GlobalEPD

A VERIFIED ENVIRONMENTAL DECLARATION

AENOR

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Declaration
Environmental
Product

EN ISO 14025:2010
EN 15804:2012+A2:2020

Copper contact wire
EN 1977
eRod

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Cunext GROUP

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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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 contact wire, 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

1.2. Scope of the Declaration

This environmental product declaration describes environmental information relating to the life cycle of eRod copper contact wire produced at the Cunext Copper Industries plant in Córdoba, in the Spanish geographical and technological environment during the year 2021.

Copper contact wire is an intermediate product that is transformed during downstream production processes, mainly into cables and electrical products.

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 15804:2012+A2:2020, and includes the following life cycle stages:

Product stage	A1	Supply of raw materials	X
	A2	Transport to the factory	X
	A3	Manufacture	X
Construction	A4	Transport to construction site	MNA
	A5	Installation / construction	MNA
Stage of use	B1	Application	MNA
	B2	Maintenance	MNA
	B3	Repair	MNA
	B4	Replacement	MNA
	B5	Reinstatement	MNA
	B6	In-service energy use	MNA
	B7	In-service water use	MNA
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 not evaluated

Table 1. Information modules considered

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 EPD has been modified to include ENAC accreditation

2. The product

2.1. Identification of the product

ERod contact wire is produced from high-grade electrolytic copper containing 99.99% copper and 32% recycled copper, and a portion of the raw material is replaced by secondary recovered and recycled copper from cut-offs and scrap generated during copper transformation processes or removed from end-of-life copper equipment and products. The use of this secondary copper in the contact wire production process avoids the environmental impacts that would be generated by the production of the primary copper it replaces.

Copper contact wire is used in all sectors related to the transmission of energy, data or signals, industrial and electric motors, the automotive and railway industry, renewable energies such as photovoltaic or wind farms, telecommunications, household appliances or construction.

The composition and typical characteristics of eRod contact wire are in accordance with EN 1977.

UN CPC code: 4151.

2.2. Features of the product

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

Characteristic	Value	Unit
Diameter	8	mm
Conductivity	> 101	% IACS
Elongation	> 30	%
Spiral elongation	Not applicable	

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 product is presented in rolls of up to 5,000 kg, strapped on wooden pallets and protected by plastic film. The strapping is made of 100% post-consumer recycled polyethylene terephthalate (PET). The film is composed of low density polyethylene (LDPE) with an 80% post-consumer recycled content.

Packaging Material	Contents	Unit
PET Strap	0.12	kg
LDPE film	0.09	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 eRod contact wire manufacturing process at the Cunext Copper Industries plant in Córdoba, corresponding to the year 2021

As a generic data source, the GaBi V10.6.2.9 software has been used together with the Professional DB 2022 database.

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

The LCA includes the stages of mining and processing of the ore, the production of the electrolytic copper, and its use as a raw material in Cunext Copper Industries' smelting and rolling processes for the manufacture of contact wire, as well as its end-of-life.

3.2. Declared unit

The reported unit is defined as **1 tonne** of eRod copper contact wire.

3.3. Allocation and cut-off criteria

Where possible, allocation has been avoided. For processes shared with the production of other types of contact wire, 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.

The data used for the LCA are representative of the copper contact wire production technology at the Cunext Copper Industries plant, as well as the processes included in the scope of the LCA.

Specific data on contact wire production at the Cunext Copper Industries plant covers the full year 2021.

As a generic data source, the GaBi V10.6.2.9 software has been used together with the Professional DB 2022 database. Generic data are representative of a period within the last 10 years.

The data are representative of the production technologies of the reference product, eRod copper contact wire, at the Cunext Copper Industries plant where it is produced, as well as of the technologies involved in the different life cycle stages analysed.

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.

4. System limits, scenarios and additional technical information.

4.1. Pre-manufacturing processes

Module A1 includes the extraction and processing of raw materials. 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 contact wire 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 raw material transport processes, which for eRod contact wire originates both nationally and internationally (America, Africa, Europe) and is transported by sea and by road to Cunext's facilities.

4.2. Manufacture of the product

Module A3 includes the manufacturing processes, all the way to the factory gate. In the eRod copper contact wire production process, the raw material is melted, and the liquid copper is passed into a rotary holding furnace.

This furnace supplies the required quantity to a horizontal casting machine, from which a solid bar is produced and rolled in twelve successive steps of pairs of rolls until it is transformed into contact wire.

The contact wire is stripped of surface oxides and coiled into 5-tonne coils.

4.3. End-of-life stage

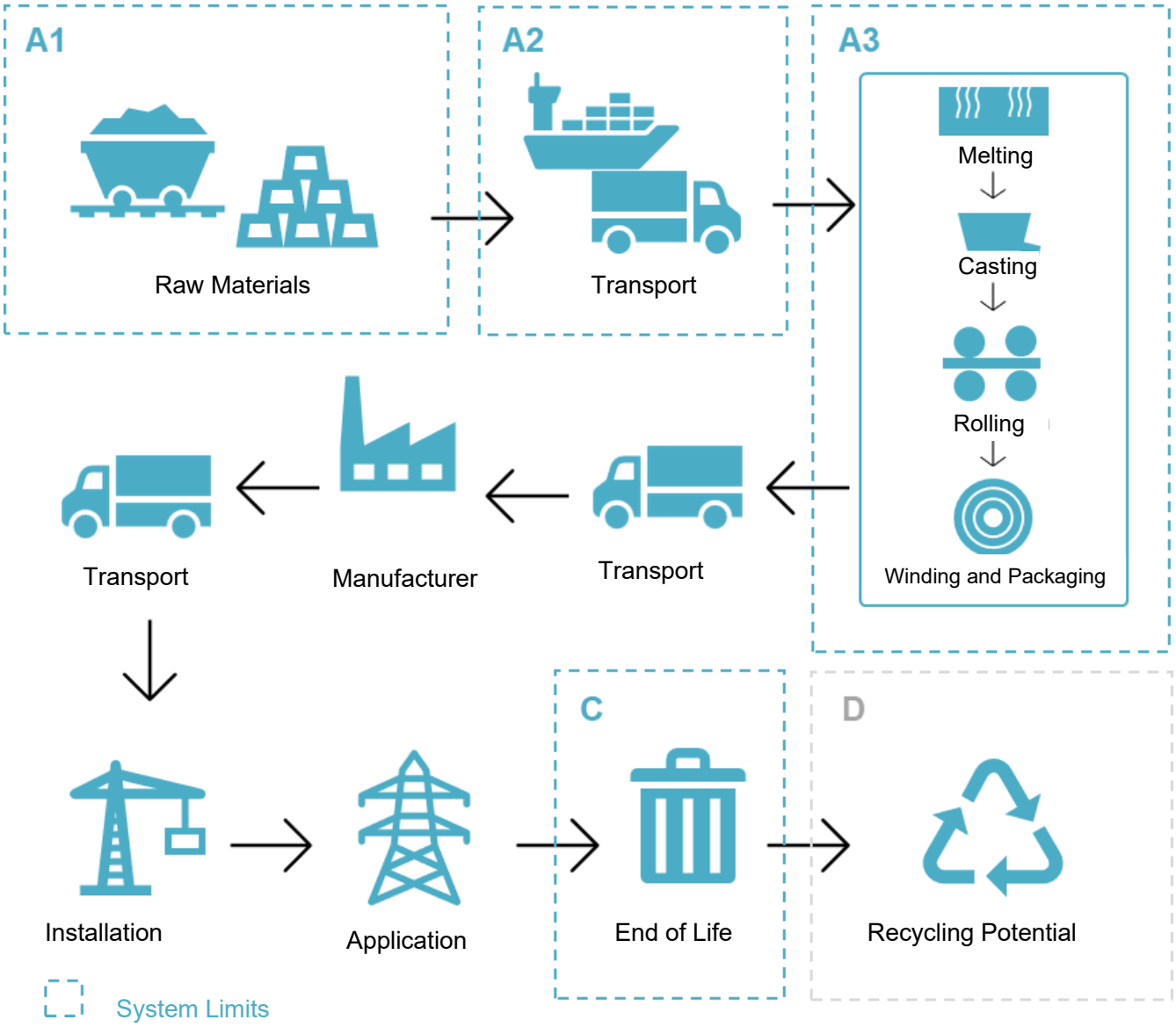
For modules C1-C4: the following assumptions and scenarios have been considered.

- In module C1 (deconstruction) the impact of the removal of cables is considered negligible in the context of demolition or dismantling work on the building or civil works.
- For module C2, it is taken into account that copper is transported to a recycling centre, travelling a distance of 1,000 km by road (conservative assumption).
- For module C3, treatment of packaging materials by incineration has been considered.
- It has been taken into account that all the copper in the contact wire is recycled, so there is no impact from copper waste disposal in module C4.

4.4. Benefits and burdens beyond the system

For module D: the following assumptions and scenarios have been taken into account.

- It has been taken into account that no copper waste disposal takes place, and that all copper is sent for recycling. Recycled copper replaces copper produced from virgin raw materials.
- All packaging is sent for incineration with energy recovery.
- The net impacts related to the recycling potential have been calculated by adding the impacts related to the aluminium recycling processes, subtracting the impacts of the material it replaces as a raw material, and subtracting the benefits allocated to the secondary material used as a raw material.
- The net impacts related to the energy recovery potential have been calculated by adding the impacts related to the incineration processes of packaging plastics and subtracting the impacts of the generation of such energy in the national electricity mix


A1
Raw Materials
A2
Transport
A3
Melting
Casting
Rolling
Winding and Packaging
Transport
Manufacturer
Transport
Installation
Application
C
End of Life
D
Recycling Potential
System Limits

5. LCA and LCI environmental parameter declarations

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	2.91E+03	3.57E+01	1.59E+02	**3.11E+03**	0.0E+00	6.41E+00	4.79E-01	0.0E+00	-1.88E+03
GWP-fossil	kg CO2 eq	2.89E+03	3.58E+01	1.56E+02	**3.08E+03**	0.0E+00	6.12E+00	4.79E-01	0.0E+00	-1.88E+03
GWP-biogenic	kg CO2 eq	1.73E+01	-3.24E-01	2.85E+00	**1.98E+01**	0.0E+00	2.92E-01	2.11E-05	0.0E+00	9.01E+00
GWP-luluc	kg CO2 eq	5.12E-01	2.25E-01	1.03E-02	**7.48E-01**	0.0E+00	6.60E-07	6.60E-07	0.0E+00	-7.92E+00
ODP	kg CFC11 eq	4.46E-08	3.42E-12	6.18E-12	**4.46E-08**	0.0E+00	2.78E-14	2.78E-14	0.0E+00	-6.75E-09
AP	mol H+ eq	4.71E+01	1.28E-01	9.78E-02	**4.73E+01**	0.0E+00	2.59E-03	4.62E-05	0.0E+00	-3.89E+01
EP-freshwater	kg PO4 eq	1.34E-02	1.20E-04	1.77E-04	**1.37E-02**	0.0E+00	6.46E-09	6.46E-09	0.0E+00	-4.45E-03
EP-marine	kg N eq	4.55E+00	3.61E-02	3.13E-02	**4.62E+00**	0.0E+00	1.29E-03	1.30E-05	0.0E+00	-1.91E+00
EP-terrestrial	mol N eq	5.04E+01	4.07E-01	3.37E-01	**5.11E+01**	0.0E+00	1.45E-02	2.21E-04	0.0E+00	-1.95E+01
POCP	kg NMVOC eq	1.51E+01	9.91E-02	9.04E-02	**1.53E+01**	0.0E+00	2.63E-03	3.63E-05	0.0E+00	-6.83E+00
ADP-minerals&metals [2]	kg Sb eq	1.78E+00	3.46E-06	6.59E-07	**1.78E+00**	0.0E+00	6.72E-10	6.72E-10	0.0E+00	-1.80E+00
ADP-fossil [2]	MJ	3.32E+04	4.68E+02	1.57E+02	**3.39E+04**	0.0E+00	7.59E-02	7.59E-02	0.0E+00	-1.79E+04
WDP 2	m_3	2.45E+03	3.78E-01	4.04E+01	**2.50E+03**	0.0E+00	4.27E-02	4.27E-02	0.0E+00	-1.42E+03

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. **NR**: Not relevant

Additional environmental impacts

Parameter	Units	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
PM	Incidence of illnesses	9.04E-04	1.79E-06	7.38E-07	**9.06E-04**	8.0E+03	1.08E-08	2.47E-10	8.0E+03	-3.08E-04
IRP 1	kBq U235 eq	8.31E+01	1.28E-01	1.15E-01	**8.34E+01**	9.0E+03	7.56E-04	7.56E-04	9.0E+03	-2.14E+00
ETP-fw 2	CTUe	2.03E+04	3.31E+02	8.51E+01	**2.08E+04**	1.0E+04	3.80E-02	3.38E-02	1.0E+04	-2.15E+04
HTP-c 2	CTUh	6.91E-06	6.78E-09	3.61E-09	**6.92E-06**	1.1E+04	3.36E-12	2.58E-12	1.1E+04	-1.23E-06
HTP-nc 2	CTUh	4.00E-04	3.64E-07	4.18E-07	**4.01E-04**	1.2E+04	9.97E-10	8.71E-11	1.2E+04	-4.19E-05
SQP 2	-	2.03E+03	1.86E+02	1.11E+01	**2.22E+03**	1.3E+04	2.30E-02	2.30E-02	1.3E+04	-2.75E+04

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; **HTP-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	3.52E+03	3.05E+01	4.93E+00	**3.56E+03**	0.0E+00	1.78E-02	1.78E-02	0.0E+00	-5.93E+03
PERM	MJ	0.00E+00	0.00E+00	4.39E-03	**4.39E-03**	0.0E+00	0.00E+00	0.00E+00	0.0E+00	0.00E+00
PERT	MJ	3.52E+03	3.05E+01	4.94E+00	**3.56E+03**	0.0E+00	1.78E-02	1.78E-02	0.0E+00	-5.93E+03
PENRE	MJ	3.35E+04	4.70E+02	1.57E+02	**3.41E+04**	0.0E+00	7.60E-02	7.60E-02	0.0E+00	-1.79E+04
PENRM	MJ	1.62E-08	0.00E+00	2.63E-02	**2.63E-02**	0.0E+00	5.01E-16	5.01E-16	0.0E+00	0.00E+00
PENRT	MJ	3.35E+04	4.70E+02	1.57E+02	**3.41E+04**	0.0E+00	7.60E-02	7.60E-02	0.0E+00	-1.79E+04
SM	kg	0.00E+00	0.00E+00	3.25E+02	**3.25E+02**	0.0E+00	0.00E+00	0.00E+00	0.0E+00	0.00E+00
FW	m3	5.67E+01	3.53E-02	4.40E-01	**5.71E+01**	1.0E+03	1.00E-03	1.00E-03	1.0E+03	-2.33E+01

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	2.06E-03	2.45E-09	1.49E-08	**2.06E-03**	3.0E+03	7.15E-12	7.15E-12	3.0E+03	-4.10E-06
NHWD	kg	8.99E+01	7.45E-02	3.20E+00	**9.32E+01**	4.0E+03	2.27E-03	2.27E-03	4.0E+03	1.39E+03
RWD	kg	6.14E-01	8.51E-04	7.56E-04	**6.16E-01**	5.0E+03	4.60E-06	4.60E-06	5.0E+03	2.37E-03

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	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
MFR	kg	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.00E+03	0.0E+00	0.0E+00
MER	kg	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.09E-01	0.0E+00	0.0E+00
EE	MJ	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	-6.87E-01

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	0.0E+00
Biogenic carbon content packaging — KgC	kg C	0.0E+00

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