GlobalEPD

A VERIFIED ENVIRONMENTAL DECLARATION

AENOR

Earthing Cable
EN 60228

Environmental Product Declaration

EN ISO 14025:2010

EN 15804:2012+A2:2019

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Cunext Copper Industries

The holder of this Declaration is responsible for its content, as well as for keeping the supporting documentation that justifies the data and statements included during the period of validity

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AENOR is a founding member of ECO Platform, the European Association of Environmental Product Declaration Verification Programmes

Product category rule
European Standard UNE-EN 15804:2012+A2:2020 serves as the basis for the PCR (Product Category Rules)
Independent verification of the declaration and data in accordance with EN ISO 14025:2010 ☐ Internal ☒External
Verification body AENOR Product certification body accredited by ENAC with accreditation No. 1/C-PR468.

1. General information

1.1. The organisation

Grupo Cunext is a leader in the transformation of copper and aluminium of the highest quality, with sustainability, continuous innovation and the development of products that bring greater value to the market at the core of its operations.

Its facilities are located in Spain, in the provinces of Córdoba, Madrid, Barcelona, Zaragoza and Vitoria. It also has an international presence in Italy and the United States.

The copper and aluminium products manufactured by the Cunext Group are always at the top of the quality range, with the company positioning itself as a leading supplier in its sector in Southern Europe and North Africa; being a leading supplier of wire rod, wire and drawn products, ropes and extruded products.

The Cunext Group's facilities have various certifications that endorse the commitment to sustainability adopted in the management of all its processes:

- UNE-EN-ISO 9001:2015. Registration No. ER-0128/1994
- UNE-EN-ISO 14001:2015. Registration No. CA-1998/0084

European Regulation 1221/2009 (EMAS), Registration No. E-AN-0000006

- UNE-EN-ISO 45001:2018. Registration No. SST-0129/2006
- UNE-EN-ISO 50001:2018. Registration No. GE-2022/0064

AENOR GESTIÓN ENERGÉTICA ISO 50001 GE-2022/0064 | AENOR GESTIÓN DE LA CALIDAD ISO 9001 ER-0128/1994 | AENOR GESTIÓN AMBIENTAL ISO 14001 GA-1998/0084 | AENOR SEGURIDAD Y SALUD EN EL TRABAJO ISO 45001 SST-0129/2006

1.2. Scope of the Declaration

This environmental product declaration describes environmental information relating to the life cycle of the earthing cable produced at the Cunext Copper Industries plant in Córdoba, in the Spanish geographical and technological environment during the year 2023.

The earthing cable is commonly used for the derivation to earth of any unwanted electrical charge that may exist in machine chassis, structures, or installations, so that they do not pose a risk of electrocution in the event of accidental contact.

The range of the EPD is cradle-to-gate with options, with modules A1-A3, C and D.

1.3. Life cycle and compliance.

This EPD has been developed and verified in accordance with UNE-EN ISO 14025:2010 and UNE-EN ISO 14025:2010. 15804:2012+A2:2020, and includes the following life cycle stages:

Limits of the system. Information modules considered

	A1	Supply of raw materials	X
	A2	Transport to the factory	X
	A3	Orders	X
Construction	A4	Transportation	MNE
	A5	Installation / construction	MNE
Stage of use	B1	Application	MNE
	B2	Maintenance	MNE
	B3	Repair	MNE
	B4	Replacement	MNE
	B5	Reinstatement	MNE
	B6	In-service energy use	MNE
	B7	In-service water use	MNE
End of life	C1	Deconstruction / demolition	X
	C2	Transport	X
	C3	Waste treatment	X
	C4	Removal	X
	D	Potential for reuse, recovery and/or recycling	X

X = Module included in the LCA; NR = Module not relevant; MNE = Module

This EPD may not be comparable with those developed in other Programmes or according to different reference documents, in particular it may not be comparable with EPDs not developed according to UNE-EN 15804+A2.

Similarly, these EPDs may not be comparable if the origin of the data is different (e.g. databases), or not all relevant information modules are included, or they are not based on the same scenarios

The comparison of construction products must be made on the same function, applying the same functional unit and at the level of the building (or architectural or engineering work), i.e. including the behaviour of the product throughout its life cycle, as well as the specifications of section 6.7.2 of UNE-EN ISO 14025.

1.4. Differences from previous versions of this EPD

This version of the EPD is issued to correct an erratum in the previous version.

2. The product

2.1. Identification of the product

The earthing cable is produced from Cunext eRod copper rod. eRod copper rod contains 32% recycled copper and 68% high grade electrolytic copper. Recycled copper comes from copper scrap recovered from the manufacture of copper products, as well as from the recovery of copper content from products after their useful life.

The earthing cable is commonly used for the derivation to earth of any unwanted electrical charge that may exist in machine chassis, structures, or installations, so that they do not pose a risk of electrocution in the event of accidental contact. In this sense, earthing cables are present in all sectors and applications related to the generation, transmission or use of electrical energy.

The typical characteristics of the Cunext earthing cable are in accordance with EN 60228.

The classification of the product according to the United Nations Central Product Classification (CPC) is as follows:
UN CPC code: 41513.

2.2. Features of the product

The manufacturer declares the following information on the technical specifications of the product:

Characteristic	Value	Unit
Section	50	mm_2
Resistance max 20º.	0.387	Ω/km
Minimum number of wires:	19 (circular)	units
	6 (compacted circular)	units
	6 (sectoral)	units

Table 2. Product characteristics

2.3. Product composition

The composition declared by the manufacturer is as follows:

Substance:	Contents	Unit
Copper	99.9	%
Oxygen	< 0.040	%
Other impurities	< 0.040	%

Table 3. Product composition

The following table indicates the average packaging material used for the distribution of the product per kg of earthing cable:

Packaging Material	Contents	Unit
Wood	4.8E-03	kg
Kraft paper	5.3E-06	kg
Cardboard packaging (recycled)	3.3E-04	kg
PET (recycled)	2.8E-05	kg
PET (0%recycled)	1.1E-05	kg
PE plastic film (recycled)	3.2E-05	kg
PVC film	4.3E-04	kg

Table 4. Packaging material per tonne of product

No substances listed in the Candidate List of Substances of Very High Concern (SVHC) for authorisation, or subject to other regulations, have been used in the manufacture.

3. Information on the LCA

3.1. Life cycle assessment

The Life Cycle Assessment Report that supports this EPD has been developed by Sinergy, based on specific data provided by the Cunext Group for the earthing cable manufacturing process at the Cunext Copper Industries plant in Córdoba, corresponding to the year 2023

The generic data source was the SimaPro 9.6 software together with the Ecoinvent 3.10 database.

The LCA life cycle analysis has a cradle-to-gate scope with options, including modules A1-A3, C1 to C4 and D.

3.2. Declared unit

The declared unit is defined as **1 kg** of earthing cable.

3.3. Allocation criteria

Where possible, allocation has been avoided. For processes shared with the production of other types of wire rod, where it has not been possible to avoid allocation, allocation rules have been applied based on the mass of the products.

In the quantification of material and energy flows, cut-off criteria in accordance with EN 15804 +A2 have been used. Thus, matter flows of less than 1% of the cumulative mass of inputs and outputs can be excluded, unless their environmental relevance is significant. Similarly, energy flows of less than 1% of the cumulative energy inputs and outputs can be excluded, unless their environmental relevance is significant.

In any case, the sum of the excluded flows does not exceed 5% of the mass, energy or overall environmental impact. The cut-off criterion has not been applied to omit available data with relevant impact.

3.4. Representativity, quality and selection of data

The data used for the LCA are representative of the earthing cable production technologies at the Cunext Copper Industries plant in Cordoba where it is produced, as well as the technologies and processes involved in the different life cycle stages analysed.

Specific data for the production of earth wire at Cunext Copper Industries' Cordoba plant covers the full year 2023.

The generic data source was the SimaPro 9.6 software together with the Ecoinvent 3.10 database. Generic data are representative of a period within the last 10 years.

The geographical scope of the data is representative of the operational reality of the different phases of the life cycle analysed.

Following the data quality criteria of the product category rules of the environmental footprint, and considering that the processes are representative of the declared geographical area, that the technological aspects are very similar with no need to modify technical aspects significantly and that the data are less than 3 years old, the level of data quality is considered to be good.

3.5. Other calculation rules and assumptions

The GWP of the electricity mix applied specifically for A1-A3 in is 0.48 kg CO2e/kWh.

In order to determine the impacts associated with electricity consumption in the manufacturing stage, the energy mix of the supplier has been modelled, without the use of GDO.

No fuels or other sources of direct GHG emissions are used in the manufacturing stage of the earthing cable.

4. System limits, scenarios and additional technical information.

4.1. Pre-manufacturing processes

Module A1 includes the extraction and processing of raw materials, as well as the generation of imported electricity consumed in the product manufacturing processes.

The raw material used to manufacture the earthing cable is eRod copper rod produced at the Cunext plant in Cordoba.

Copper ore is found in nature in the form of copper sulphides, or in the form of copper oxides, with two distinct production process types.

Following the hydrometallurgical process, ores with high copper oxide content are extracted and processed for subsequent treatment in the stages of leaching, solvent extraction and production of copper cathodes by electrowinning.

Following the pyrometallurgical process, ores with high copper sulphide content are extracted and processed. The copper concentrate obtained is transformed in smelting, conversion, refining and casting stages to obtain copper anodes, which are treated in an electrolysis process to produce copper cathodes.

The raw material of ERod wire rod also includes recycled copper scrap reclaimed during manufacturing of copper products, or copper reclaimed from products that have exceeded their useful service lives.

Module A2 includes the processes of transporting the materials to the production plant, which for eRod wire rod is the same Cunext facility where the earthing cable is manufactured.

4.2. Manufacture of the product.

Module A3 includes the earthing cable manufacturing processes at the Cunext Copper Industries facility. The eRod rod is subjected to a roughing process for the production of eRod wire, which is used in a cabling process for the final manufacture of the earthing cable.

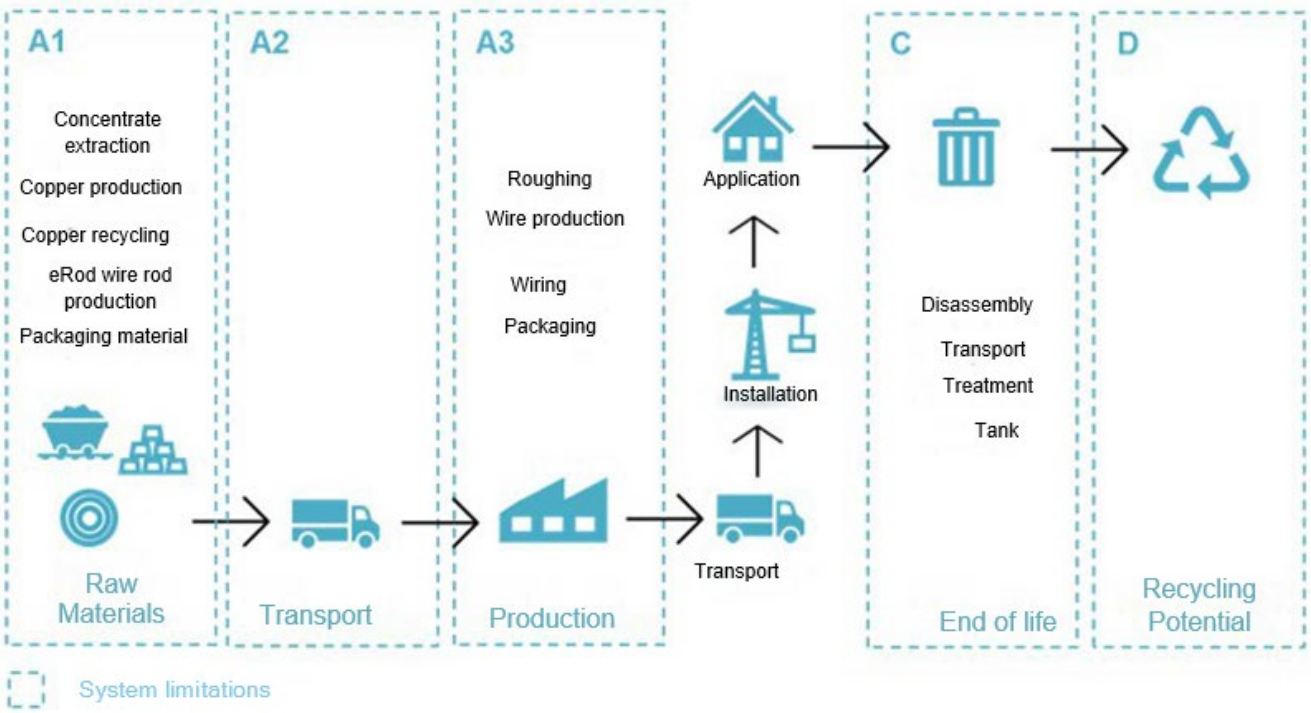
4.3. End-of-life stage

For modules C1-C4: the following assumptions and scenarios have been considered.

- C1: the dismantling or demolition of the product of the building or facility has been undertaken, indistinguishable from the enclosure materials, and the sorting of materials on site.
- C2: a transport distance from the place of disassembly to the treatment or disposal plant of 150 km is considered.
- C3: 70% (Law 7/2022) of the material has been considered for subsequent recycling.
- C4: final disposal of the remaining 30% of the material in an inert landfill has been considered.

4.4. Benefits and burdens beyond the system

D: the net impacts related to the recycling potential have been calculated by adding the impacts related to the recycling processes of the constituent copper of the earth wire after its end of life, and subtracting the impacts of the material it replaces as raw material.


A1
Concentrate extraction
Copper production
Copper recycling
eRod wire rod production
Packaging material
Raw Materials
A2
Transport
A3
Roughing
Wire production
Wiring
Packaging
Production
Transport
Application
Installation
C
Disassembly
Transport
Treatment
Tank
End of life
D
Recycling Potential
System limitations

5. LCA and LCI environmental parameter statements

Environmental impacts.

The estimated impact results are relative and do not indicate the final value of the impact categories, nor do they refer to threshold values, safety margins or risks.

Parameter	Units	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
GWP-total	kg CO2 eq	3.32E+00	1.88E-03	4.34E-03	**3.33E+00**	1.63E-01	2.97E-02	8.97E-02	1.77E-03	-1.32E+00
GWP-fossil	kg CO2 eq	3.29E+00	1.88E-03	1.34E-02	**3.30E+00**	1.63E-01	2.97E-02	8.92E-02	1.77E-03	-1.32E+00
GWP-biogenic	kg CO2 eq	2.76E-02	1.29E-06	-9.12E-03	**1.85E-02**	2.52E-05	9.63E-06	4.19E-04	4.52E-06	6.31E-03
GWP-luluc	kg CO2 eq	8.08E-04	6.14E-07	2.75E-05	**8.36E-04**	5.61E-06	7.22E-07	1.19E-04	2.82E-07	-5.54E-03
ODP	kg CFC11 eq	1.66E-09	3.74E-11	2.92E-10	**1.99E-09**	2.56E-09	6.00E-10	5.12E-10	6.59E-11	-4.73E-12
AP	mol H+ eq	4.86E-02	5.88E-06	7.15E-05	**4.87E-02**	1.52E-03	7.11E-05	4.25E-04	1.10E-05	-2.73E-02
EP-freshwater	kg P eq	1.58E-05	1.45E-08	8.82E-07	**1.67E-05**	1.54E-07	2.46E-08	4.28E-06	9.97E-09	-3.11E-06
EP-marine	kg N eq	4.79E-03	1.96E-06	2.75E-05	**4.82E-03**	7.16E-04	2.69E-05	7.69E-05	4.69E-06	-1.34E-03
EP-terrestrial	mol N eq	5.30E-02	2.16E-05	2.41E-04	**5.33E-02**	7.85E-03	2.95E-04	8.48E-04	5.14E-05	-1.36E-02
POCP	kg NMVOC eq	1.59E-02	9.21E-06	1.18E-04	**1.61E-02**	2.33E-03	1.25E-04	2.52E-04	2.08E-05	-4.78E-03
ADP-minerals& metals [2]	kg Sb eq	1.81E-03	6.01E-09	7.12E-08	**1.81E-03**	6.81E-09	9.71E-10	2.39E-09	2.22E-09	-1.26E-03
ADP-fossil [2]	MJ	3.64E+01	2.17E-03	3.60E-02	**3.65E+01**	2.30E-02	3.89E-03	7.94E-01	1.69E-03	-1.25E+01
WDP [2]	m3 worl eq depriv	2.61E+00	1.08E-04	3.43E-02	**2.64E+00**	1.69E-03	1.65E-04	1.36E-02	1.52E-04	-9.91E-01

GWP — total: Global warming potential; **GWP — fossil**: Global warming potential of fossil fuels; **GWP — biogenic**: Biogenic global warming potential; **GWP — LULUC:** Global warming potential of land use and land use change; **ODP**: Stratospheric ozone depletion potential; **AP**: Acidification potential, cumulative surplus; **EP-freshwater**: Eutrophication potential, fraction of nutrients reaching the final freshwater compartment; **EP-marine**: Eutrophication potential, fraction of nutrients reaching the final marine water compartment; **EP-terrestrial**: Eutrophication potential, cumulative surplus; **POCP**: Tropospheric ozone formation potential; **ADP- minerals&metals** Abiotic resource depletion potential for non-fossil resources; **APD-fossil**: Abiotic resource depletion potential for fossil resources; **WDP**: Water deprivation potential (user), weighted water deprivation consumption. RL: Not relevant

Additional environmental impacts

Parameter	Units	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
IP	Incidence of diseases	9.25E-07	1.47E-10	1.68E-09	**9.27E-07**	4.03E-07	1.65E-09	3.70E-09	2.78E-10	-2.16E-07
IRP [1]	kBq U235 eq	1.12E-01	1.20E-05	2.07E-04	**1.12E-01**	1.92E-04	5.29E-05	4.69E-03	1.42E-05	-1.50E-03
ETP-fw [2]	CTUe	2.13E+01	7.08E-03	1.71E-01	**2.15E+01**	7.42E-02	1.22E-02	1.74E-01	4.49E-03	-1.51E+01
HTP-c [2]	CTUh	7.28E-09	1.31E-11	6.19E-11	**7.36E-09**	1.14E-11	2.10E-12	1.85E-11	7.43E-12	-8.64E-10
HTP-nc [2]	CTUh	4.09E-07	1.65E-11	1.87E-10	**4.09E-07**	1.62E-10	1.66E-10	4.23E-10	6.48E-12	-2.93E-08
SQP [2]	—	2.83E+00	1.57E-02	1.11E+00	**3.96E+00**	4.55E-03	8.69E-04	1.13E-01	8.90E-02	-1.92E+01

PM: Potential incidence of illness due to emissions of particulate matter (PM); **IRP** : Exposure efficiency of human potential relative to U235; **ETP-fw :** Comparative ecosystem toxic unit potential — freshwater; **HTP-c:** Comparative ecosystem toxic unit potential — carcinogenic effects; **TPH-nc:** Comparative ecosystem toxic unit potential — non-carcinogenic effects; **SQP:** Soil quality potential index; **NR**: Not relevant

Notice 1: This impact category deals mainly with the potential impacts of low doses of ionising radiation on human health from the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents and occupational exposure due to the disposal of radioactive waste in underground facilities. The ionising radiation potential of soil, due to radon or some building materials is also not measured with this parameter.

Notice 2: The results of this environmental impact indicator should be used with caution, as the uncertainties of the results are high and experience with this parameter is limited.

Use of resources

Parameter	Units	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
PERE	MJ	4.18E+00	4.49E-04	2.55E-01	**4.44E+00**	4.81E-03	1.37E-03	1.35E-01	9.00E-04	-4.15E+00
PERM	MJ	4.47E-06	0.00E+00	3.86E-07	**4.86E-06**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	4.18E+00	4.49E-04	2.55E-01	**4.44E+00**	4.81E-03	1.37E-03	1.35E-01	9.00E-04	-4.15E+00
PENRE	MJ	3.67E+01	2.17E-03	-1.20E-01	**3.66E+01**	2.30E-02	3.88E-03	7.94E-01	1.69E-03	-1.25E+01
PENRM	MJ	2.68E-05	0.00E+00	1.56E-01	**1.56E-01**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	3.67E+01	2.17E-03	3.60E-02	**3.67E+01**	2.30E-02	3.88E-03	7.94E-01	1.69E-03	-1.25E+01
SM	kg	3.31E-01	0.00E+00	0.00E+00	**3.31E-01**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m_3	3.32E-01	3.61E-06	4.34E-04	**3.32E-01**	6.72E-05	9.96E-06	5.40E-04	5.02E-05	0.00E+00

PERE: Renewable primary energy use excluding renewable primary energy resources used as feedstock; **PERM**: Use of renewable primary energy used as feedstock; **PERT**: Total use of renewable primary energy; **PENRE**: Non-renewable primary energy use, excluding non-renewable primary energy resources used as feedstock; **PENRM**: Use of non-renewable primary energy used as feedstock; **PENRT**: Total non-renewable primary energy use; **SM**: Use of secondary materials; **RSF:** Use of renewable secondary fuels; **NRSF**: Use of non-renewable secondary fuels; **FW**: Net use of flowing water resources; **NR**: Not relevant

Waste categories

Parameter	Units	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
HWD	kg	5.98E-05	6.54E-07	3.44E-05	**9.49E-05**	1.60E-05	2.86E-06	3.14E-05	6.31E-07	-2.87E-09
NHWD	kg	9.81E-02	1.25E-03	2.51E-03	**1.02E-01**	6.13E-05	1.15E-05	4.85E-04	3.00E-01	9.70E-01
RWD	kg	6.50E-04	8.41E-09	1.60E-07	**6.50E-04**	1.10E-07	3.65E-08	3.01E-06	8.86E-09	1.66E-06

HWD: Hazardous waste disposed of; **NHWD**: Non-hazardous waste disposed of; **RWD**: Radioactive waste disposed of;
NR: Not relevant

Outflows

Parameter	Units	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
CRU	kg	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	0.00E+00	0.00E+00	1.92E-02	**1.92E-02**	0.00E+00	0.00E+00	7.00E-01	0.00E+00	0.00E+00
MER	kg	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	MJ	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

CRU: Components for re-use; **MFR**: Materials for recycling; MER: Materials for energy recovery;
EE: Energy exported; NR: Not relevant

Information on biogenic carbon content

Biogenic carbon content	Units	Result per declared functional unit
Product biogenic carbon content — KgC	kg C	0.00E+00
Biogenic carbon content packaging — KgC	kg C	2.55E-03

References

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[2] UNE-EN ISO 14025:2010 Environmental labels. Model environmental declarations III. Principles and procedures (ISO 14025:2006).

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[7] Environmental Product Declaration eRod copper rod. GlobalEPD EN15804-032 2023

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A verified environmental declaration

GlobalEPD