epd-norge
Global program operatør

Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

LAPP ÖLFLEX® CLASSIC 110 CY 4G1,5mm² Elnr 1090671

The Norwegian EPD Foundation

Owner of the declaration:
Elektroskandia Norge AS

Product:
LAPP ÖLFLEX® CLASSIC 110 CY 4G1,5mm² Elnr 1090671

Declared unit:
1 m

This declaration is based on Product Category Rules:
CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR 027:2020 Part B for Electrical cables and wires

Program operator:
The Norwegian EPD Foundation

Declaration number:
NEPD-4647-3909-EN

Registration number:
NEPD-4647-3909-EN

Issue date:
10.07.2023

Valid to:
10.07.2028

EPD Software:
LCA.no EPD generator ID: 66659

General information

Product

LAPP ÖLFLEX® CLASSIC 110 CY 4G1,5mm² Elnr 1090671

Program operator:

Post Box 5250 Majorstuen, 0303 Oslo, Norway
The Norwegian EPD Foundation
Phone: +47 23 08 80 00
web: post@epd-norge.no

Declaration number:

NEPD-4647-3909-EN

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR 027:2020 Part B for Electrical cables and wires

Statement of liability:

The owner of the declaration shall be liable for the underlying information and evidence. EPD Norway shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

Declared unit:

1 m LAPP ÖLFLEX® CLASSIC 110 CY 4G1,5mm² Elnr 1090671

Declared unit with option:

A1,A2,A3,A4,A5,C1,C2,C3,C4,D

Functional unit:

1 meter of ÖLFLEX® CLASSIC 4G1,5mm2 from cradle-to-grave, including waste treatment at end-of-life.

General information on verification of EPD from EPD tools:

Independent verification of data, other environmental information and the declaration according to ISO 14025:2010, § 8.1.3 and § 8.1.4. Verification of each EPD is made according to EPD-Norway's guidelines for verification and approval requiring that tools are i) integrated into the company's environmental management system, ii) the procedures for use of the EPD tool are approved by EPD-Norway, and iii) the process is reviewed annually by an independent third party verifier. See Appendix G of EPD-Norway's General Programme Instructions for further information on EPD tools

Verification of EPD tool:

Independent third party verification of the EPD tool, background data and test-EPD in accordance with EPDNorway's procedures and guidelines for verification and approval of EPD tools. Approval number: NEPDT32.

Third party verifier:

Vito D'Incognito - Take Care International

(no signature required)

Owner of the declaration:

Elektroskandia Norge AS
Contact person: Pål Kristiansen
Phone: +47 97 66 22 12
e-mail: pkr@elektroskandia.no

Manufacturer:

Lapp Norway AS
Eikringen 11
3036 Drammen, Norway

Place of production:

Cableries Lapp S.a.r.l.
Technopole Sud Forbach
F - 57600 FORBACH, France

Management system:

ISO 14001, ISO 9001

Organisation no:

977 454 700

Issue date:

10.07.2023

Valid to:

10.07.2028

Year of study:

2021

Comparability:

EPD of construction products may not be comparable if they not comply with EN 15804 and seen in a building context.

Development and verification of EPD:

The declaration is created using EPD tool lca.tools ver EPD2022.03, developed by LCA.no. The EPD tool is integrated in the company's management system, and has been approved by EPD Norway. Approval number:

Developer of EPD: Petter Dahl - Lapp Norway AS

Reviewer of company-specific input data and EPD: Lars Nilsen - Lapp Norway AS

Approved:

Håkon Hauan
Managing Director of EPD-Norway

Product

Product description:

Benefits

Space-saving installation due to small cable diameters
High electrical performance due to 4 kV test voltage

Application range

Plant engineering
Industrial machinery
Heating and air-conditioning systems
Conveyor and transport systems
In EMC-sensitive environments
(electromagnetic compatibility)

Product specification

Product Make-up

Fine-wire strand made of bare copper wires
PVC insulation LAPP P8/1
Cores twisted in layers
PVC inner sheath, grey
Tinned-copper braiding
PVC outer sheath, transparent

Materials	kg	%
Plastic - Polyvinyl chloride (PVC)	0,07	42,77
Metal - Copper	0,10	57,23
Total	0,17	

Technical data:

Flame-retardant according IEC 60332-1-2
Good chemical resistance
High degree of screening
low transfer impedance (max. 250 O/km at 30 MHz)
Core identification code: Black with white numbers acc. to VDE 0293-334
Conductor stranding: Fine wire according to VDE 0295,
class 5/IEC 60228 class 5
Minimum bending radius: Occasional flexing: 20 x outer diameter
Fixed installation: 6 x outer diameter
Nominal voltage: U0/U: 300/500 V
Test voltage: 4000 V
Protective conductor: G = with GN-YE protective conductor
X = without protective conductor
Temperature range: Occasional flexing: -5°C to +70°C
Fixed installation: -40°C to +80°C

Market:

Norway

Reference service life, product

40 years. Standard lifetime for energy distribution network applications, provided in appendix 1 of PSR for wires, cables, and accessories of PEP Ecopassport.

Reference service life, building or construction works

40 years. Estimation made to match the product service life and keep the EPD environmental impact calculations at the product level.

LCA: Calculation rules

Declared unit:

1 m LAPP ÖLFLEX® CLASSIC 110 CY 4G1,5mm² Elnr 1090671

Cut-off criteria:

All major raw materials and all the essential energy is included. The production processes for raw materials and energy flows with very small amounts (less than 1%) are not included. These cut-off criteria do not apply for hazardous materials and substances.

Allocation:

The allocation is made in accordance with the provisions of EN 15804. Incoming energy and water and waste production in-house is allocated equally among all products through mass allocation. Effects of primary production of recycled materials is allocated to the main product in which the material was used. The recycling process and transportation of the material is allocated to this analysis.

Data quality:

Specific data for the product composition are provided by the manufacturer. The data represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on EPDs according to EN 15804 and different LCA databases. The data quality of the raw materials in A1 is presented in the table below.

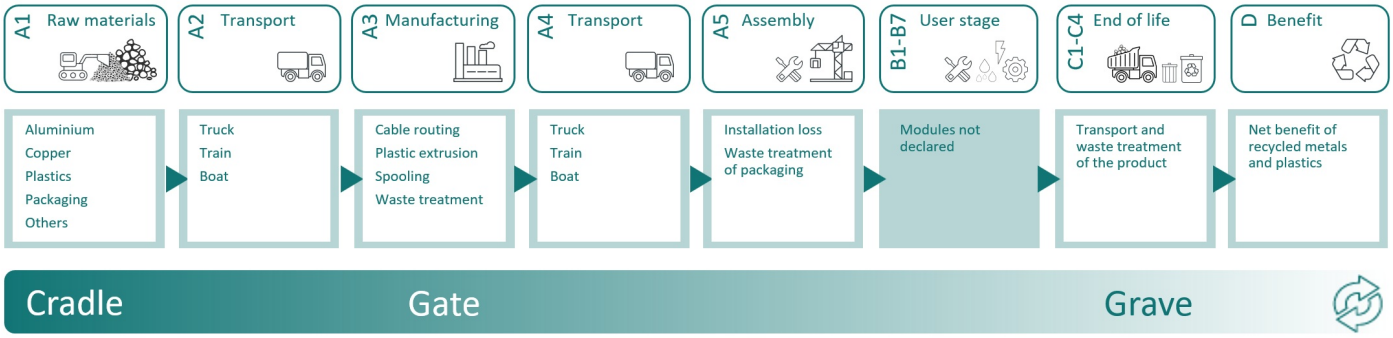
Materials	Source	Data quality	Year
Metal - Copper	ecoinvent 3.6	Database	2019
Plastic - Polyvinyl chloride (PVC)	ecoinvent 3.6	Database	2019

System boundaries (X=included, MND=module not declared, MNR=module not relevant)

Product stage			Construction installation stage		Use stage							End of life stage				Beyond the system boundaries
Raw materials	Transport	Manufacturing	Transport	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

System boundary:

The flowchart below illustrates the system boundaries of the analysis:



Additional technical information:

This EPD includes only the spesific cable as named in the heading. For other cross sections EPD can be made on request.

LCA: Scenarios and additional technical information

The following information describe the scenarios in the different modules of the EPD.

Module A4 = In A4, a transport distance from the production site to Elektroskandia's warehouse in Langhus was included. A distance of 300 km was also added as additional transport to market.

Modules A5 = 2 % product losses during installation are estimated by the company. No energy use has been quantified since installation in buildings is often done by manual labour. Use of portable electrical devices (e.g., drill) usually have low energy requirements falling under the cut-off criterion of 1%.

Module C1 = de-construction in buildings is often done by manual labour. Use of portable electrical devices (e.g., drill) usually have low energy requirements falling under the cut-off criterion of 1%.

Module C2 = 300 km is added as default transport to waste treatment in C2.

Modules C3 and C4 = Waste treatment of the product follows the default values provided in EN 50693, Product Category Rules for life cycle assessments of electronic and electrical products and systems, table G.4. This table specified how different types of raw materials used in A1 will likely be treated during the end-of-life of the product. Waste treatments in C3 include material recycling and incineration with and without energy recovery and fly ash extraction. Disposal in C4 consist of landfilling of different waste fractions and of ashes.

Module D = The recyclability of metals and plastics allows the producers a credit for the net scrap that is produced at the end of a product's life. The benefits from recycling of net scrap are described in formula from EN 15804:2012+A2:2019. Substitution of heat and electricity generated by the incineration with energy recovery of plastics is also calculated in module D.

Transport from production place to user (A4)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, over 32 tonnes, EURO 6 (km)	53,3 %	300	0,023	l/tkm	6,90
Truck, over 32 tonnes, EURO 6 (km)	53,3 %	1956	0,023	l/tkm	44,99

Assembly (A5)	Unit	Value			
Product loss during installation (percentage of cable)	Units/DU	0,02			

Transport to waste processing (C2)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, 16-32 tonnes, EURO 6 (kgkm) - RER	36,7 %	300	0,043	l/tkm	12,90

Waste processing (C3)	Unit	Value			
Aluminium to recycling (kg)	kg/DU	0,09			
Copper to recycling (kg)	kg	0,06			
Waste treatment of polyvinylchloride (PVC), incineration with energy recovery and fly ash extraction (kg)	kg	0,04			
Waste treatment of polyvinylchloride (PVC), incineration with energy recovery and fly ash extraction (kg)	kg/DU	0,07			

Disposal (C4)	Unit	Value			
Landfilling of aluminium (kg)	kg/DU	0,01			
Landfilling of ashes from incineration of Polyvinylchloride (PVC), process per kg ashes and residues (kg)	kg	0,02			
Landfilling of ashes from incineration of Polyvinylchloride (PVC), process per kg ashes and residues (kg)	kg/DU	0,01			
Landfilling of copper (kg)	kg	0,04			
Landfilling of plastic mixture (kg)	kg	0,04			

Benefits and loads beyond the system boundaries (D)	Unit	Value			
Substitution of electricity, in Norway (MJ)	MJ	0,11			
Substitution of electricity, in Norway (MJ)	MJ/DU	0,12			
Substitution of primary copper with net scrap (kg)	kg	0,04			
Substitution of primary copper with net scrap (kg)	kg/DU	0,07			
Substitution of thermal energy, district heating, in Norway (MJ)	MJ	1,65			
Substitution of thermal energy, district heating, in Norway (MJ)	MJ/DU	0,81			

LCA: Results

The LCA results are presented below for the declared unit defined on page 2 of the EPD document.

Environmental impact												
	Indicator	**Unit**	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
	GWP-total	kg CO_2 -eq	9,77E-01	6,77E-03	1,29E-01	3,26E-02	2,76E-02	0	8,14E-03	2,13E-01	1,15E-02	-2,60E-01
	GWP-fossil	kg CO_2 -eq	9,57E-01	6,77E-03	1,27E-01	3,26E-02	2,71E-02	0	8,13E-03	2,13E-01	1,15E-02	-2,58E-01
	GWP-biogenic	kg CO_2 -eq	1,90E-02	2,80E-06	8,95E-04	1,40E-05	4,00E-04	0	3,37E-06	8,69E-05	3,61E-06	-1,17E-03
	GWP-luluc	kg CO_2 -eq	8,15E-04	2,41E-06	2,96E-04	9,94E-06	2,29E-05	0	2,90E-06	1,67E-05	1,16E-06	-7,49E-04
	ODP	kg CFC11 -eq	1,27E-07	1,53E-09	1,08E-08	7,87E-09	3,13E-09	0	1,84E-09	7,01E-09	7,34E-10	-1,04E-03
	AP	mol H+ -eq	8,01E-02	1,94E-05	7,43E-04	1,05E-04	1,62E-03	0	2,34E-05	1,23E-04	2,66E-05	-4,10E-02
	EP-FreshWater	kg P -eq	7,83E-04	5,41E-08	1,36E-05	2,60E-07	1,60E-05	0	6,50E-08	6,28E-07	1,12E-07	-2,77E-04
	EP-Marine	kg N -eq	2,76E-03	3,85E-06	9,45E-05	2,30E-05	5,86E-05	0	4,63E-06	3,01E-05	1,24E-05	-1,72E-03
	EP-Terrestial	mol N -eq	3,92E-02	4,30E-05	1,16E-03	2,57E-04	8,23E-04	0	5,17E-05	3,23E-04	9,44E-05	-2,64E-02
	POCP	kg NMVOC -eq	1,24E-02	1,65E-05	2,95E-04	1,01E-04	2,59E-04	0	1,98E-05	9,14E-05	2,67E-05	-7,18E-03
	ADP-minerals&metals[1]	kg Sb -eq	2,28E-04	1,87E-07	9,34E-07	5,81E-07	4,61E-06	0	2,25E-07	4,49E-07	2,89E-08	-2,29E-04
	ADP-fossil[1]	MJ	1,27E+01	1,02E-01	2,63E+00	5,30E-01	3,29E-01	0	1,23E-01	2,81E-01	6,52E-02	-2,38E+00
	WDP[1]	m^3	3,11E+00	9,89E-02	3,95E+01	4,06E-01	1,00E+00	0	1,19E-01	5,73E+00	1,18E+00	9,78E+00

GWP-total = Global Warming Potential total; GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; 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 Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

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 experienced with the indicator

Remarks to environmental impacts

Additional environmental impact indicators

Indicator		Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
	PM	Disease incidence	1,48E-07	4,14E-10	1,95E-09	3,00E-09	3,10E-09	0	4,98E-10	8,02E-10	3,17E-10	-8,88E-08
	IRP[2]	kgBq U235 -eq	2,44E-02	4,47E-04	2,30E-02	2,32E-03	1,05E-03	0	5,38E-04	1,36E-03	3,65E-04	-4,10E-03
	ETP-fw[1]	CTUe	6,04E+02	7,58E-02	1,84E+00	3,87E-01	1,30E+01	0	9,12E-02	1,35E+01	2,95E+01	-3,77E+02
	HTP-c[1]	CTUh	1,45E-08	0,00E+00	5,10E-11	0,00E+00	2,92E-10	0	0,00E+00	3,00E-11	6,00E-12	-5,32E-09
	HTP-nc[1]	CTUh	1,29E-06	8,30E-11	1,77E-09	3,75E-10	2,58E-08	0	1,00E-10	3,17E-09	2,63E-10	-4,56E-07
	SQP[1]	dimensionless	8,13E+00	7,16E-02	6,35E-01	6,07E-01	1,97E-01	0	8,60E-02	1,02E-01	1,93E-01	-6,13E+00

PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Potential Soil Quality Index (dimensionless)

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

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 experienced with the indicator
2. 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 disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Resource use											
Indicator		**Unit**	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
	PERE	MJ	1,41E+00	1,46E-03	5,09E-01	6,66E-03	3,95E-02	0	1,76E-03	3,58E-02	6,29E-03	-2,20E+00
	PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	PERT	MJ	1,41E+00	1,46E-03	5,09E-01	6,66E-03	3,95E-02	0	1,76E-03	3,58E-02	6,29E-03	-2,20E+00
	PENRE	MJ	1,12E+01	1,02E-01	2,63E+00	5,30E-01	2,99E-01	0	1,23E-01	2,81E-01	6,53E-02	-2,38E+00
	PENRM	MJ	1,53E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00	-1,53E+00	0,00E+00	0,00E+00
	PENRT	MJ	1,27E+01	1,02E-01	2,63E+00	5,30E-01	2,99E-01	0	1,23E-01	-1,25E+00	6,53E-02	-2,38E+00
	SM	kg	2,25E-02	0,00E+00	0,00E+00	0,00E+00	4,56E-04	0	0,00E+00	0,00E+00	2,41E-04	7,12E-02
	RSF	MJ	8,95E-03	5,24E-05	3,71E-02	2,33E-04	9,43E-04	0	6,30E-05	6,48E-04	1,45E-04	6,49E-03
	NRSF	MJ	1,48E-02	1,87E-04	8,81E-03	7,81E-04	5,07E-04	0	2,25E-04	0,00E+00	5,97E-04	-6,01E-02
	FW	m^3	1,57E-02	1,09E-05	2,23E-03	6,03E-05	4,95E-04	0	1,32E-05	6,72E-03	6,93E-05	-8,02E-03

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 materials; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

End of life - Waste

Indicator		Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
	HWD	kg	9,67E-03	5,28E-06	3,95E-04	2,90E-05	2,89E-04	0	6,34E-06	0,00E+00	4,33E-03	-2,77E-03
	NHWD	kg	2,55E-01	4,97E-03	1,20E-02	4,61E-02	8,67E-03	0	5,98E-03	0,00E+00	1,09E-01	-1,23E-01
	RWD	kg	2,36E-05	6,97E-07	1,88E-05	3,62E-06	9,56E-07	0	8,38E-07	0,00E+00	2,60E-07	-3,56E-06

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

End of life - Output flow

Indicator		Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
	CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	MFR	kg	0,00E+00	0,00E+00	2,04E-03	0,00E+00	2,89E-03	0	0,00E+00	1,43E-01	3,63E-06	-2,79E-03
	MER	kg	0,00E+00	0,00E+00	1,07E-07	0,00E+00	2,13E-03	0	0,00E+00	1,07E-01	6,08E-06	-3,67E-04
	EEE	MJ	0,00E+00	0,00E+00	1,64E-07	0,00E+00	2,18E-03	0	0,00E+00	1,09E-01	5,83E-05	-8,99E-04
	EET	MJ	0,00E+00	0,00E+00	2,48E-06	0,00E+00	3,30E-02	0	0,00E+00	1,65E+00	8,82E-04	-1,36E-02

CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported energy electrical; EET = Exported energy thermal

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

Biogenic Carbon Content

Indicator	Unit	At the factory gate
Biogenic carbon content in product	kg C	0,00E+00
Biogenic carbon content in accompanying packaging	kg C	0,00E+00

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

Additional requirements

Greenhouse gas emissions from the use of electricity in the manufacturing phase

National production mix from import, low voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing process (A3).

Electricity mix	Data source	Amount	Unit
Electricity, European average (kWh)	ecoinvent 3.6	428,03	g CO2-eq/kWh

Dangerous substances

The product contains no substances given by the REACH Candidate list or the Norwegian priority list.

Indoor environment

No effect on indoor environment.

Additional Environmental Information

Additional environmental impact indicators required in NPCR Part A for construction products											
Indicator	**Unit**	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
GWPIOBC	kg CO_2 -eq	9,75E-01	6,77E-03	1,38E-01	3,26E-02	2,77E-02	0	8,14E-03	2,14E-01	7,85E-03	-1,30E-01

GWP-IOBC: Global warming potential calculated according to the principle of instantaneous oxidation. In order to increase the transparency of biogenic carbon contribution to climate impact, the indicator GWP-IOBC is required as it declares climate impacts calculated according to the principle of instantaneous oxidation. GWP-IOBC is also referred to as GWP-GHG in context to Swedish public procurement legislation.

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