Cabelte – Cabos Eléctricos. S.A

ENVIRONMENTAL PRODUCT DECLARATION

Power Cable 72282140 - RHZ1-OL 8.7/15 3X1X240KAL+H25

Arcozelo. Vila Nova de Gaia – Portugal

In accordance with ISO 14025 and EN 50693:2019

Program Operator	EPDItaly
Publisher	EPDItaly

Declaration Number	EPD06
Registration Number	EPDITALY1100

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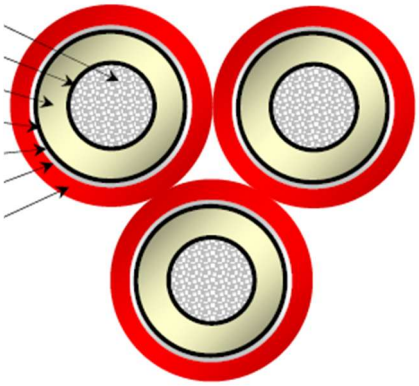

Disclamer: Image may not be identical to declared product but represents the product family

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GENERAL INFORMATION

EPD OWNER	
Name of the company	Cabelte - Cabos Eléctricos. S.A
Registered office	Rua de Espírito Santo 4410-420 ARCOZELO VILA NOVA DE GAIA PORTUGAL
Contacts for information on the EPD	+351 227 537 500 inform@cabelte.pt
PROGRAM OPERATOR	
EPDItaly	Via Gaetano De Castillia n° 10 - 20124 Milano. Italy
INFORMATION ON THE EPD	
Product name (s)	Power cable 72282140
Site (s)	The product was produced in the following Cabelte's sites: Arcozelo unit: Rua de Espírito Santo 4410-420 ARCOZELO VILA NOVA DE GAIA PORTUGAL Ribeirão unit: Avenida da Indústria. 382 4760-715 RIBEIRÃO VILA NOVA DE FAMALICÃO PORTUGAL
Short description and technical information of the product (s)	MV UNDERGROUND TRIPLEX CABLES 8.7/15(17.5) 240 mm2 ALUMINUM CONDUCTOR XLPE INSULATION COPPER WIRES SCREEN POLYETHYLENE OUTER SHEATH RHZ1-OL 8.7/15 3X1X240KAL+H25
Field of application of the product (s)	Medium voltage networks
CPC Code (number) https://unstats.un.org/unsd/classifications/Econ	46310 Insulated wire and cable; optical fibre cables
VERIFICATION INFORMATION	
PCR (title. version. date of publication or update)	PCR EPDItaly007- Electronic and electrical products and systems – Rev. 3.1; 12/11/2024 PCR EPDItaly016– Electronic and electrical products and systems – Cables and wires - Rev. 3; 03/10/2024
EPDItaly Regulation (version. date of publication or update)	Regulations of the EPDItaly Programme. revision 6.0. 30/10/2023
Project Report LCA	LCA Report 72282140
Independent Verification Statement	The PCR review was performed by the EPD review panel - info@epditaly.it. Independent verification of the declaration and data. carried out according to ISO 14025: 2010. ☐ Internal ☑ External Third party verification carried out by: ICMQ S.p.A.. via Gaetano De Castillia n ° 10 - 20124 Milan. Italy. Accredited by Accredia.
Comparability Statement	Environmental statements published within the same product category. but from different programs. may not be comparable. In particular. EPDs of construction products may not be comparable if they do not comply with EN 15804:2012+A2:2019/AC:2021 and EN 50693:2019.
Liability Statement	The EPD Owner releases EPDItaly from any non-compliance with environmental legislation. The holder of the declaration will be responsible for the information and supporting evidence. EPDItaly disclaims any responsibility for the information. data and results provided by the EPD Owner for life cycle assessment.

Information about the EPD

This is a product specific declaration.

Geographic locations: The product is produced in Portugal. The use and the end of life phase occur in Colombia.

Time representativeness: Data was collected during 2023 and its valid until any change implies its revision.

LCI and LCIA were performed using the LCA software Umberto with the database Ecoinvent EN15804 add on.

Scope of the study

All the stages of the life cycle are included (cradle to grave).

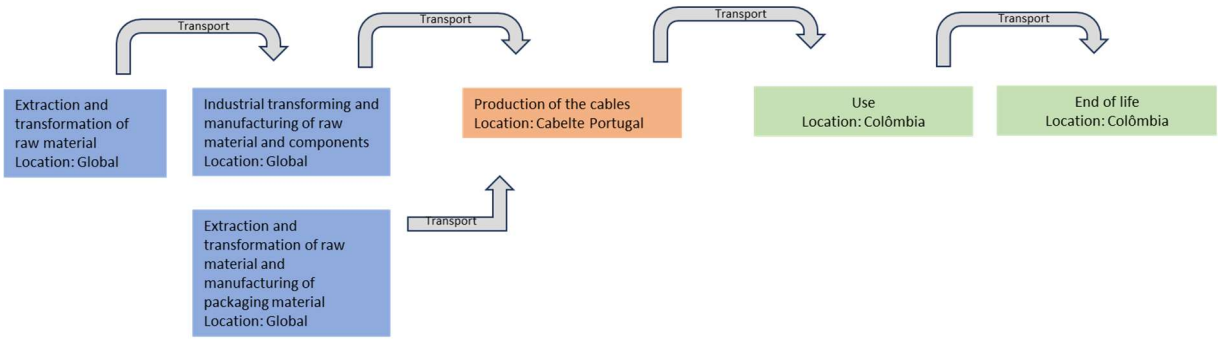


Figure 1 – Schematic representation of the life cycle of the product under study – geographic location

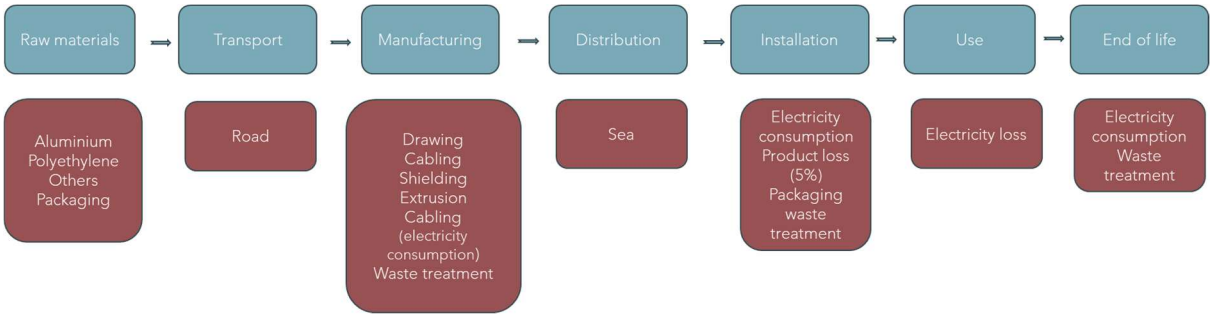


Figure 2 – Schematic representation of the life cycle of the product under study – main environmental factors

Organization description

Cabelte has been in business for over 80 years. which is a reflection of the trust we have earned with some of the world's most demanding utilities and demonstrates our commitment to quality. reliable products and competitive prices.

Integrated manufacturing that sources aluminium ingots directly from partner mines and uses its own smelting facilities. all to control the purity of the aluminium. Our integrated approach and long history with our suppliers has reduced our exposure to supply chain problems in these difficult times.

For the Energy sector. the Cabelte Group supplies Low (LV). Medium (MV) and High Voltage (HV) electrical cables to the main electrical utilities in the Iberian market. In recent years. the most important segments have been Renewable Energies and Energy Transmission Networks.

Cabelte is certified ISO 9001. ISO 14001 and ISO 45001.

The industrial units involved in the production of this cable are:

Arcozelo unit: Rua de Espírito Santo

4410-420 ARCOZELO VILA NOVA DE GAIA

PORTUGAL

Ribeirão unit: Avenida da Indústria. 382

4760-715 RIBEIRÃO VILA NOVA DE FAMALICÃO

PORTUGAL

Product description

MV underground triplex cables 8.7/15(17.5) 240 mm2
Aluminum conductor
Xlpe insulation
Copper wires
Screen polyethylene outer sheath
RHZ1-OL 8.7/15 3X1X240KAL+H25

Product Composition				
	Material		Mass (kg)	% mass
Mass composition of the main materials	FIO MAQ.Al.9.50mm - Tipo H12	Aluminium	2035.79	40%
	SCI/SCE ADER.DRY CUR(XLC 09)	Catalyst Mixture 70% ethylene + 30% propylene	133.16	3%
	PE WC DOW HFDC 4202 EC	PE WC DOW	1019.28	20%
	SCE PEL.DRY CURING KI-XLC-09S	Catalyst Mixture 70% ethylene + 30% propylene	204.79	4%
	FIO MAQ. Cu 8mm DIAM.	Copper machine wire	750.79	15%
	PE CAB 4805-UV	PE CAB	862.49	17%
	Weight with exclusions		5006.30	98.6%
	Weight without exclusions		5077.96	100%
	Weight of the cable (kg/km)		4728.91	
	Packaging (wood)		884.58	

Declared Unit: One km of cable with a load of 1 A.

Weight of the declared unit: 4728.91 kg

The product is to be used in: Medium voltage networks

Reference Service Life (RSL): Forty years (based on the HD 605 S2:2008 standard. considering that a Medium Voltage cable (Power Cables) may be at an average operating temperature of 75ºC. according to table 5.1.1 of this standard the estimated service life will be 40 years).

Presence of dangerous substances: No substances of concern or very high concern are present in the final product nor are expected to be released during use phase.

Calculation rules

Relevant aspect for the study	Description
LCI and LCIA	LCI and LCIA were performed using the LCA software Umberto with the database Ecoinvent EN15804 add on
System model	Allocation. cut-off. EN15804
LCA assessment method	EN15804 EF 3.1. EN15804
Cut-off and exclusions	Were followed the PCRs indications No relevant mass or energy flows were excluded. In the composition of the product the cut-off doesn't overcome the maximum of 5% mass.
Allocation	Physical allocation rules were used to determine the energy (natural gas and electricity) consumption and the waste production.
Transportation and end of life scenarios	Were followed the PCRs indications. described below
Waste management	Applied the polluters pays principle. adopting the end of waste state based on the definition of EN 15804 and EU's Waste Framework Directive (European Commission).

Technical and additional information

Processes/Stages	Description	Additional information
Upstream **Raw materials** **Production (extraction. treatment. transformation. etc.) of raw materials**	This process takes place globally	The composition of each raw material and component of the product is primary data and derives from the ERP software. From there. given the difficulty to obtain information from the suppliers along the upstream chain. we resorted to the use of commercial database. taking into account the data availability at Ecoinvent data base.
Upstream **Raw materials** **Production of finished product packaging. including packaging for distribution in the reference market segment**	Similar to what was described in the previous point	Similar to what was described in the previous point
Upstream **Transportation** **Transport of raw materials and semi-finished products along the entire supply chain**	The environmental impact indicators associated with the transport of raw materials for the manufacture of components and integral parts to direct suppliers (tier 1) are included in their manufacturing process.	The transport distance was determined and included in the calculation

Processes/Stages	Description	Additional information
Core **Production of the cables**	This activity takes place at Cabelte Portugal	Primary data was used. The production of the cables includes the activities of production of aluminium machine wire from aluminium ingot and the operations of drawing. cabling and extrusion. To produce the cables. was considered the electricity consumption (through equipment's technical data was determined the electricity consumption and through the velocity of the machines was determined the time required). To determine the waste generated by the cable's production a physical allocation rule was used. Electricity production. photovoltaic. 570 kWp open ground installation. multi-SI PT (Cabelte has warranties of origin. all the energy comes from renewable resources and the photovoltaic energy has the highest contribution) The GWP (global warming potential) value is 0.017 kg CO2e/kWh
Downstream **Distribution**	The distance between Cabelte Portugal and the installation site was calculated and the type of transport carried out (maritime and land) was determined	Sea transportation The distance was determined
Downstream **Installation**	This stage takes place in Colombia	In this process are used mainly manual and electrical tools. The impacts of installation are related to the waste resulting from the packaging of the product. the electricity consumption (estimated) by the tools and a product loss of 5%. Market for electricity. low voltage. CO. was used to model the electricity consumption. The GWP is 0.079 kg CO2e/kWh.
Downstream **Use and maintenance**	This stage takes place in Colombia	PCR indications were used The energy consumption during the use phase was determined. taking into account that cable dissipates energy due to the Joule effect according to the formula: $E_{use}\left[\frac{J}{km}\right] = R_{linear} * I^2 * RSL$ Euse (losses) 46867248 J/km Euse (losses) 13.02 kWh/km The market for electricity. medium voltage. CO. was used in this case. The GWP is 0.073 kg CO2e/kWh.
Downstream **De-Installation**	This stage takes place in Colombia	In this process are used mainly manual and electrical tools. The market for electricity. low voltage. CO. was used in this case. The GWP is 0.079 kg CO2e/kWh.

Processes/Stages	Description	Additional information
Downstream **End of life (EoL)**	This stage takes place in Colombia	The EoL stage was modelled taking into account the composition of the cable. the percentages of EN50693_2019. table G.4 of material recovery. energy recovery and disposal per material. the shredding and grinding with separation of materials of the cable. the preparation for recycling of the materials taking into account "the end of waste state" and the final disposal of the materials. as well as the transportation to the waste managers.

LCA (life cycle assessment) Results

ENVIRONMENTAL IMPACT DESCRIPTIVE PARAMETERS

Environmental impact indicators	Units	Manufacturing	Distribution	Installation	Use	EoL	Total
Climate change total	kg CO2-Eq	8.78E+03	2.69E+02	1.99E+02	9.47E-01	1.77E+03	1.10E+04
Climate change - biogenic	kg CO2-Eq	-3.14E+02	4.38E-02	1.21E+02	9.76E-02	1.92E+02	0.00E+00
Climate change - land use and land use change	kg CO2-Eq	9.58E+01	1.13E-01	3.34E-01	6.87E-02	7.45E-01	9.71E+01
Climate change - fossil	kg CO2-Eq	9.00E+03	2.69E+02	7.77E+01	7.81E-01	1.58E+03	1.09E+04
Ozone depletion (ODP)	kg CFC-11-Eq	1.38E-04	4.78E-06	4.99E-07	4.73E-09	9.43E-06	1.52E-04
Photochemical ozone formation (POCP)	kg NMVOC-Eq	5.31E+01	3.44E+00	3.29E-01	2.60E-03	2.24E+00	5.91E+01
Eutrophication potential - freshwater (EP-freshwater)	kg P-Eq	1.17E+01	1.43E-02	1.18E-02	2.35E-04	1.88E-01	1.19E+01
Eutrophication potential - marine (EP-marine)	kg N-Eq	1.25E+01	1.05E+00	2.62E-01	7.69E-04	1.12E+00	1.49E+01
Eutrophication potential - terrestrial (EP-terrestrial)	mol N-Eq	1.48E+02	1.16E+01	8.00E-01	8.29E-03	6.50E+00	1.67E+02
Acidifcation potential. accumulated Exceedance (AP)	mol H+-Eq	1.60E+02	3.90E+00	2.29E-01	7.37E-03	2.41E+00	1.67E+02
Depletion of abiotic resources - fossil resources (ADPF)	MJ	1.35E+05	3.66E+03	4.38E+02	9.42E+00	6.77E+03	1.46E+05
Depletion of abiotic resources – minerals and metals (ADPE)	kg Sb-Eq	1.51E+00	5.45E-04	1.44E-04	1.71E-06	3.84E-03	1.51E+00
Water (user) deprivation potential (WDP)	m3 world-Eq deprived	7.61E+03	1.53E+01	4.19E+01	4.70E-01	7.98E+02	8.46E+03

PARAMETERS DESCRIBING RESOURCE USE

Environmental impact indicators	Units	Manufacturing	Distribution	Installation	Use	EoL	Total
Use of secondary materials (SM)	kg	1.04E+02	1.64E+00	1.49E-01	1.61E-03	2.29E+00	1.08E+02
Use of renewable secondary fuels (RSF)	MJ	1.12E+02	1.39E-02	6.09E-03	6.00E-06	1.28E-01	1.12E+02
Use of non-renewable secondary fuels (RSF)	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water (FW)	m3	1.86E+02	4.24E-01	9.69E-01	1.11E-02	1.73E+01	2.05E+02
Total use of non renewable primary energy (PENRT)	MJ	1.35E+05	3.66E+03	4.38E+02	9.42E+00	6.77E+03	1.46E+05
Use of non renewable primary energy as energy carrier (PENRE)	MJ	1.35E+05	3.66E+03	4.38E+02	9.42E+00	6.77E+03	1.46E+05
Use of non renewable primary energy resources used as raw materials (PENRM)	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy (PERT)	MJ	3.50E+04	4.65E+01	6.69E+01	1.01E+01	5.56E+02	3.57E+04

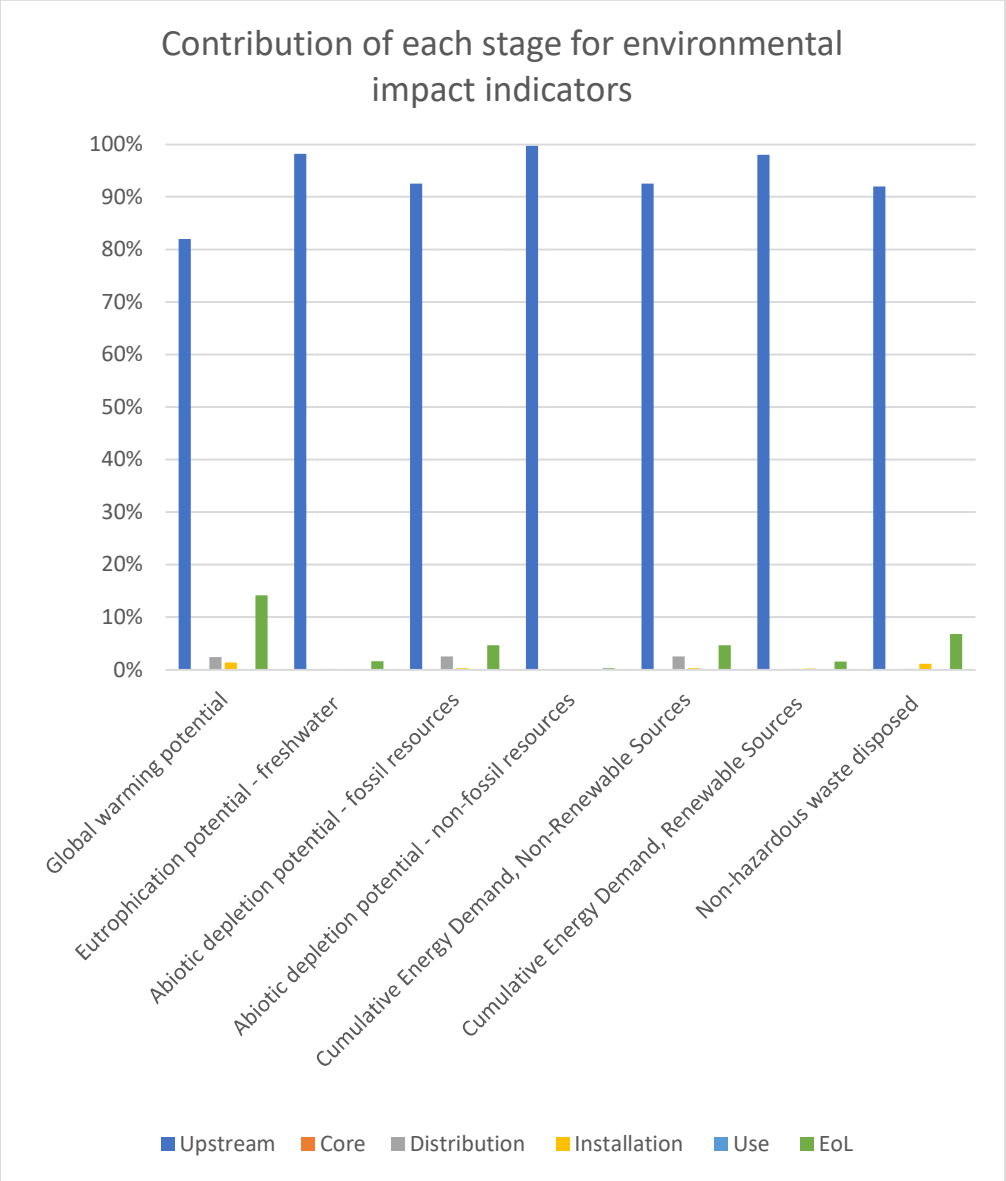
Environmental impact indicators	Units	Manufacturing	Distribution	Installation	Use	EoL	Total
Use of renewable primary energy as energy carrier (PERE)	MJ	3.50E+04	4.65E+01	6.69E+01	1.01E+01	5.56E+02	3.57E+04
Use of renewable primary energy resources used as raw materials (PERM)	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

WASTE PRODUCTION DESCRIPTIVE PARAMETERS

Environmental impact indicators	Units	Manufacturing	Distribution	Installation	Use	EoL	Total
Non-hazardous waste disposed (NHWD)	kg	5.51E+04	9.13E+01	6.72E+02	1.16E+00	4.06E+03	5.99E+04
Hazardous waste disposed (HWD)	kg	2.00E+03	5.15E+00	1.01E+01	8.25E-02	2.33E+02	2.25E+03
Radioactive waste disposed (RWD)	kg	8.40E-04	3.78E-04	4.32E-07	9.58E-03	2.44E-01	8.40E-04
Materials for recycling (MFR)	kg	7.14E+00	1.80E-01	3.27E-02	1.54E-03	4.36E+02	4.44E+02
Materials for energy recovery (MER)	kg	1.27E-02	1.25E-04	2.35E-05	1.29E-07	4.08E-04	1.32E-02
Components for reuse (CRU)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy. electric (EEE)	MJ	2.47E+01	4.08E-01	1.50E-01	1.87E-04	3.87E+01	6.39E+01
Exported energy. thermal (EET)	MJ	4.87E+01	4.65E-01	6.39E-02	2.64E-04	1.38E+01	6.30E+01

(1) The values of the indicator use of secondary materials are default values from the database associated to the selected data sets.

Interpretation



For different impact categories. the manufacturing stage is the most relevant stage because of the production of the materials. especially the metal ores-based materials.

REFERENCES

LCA Report 72282140. 15/05/2025

ISO 14067:2018 - Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification.

ISO 14025:2006 Environmental labels and declarations — Type III environmental declarations — Principles and procedures

ISO 14026:2017 Environmental labels and declarations — Principles. requirements and guidelines for communication of footprint information

ISO 14040:2006 Environmental management — Life cycle assessment — Principles and framework

ISO 14040:2006/Amd 1:2020 Environmental management — Life cycle assessment — Principles and framework — Amendment 1

ISO 14044:2006 Environmental management — Life cycle assessment — Requirements and guidelines

ISO 14044:2006/Amd 1:2017 Environmental management — Life cycle assessment — Requirements and guidelines — Amendment 1

ISO 14044:2006/Amd 2:2020 Environmental management — Life cycle assessment — Requirements and guidelines — Amendment 2

PCR EPDItaly007- Electronic and electrical products and systems – Rev. 3.1; 12/11/2024

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EN 15804:2012+A2:2019**/**AC:2021- Sustainability of construction works. Environmental product declarations. Core rules for the product category of construction products.

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IEC TR 62635:2012 - Guidelines for end-of-life information provided by manufacturers and recyclers and for recyclability rate calculation of electrical and electronic equipment