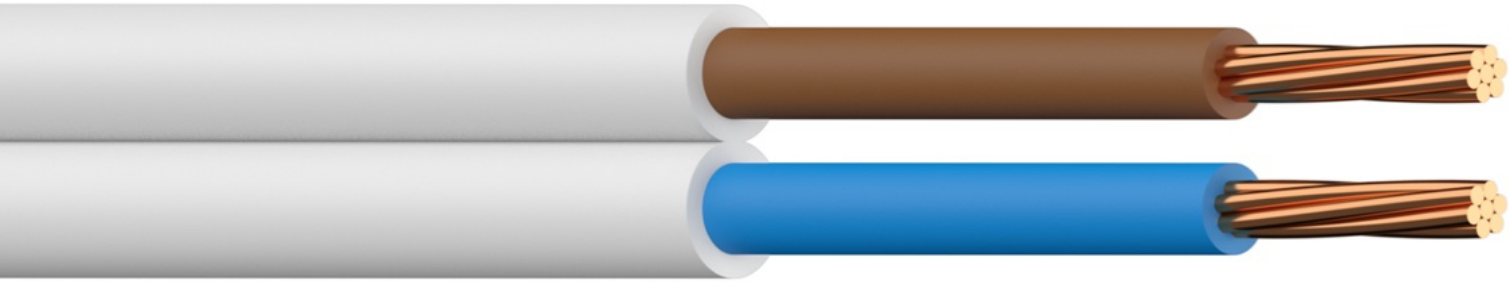
epd-norge
Global program operatør

Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

TwinLed 500V 2x1,5mm²



Draka | A Brand of Prysmian Group

Prysmian Group

The Norwegian EPD Foundation

Owner of the declaration:
Prysmian Group Norge AS

Product:
TwinLed 500V 2x1,5mm²

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:

Registration number:

Issue date:

Valid to:

EPD Software:
LCA.no EPD generator ID: 63411

General information

Product

TwinLed 500V 2x1,5mm²

Owner of the declaration:

Prysmian Group Norge AS
Contact person: Anders Nymark
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Program operator:

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The Norwegian EPD Foundation
Phone: +47 23 08 80 00
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Manufacturer:

Prysmian Group Norge AS
Kjerraten 16
3013 Drammen, Norway

Declaration number:

Place of production:

Prysmian Group production site Oulu (Finland)
Johdintie 5
90630 Oulu, Finland

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

Management system:

ISO 9001, ISO 14001, ISO 45001

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.

Organisation no:

814 780 422

Declared unit:

1 m TwinLed 500V 2x1,5mm²

Issue date:

Declared unit with option:

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

Valid to:

Year of study:

2022

Functional unit:

1 m of TwinLed 500V 2x1,5mm² electrical cable, installed open or piped in indoor installations, with a reference service life of 50 years.

Comparability:

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

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

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: NEPDT33

Developer of EPD: Siri Andersen

Reviewer of company-specific input data and EPD: Anders Nymark

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:

Approved:

Vito D'Incognito - Take Care International

(no signature required)

Product

Product description:

90°C double insulated twin cable for indoor low voltage installations. E.g: Halogen lamps, downlights, solar panels, speaker cable
Cenelec: N05XVH2-R

Product specification

Conductor material Copper
Core insulation material XLPE
Drain wire No
Longitudinal water blocking cable No
Radial water blocking cable No
Core identification (acc. HD 308 S2) Yes
Twisted cores No
Armouring No
Screen No
Lead sheath No
Material outer sheath Polyvinyl chloride (PVC)
Cable shape Twin

Materials	kg	%
Plastic - Polyvinyl chloride (PVC)	0,02	43,17
Metal - Copper	0,03	45,13
Plastic - Polyethylene	0,01	11,70
Total	0,06	

Technical data:

TwinLed 500V 2x1,5mm²
SAPcode: 20318808
El nr.: 1069201

STANDARDS APPLIED:
EN 50525-1 EN 50525-1
IEC 60332-1 Flame retardant properties
EN 50575:2014+A1:2016 Reaction to fire
Flame retardant Yes
Halogen-free No
IEC 60228 class 2 Conductors

Market:

Norway

Reference service life, product

Highly dependent on the conditions of use, estimated to be 50 years.

Reference service life, building or construction works

Standard average service life of buildings and infrastructure 60-100 years, as suggested by NPCR 027.

LCA: Calculation rules

Declared unit:

1 m TwinLed 500V 2x1,5mm²

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.

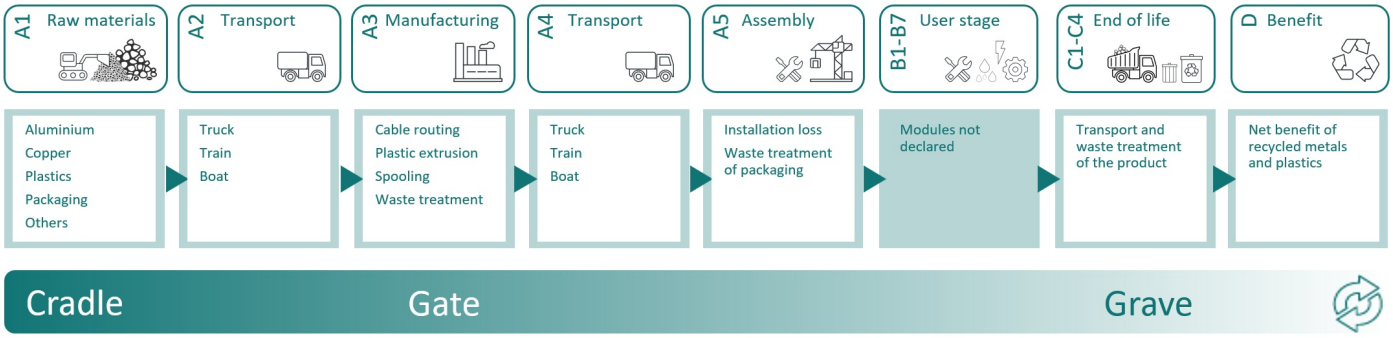
Materials	Source	Data quality	Year
Plastic - Polyethylene	ecoinvent 3.6	Database	2019
Plastic - Polyvinyl chloride (PVC)	ecoinvent 3.6	Database	2019
Metal - Copper	Modified ecoinvent 3.6	Database	2019

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	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X

System boundary:

The flowchart below illustrates the system boundaries of the analysis:



Additional technical information:

Nominal voltage U0 [V] 300
Nominal voltage U [V] 500
Flame retardant In accordance with EN/IEC 60332-1-2
Reaction-to-fire class (acc. EN 13501-6) Eca Max. conductor temperature [°C] 90
Min. outer temperature during installation [°C] 0
Max. outer temperature during installation [°C] 40
Suitable as installation cable Yes
Bending radius (rule) 6xD

LCA: Scenarios and additional technical information

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

In A4, a transport distance of 1445 km from the Prysmian Group production site in Oulu to Prysmian Group's warehouse in Loesmoen 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. In C2, a distance of 300 km has been added as average transport to the Norwegian waste treatment facilities. In C3, datasets are developed for the recycling of metals and plastics and for the incinerations of plastic fractions (including energy recovery and fly ash extraction). All other minor raw materials in the product are assumed to be incinerated. Net benefit of material recycling and energy recovery are given 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 5 (km)	53,3 %	1745	0,023	l/tkm	40,14

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 5 (km)	36,7 %	300	0,044	l/tkm	13,20

Waste processing (C3)	Unit	Value			
Copper to recycling (kg)	kg	0,02			
Waste treatment of plastic mixture, incineration with energy recovery and fly ash extraction (kg)	kg	0,01			
Waste treatment of polyethylene (PE), incineration with energy recovery and fly ash extraction (kg)	kg	0,00			

Disposal (C4)	Unit	Value			
Landfilling of ashes from incineration of Plastic mixture, process per kg ashes and residues (kg)	kg	0,00			
Landfilling of ashes from incineration of Polyethylene (PE), process per kg ashes and residues (kg)	kg	0,00			
Landfilling of copper (kg)	kg	0,01			
Landfilling of plastic mixture (kg)	kg	0,02			

Benefits and loads beyond the system boundaries (D)	Unit	Value			
Substitution of electricity, in Norway (MJ)	MJ	0,03			
Substitution of primary copper with net scrap (kg)	kg	0,01			
Substitution of thermal energy, district heating, in Norway (MJ)	MJ	0,38			

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	2,05E-01	1,19E-02	1,92E-02	9,00E-03	5,78E-03	0	2,84E-03	3,90E-02	1,93E-03	-1,70E-02
	GWP-fossil	kg CO_2 -eq	2,04E-01	1,19E-02	1,83E-02	8,99E-03	5,73E-03	0	2,84E-03	3,90E-02	1,93E-03	-1,69E-02
	GWP-biogenic	kg CO_2 -eq	1,04E-03	4,84E-06	7,32E-04	3,69E-06	3,56E-05	0	1,16E-06	7,10E-07	1,62E-07	-7,28E-05
	GWP-luluc	kg CO_2 -eq	1,86E-04	3,62E-06	1,66E-04	2,63E-06	7,18E-06	0	9,91E-07	1,29E-07	9,30E-08	-9,17E-05
	ODP	kg CFC11 -eq	3,16E-08	2,74E-09	2,14E-09	2,08E-09	7,87E-10	0	6,46E-10	7,10E-11	9,00E-11	-1,61E-04
	AP	mol H+ -eq	1,01E-02	6,14E-05	6,87E-05	3,78E-05	2,06E-04	0	1,16E-05	7,60E-06	2,37E-06	-2,48E-03
	EP-FreshWater	kg P -eq	8,66E-05	8,95E-08	6,75E-07	6,86E-08	1,75E-06	0	2,23E-08	6,35E-09	4,36E-09	-1,68E-05
	EP-Marine	kg N -eq	4,56E-04	1,78E-05	1,25E-05	1,14E-05	1,01E-05	0	3,44E-06	3,64E-06	2,69E-06	-1,07E-04
	EP-Terrestial	mol N -eq	6,52E-03	1,97E-04	1,42E-04	1,26E-04	1,41E-04	0	3,80E-05	3,76E-05	9,49E-06	-1,63E-03
	POCP	kg NMVOC -eq	1,95E-03	6,11E-05	3,63E-05	4,04E-05	4,22E-05	0	1,16E-05	9,06E-06	3,07E-06	-4,44E-04
	ADP-minerals&metals[1]	kg Sb -eq	7,48E-04	2,01E-07	1,26E-07	1,54E-07	1,50E-05	0	7,68E-08	3,52E-09	2,34E-09	-1,38E-05
	ADP-fossil[1]	MJ	3,54E+00	1,84E-01	4,61E-01	1,40E-01	8,76E-02	0	4,28E-02	4,64E-03	7,03E-03	-1,63E-01
	WDP[1]	m^3	9,64E+00	1,39E-01	2,54E+01	1,07E-01	7,09E-01	0	4,08E-02	3,02E-02	1,19E-01	4,09E-01

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	2,47E-08	1,03E-09	3,23E-10	7,92E-10	5,43E-10	0	2,04E-10	3,30E-11	4,40E-11	-6,03E-09
	IRP[2]	kgBq U235 -eq	9,97E-03	8,06E-04	1,12E-02	6,11E-04	4,57E-04	0	1,87E-04	1,11E-05	4,03E-05	-3,65E-04
	ETP-fw[1]	CTUe	8,44E+01	1,34E-01	3,41E-01	1,02E-01	1,83E+00	0	3,15E-02	6,32E-02	6,34E+00	-2,28E+01
	HTP-c[1]	CTUh	1,59E-09	0,00E+00	9,00E-12	0,00E+00	3,20E-11	0	0,00E+00	2,00E-12	0,00E+00	-3,23E-10
	HTP-nc[1]	CTUh	1,33E-07	1,30E-10	2,40E-10	9,90E-11	2,68E-09	0	3,40E-11	8,40E-11	8,00E-12	-2,76E-08
	SQP[1]	dimensionless	1,69E+00	2,05E-01	2,82E-01	1,60E-01	4,77E-02	0	2,95E-02	8,06E-04	1,96E-02	-4,99E-01

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	3,49E-01	2,29E-03	1,42E-01	1,76E-03	9,95E-03	0	6,03E-04	2,41E-04	6,43E-04	-2,48E-01
	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	3,49E-01	2,29E-03	1,42E-01	1,76E-03	9,95E-03	0	6,03E-04	2,41E-04	6,43E-04	-2,48E-01
	PENRE	MJ	2,72E+00	1,84E-01	4,77E-01	1,40E-01	7,15E-02	0	4,28E-02	4,64E-03	7,03E-03	-1,63E-01
	PENRM	MJ	8,48E-01	0,00E+00	0,00E+00	0,00E+00	1,08E-03	0	0,00E+00	-7,94E-01	0,00E+00	0,00E+00
	PENRT	MJ	3,57E+00	1,84E-01	4,77E-01	1,40E-01	7,26E-02	0	4,28E-02	-7,89E-01	7,03E-03	-1,63E-01
	SM	kg	1,02E-02	0,00E+00	0,00E+00	0,00E+00	2,05E-04	0	0,00E+00	0,00E+00	5,28E-05	4,29E-03
	RSF	MJ	5,95E-03	7,99E-05	1,66E-03	6,16E-05	1,56E-04	0	2,16E-05	5,30E-06	1,33E-05	3,74E-04
	NRSF	MJ	-2,81E-04	2,65E-04	5,33E-03	2,06E-04	1,12E-04	0	7,71E-05	0,00E+00	1,44E-05	-1,07E-02
	FW	m^3	3,02E-03	2,07E-05	4,70E-04	1,59E-05	7,15E-05	0	4,50E-06	3,55E-05	8,96E-06	-5,94E-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 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	1,32E-03	1,00E-05	1,40E-03	7,66E-06	6,47E-05	0	2,18E-06	0,00E+00	4,94E-04	-1,68E-04
	NHWD	kg	4,18E-02	1,55E-02	2,56E-03	1,22E-02	2,00E-03	0	2,04E-03	0,00E+00	2,60E-02	-7,82E-03
	RWD	kg	9,96E-06	1,26E-06	5,16E-06	9,55E-07	3,53E-07	0	2,92E-07	0,00E+00	4,76E-08	-3,13E-07

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	9,03E-06	0,00E+00	1,15E-04	0,00E+00	3,09E-04	0	0,00E+00	1,53E-02	1,49E-06	-1,68E-04
	MER	kg	2,12E-05	0,00E+00	5,62E-08	0,00E+00	3,11E-04	0	0,00E+00	1,56E-02	1,33E-06	-2,21E-05
	EEE	MJ	3,94E-05	0,00E+00	3,36E-03	0,00E+00	5,73E-04	0	0,00E+00	2,52E-02	1,37E-05	-5,42E-05
	EET	MJ	5,95E-04	0,00E+00	5,09E-02	0,00E+00	8,67E-03	0	0,00E+00	3,82E-01	2,07E-04	-8,20E-04

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, Finland (kWh)	ecoinvent 3.6	255,20	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 known impact 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	2,04E-01	1,19E-02	2,01E-02	9,00E-03	5,74E-03	0	2,84E-03	3,90E-02	2,20E-04	-9,22E-03

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.

Bibliography

ISO 14025:2010. Environmental labels and declarations - Type III environmental declarations - Principles and procedures. International Organization for Standardization.
ISO 14044:2006. Environmental management - Life cycle assessment - Requirements and guidelines. International Organization for Standardization.
EN 15804:2012+A2:2019. Environmental product declaration - Core rules for the product category of construction products. European Committee for Standardization.
ISO 21930:2017. Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products. International Organization for Standardization.
EN 50693:2019. Product category rules for life cycle assessments of electronic and electrical products and systems. European Committee for Standardization.
Ecoinvent v3, 2019. Allocation, cut-off by classification. Swiss Centre of Life Cycle Inventories.
Iversen et al., (2021). eEPD v2021.09, background information for EPD generator tool system verification, LCA.no. Report number: 07.21. System verification report.
Philis et al., (2022). EPD generator for NPCR 027 part B for electrical wires and cables, background information for EPD generator application and LCA data, LCA.no Report number: 03.22. PCR verification report.
EPD Norway (2022). NPCR Part A: Construction products and services. The Norwegian EPD foundation. Version 2.0 published 24.03.2021.
EPD Norway (2022). NPCR 027 Part B for electrical cables and wires. The Norwegian EPD foundation. Version 2.0 published 01.03.2022.

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