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-3360-1989-EN
Registration number:	NEPD-3360-1989-EN
ECO Platform reference number:	-
Issue date:	16.02.2022
Valid to:	16.02.2027

3G2,5 PFXP-LX-ER WHITE

Elektroskandia Norge AS

www.epd-norge.no

General information

Product:

3G2,5 PFXP-LX-ER WHITE

Owner of the declaration:

Elektroskandia Norge AS
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Program operator:

The Norwegian EPD Foundation
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Manufacturer:

NKT AS
Støperigata 7 3040 Drammen
Norway

Declaration number:

NEPD-3360-1989-EN

Place of production:

NKT (Denmark) A/S
Toftegårdsvej 25 DK-4550 Asnæs
Denmark

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:

16.02.2022

Valid to:

16.02.2027

Declared unit:

1 m 3G2,5 PFXP-LX-ER WHITE

Year of study:

2020

Declared unit with option:

A1,A2,A3,A4,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 m of 3G2,5 PFXP-LX electrical cable installed in open installations and pipes from cradle-to-grave with with a reference service life of 80 years

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:

Preben Hansen, NKT as

Reviewer of company-specific input data and EPD:

Marco Mezzadra

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:

For fixed installation in open installations and pipes.
The cable is double insulated. Can be laid in the ground if extra protection is provided. The conductor insulation must be protected against UV radiation.
This EPD represent the entire product family of the Building wire "300/500V PFXP-LX ER". This EPD is for our most sold product. Contact us for the specific EPD of other cables within this product family (product references are listed under the additional technical information)

Product specification

Building wire 300/500V
PFXP-LX-ER WHITE

Materials	kg	%
E-PVC	0,07	49,07
Copper	0,06	44,02
Polyethylene	0,01	6,91
Total:	0,14	

Technical data:

Standard: NKT factory standard 014
Solid or stranded, round copper conductor
XLPE insulation
Filling sheat, lead-free PVC
Outer sheat, lead-free PVC
Test voltage: 2 kV AC
Rated voltage: 300/500 V
Max. conductor temperature: 70 °C
Max. short-circuit temperature: 250 °C
Min. handling temperature: -5 °C
Bending radius: 5 x D
CPR fire class: Eca
Colour of sheath: White
Fulfills the low voltage directive: Yes

Market:

Norway

Reference service life, product

80 years

Reference service life, construcion

100 years

LCA: Calculation rules

Declared unit:

1 m 3G2,5 PFXP-LX-ER WHITE

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:

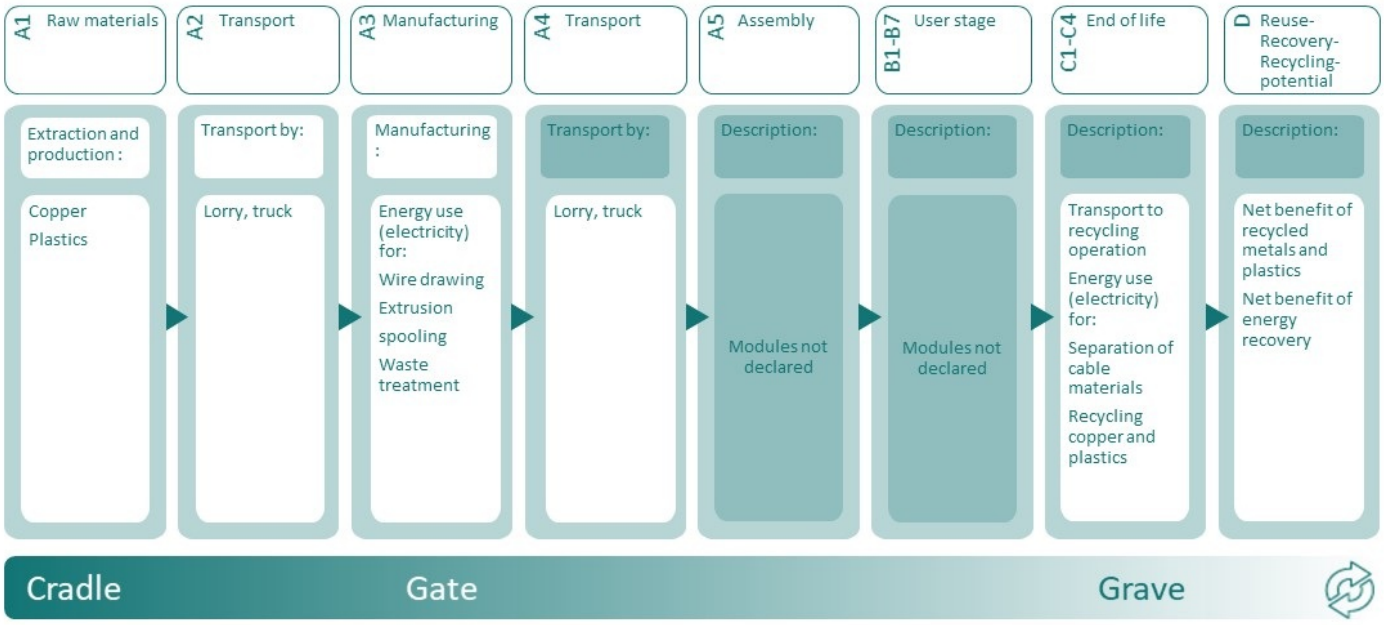
The allocation is made in accordance with the provisions of EN 15804. Incoming energy and water and waste production in-house is allocated equally among all products through mass allocation. Effects of primary production of recycled materials is allocated to the main product in which the material was 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
Copper	ecoinvent 3.6	Database	2019
E-PVC	ecoinvent 3.6	Database	2019
Polyethylene	ecoinvent 3.6	Database	2019

System boundary:



Additional technical information:

This EPD is for our most sold product, contact us for the specific EPD of other cables within this family.
Building wire 300/500V PFXP-LX ER.
All the different products are specified in the this paragraph.
PFXP-LX ER
3G1,5 B/100 1056520
3G1,5 T/300 1056530
4G1,5 B/100 1056521
4G1,5 T/300 1056531
5G1,5 B/100 1056522
5G1,5 T/250 1056532
3G2,5 B/50 1056523
3G2,5 T/250 1056533
4G2,5 B/50 1056524
4G2,5 T/250 1056534
5G2,5 B/50 1056525
5G2,5 T/200 1056535

PFXP-LX FR
3G1,5 B/100 1056540
3G1,5 T/300 1056550
4G1,5 B/100 1056541
4G1,5 T/300 1056551
5G1,5 B/50 1056542
5G1,5 T/250 1056552
3G2,5 B/50 1056543
3G2,5 T/250 1056553
4G2,5 B/50 1056544
4G2,5 T/250 1053554
5G2,5 B/50 1056545
5G2,5 T/200 1056555

LCA: Scenarios and additional technical information

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

The following information describe the scenarios in the different modules of the EPD. In A4, a transport distance of 669 km from the NKT Group production site in Denmark to Elektroskandia's warehouse in Langhus was included. 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 construction 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 are sent to recycling, like vice cross-linked polyethylene is reused in other cable industry applications, finally other plastic materials are sent to municipal incineration. Net benefit of material recycling and energy recovery is given in module D.

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	38,8 %	Truck, lorry 16-32 tonnes, EURO 4	969	0,044575	l/tkm	43,19
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	0,0573
Energy recovery	kg	0,0810
To landfill	kg	0,0092

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	

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Benefits and loads beyond the system boundaries (D)

.	Unit	Value
Substitution of primary Copper with net secondary copper (kg)	kg	0,04
Substitution of electricity, in Norway (MJ)	MJ	0,30
Substitution of thermal energy, district heating, in Norway (MJ)	MJ	2,05

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	MND	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	.	X

Environmental impact

Parameter	Unit	A1-A3	A4	C1	C2	C3	C4	D
GWP	kg CO_2 -eq	7,35E-01	2,26E-02	0	1,96E-03	1,86E-01	5,04E-04	-9,80E-02
ODP	kg CFC11 -eq	1,16E-07	4,21E-09	0	3,69E-10	2,93E-09	3,80E-11	-8,83E-09
POCP	kg C_2H_4-eq	1,56E-03	3,71E-06	0	2,97E-07	3,25E-06	5,80E-08	-7,81E-04
AP	kg SO_2 -eq	4,05E-02	8,79E-05	0	4,61E-06	5,09E-05	1,23E-06	-1,98E-02
EP	kg PO_4^{3-} -eq	2,31E-03	1,58E-05	0	6,05E-07	9,34E-06	2,05E-07	-9,22E-04
ADPM	kg Sb -eq	5,30E-07	6,95E-08	0	6,09E-09	3,51E-08	4,00E-12	-1,77E-07
ADPE	MJ	9,64E+00	3,43E-01	0	2,96E-02	1,12E-01	3,57E-03	-1,23E+00

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	C1	C2	C3	C4	D
RPEE	MJ	1,59E+00	5,01E-03	0	4,37E-04	1,55E-02	2,55E-04	-1,17E+00
RPEM	MJ	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
TPE	MJ	1,59E+00	5,01E-03	0	4,37E-04	1,55E-02	2,55E-04	-1,17E+00
NRPE	MJ	8,80E+00	3,52E-01	0	3,03E-02	1,28E-01	3,91E-03	-1,58E+00
NRPM	MJ	1,93E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
TRPE	MJ	1,07E+01	3,52E-01	0	3,03E-02	1,28E-01	3,91E-03	-1,58E+00
SM	kg	1,27E-02	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	-5,88E-05
NRSF	MJ	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
W	m^3	1,83E-02	6,59E-05	0	5,73E-06	4,28E-03	4,03E-06	-4,83E-03

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	C1	C2	C3	C4	D
HW	kg	1,01E-03	2,05E-07	0	1,78E-08	4,54E-07	4,31E-09	-2,04E-06
NHW	kg	4,18E+00	1,85E-02	0	1,62E-03	7,45E-03	1,21E-02	-1,27E+00
RW	kg	2,43E-05	2,41E-06	0	2,08E-07	6,52E-07	2,37E-08	-6,53E-06

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	C1	C2	C3	C4	D
CR	kg	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MR	kg	1,17E-03	0,00E+00	0	0,00E+00	5,73E-02	0,00E+00	0,00E+00
MER	kg	3,13E-05	0,00E+00	0	0,00E+00	8,10E-02	0,00E+00	0,00E+00
EEE	MJ	7,17E-05	0,00E+00	0	0,00E+00	1,82E-01	0,00E+00	0,00E+00
ETE	MJ	1,40E-04	0,00E+00	0	0,00E+00	1,25E+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
Danish wind power - Renewable electricity with Guarantee of Origin from EAC (kWh)	ecoinvent 3.6	15,08	g CO2-ekv/kWh

Dangerous substances

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

Indoor environment

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.
ecoinvent v3, Allocation, cut-off by classification, Swiss Centre of Life Cycle Inventories.
Iversen et al., (2018) eEPD v3- Background information for EPD generator system. LCA.no report 04.18. Iversen et al., (2020) EPD generator for Elektroskandia and Prysmian Group - Background information and LCA data, LCA.no report 01.20
NPCR Part A: Construction products and services. Ver. 1.04.2017 EPD-Norge. NPCR 27 Part B for electrical cables and wires or NPCR 28 Part B for cable pipes Ver. 1.02.2020 EPD-Norge.

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