epd-norge
The Norwegian EPD Foundation

ENVIRONMENTAL PRODUCT DECLARATION

in accordance with ISO 14025, ISO 21930 and EN 15804

Owner of the declaration:	Elektroskandia Norge AS
Program operator:	The Norwegian EPD Foundation
Publisher:	The Norwegian EPD Foundation
Declaration number:	NEPD-3417-2032-EN
Registration number:	NEPD-3417-2032-EN
ECO Platform reference number:	-
Issue date:	29.03.2022
Valid to:	29.03.2027

LAPP INFRALine 5G25mm² NO-N1XZ1-AFR 1012023

Elektroskandia Norge AS

www.epd-norge.no

LAPP Elektroskandia Norge REXEL GROUP

LAPP NORWAY

General information

Product:

LAPP INFRALine 5G25mm² NO-N1XZ1-AFR 1012023

Owner of the declaration:

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Program operator:

The Norwegian EPD Foundation
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Manufacturer:

Lapp Norway AS
Eikringen 11 3036 Drammen
Norway

Declaration number:

NEPD-3417-2032-EN

Place of production:

TTkabeli d.o.o.
Knešpolje bb 88200 Široki Brijeg
Bosnia and Herzegovina

ECO Platform reference number:

Management system:

ISO 14001, ISO 9001

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A1:2013 serves as core PCR
NPCR 027 Part B for Electrical cables and wires

Organisation no:

977 454 700

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.

Issue date:

29.03.2022

Valid to:

29.03.2027

Declared unit:

1 m LAPP INFRALine 5G25mm² NO-N1XZ1-AFR 1012023

Year of study:

2021

Declared unit with option:

A1,A2,A3,A4,A5,B1,B2,B3,B4,B5,B6,B7,C1,C2,C3,C4,D

Comparability:

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

Functional unit:

1 meter of INFRALine roadlight and earth cable with aluminum conductor installed in a trench, from cradle-to-grave.

Development and verification of EPD:

The declaration has been developed and verified using EPD tool lca.tools ver EPD2020.11, developed by LCA.no AS. The EPD tool is integrated into the company's environmental management system, and has been approved by EPD-Norway

Developer of EPD:

Gjøran A. Lerskallen - Lapp Norway AS

Reviewer of company-specific input data and EPD:

Petter Dahl - Lapp Norway AS

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. Individual third party verification of each EPD is not required when the EPD tool is i) integrated into the company's environmental management system, ii) the procedures for use of the EPD tool are approved by EPDNorway, and iii) the proccess is reviewed annualy. 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.

Fredrik Moltu Johnsen, Norsus AS

(no signature required)

Approved:

Sign

Håkon Hauan, CEO EPD-Norge

Product

Product description:

Halogen-free, flame-retardant and self-extinguishing power cable in aluminum with ripcord. These are important properties that protect life and property in the event of a fire. In addition, the cable is UV-resistant, double insulated, has good water resistance and good cold properties. Open permanent installation indoors and outdoors, in pipes and in the ground. Suitable for road lighting, distribution, supply, distribution and in cable ladders. It is important that the cable is end sealed (with end cap, not tape) immediately after cutting to prevent water penetration through the end. Use cable breakouts to prevent longitudinal water penetration.

Product specification

CONSTRUCTION
Conductor: Multi-wire round and annealed aluminum, class 2 (AFR), IEC 60228
Conductor insulation: XLPE compound
Filling: Watertight tape
Outer sheath: HFFR compound, Halogen-free and UV-resistant, green (also available in black)

Materials	kg	%
Metal - Aluminium	0,32	51,68
Polypropylene (PP)	0,01	1,28
Polyethylene	0,09	15,04
HFFR Polyolefin	0,20	32,00
Total:	0,63	

Technical data:

INFRAline™ 5 G 25 mm² NO-N1XZ1-AFR
LAPP Art.No: 11139453
Elnummer: 1012023
https://efobasen.efo.no/produkt/1012023

Conductor marking: HD 308 S2, Yellow-green, blue, brown, black, gray
Maximum conductor temperature for continuous operation: + 90 ° C
Lowest laying temperature: - 20 ° C (Be careful when laying below 0 ° C)
Ambient temperature: -40 ° C - + 70 ° C
Short-circuit temperature: + 250 ° C
Bending radius, during assembly: 12 x outer diameter
Bending radius, fixed installation: 8 x outer diameter
Test voltage: 4.5kV AC 50 Hz, 5 min.

STANDARDS / MATERIAL PROPERTIES
Construction: SS 424 14 18, HD 603-5M, HD 604 5D - selected parts
Halogen free: IEC 60754-1
Flame retardant: IEC 60332-1-2, IEC 60332-3-24
Smoke density: IEC 61034-2: Light penetration> 60%
Gas evolution during combustion: IEC 60754-2, pH = 4.3; conductive =10µS / cm
UV resistant: YES
Cold resistant: YES
Delivery quantity: 1000 meters
Norwegian 4-letter code: TFXI
CPR classification: Eca

Market:

Nordic countries

Reference service life, product

The reference service life of the product is highly dependent on the conditions of use.

Reference service life, construcion

Expected lifetime 50 years, provided proper installation, load and ambient temperature.

LCA: Calculation rules

Declared unit:

1 m LAPP INFRALine 5G25mm² NO-N1XZ1-AFR 1012023

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:

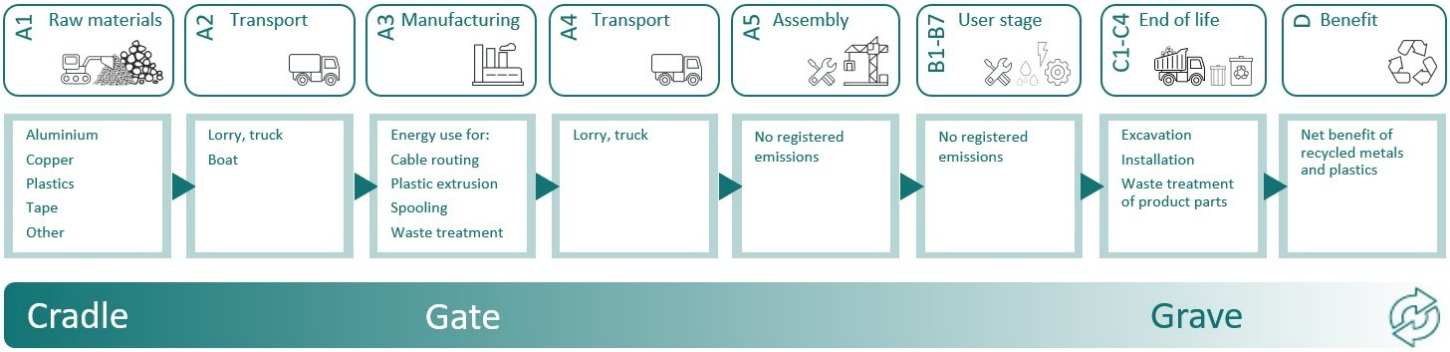
The allocation is made in accordance with the provisions of EN 15804. Incoming energy and water and waste production in-house is allocated equally among all products through mass allocation. Effects of primary production of recycled materials is allocated to the main product in which the material was 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. They represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on registered EPDs according to EN 15804, Ostfold Research databases, ecoinvent and other LCA databases. The data quality of the raw materials in A1 is presented in the table below.

Materials	Source	Data quality	Year
HFFR Polyolefin	ecoinvent 3.6	Database	2019
Metal - Aluminium	ecoinvent 3.6	Database	2019
Polyethylene	ecoinvent 3.6	Database	2019
Polypropylene (PP)	ecoinvent 3.6	Database	2019

System boundary:



Additional technical information:

This cable is available in the following cross sections:

Art.nr - Type - Elnr. - Link
11139453 - INFRAline ™ 5 G 25 mm² NO-N1XZ1-AFR - 1012023 - https://efobasen.efo.no/produkt/1012023
11139454 - INFRAline ™ 5 G 50 mm² NO-N1XZ1-AFR - 1012063 - https://efobasen.efo.no/produkt/1012063
38107732 - INFRAline ™ 5 G 95 mm² NO-N1XZ1-AFR - 1010628 - https://efobasen.efo.no/produkt/1010628

Each cross section has its own EPD

LCA: Scenarios and additional technical information

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

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. Installation in trenches (A5) and removal (C1) is assumed to be done with other products such as piping systems and should be assessed at a contruction works level. For B1-B7 the default environmental impact and resource indicators in the EPD are assumed to be zero. Some other potential environmental impacts from the use phase might not be covered by the scope of an EPD. In C3 metals such as copper and aluminium are sent to recycling and other materials such as plastic insulation is sent to municipal incineration. Net benefit of material recycling and energy recovery is given in module D. Both aluminium and copper will replace a market average process for the metals in Europe.

Transport from production place to user (A4)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Unit	Value (l/t)
Truck	55,0 %	Truck, lorry over 32 tonnes, EURO 6	3092	0,022606	l/tkm	69,90
Railway					l/tkm	
Boat					l/tkm	
Other Transportation					l/tkm	

End of Life (C1, C3, C4)

.	Unit	Value
Hazardous waste disposed	kg	
Collected as mixed construction waste	kg	
Reuse	kg	
Recycling	kg	0,2907
Energy recovery	kg	0,3020
To landfill	kg	0,0656

Transport to waste processing (C2)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Unit	Value (l/t)
Truck	38,8 %	Truck, lorry 16-32 tonnes, EURO 6	85	0,043626	l/tkm	3,71
Railway					l/tkm	
Boat					l/tkm	
Other Transportation					l/tkm	

..

Benefits and loads beyond the system boundaries (D)

.	Unit	Value
Substitution of primary Aluminium with net secondary aluminium (kg)	kg	0,24
Substitution of electricity, in Norway (MJ)	MJ	0,77
Substitution of thermal energy, district heating, in Norway (MJ)	MJ	5,26

LCA: Results

LCA results according to the indicators of EN 15804:2013+A1:2013 are presented in the following tables, for the declared unit defined on page 2 of the EPD document. All potential environmental impacts might not be covered by the EN 15804 indicators. This concerns indicators such as noise, electromagnetic radiation, electromagnetic fields and treatment brominated flame retardants.

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

Product stage			Construction installation stage		User stage							End of life stage				.	Beyond the system bondaries
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	X	X	X	X	X	X	.	X

Environmental impact

Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4
GWP	kg CO_2 -eq	4,97E+00	1,60E-01	0	0	0	0	0
ODP	kg CFC11 -eq	4,38E-07	3,29E-08	0	0	0	0	0
POCP	kg C_2H_4-eq	2,31E-03	2,50E-05	0	0	0	0	0
AP	kg SO_2 -eq	2,81E-02	4,13E-04	0	0	0	0	0
EP	kg PO_4^{3-} -eq	2,27E-03	5,69E-05	0	0	0	0	0
ADPM	kg Sb -eq	1,04E-04	3,81E-07	0	0	0	0	0
ADPE	MJ	5,94E+01	2,63E+00	0	0	0	0	0

Parameter	Unit	B5	B6	B7	C1	C2	C3	C4	D
GWP	kg CO_2 -eq	0	0	0	0	8,47E-03	7,44E-01	5,76E-03	-2,18E+00
ODP	kg CFC11 -eq	0	0	0	0	1,59E-09	8,39E-09	3,70E-10	-1,88E-07
POCP	kg C_2H_4-eq	0	0	0	0	1,28E-06	9,44E-06	6,20E-07	-1,13E-03
AP	kg SO_2 -eq	0	0	0	0	1,99E-05	1,62E-04	1,29E-05	-1,28E-02
EP	kg PO_4^{3-} -eq	0	0	0	0	2,61E-06	3,22E-05	2,14E-06	-9,94E-04
ADPM	kg Sb -eq	0	0	0	0	2,63E-08	9,95E-08	4,70E-11	-8,79E-07
ADPE	MJ	0	0	0	0	1,28E-01	3,31E-01	3,61E-02	-2,35E+01

GWP Global warming potential; ODP Depletion potential of the stratospheric ozone layer; POCP Formation potential of tropospheric photochemical oxidants; AP Acidification potential of land and water; EP Eutrophication potential; ADPM Abiotic depletion potential for non fossil resources; ADPE Abiotic depletion potential for fossil resources

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

Resource use

Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4
RPEE	MJ	1,90E+01	4,77E-02	0	0	0	0	0
RPEM	MJ	0,00E+00	0,00E+00	0	0	0	0	0
TPE	MJ	1,90E+01	4,77E-02	0	0	0	0	0
NRPE	MJ	6,81E+01	2,71E+00	0	0	0	0	0
NRPM	MJ	7,53E+00	0,00E+00	0	0	0	0	0
TRPE	MJ	7,53E+01	2,71E+00	0	0	0	0	0
SM	kg	4,95E-02	0,00E+00	0	0	0	0	0
RSF	MJ	1,34E-01	0,00E+00	0	0	0	0	0
NRSF	MJ	-6,87E-03	0,00E+00	0	0	0	0	0
W	m^3	1,75E-01	6,41E-04	0	0	0	0	0

Parameter	Unit	B5	B6	B7	C1	C2	C3	C4	D
RPEE	MJ	0	0	0	0	1,89E-03	4,42E-02	2,98E-03	-1,25E+01
RPEM	MJ	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
TPE	MJ	0	0	0	0	1,89E-03	4,42E-02	2,98E-03	-1,25E+01
NRPE	MJ	0	0	0	0	1,31E-01	3,76E-01	4,00E-02	-2,95E+01
NRPM	MJ	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
TRPE	MJ	0	0	0	0	1,31E-01	3,76E-01	4,00E-02	-2,95E+01
SM	kg	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	-1,51E-04
NRSF	MJ	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
W	m^3	0	0	0	0	2,47E-05	1,21E-02	4,09E-05	-1,03E-02

RPEE Renewable primary energy resources used as energy carrier; RPEM Renewable primary energy resources used as raw materials; TPE Total use of renewable primary energy resources; NRPE Non renewable primary energy resources used as energy carrier; NRPM Non renewable primary energy resources used as materials; TRPE 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; W Use of net fresh water

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

End of life - Waste

Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4
HW	kg	3,37E-02	1,44E-06	0	0	0	0	0
NHW	kg	1,11E+00	2,47E-01	0	0	0	0	0
RW	kg	3,33E-04	1,89E-05	0	0	0	0	0

Parameter	Unit	B5	B6	B7	C1	C2	C3	C4	D
HW	kg	0	0	0	0	7,71E-08	1,42E-06	4,16E-08	2,23E-03
NHW	kg	0	0	0	0	7,01E-03	2,14E-02	1,00E-01	-1,03E+00
RW	kg	0	0	0	0	8,98E-07	1,87E-06	2,40E-07	-1,27E-04

HW Hazardous waste disposed; NHW Non hazardous waste disposed; RW Radioactive waste disposed

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

End of life - Output flow

Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4
CR	kg	0,00E+00	0,00E+00	0	0	0	0	0
MR	kg	1,29E-02	0,00E+00	0	0	0	0	0
MER	kg	2,02E-02	0,00E+00	0	0	0	0	0
EEE	MJ	2,42E-02	0,00E+00	0	0	0	0	0
ETE	MJ	3,53E-01	0,00E+00	0	0	0	0	0

Parameter	Unit	B5	B6	B7	C1	C2	C3	C4	D
CR	kg	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MR	kg	0	0	0	0	0,00E+00	2,91E-01	0,00E+00	0,00E+00
MER	kg	0	0	0	0	0,00E+00	3,02E-01	0,00E+00	0,00E+00
EEE	MJ	0	0	0	0	0,00E+00	7,65E-01	0,00E+00	0,00E+00
ETE	MJ	0	0	0	0	0,00E+00	5,26E+00	0,00E+00	0,00E+00

CR Components for reuse; MR Materials for recycling; MER Materials for energy recovery; EEE Exported electric energy; ETE Exported thermal energy

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

Additional Norwegian 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, Bosnia and Herzegovina (kWh)	ecoinvent 3.6	972,65	g CO2-ekv/kWh

Dangerous substances

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

Indoor environment

Not relevant, the cable is intended for outdoor use.

Bibliography

ISO 14025:2010 Environmental labels and declarations - Type III environmental declarations - Principles and procedures.
ISO 14044:2006 Environmental management - Life cycle assessment - Requirements and guidelines.
EN 15804:2012+A1:2013 Environmental product declaration - Core rules for the product category of construction products.
ISO 21930:2017 Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products.
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