as "Exported Electrical Energy (EEE)" and "Exported Thermal Energy (EET)". Consequently, no waste flows enter module C4 and thus no environmental impact is recorded in this module.

Resource recovery stage, D:

In general, module D includes reuse, recovery and/or recycling potential, expressed as net impact and benefits.

Module D includes the replacement of exported thermal and electrical energy that otherwise would have been produced from other sources, as well as the recycling and material recovery of the metals. The burden from the recycling process and net benefit of replacing alternatively produced virgin material are reported in module D.

Additional LCA information

Cut-off rules:

General cut-off criteria as defined in EN15804 are followed. Life cycle inventory data includes a minimum of 95% of total inflows (mass and energy) per module.

Allocation:

Several products are produced at the manufacturing site in Alstermo as well as on the used production units. Where no measurements could be performed, i.e., for water and lubricating oils, an allocation of environmental burdens of input and output flows has been performed on production unit level.

Allocation has been performed based on mass.

LCA practitioners:

Jonathan Klement, David Lindén, Yevgeniya Arushanyan, and David Althoff Palm at Ramboll Sweden AB.

Modules declared, geographical scope, share of specific data (in GWP-GHG indicator) and data variation:

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	SE	SE	SE	-	-	-	-	-	-	-	-	-	SE	SE	SE	SE	SE
Specific data used	83% - 90%					-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	0%					-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0%					-	-	-	-	-	-	-	-	-	-	-	-

Content information

Product components	Weight, kg/km			Post-consumer material, weight-%	Renewable material, weight-%
	PN 1,5	PN 2,5	PN 6		
Copper wire	13,14	21,00	53,00	0%	0%
Insulation material	7,26	10,65	14,23	0%	0%
Additional chemicals (colouring)	0,04	0,05	0,07	0%	0%
TOTAL	20,44	31,70	67,30	0%	0%
Packaging materials	Weight, kg/km			Weight-% (versus the product)	
Cable drum – PP	0,07	0,11	0,44	0,3 – 0,7%	
Palette – Wood	0,08	0,11	0,23	0,3 – 0,4%	
TOTAL	0,15	0,22	0,67	0,7 – 1,0%	

Dangerous substances from the candidate list of SVHC for Authorisation	EC No.	CAS No.	Weight-% per functional or declared unit
Total	0	0	0,0%

Environmental Information

The environmental information per km PN is presented in the tables below.

Potential environmental impact – mandatory indicators according to EN 15804

Results per declared unit							
Indicator	Unit	A1-A3	C1	C2	C3	C4	D
PN 1,5							
GWP-fossil	kg CO ₂ eq.	7,57E+01	0,00E+00	1,68E-01	1,88E+01	0,00E+00	-4,93E+01
GWP-biogenic	kg CO ₂ eq.	1,83E-01	0,00E+00	1,81E-03	3,82E-03	0,00E+00	-4,07E-01
GWP-luluc kg	kg CO ₂ eq.	3,15E-01	0,00E+00	1,39E-03	4,23E-03	0,00E+00	-3,86E-01
GWP-total	kg CO ₂ eq.	7,62E+01	0,00E+00	1,71E-01	1,88E+01	0,00E+00	-5,01E+01
ODP	kg CFC 11 eq.	1,03E-09	0,00E+00	3,36E-17	3,02E-14	0,00E+00	-3,16E-13
AP	mol H ⁺ eq.	1,00E+00	0,00E+00	5,88E-04	5,11E-03	0,00E+00	-8,75E-01
EP-freshwater	kg PO ₄ ³⁻ eq.	4,94E-04	0,00E+00	1,55E-06	1,45E-05	0,00E+00	-9,00E-04
EP-freshwater	kg P eq.	1,61E-04	0,00E+00	5,06E-07	4,71E-06	0,00E+00	-2,93E-04
EP-marine	kg N eq.	6,40E-02	0,00E+00	2,72E-04	1,71E-03	0,00E+00	-5,29E-02
EP-terrestrial	mol N eq.	6,64E-01	0,00E+00	3,03E-03	2,11E-02	0,00E+00	-5,40E-01
POCP	kg NMVOC eq.	2,39E-01	0,00E+00	5,31E-04	4,96E-03	0,00E+00	-1,76E-01
ADP-minerals& metals**	kg Sb eq.	4,32E-02	0,00E+00	1,51E-08	4,33E-07	0,00E+00	-3,81E-02
ADP-fossil**	MJ	1,08E+03	0,00E+00	2,27E+00	3,51E+01	0,00E+00	-5,09E+02
WDP**	m ³ eq.	3,46E+01	0,00E+00	1,58E-03	1,45E+00	0,00E+00	-3,21E+01
PN 2,5							
GWP-fossil	kg CO ₂ eq.	1,19E+02	0,00E+00	2,61E-01	2,76E+01	0,00E+00	-7,87E+01
GWP-biogenic	kg CO ₂ eq.	2,72E-01	0,00E+00	2,81E-03	5,59E-03	0,00E+00	-5,72E-01
GWP-luluc kg	kg CO ₂ eq.	5,01E-01	0,00E+00	2,16E-03	6,20E-03	0,00E+00	-6,00E-01
GWP-total	kg CO ₂ eq.	1,20E+02	0,00E+00	2,66E-01	2,76E+01	0,00E+00	-7,99E+01
ODP	kg CFC 11 eq.	1,52E-09	0,00E+00	5,21E-17	4,43E-14	0,00E+00	-5,03E-13
AP	mol H ⁺ eq.	1,60E+00	0,00E+00	9,12E-04	7,48E-03	0,00E+00	-1,40E+00
EP-freshwater	kg PO ₄ ³⁻ eq.	7,46E-04	0,00E+00	2,41E-06	2,11E-05	0,00E+00	-1,36E-03
EP-freshwater	kg P eq.	2,43E-04	0,00E+00	7,84E-07	6,87E-06	0,00E+00	-4,43E-04
EP-marine	kg N eq.	1,01E-01	0,00E+00	4,21E-04	2,50E-03	0,00E+00	-8,39E-02
EP-terrestrial	mol N eq.	1,05E+00	0,00E+00	4,70E-03	3,08E-02	0,00E+00	-8,56E-01
POCP	kg NMVOC eq.	3,76E-01	0,00E+00	8,23E-04	7,26E-03	0,00E+00	-2,79E-01
ADP-minerals& metals**	kg Sb eq.	6,90E-02	0,00E+00	2,34E-08	6,33E-07	0,00E+00	-6,09E-02
ADP-fossil**	MJ	1,68E+03	0,00E+00	3,52E+00	5,14E+01	0,00E+00	-8,10E+02
WDP**	m ³ eq.	5,60E+01	0,00E+00	2,45E-03	2,13E+00	0,00E+00	-5,12E+01
PN 6							
GWP-fossil	kg CO ₂ eq.	2,79E+02	0,00E+00	5,54E-01	3,69E+01	0,00E+00	-1,97E+02
GWP-biogenic	kg CO ₂ eq.	5,50E-01	0,00E+00	5,97E-03	7,46E-03	0,00E+00	-4,09E-01
GWP-luluc kg	kg CO ₂ eq.	1,24E+00	0,00E+00	4,58E-03	8,28E-03	0,00E+00	-1,30E+00
GWP-total	kg CO ₂ eq.	2,81E+02	0,00E+00	5,64E-01	3,69E+01	0,00E+00	-1,99E+02
ODP	kg CFC 11 eq.	2,10E-09	0,00E+00	1,11E-16	5,92E-14	0,00E+00	-1,25E-12
AP	mol H ⁺ eq.	4,00E+00	0,00E+00	1,94E-03	1,00E-02	0,00E+00	-3,50E+00
EP-freshwater	kg PO ₄ ³⁻ eq.	1,67E-03	0,00E+00	5,11E-06	2,81E-05	0,00E+00	-2,40E-03
EP-freshwater	kg P eq.	5,44E-04	0,00E+00	1,67E-06	9,16E-06	0,00E+00	-7,82E-04
EP-marine	kg N eq.	2,43E-01	0,00E+00	8,94E-04	3,34E-03	0,00E+00	-2,03E-01
EP-terrestrial	mol N eq.	2,52E+00	0,00E+00	9,98E-03	4,12E-02	0,00E+00	-2,07E+00

POCP	kg NMVOC eq.	8,77E-01	0,00E+00	1,75E-03	9,70E-03	0,00E+00	-6,89E-01
ADP-minerals& metals**	kg Sb eq.	1,74E-01	0,00E+00	4,97E-08	8,45E-07	0,00E+00	-1,54E-01
ADP-fossil**	MJ	3,58E+03	0,00E+00	7,47E+00	6,86E+01	0,00E+00	-2,00E+03
WDP**	m³ eq.	1,44E+02	0,00E+00	5,20E-03	2,85E+00	0,00E+00	-1,29E+02

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

Potential environmental impact – additional mandatory and voluntary indicators

Results per declared unit							
Indicator	Unit	A1-A3	C1	C2	C3	C4	D
PN 1,5							
GWP-GHG	kg CO ₂ eq.	7,48E+01	0,00E+00	1,66E-01	1,86E+01	0,00E+00	-4,93E+01
PN 2,5							
GWP-GHG	kg CO ₂ eq.	1,18E+02	0,00E+00	2,58E-01	2,73E+01	0,00E+00	-7,86E+01
PN 6							
GWP-GHG	kg CO ₂ eq.	2,76E+02	0,00E+00	5,48E-01	3,65E+01	0,00E+00	-1,96E+02

Use of resources

Results per declared unit							
Indicator	Unit	A1-A3	C1	C2	C3	C4	D
PN 1,5							
PERE	MJ	1,82E+02	0,00E+00	1,30E-01	8,02E+00	0,00E+00	-2,29E+02
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	1,83E+02	0,00E+00	1,30E-01	8,02E+00	0,00E+00	-2,29E+02
PENRE	MJ	9,58E+02	0,00E+00	2,28E+00	1,57E+02	0,00E+00	-5,10E+02
PENRM	MJ	1,22E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	1,08E+03	0,00E+00	2,28E+00	3,52E+01	0,00E+00	-5,10E+02
SM	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m³	7,04E-01	0,00E+00	1,49E-04	3,84E-02	0,00E+00	-5,71E-01
PN 2,5							
PERE	MJ	2,84E+02	0,00E+00	2,02E-01	1,16E+01	0,00E+00	-3,49E+02
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	2,86E+02	0,00E+00	2,02E-01	1,16E+01	0,00E+00	-3,49E+02
PENRE	MJ	1,49E+03	0,00E+00	3,53E+00	2,30E+02	0,00E+00	-8,11E+02
PENRM	MJ	1,78E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	1,68E+03	0,00E+00	3,53E+00	5,14E+01	0,00E+00	-8,11E+02
SM	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m³	1,11E+00	0,00E+00	2,32E-04	5,61E-02	0,00E+00	-9,06E-01
PN 6							
PERE	MJ	6,84E+02	0,00E+00	4,30E-01	1,55E+01	0,00E+00	-6,62E+02
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	6,88E+02	0,00E+00	4,30E-01	1,55E+01	0,00E+00	-6,62E+02

PENRE	MJ	3,33E+03	0,00E+00	7,49E+00	3,07E+02	0,00E+00	-2,00E+03
PENRM	MJ	2,58E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	3,58E+03	0,00E+00	7,49E+00	6,86E+01	0,00E+00	-2,00E+03
SM	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m ³	2,71E+00	0,00E+00	4,92E-04	7,48E-02	0,00E+00	-2,19E+00
Acronyms	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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water						

Waste production and output flows

Waste production

Results per declared unit							
Indicator	Unit	A1-A3	C1	C2	C3	C4	D
PN 1,5							
Hazardous waste disposed	kg	0,00E+00	0,00E+00	0,00E+00	1,31E+01	0,00E+00	0,00E+00
Non-hazardous waste disposed	kg	3,07E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Radioactive waste disposed	kg	0,00E+00	0,00E+00	0,00E+00	1,90E+01	0,00E+00	0,00E+00
PN 2,5							
Hazardous waste disposed	kg	0,00E+00	0,00E+00	0,00E+00	2,10E+01	0,00E+00	0,00E+00
Non-hazardous waste disposed	kg	4,82E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Radioactive waste disposed	kg	0,00E+00	0,00E+00	0,00E+00	2,78E+01	0,00E+00	0,00E+00
PN 6							
Hazardous waste disposed	kg	0,00E+00	0,00E+00	0,00E+00	5,30E+01	0,00E+00	0,00E+00
Non-hazardous waste disposed	kg	1,48E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Radioactive waste disposed	kg	0,00E+00	0,00E+00	0,00E+00	3,72E+01	0,00E+00	0,00E+00

Output flows

Results per declared unit							
Indicator	Unit	A1-3	C1	C2	C3	C4	D
PN 1,5							
Components for re-use	kg	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00
Material for recycling	kg	0,0E+00	0,0E+00	0,0E+00	1,3E+01	0,0E+00	0,0E+00
Materials for energy recovery	kg	3,1E-01	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00
Exported energy, electricity	MJ	0,0E+00	0,0E+00	0,0E+00	1,9E+01	0,0E+00	0,0E+00
Exported energy, thermal	MJ	0,0E+00	0,0E+00	0,0E+00	3,5E+01	0,0E+00	0,0E+00
PN 2,5							
Components for re-use	kg	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00
Material for recycling	kg	0,0E+00	0,0E+00	0,0E+00	1,3E+01	0,0E+00	0,0E+00
Materials for energy recovery	kg	3,1E-01	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00
Exported energy, electricity	MJ	0,0E+00	0,0E+00	0,0E+00	1,9E+01	0,0E+00	0,0E+00
Exported energy, thermal	MJ	0,0E+00	0,0E+00	0,0E+00	3,5E+01	0,0E+00	0,0E+00
PN 6							
Components for re-use	kg	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00
Material for recycling	kg	0,0E+00	0,0E+00	0,0E+00	1,3E+01	0,0E+00	0,0E+00

Materials for energy recovery	kg	3,1E-01	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00
Exported energy, electricity	MJ	0,0E+00	0,0E+00	0,0E+00	1,9E+01	0,0E+00	0,0E+00
Exported energy, thermal	MJ	0,0E+00	0,0E+00	0,0E+00	3,5E+01	0,0E+00	0,0E+00

Information on biogenic carbon content

Results per declared unit				
Biogenic Carbon Content	Unit	Quantity		
		PN 1,5	PN 2,5	PN 6
Biogenic carbon content in product	kg C	<5%		
Biogenic carbon content in packaging	kg C	4,00E-02	6,00E-02	1,21E-01

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO₂.

References

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- General Programme Instructions of the International EPD® System. Version 3.01.
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