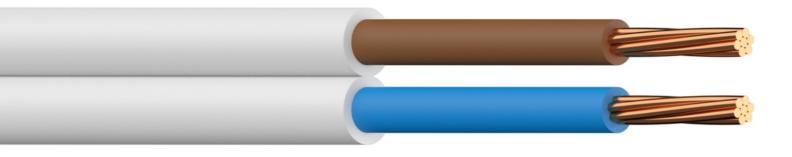


Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

TwinLed 500V 2x1,5mm²



Draka

A Brand of 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:

NEPD-4560-3819-EN

Registration number:

NEPD-4560-3819-EN

Issue date: 09.06.2023

Valid to: 09.06.2028

ver-130723

EPD Software: LCA.no EPD generator ID: 63411



General information

Product TwinLed 500V 2x1,5mm²

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-4560-3819-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 TwinLed 500V 2x1,5mm²

Declared unit with option:

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

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.

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:

Owner of the declaration:

Prysmian Group Norge AS Contact person: Anders Nymark Phone: +47 90066733 e-mail: anders.nymark@prysmiangroup.com

Manufacturer:

Prysmian Group Norge AS Kjerraten 16 3013 Drammen, Norway

Place of production:

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

Management system:

ISO 9001, ISO 14001, ISO 45001

Organisation no:

814 780 422

Issue date: 09.06.2023

Valid to: 09.06.2028

Year of study:

2022

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: NEPDT33

Developer of EPD: Siri Andersen

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

Approved:

Håkon Hauan Managing Director of EPD-Norway

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.

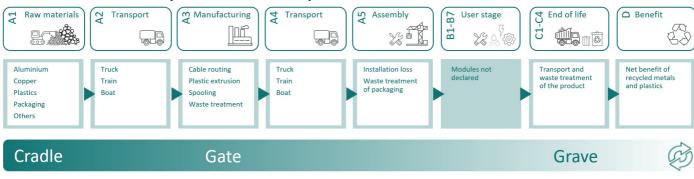
Materials	Source	Data quality	Year
Plastic - Polyethylene	ecoinvent 3.6	Database	2019
Plastic - Polyvinyl chloride (PVC)	ecoinvent 3.6	Database	2019
Metal - Copper	Modified ecoinvent 3.6	Database	2019

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

	Р	roduct stag	je		uction on stage		Use stage						End of I	ife 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
A	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
	Х	Х	Х	Х	Х	MND	MND	MND	MND	MND	MND	MND	Х	Х	Х	Х	Х

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.

Envir	Environmental impact												
	Indicator	Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D	
P	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	
P	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	
P	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	
P	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	
Ò	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	
	РОСР	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	
-5D	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	
B	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	
6	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

Addi	Additional environmental impact indicators												
Ind	licator	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	
(***) Q	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	
4 <u>6</u>	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	Resource use												
	licator	Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D	
ir S	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	
B	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	
° ≓ s	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	
Ð	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	
je	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	
IA	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	
r	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	
D.	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; SENRE = Use of non renewable primary energy resources; SENRE = Use of secondary materials; PENRT = Total use of non renewable primary energy resources; SM = Use of secondary materials; RERT = Total use of non renewable primary energy resources; SM = Use of secondary materials; RERT = 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 lit	fe - Waste											
Ind	licator	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
Ū	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	End of life - Output flow													
Indic	ator	Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D		
¢۵	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		
\$D	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		
DF	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		
$\forall \triangleright$	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		
DI	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 e	Additional environmental impact indicators required in NPCR Part A for construction products												
Indicator	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.



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