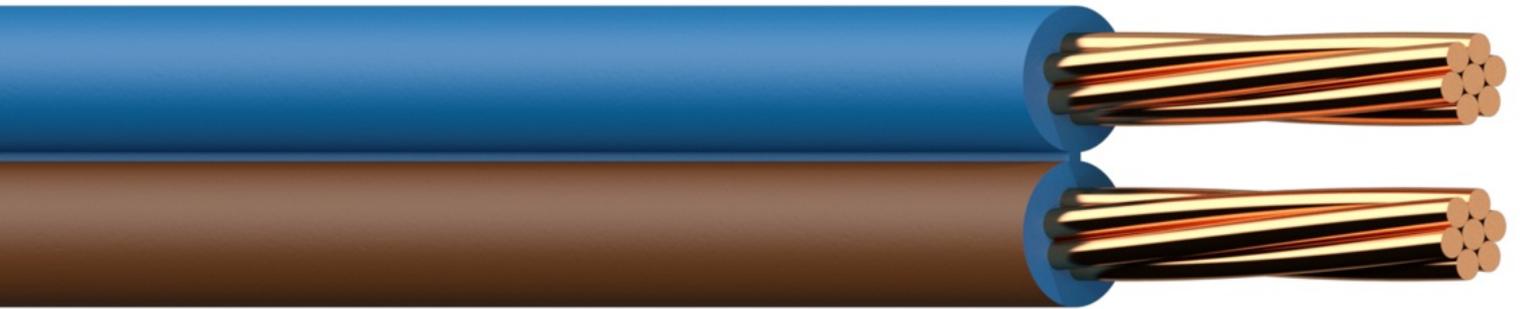


Environmental product declaration

In accordance with 14025 and EN15804+A2

TwinLed light 750V 2x1,5mm² FR



Draka

A Brand of Prysmian Group

Prysmian
Group

The Norwegian EPD Foundation

Owner of the declaration:

Prysmian Group Norge AS

Product:

TwinLed light 750V 2x1,5mm² FR

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 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: 63422

General information

Product

TwinLed light 750V 2x1,5mm2 FR

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:

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR 027 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 light 750V 2x1,5mm2 FR

Declared unit with option:

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

Functional unit:

1 m of TWIN Led Light 750V 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. 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 EPD Norway, and iii) the process is reviewed annually. 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 EPD Norway'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:

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:

Valid to:

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:

Product

Product description:

90°C insulated twin cable for indoor low voltage installations. E.g: Halogen lamps, downlights, solar panels, speaker cable. When used with strain relief make sure to add proper protective sleeve

Cenelec: H07V2-R

Product specification

Conductor material Copper

Core insulation material Polyvinyl chloride (PVC)

Drain wire No

Longitudinal water blocking cable No

Radial water blocking cable No

Core identification (acc. HD 308 S2) Yes

Twisted cores No

Armoring No

Cable shape Twin

Materials	kg	%
Plastic - Polyvinyl chloride (PVC)	0,02	37,50
Metal - Copper	0,03	62,50
Total	0,04	

Technical data:

TwinLed light 750V 2x1,5mm² FR

SAP code: 20377117

El nr.: 1003889

STANDARDS APPLIED:

HD 21.3 Construction

IEC 60332-1 Flame retardant properties

EN 50575:2014+A1:2016 Reaction to fire

Flame retardant Yes

Halogenfree 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 light 750V 2x1,5mm² FR

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.

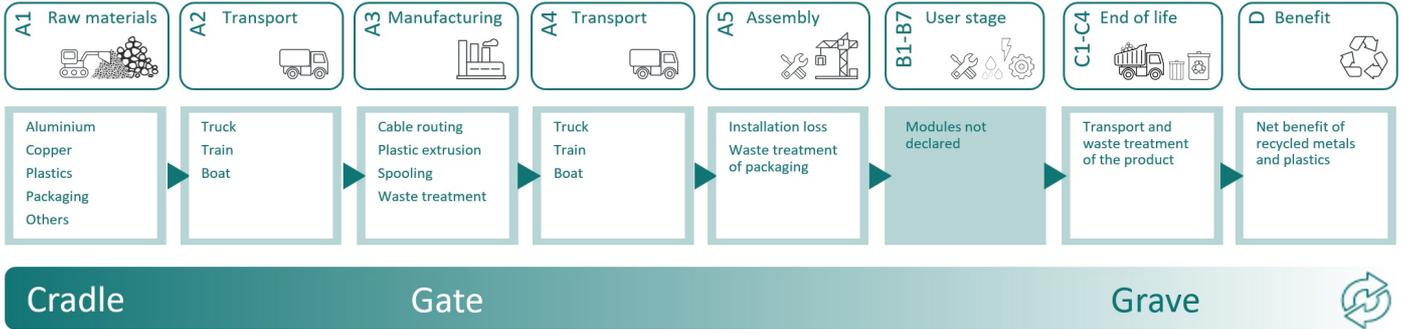
Materials	Source	Data quality	Year
Plastic - Polyvinyl chloride (PVC)	ecoinvent 3.6	Database	2019
Metal - Copper	Modified ecoinvent 3.6	Database	2019

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	MND	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] 450
- Nominal voltage U [V] 750
- Rated voltage U0/U (Um) 450/750 V
- 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, fixed installation [°C] -40
- Max. outer temperature, fixed installation [°C] 70
- Suitable as installation cable Yes
- Bending radius (rule) 4xD

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 construction 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
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			
Disposal (C4)	Unit	Value			
Landfilling of ashes from incineration of Plastic mixture, process per kg ashes and residues (kg)	kg	0,00			
Landfilling of copper (kg)	kg	0,01			
Landfilling of plastic mixture (kg)	kg	0,01			
Benefits and loads beyond the system boundaries (D)	Unit	Value			
Substitution of electricity, in Norway (MJ)	MJ	0,01			
Substitution of primary copper with net scrap (kg)	kg	0,01			
Substitution of thermal energy, district heating, in Norway (MJ)	MJ	0,18			

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	C1	C2	C3	C4	D	
GWP-total	kg CO ₂ -eq	1,54E-01	8,68E-03	3,38E-01	6,49E-03	0	2,05E-03	1,82E-02	1,02E-03	-1,58E-02	
GWP-fossil	kg CO ₂ -eq	1,53E-01	8,68E-03	3,22E-01	6,49E-03	0	2,05E-03	1,82E-02	1,02E-03	-1,57E-02	
GWP-biogenic	kg CO ₂ -eq	8,32E-04	3,50E-06	1,29E-02	2,66E-06	0	8,34E-07	3,95E-07	7,85E-08	-7,03E-05	
GWP-luluc	kg CO ₂ -eq	1,57E-04	2,66E-06	2,92E-03	1,89E-06	0	7,15E-07	7,36E-08	7,44E-08	-5,11E-05	
ODP	kg CFC11 -eq	2,26E-08	1,99E-09	3,78E-08	1,50E-09	0	4,66E-10	3,90E-11	6,50E-11	-7,54E-05	
AP	mol H+ -eq	9,66E-03	4,75E-05	1,21E-03	2,73E-05	0	8,36E-06	3,98E-06	1,74E-06	-2,47E-03	
EP-FreshWater	kg P -eq	8,26E-05	6,47E-08	1,19E-05	4,95E-08	0	1,61E-08	3,50E-09	3,46E-09	-1,67E-05	
EP-Marine	kg N -eq	4,09E-04	1,36E-05	2,20E-04	8,20E-06	0	2,48E-06	1,90E-06	1,53E-06	-1,04E-04	
EP-Terrestrial	mol N -eq	5,94E-03	1,51E-04	2,50E-03	9,07E-05	0	2,74E-05	1,95E-05	6,98E-06	-1,60E-03	
POCP	kg NMVOC -eq	1,74E-03	4,64E-05	6,40E-04	2,92E-05	0	8,40E-06	4,71E-06	2,16E-06	-4,34E-04	
ADP-minerals&metals ¹	kg Sb -eq	4,88E-04	1,44E-07	2,23E-06	1,11E-07	0	5,54E-08	1,99E-09	1,70E-09	-1,38E-05	
ADP-fossil ¹	MJ	2,32E+00	1,34E-01	8,13E+00	1,01E-01	0	3,08E-02	2,50E-03	5,16E-03	-1,46E-01	
WDP ¹	m ³	6,51E+00	9,99E-02	4,48E+02	7,74E-02	0	2,94E-02	1,80E-02	1,03E-01	6,19E-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 change; ODP Ozone Depletion; AP Acidification; EP freshwater Eutrophication aquatic freshwater; EP marine Eutrophication aquatic marine; EP terrestrial Eutrophication terrestrial ;POCP Photochemical zone formation; ADPE Abiotic Depletion Potential minerals and metals; ADPf Abiotic Depletion Potential fossil fuels;

"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	C1	C2	C3	C4	D	
 PM	Disease incidence	2,17E-08	7,40E-10	5,72E-09	5,71E-10	0	1,47E-10	1,70E-11	3,20E-11	-5,44E-09	
 IRP ²	kgBq U235 -eq	7,52E-03	5,85E-04	1,98E-01	4,41E-04	0	1,35E-04	6,28E-06	3,13E-05	-2,57E-04	
 ETP-fw ¹	CTUe	8,06E+01	9,71E-02	6,01E+00	7,38E-02	0	2,27E-02	3,84E-02	6,34E+00	-2,27E+01	
 HTP-c ¹	CTUh	1,54E-09	0,00E+00	1,62E-10	0,00E+00	0	0,00E+00	1,00E-12	0,00E+00	-3,21E-10	
 HTP-nc ¹	CTUh	1,30E-07	9,50E-11	4,22E-09	7,10E-11	0	2,50E-11	4,80E-11	6,00E-12	-2,75E-08	
 SQP ¹	dimensionless	1,54E+00	1,49E-01	4,97E+00	1,16E-01	0	2,13E-02	4,56E-04	1,26E-02	-3,86E-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 Soil Quality (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	C1	C2	C3	C4	D	
 PERE	MJ	3,02E-01	1,65E-03	2,51E+00	1,27E-03	0	4,35E-04	1,39E-04	5,56E-04	-1,44E-01	
 PERM	MJ	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	3,02E-01	1,65E-03	2,51E+00	1,27E-03	0	4,35E-04	1,39E-04	5,56E-04	-1,44E-01	
 PENRE	MJ	1,97E+00	1,34E-01	8,42E+00	1,01E-01	0	3,08E-02	2,50E-03	5,16E-03	-1,46E-01	
 PENRM	MJ	3,48E-01	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00	-3,21E-01	0,00E+00	0,00E+00	
 PENRT	MJ	2,32E+00	1,34E-01	8,42E+00	1,01E-01	0	3,08E-02	-3,19E-01	5,16E-03	-1,46E-01	
 SM	kg	9,81E-03	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	5,19E-05	4,29E-03	
 RSF	MJ	3,23E-03	5,76E-05	2,93E-02	4,44E-05	0	1,56E-05	2,99E-06	1,15E-05	3,92E-04	
 NRSF	MJ	-2,80E-04	1,90E-04	9,41E-02	1,49E-04	0	5,56E-05	0,00E+00	-8,72E-07	-4,53E-03	
 FW	m ³	2,44E-03	1,49E-05	8,29E-03	1,15E-05	0	3,25E-06	2,11E-05	6,65E-06	-4,69E-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 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										
Indicator	Unit	A1	A2	A3	A4	C1	C2	C3	C4	D
 HWD	kg	1,25E-03	7,26E-06	2,47E-02	5,52E-06	0	1,57E-06	0,00E+00	3,91E-04	-1,67E-04
 NHWD	kg	3,84E-02	1,12E-02	4,51E-02	8,78E-03	0	1,47E-03	0,00E+00	1,81E-02	-7,42E-03
 RWD	kg	7,44E-06	9,15E-07	9,10E-05	6,89E-07	0	2,10E-07	0,00E+00	3,53E-08	-2,25E-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	C1	C2	C3	C4	D
 CRU	kg	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	0	0,00E+00	1,53E-02	7,84E-07	-1,68E-04
 MER	kg	0,00E+00	0,00E+00	9,90E-07	0,00E+00	0	0,00E+00	7,68E-03	1,31E-06	-2,21E-05
 EEE	MJ	0,00E+00	0,00E+00	5,93E-02	0,00E+00	0	0,00E+00	1,18E-02	1,26E-05	-5,42E-05
 EET	MJ	0,00E+00	0,00E+00	8,97E-01	0,00E+00	0	0,00E+00	1,78E-01	1,90E-04	-8,20E-04

CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; 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 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, Finland (kWh)	ecoinvent 3.6	255,20	g CO ₂ -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

Environmental impact indicators EN 15804+A1 and NPCR Part A v2.0										
Indicator	Unit	A1	A2	A3	A4	C1	C2	C3	C4	D
GWP	kg CO ₂ -eq	5,99E-02	8,59E-03	4,19E-01	6,42E-03	0	2,02E-03	1,82E-02	8,55E-04	-1,52E-02
ODP	kg CFC11 -eq	1,44E-08	1,61E-09	5,58E-08	1,21E-09	0	3,68E-10	3,60E-11	5,60E-11	-7,18E-10
POCP	kg C ₂ H ₄ -eq	1,64E-05	1,33E-06	4,60E-05	8,37E-07	0	2,70E-07	5,75E-08	1,65E-07	-8,31E-05
AP	kg SO ₂ -eq	3,55E-04	2,67E-05	9,61E-04	1,29E-05	0	4,02E-06	2,79E-06	7,41E-07	-2,11E-03
EP	kg PO ₄ ³⁻ -eq	3,30E-05	2,91E-06	1,33E-04	1,41E-06	0	4,29E-07	9,41E-07	5,28E-07	-8,99E-05
ADPM	kg Sb -eq	4,61E-04	1,44E-07	2,23E-06	1,11E-07	0	5,54E-08	1,99E-09	1,80E-09	-1,38E-05
ADPE	MJ	1,09E+00	1,31E-01	8,50E+00	9,90E-02	0	3,02E-02	2,50E-03	4,72E-03	-1,46E-01
GWPIOBC	kg CO ₂ -eq	1,53E-01	8,68E-03	3,54E-01	6,49E-03	0	2,05E-03	1,82E-02	1,99E-04	-8,02E-03

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; GWP-IOBC/GHG Global warming potential calculated according to the principle of instantaneous oxidation (except emissions and uptake of biogenic carbon)

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.

	Program operator and publisher The Norwegian EPD Foundation Post Box 5250 Majorstuen, 0303 Oslo, Norway	Phone: +47 23 08 80 00 e-mail: post@epd-norge.no web: www.epd-norge.no
	Owner of the declaration: Prysmian Group Norge AS Kjerraten 16, 3013 Drammen	Phone: +47 90066733 e-mail: anders.nymark@prysmiangroup.com web: www.prysmiangroup.no
	Author of the Life Cycle Assessment LCA.no AS Dokka 6B, 1671	Phone: +47 916 50 916 e-mail: post@lca.no web: www.lca.no
	Developer of EPD generator LCA.no AS Dokka 6B,1671 Kråkerøy	Phone: +47 916 50 916 e-mail: post@lca.no web: www.lca.no
	ECO Platform ECO Portal	web: www.eco-platform.org web: ECO Portal