GlobalEPD

A VERIFIED ENVIRONMENTAL DECLARATION

AENOR

Environmental Product Declaration

KTL CERÁMICAS SLU

Ceramic Tiles.

Glazed stoneware tiles (BIIa)

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EN 17160:2019

KTL CERAMICA

The owner 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.

UNE-EN 17160: 2019 The European Standard EN 15804:2012+A2:2020 serves as the basis for CPR.
Independent verification of the declaration and data, in accordance with the Standard ISO 14025:2006 ☐ Internal ☒External
Verification Body AENOR The Certification Body is accredited by ENAC. 1/C-PR468

1. General Information

1.1. Description of the organisation

At KTL Ceramics, our dedication to excellence is the driving force behind every aspect of our brand. We work relentlessly to raise the quality of our products, ensuring that they are perfectly aligned with changing market demands. This commitment to continuous improvement is the foundation of our business philosophy.

Our aim is to contribute to the creation of pleasant, comfortable, and functional environments. We strive to exceed expectations in terms of maintenance, performance, and upkeep, so that our products are not only a sound investment but also improve the quality of life for those who use them.

In short, at KTL, we are dedicated to constant improvement, sustainability, and customer satisfaction. We believe that our efforts not only benefit our customers but also contribute to a better, more liveable world for all.

1.2. Scope of the Declaration

This Environmental Product Declaration includes environmental information of a group of products manufactured in a production centre of KTL in a geographical and technological environment of Spain 2022.

The location of this production centre is shown below:

Cerámicas Tesany S.L.U.
C/ Ferrocarril, 4, 12593 Moncofa, Castellón, Spain

The results shown the environmental performance of the glazed stoneware tiles, as average weighted by production, as well as the environmental data of the tiles with the lowest and highest impact, thus narrowing down the results obtained in the LCA. The scope of this Environmental Product Declaration (hereinafter EPD) is from cradle to grave.

1.3. Life cycle and compliance

This EPD has been developed and verified in accordance with EN ISO 14025:2006 and EN 15804:2012+A2:2019 the following Category Rule:

INFORMATION ABOUT PRODUCT CATEGORY RULES	
Descriptive title	Product Category Rules for Ceramic Tiles
Registration code and version	EN 17160:2019
Publication date	2019
Compliance	EN 15804:2012+A2:2019

This Environmental Statement includes the following life cycle stages:

Limits of the system. Information modules considered

Product Stage	A1	Raw materials supply	X
	A2	Transport	X
	A3	Manufacturing	X
Construction	A4	Transport of the product	X
	A5	Installation and construction processes	X
Use	B1	Use	X
	B2	Maintenance	X
	B3	Repair	X
	B4	Replacement	X
	B5	Refurbishment	X
	B6	Use of energy in service	X
	B7	Use of water in service	X
End of Life	C1	Deconstruction	X
	C2	Transport	X
	C3	Waste management	X
	C4	Waste disposal	X
	D	Potential for reuse, recovery and recycling of materials	X

X = Module included in the LCA

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 EN 15804+A2.

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

The comparison of construction products should be done 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 the EN ISO 14025 standard.

2. Product information

2.1. Product identification

The ceramic tiles included in this study belong to group BIIa (glazed stoneware), a classification based on standard EN 14411:2016 (equivalent to standard ISO 13006:2018), i.e. they have a water absorption between 3% and 6% and are formed by pressing. Its common name is Glazed Stoneware Tile.

The glazed stoneware tiles included in this study include 7 commercial formats, all of them are glazed and some of them are treated mechanically. Their thicknesses range from 8 mm to 13 mm, with an average weight of 19.9 kg/m^2.

In the annexes, the results of the formats included in the scope of this EPD with the minimum and maximum environmental impact can be found, corresponding to the formats: 33.3x33.3 cm of 17.4 kg/m^2 and 33.3x33.3 cm of 23 kg/m^2 fired weight respectively.

The CPC code of the product is 37370.

2.2. Product technical features

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

Product technical features

Technical properties	Standard	Requirements
Width	ISO 10545-2	Parameters within standard
Length		Parameters within standard
Thickness		Parameters within standard
Straightness of Sides		Parameters within standard
Rectangularity		Parameters within standard
Edge Curvature		Parameters within standard
Warpage		Parameters within standard
Modulus of Rupture	*ISO 10545-4*	*Parameters within standard*
Breaking Strength	ISO 10545-4	Parameters within standard
Surface Abrasion (Glazed)	ISO 10545-7	Parameters within standard
Thermal Expansion	ISO 10545-8	Parameters within standard
Thermal Shock	ISO 10545-9	Parameters within standard
Moisture Expansion	ISO 10545-10	Parameters within standard
Crazing Resistance	ISO 10545-11	Parameters within standard
Frost Resistance	ISO 10545-12	Parameters within standard
Resistance to Chemicals	ISO 10545-13	Parameters within standard
Stain Resistance	ISO 10545-14	Parameters within standard

This EPD contemplates residential interior floor coverings as a study scenario, however, the versatility of these ceramic tiles allows their installation in other places such as walls, or other types of buildings like hospitals, schools, offices or shopping centres.

2.3. Product composition

The composition declared by the manufacturer is as follows:

Product composition

Substance/Component	Content
Support (clays, feldspars, sands, etc.)	98%
Decoration raw materials (quartz, clays, feldspars, etc.)	2%

Substances contained in the product that are listed in the "Candidate List of Substances of Very High Concern (SVHC) for authorisation" do not exceed 0.1% by weight of the product.

3. LCA information

3.1. Life Cycle Assessment

The LCA has been carried out with the support of the LCA for Experts software (Sphera-GaBi) [7] and with the database version 2023.2 (SP40.0) [8]) (SpheraSolutions). The characterisation factors used are those included in the EN 15804:2012+A2:2019 standard.

3.2. Functional unit / declared unit

The functional unit considered is *"Covering 1 m^2 of the interior floor of a dwelling with ceramic tiles of group BIIa, 19.9 kg/m^2, for 50 years".*

3.3. Reference service life (RSL)

The reference useful life of the product is the same as that of the building where it is installed, provided it is installed correctly, as it is a long-lasting product that does not require replacement. A useful life of 50 years has been considered.

Reference service life

Parameter	Unit (expressed per functional unit or per declared unit)
Reference service life	Minimum 50 years
Declared product properties (on gate), coatings, etc.	Minimum values of the relevant characteristics according to Annex J of the EN 14411. For more information request technical data sheets according to model.
Design parameters of the application (manufacturer's instructions), including references to good practices	For more information request technical data sheets according to model.
Estimated quality of work, when installed according to the manufacturer's specifications	For more information request technical data sheets according to model.
Installed from outside environment (for outdoor applications), e.g. weathering, pollutants, UV radiation and wind exposure, building orientation, shading, temperature, etc.	Results of the values of the relevant characteristics according to Annex J of the EN 14411. For more information request technical data sheets according to model.
Indoor environment (for indoor applications), e.g. temperature, humidity, chemical exposure	Results of the values of the relevant characteristics according to Annex J of the EN 14411. For more information request technical data sheets according to model.
Conditions of use, e.g.: frequency of use, mechanical exposure, etc.	For more information request technical data sheets according to model.
Maintenance, e.g.: required frequency, type and quality and replacement of replaceable components	For more information request technical data sheets according to model.

3.4. Allocation rules

In accordance with the standards and PCR, the principle of causality has been applied when assigning inputs and outputs in processes with multiple inputs and/or outputs. Therefore, an attempt has been made to establish the physical relationship between the inputs and outputs of the system and its different products.

Generally speaking, in the allocation of inputs and outputs to the declared unit, production-weighted averages have been carried out.

3.5. Cut-off rule and exclusions

In this cradle-to-grave LCA study, a cut-off rule of 1% for the energy use (renewable and non - renewable) and 1% of total mass in those unitary processes, whose data is insufficient, have been applied. In total, more than 95% of all mass and energy inputs and outputs of the system have been included, excluding the not available nor quantified data.

The excluded data are the following:

- Diffuse particle emissions to the atmosphere
- Atmospheric emissions of pollutants, non-regulated
- Long-term emissions (>100 years)
- The production of some auxiliary materials used in the production of tiles representing less than 0.01% by total mass.
- Machinery and industrial equipment production.

3.6. Representativeness, quality and selection of data

The primary data have been provided directly by the company KTL, with two production centres located in Chilches and Moncofa (Castellón), Spain. For the secondary data, the most updated Sphera-GaBi databases [8] have been used and modelled with the version of LCA for Experts (Sphera-GaBi) [7]. All data belong to a geographical scenario of Spain 2022.

The results presented are representative of ceramic tiles, expressed as an average weighted by the production of the ceramic tiles belonging to the BIIa group range, limiting this average by the products with the minimum and maximum environmental impact.

3.7. Other calculation rules and assumptions

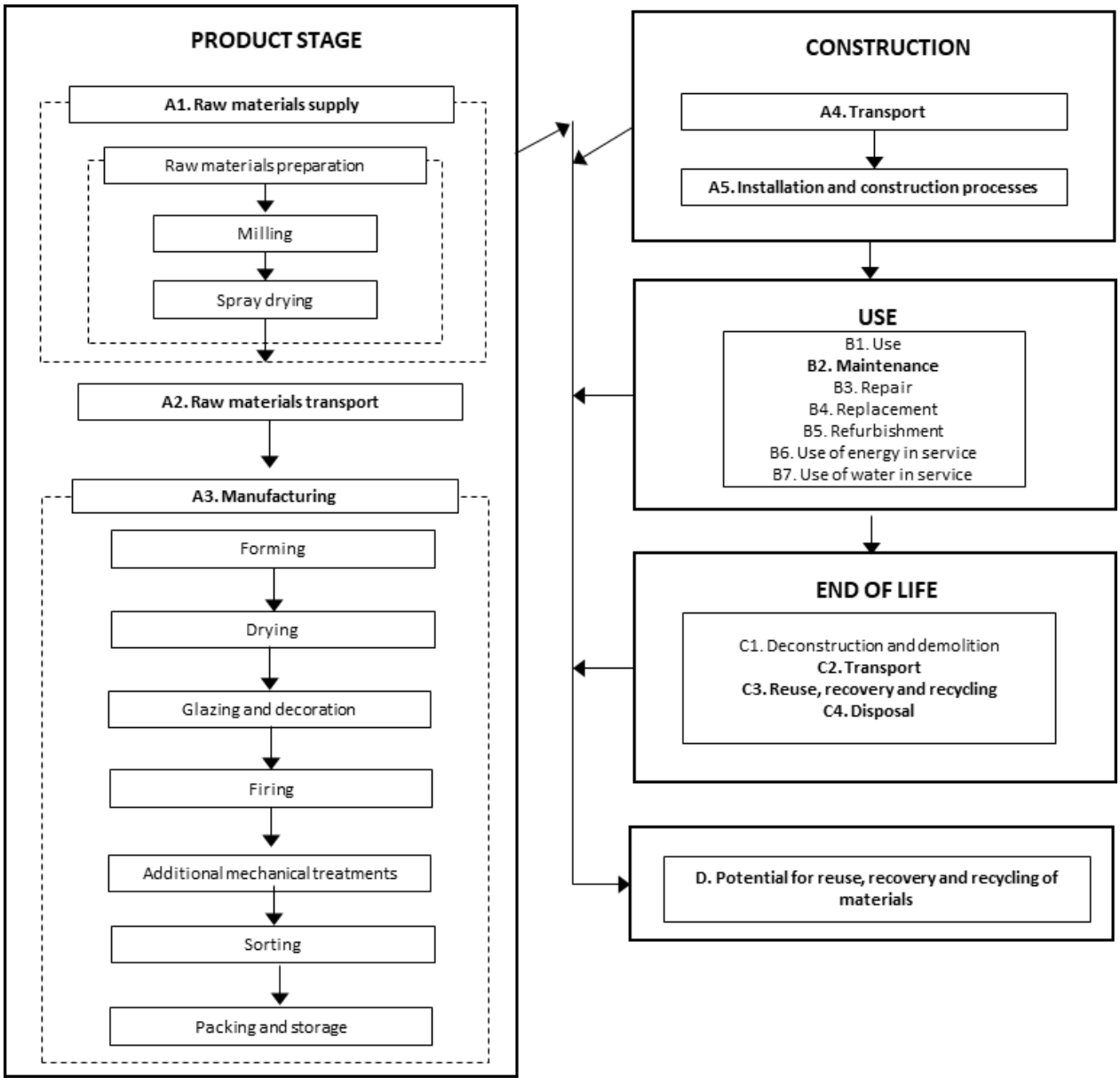
The 5 tile references have different weights and environmental impacts. The following table shows the deviations of the format with the highest and lowest environmental impact with respect to the average, in relation to the product stage (A1-A3). Annex I and Annex II show the environmental impact results of the reference with minimum and maximum impact values respectively.

Impact Indicator	Relative variation from the average
GWP-total	-8%/+17%
AP	-5%/+12%
POCP	-5%/+11%

4. System limits, scenarios and additional technical information.

All life cycle modules relevant to ceramic tiles according to the PCR have been included:

System diagram



4.1. Pre-manufacturing processes (upstream).

Raw materials (A1) and Transport (A2)

Ceramic tiles are composed of a ceramic support and a decorative layer.

The raw materials included in the composition of the support are mainly clays, feldspars, sands and ceramic waste generated during the manufacture.

The raw materials for decoration (glazes, engobes and inks) are produced in specialised plants. The most common raw materials are ceramic frits, pigments and inorganic materials. Ceramic frits are insoluble glasses, prepared in advance by complete melting of their original raw materials and fast cooling.

The raw materials used have different origins, according to their nature and properties; they are transported by road or by ship in bulk, depending on the distance and location of the extraction point.

4.2. Manufacturing of the product

Manufacturing (A3)

The preparation of raw materials for the ceramic body starts with a mixture preparation, wet milling and subsequent spray drying to obtain granules.

This granule is sent to the forming stage by uniaxial dry pressing and later, they are placed in a continuous dryer to reduce their humidity

The tiles coming from the dryer are covered with one or more thin layers of engobe and glaze, and in some cases, it is mostly decorated by inkjet printing.

Then, the ceramic pieces are subject to a single firing single-deck roller kiln. This treatment is used to confer the product surface a series of technique and aesthetic features, as impermeability, ease of cleaning, brightness, colour, superficial texture, chemical and mechanical resistance.

In some cases, mechanical treatments such as cutting and grinding are applied to provide new effects. Once the quality controls are met, the classified pieces are packaged in primary cardboard packs and wood pallets. Finally, they are covered with film LDPE.

4.3. Construction process

Transport (A4)

The product is distributed 32% in Spain, 29% in Europe and 40% in the rest of the world.

Module A4 Transport to site

Parameter	Result (expressed per functional unit)
Type and fuel consumption of the vehicle, type of vehicles used for transport, e.g. long distance trucks, ship, etc..	According to the destinations in the distribution as described above: 0.1454 l diesel (Euro truck 6, 27 t) 0.0242 l fuel oil (ship)
Distance	300 km national distribution: 32% 1390 km rest of Europe distribution: 29% 6520 km rest of the world distribution: 40%
Capacity utilisation (including no-load return)	85% in truck 100% ship
Bulk density of transported products	≈1800 kg/m^3
Usable capacity factor (factor: = 1 or < 1 or ≥ 1 for products that are packed compressed or nested)	Not applicable

Product installation and construction process (A5).

Once the product is unpacked, it is installed. According to the PCRs for ceramic tiles, it has been established that the application of mortar is required for installation.

The waste derived from the packaging of the pieces is managed separately according to the geographical location of the installation site. Otherwise, 3% of product losses have been considered at the installation stage.

Module A5 - Installation

Parameter	Result (expressed per functional unit)
Supplementary materials for installation	3.3 kg
Water use	0.8 l
Use of other resources	Not applicable
Quantitative description of the type of energy (regional mix) and consumption during the installation process	Not applicable
Waste of materials at the construction site before processing of waste generated at the product installation (specified by type)	Product losses: 597g Packaging wastes: Cardboard: 93 g Plastic: 20g Wood: 419 g
Output of materials (specified by type) as a result of waste treatment waste at the construction site, e.g. from waste collected for recycling, energy recovery, disposal (specified by route)	Product losses for recycling: 417g Product losses for final deposition: 179g Incinerated cardboard: 0g Recycled cardboard: 93g Cardboard for final deposition: 0 g Incinerated plastic: 2g Recycled plastic: 16g Plastic for final deposition:3g Incinerated wood: 93g Recycled wood: 316g Wood for final deposition: 10g
Direct emissions to ambient air, soil and water	Not applicable

4.4. Use Stage

B1 Use

Once it had been installed, the product needed neither water nor energy input for use and do not emissions into the environment. At this stage, there are no processes that generate environmental impacts. For this reason, only the environmental burdens attributable to the maintenance of the product (module B2) are considered.

B2 Maintenance

It can be done with a damp cloth and, if the surface is dirty or greasy, cleaning agents such as detergents or bleaches can be used.

Use linked to the building structure

Parameter	Result (expressed per functional unit)
B2 Maintenance	
Maintenance process	According to RCP for ceramic tiles (EN17160) residential floor and wall cleaning scenario
Maintenance cycle	Washing once a week with water and once every two weeks with detergent.
Auxiliary materials for maintenance (e.g. cleaning products) (specify each material)	Detergent: 1.34E-04 kg/m^2
Material wastage during maintenance (specify type))	Not applicable
Net tap water consumption	0.1 l/m^2
Energy input during maintenance (e.g. vacuum cleaning), type of energy carrier (e.g. electricity) and amount, if applicable and relevant	Not applicable

B3-B4-B5 Repair, replacement and refurbishment

The tiles do not require repair, replacement or renovation if the tiles are correctly installed.

4.5. Use linked to the operation of the building

B6-B7 Operational energy use and Operational water use

These modules are not relevant for ceramic tiles.

4.6. End of Life Stage

C1 Deconstruction and demolition

At the end of its service life, the product will be removed, either as part of a building renovation or during demolition. In the context of the demolition of a building, the impacts attributable to the removal of the product are negligible.

C2 Transport

The product waste is transported in a truck to be managed either by deposition in inert landfills or recycling.

C3 Waste management for reuse, recovery and recycling

70% of tiles are considered to be recycled and/or reused, as indicated in the PCR.

C4 Final disposal

It was assumed that 30% of the product was sent to controlled landfills after its service life had ended.

End of life

Parameter	Result (expressed per functional unit)
Collection process, specified by type	23.2 kg total
Recovery system, specified by type	16.2 kg for recycling
Disposal, specified by type	7.0 kg to landfill
Assumptions for scenario development (e.g.: transport)	The product waste is transported in a Euro 6 compliant heavy-duty truck (27 t) to be managed either to landfilling or recycling. An average distance of 50km from the building site to the final destination is considered. The return journey of the lorries is also included (100% empty return).

4.7. Benefits and burdens beyond the system

Module D

The net environmental burdens and net benefits of obtaining the secondary material from waste at the installation stage and at the end of life of the product have been considered.

4.8. Information on biogenic carbon content

The carbon content of both the product and its packaging was separately declared. In the case of the product at issue, ceramic tiles, the tile components were inorganic, so that the biogenic carbon calculation did not apply.

In regard to the packaging used for tile distribution, its mass was less than 5% of the total product mass, so that the declaration of packaging biogenic carbon content was omitted.

5. Environmental Information.

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.

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-fossil	kg CO_2 eq	8.8	5.8E-01	1.3	0	2.6E-01	0	0	0	0	0	0	1.8E-01	0	1.1E-01	-1.8E-01
GWP-biogenic	kg CO_2 eq	4.1E-02	-6.4E-03	-1.7E-03	0	2.4E-03	0	0	0	0	0	0	-2.4E-03	0	1.1E-03	-1.4E-04
GWP-luluc	kg CO_2 eq	5.8E-03	4.4E-03	9.2E-04	0	2.0E-05	0	0	0	0	0	0	1.6E-03	0	4.8E-04	-5.6E-04
GWP-total	kg CO_2 eq	8.8	5.8E-01	1.2E+00	0	2.7E-01	0	0	0	0	0	0	1.8E-01	0	1.1E-01	-1.8E-01
ODP	kg CFC11 eq	2.8E-08	6.8E-14	8.5E-10	0	1.2E-07	0	0	0	0	0	0	2.3E-14	0	6.3E-14	-3.6E-09
AP	mol H^+ eq	1.5E-02	3.8E-03	2.4E-03	0	2.8E-03	0	0	0	0	0	0	1.9E-04	0	8.2E-04	-5.2E-04
EP-freshwater	kg PO_4 eq	1.3E-04	1.7E-06	5.3E-06	0	6.9E-06	0	0	0	0	0	0	6.4E-07	0	2.3E-06	-1.5E-06
EP-marine	kg N eq	3.9E-04	5.3E-06	1.6E-05	0	2.1E-05	0	0	0	0	0	0	2.0E-06	0	7.2E-06	-4.6E-06
EP-terrestrial	mol N eq	4.8E-03	9.5E-04	8.3E-04	0	3.1E-04	0	0	0	0	0	0	5.9E-05	0	2.3E-04	-1.8E-04
POCP	Kg NMVOC eq	5.4E-02	1.1E-02	9.1E-03	0	1.1E-02	0	0	0	0	0	0	7.0E-04	0	2.4E-03	-2.0E-03
ADP-minerals& metals [2]	kg Sb eq	1.5E-02	2.7E-03	2.3E-03	0	2.0E-03	0	0	0	0	0	0	1.8E-04	0	6.6E-04	-4.9E-04
ADP-fossil [2]	MJ	8.1E-06	3.2E-08	2.6E-07	0	1.8E-08	0	0	0	0	0	0	1.2E-08	0	1.1E-08	-8.0E-08
WDP [2]	m^3	135.0	7.6	9.2	0	1.7	0	0	0	0	0	0	2.4	0	1.5	-2.5

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

Additional environmental impacts

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PM	Incidence of diseases	4.0E-07	6.3E-08	4.3E-08	0	1.8E-08	0	0	0	0	0	0	1.4E-09	0	9.9E-09	-2.6E-09
IRP [1]	kBq U235 eq	16.8	5.4	2.9	0	8.2E-01	0	0	0	0	0	0	1.7E+00	0	8.9E-01	-1.0E+00
ETP-fw [2]	CTUe	2.8E-09	1.1E-10	2.1E-10	0	9.7E-11	0	0	0	0	0	0	3.5E-11	0	1.1E-10	2.1E-12
HTP-c [2]	CTUh	3.1E-08	4.6E-09	1.0E-08	0	1.1E-08	0	0	0	0	0	0	1.5E-09	0	1.2E-08	-1.1E-09
HTP-nc [2]	CTUh	2.5E-01	2.0E-03	3.8E-02	0	2.3E-03	0	0	0	0	0	0	6.7E-04	0	2.0E-03	-9.3E-03
SQP [2]	-	100.0	2.7	10.8	0	298.0	0	0	0	0	0	0	9.9E-01	0	3.5E-01	-1.5E+00

PM: Potential for disease incidence due to emissions of particulate matter (PM); IRP : Exposure efficiency of human potential relative to U235; ETP-fw : Ecosystem toxic unit comparative potential - freshwater; HTP-c : Ecosystem toxic unit comparative potential - carcinogenic effects; HTP-nc : Ecosystem toxic unit comparative potential - non-carcinogenic effects; SQP : Soil quality potential index;
NR: Not relevant

Note 1: This impact category deals mainly with 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 or occupational exposure due to disposal of radioactive waste in underground facilities. Ionising radiation potential of soil, due to radon or some building materials is also not measured by this parameter.

Note 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

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	21.1	4.7E-01	2.1	0	6.1	0	0	0	0	0	0	1.7E-01	0	1.7E-01	-4.7
PERM	MJ	0.0	0	0.0E+00	0	0	0	0	0	0	0	0	0	0	0	0
PERT	MJ	21.1	4.7E-01	2.1	0	6.1	0	0	0	0	0	0	1.7E-01	0	1.7E-01	-4.7
PENRE	MJ	136.0	7.6	9.2	0	1.7	0	0	0	0	0	0	2.4E+00	0	1.5E+00	-2.5
PENRM	MJ	0.0	0	0.0E+00	0	0	0	0	0	0	0	0	0	0	0	0
PENRT	MJ	136.0	7.6	9.2	0	1.7	0	0	0	0	0	0	2.4E+00	0	1.5E+00	-2.5
SM	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FW	m^3	2.4E-02	5.2E-04	2.9E-03	0	2.3E-01	0	0	0	0	0	0	1.9E-04	0	2.8E-04	-1.4E-03

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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

Waste categories

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	1.6E-03	2.4E-11	4.9E-05	0	8.4E-12	0	0	0	0	0	0	7.4E-12	0	2.3E-08	-3.5E-08
NHWD	kg	1.4	1.1E-03	3.3E-01	0	6.6E-02	0	0	0	0	0	0	3.6E-04	0	6.8	-1.1E-03
RWD	kg	3.2E-03	1.4E-05	2.9E-04	0	2.1E-05	0	0	0	0	0	0	4.5E-06	0	2.0E-05	-1.9E-05

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

Output flows

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MFR	kg	1.19E-02	0	8.29E-01	0	0	0	0	0	0	0	0	0	16.2	0	0
MER	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EE	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

CRU: Components for reuse; MFR: Materials for recycling; MER: Materials for energy recovery; EE: Energy exported; NR: Not relevant.

6. Additional environmental impacts

Indoor air emissions

Ceramic tiles, in their manufacturing process, are subjected to a thermal process that exceeds 1000°C. At these temperatures, any organic compounds present in the compositions decompose, resulting in a final product that is inert and free of volatile organic compounds that may be emitted during the use phase.

Release to soil and water

Ceramic tiles do not emit any compounds into the soil or water during the use phase, as it is a totally inert product, which does not undergo physical, chemical or biological transformations, is not soluble or combustible, does not react physically, chemically or in any other way, is not biodegradable, does not adversely affect other materials with which it comes into contact in a way that could lead to environmental pollution or harm human health. It is a non-leaching product and therefore does not pose a risk to surface or groundwater quality**.**

Contribution to the Global Warming Potential category (Total GWP)

On average, BIIa Group tiles contribute 0.44 kg of CO_2 equivalent per kg of product (GWP-Total).

Environmental information about the company

In March 2022, the new PV AUTOCONSUMO CENUSA photovoltaic solar plant came into operation, installed on various roofs of the industrial warehouses that the company has at its facilities in Nules (Castellón) with a peak installed power of

2,785.96 kWp and a power inverter rating of 2,500 kW.

This evolution has been possible thanks to sustained growth that has allowed investments to improve and modernize industrial plants. This allows KTL to be a leader in competitiveness and manufacturing capacity for all types of ceramic products in any of the formats available on the market, combining the highest quality and the best designs.

The installation has had a cost of 1,540,638.65 +VAT and has received a subsidy of €180,948.42 granted through the IVACE (Valencian Institute of Business Competitiveness), the Ministry for the Ecological Transition and the Demographic Challenge, and the IDAE (Institute for Energy Diversification and Saving), being financed by the Next Generation Funds of the European Union.

The solar plant consists of 6,123 photovoltaic panels and 25 inverters, which in turn makes it possible to monitor the production of the plant and the consumption of the network.

In this way, KTL joins the strategy of energy independence and the use of renewable energies, which in the current circumstances appears as a basic necessity, both for reducing environmental impact and for energy savings

In addition, KTL has several certificates in each of its plants:

AZULMED

ISO 9001: Certificate: 34/5200/15/0671

ISO 50001: Certificate: GE-2023/0077

TESANY

ISO 9001: Certificate: 34/5200/21/5176

According to ISO 17889-1 the pre-consumer recycled content is 12.5%.

Annex I. Declaration of the environmental parameters of the LCA and LCI for the format with minimum impacts

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.

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-fossil	kg CO_2 eq	8.1	5.2E-01	1.1	0	2.4E-01	0	0	0	0	0	0	1.6E-01	0	9.9E-02	-1.6E-01
GWP-biogenic	kg CO_2 eq	3.8E-02	-5.8E-03	-1.5E-03	0	2.2E-03	0	0	0	0	0	0	-2.2E-03	0	1.0E-03	-1.2E-04
GWP-luluc	kg CO_2 eq	5.3E-03	3.9E-03	8.3E-04	0	1.8E-05	0	0	0	0	0	0	1.5E-03	0	4.3E-04	-5.0E-04
GWP-total	kg CO_2 eq	8.1	5.2E-01	1.1E+00	0	2.4E-01	0	0	0	0	0	0	1.6E-01	0	1.0E-01	-1.6E-01
ODP	kg CFC11 eq	2.6E-08	6.1E-14	7.9E-10	0	1.1E-07	0	0	0	0	0	0	2.0E-14	0	5.7E-14	-3.3E-09
AP	mol H^+ eq	1.4E-02	3.4E-03	2.2E-03	0	2.5E-03	0	0	0	0	0	0	1.7E-04	0	7.3E-04	-4.7E-04
EP-freshwater	kg PO_4 eq	1.2E-04	1.6E-06	4.8E-06	0	6.2E-06	0	0	0	0	0	0	5.7E-07	0	2.1E-06	-1.3E-06
EP-marine	kg N eq	3.6E-04	4.8E-06	1.5E-05	0	1.9E-05	0	0	0	0	0	0	1.8E-06	0	6.5E-06	-4.1E-06
EP-terrestrial	mol N eq	4.6E-03	8.5E-04	7.5E-04	0	2.8E-04	0	0	0	0	0	0	5.3E-05	0	2.0E-04	-1.6E-04
POCP	Kg NMVOC eq	5.1E-02	9.5E-03	8.2E-03	0	1.0E-02	0	0	0	0	0	0	6.3E-04	0	2.2E-03	-1.8E-03
ADP-minerals& metals [2]	kg Sb eq	1.4E-02	2.5E-03	2.1E-03	0	1.8E-03	0	0	0	0	0	0	1.6E-04	0	5.9E-04	-4.4E-04
ADP-fossil [2]	MJ	7.5E-06	2.9E-08	2.4E-07	0	1.6E-08	0	0	0	0	0	0	1.0E-08	0	1.0E-08	-7.2E-08
WDP [2]	m^3	125.0	6.9	8.4	0	1.5	0	0	0	0	0	0	2.1	0	1.3	-2.2

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.

Additional environmental impacts

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PM	Incidence of diseases	8.1	5.2E-01	1.1	0	2.4E-01	0	0	0	0	0	0	1.6E-01	0	9.9E-02	-1.6E-01
IRP [1]	kBq U235 eq	3.8E-02	-5.8E-03	-1.5E-03	0	2.2E-03	0	0	0	0	0	0	-2.2E-03	0	1.0E-03	-1.2E-04
ETP-fw [2]	CTUe	5.3E-03	3.9E-03	8.3E-04	0	1.8E-05	0	0	0	0	0	0	1.5E-03	0	4.3E-04	-5.0E-04
HTP-c [2]	CTUh	8.1	5.2E-01	1.1E+00	0	2.4E-01	0	0	0	0	0	0	1.6E-01	0	1.0E-01	-1.6E-01
HTP-nc [2]	CTUh	2.6E-08	6.1E-14	7.9E-10	0	1.1E-07	0	0	0	0	0	0	2.0E-14	0	5.7E-14	-3.3E-09
SQP [2]	-	1.4E-02	3.4E-03	2.2E-03	0	2.5E-03	0	0	0	0	0	0	1.7E-04	0	7.3E-04	-4.7E-04

PM: Potential for disease incidence due to emissions of particulate matter (PM); IRP : Exposure efficiency of human potential relative to U235; ETP-fw : Ecosystem toxic unit comparative potential - freshwater; HTP-c : Ecosystem toxic unit comparative potential - carcinogenic effects; HTP-nc : Ecosystem toxic unit comparative potential - non-carcinogenic effects; SQP : Soil quality potential index; NR: Not relevant

Note 1: This impact category deals mainly with 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 or occupational exposure due to disposal of radioactive waste in underground facilities. Ionising radiation potential of soil, due to radon or some building materials is also not measured by this parameter.

Note 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

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	19.9	4.3E-01	1.9	0	5.5	0	0	0	0	0	0	1.6E-01	0	1.6E-01	-4.3
PERM	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PERT	MJ	19.9	4.3E-01	1.9	0	5.5	0	0	0	0	0	0	1.6E-01	0	1.6E-01	-4.3
PENRE	MJ	126.0	6.9	8.4	0	1.5	0	0	0	0	0	0	2.1E+00	0	1.3E+00	-2.2
PENRM	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PENRT	MJ	126.0	6.9	8.4	0	1.5	0	0	0	0	0	0	2.1E+00	0	1.3E+00	-2.2
SM	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FW	m^3	2.4E-02	4.7E-04	2.7E-03	0	2.1E-01	0	0	0	0	0	0	1.7E-04	0	2.5E-04	-1.3E-03

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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water.

Waste categories

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	1.4E-03	2.1E-11	4.3E-05	0	7.6E-12	0	0	0	0	0	0	6.6E-12	0	2.1E-08	-3.2E-08
NHWD	kg	1.8	9.8E-04	3.1E-01	0	5.9E-02	0	0	0	0	0	0	3.3E-04	0	6.2	-9.6E-04
RWD	kg	3.2E-03	1.2E-05	2.7E-04	0	1.9E-05	0	0	0	0	0	0	4.0E-06	0	1.8E-05	-1.7E-05

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

Output flows

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MFR	kg	1.07E-02	0	7.8E-01	0	0	0	0	0	0	0	0	0	14.5	0	0
MER	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EE	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

CRU: Components for reuse; MFR: Materials for recycling; MER: Materials for energy recovery; EE: Energy exported; NR: Not relevant.

Annex II. Declaration of the environmental parameters of the LCA and LCI for the format with maximum impacts

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.

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-fossil	kg CO_2 eq	10.2	6.9E-01	1.5	0	3.2E-01	0	0	0	0	0	0	2.1E-01	0	1.3E-01	-2.1E-01
GWP-biogenic	kg CO_2 eq	4.6E-02	-7.6E-03	-2.3E-03	0	2.9E-03	0	0	0	0	0	0	-2.9E-03	0	1.4E-03	-1.6E-04
GWP-luluc	kg CO_2 eq	6.9E-03	5.2E-03	1.1E-03	0	2.4E-05	0	0	0	0	0	0	1.9E-03	0	5.7E-04	-6.7E-04
GWP-total	kg CO_2 eq	10.3	6.9E-01	1.5E+00	0	3.2E-01	0	0	0	0	0	0	2.1E-01	0	1.3E-01	-2.1E-01
ODP	kg CFC11 eq	3.2E-08	8.1E-14	9.6E-10	0	1.4E-07	0	0	0	0	0	0	2.7E-14	0	7.6E-14	-4.3E-09
AP	mol H^+ eq	1.6E-02	4.5E-03	2.8E-03	0	3.3E-03	0	0	0	0	0	0	2.2E-04	0	9.8E-04	-6.1E-04
EP-freshwater	kg PO_4 eq	1.5E-04	2.1E-06	6.2E-06	0	8.3E-06	0	0	0	0	0	0	7.6E-07	0	2.8E-06	-1.8E-06
EP-marine	kg N eq	4.5E-04	6.4E-06	1.9E-05	0	2.5E-05	0	0	0	0	0	0	2.3E-06	0	8.6E-06	-5.4E-06
EP-terrestrial	mol N eq	5.3E-03	1.1E-03	9.7E-04	0	3.7E-04	0	0	0	0	0	0	7.0E-05	0	2.7E-04	-2.2E-04
POCP	Kg NMVOC eq	6.0E-02	1.3E-02	1.1E-02	0	1.4E-02	0	0	0	0	0	0	8.4E-04	0	2.9E-03	-2.4E-03
ADP-minerals& metals [2]	kg Sb eq	1.6E-02	3.2E-03	2.7E-03	0	2.4E-03	0	0	0	0	0	0	2.2E-04	0	7.8E-04	-5.8E-04
ADP-fossil [2]	MJ	9.4E-06	3.8E-08	3.0E-07	0	2.2E-08	0	0	0	0	0	0	1.4E-08	0	1.4E-08	-9.6E-08
WDP [2]	m^3	156.0	9.0	10.8	0	2.0	0	0	0	0	0	0	2.8	0	1.8	-2.9

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.

Additional environmental impacts

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PM	Incidence of diseases	4.2E-07	7.4E-08	5.0E-08	0	2.2E-08	0	0	0	0	0	0	1.6E-09	0	1.2E-08	-3.1E-09
IRP [1]	kBq U235 eq	19.3	6.5	3.5	0	9.8E-01	0	0	0	0	0	0	2.0	0	1.1	-1.2E+00
ETP-fw [2]	CTUe	3.2E-09	1.3E-10	2.5E-10	0	1.2E-10	0	0	0	0	0	0	4.1E-11	0	1.4E-10	2.5E-12
HTP-c [2]	CTUh	4.1E-08	5.5E-09	1.2E-08	0	1.3E-08	0	0	0	0	0	0	1.8E-09	0	1.4E-08	-1.3E-09
HTP-nc [2]	CTUh	2.5E-01	2.4E-03	4.4E-02	0	2.7E-03	0	0	0	0	0	0	7.9E-04	0	2.3E-03	-1.1E-02
SQP [2]	-	114.0	3.2	12.8	0	356.0	0	0	0	0	0	0	1.2E+00	0	4.1E-01	-1.8E+00

PM: Potential for disease incidence due to emissions of particulate matter (PM); IRP : Exposure efficiency of human potential relative to U235; ETP-fw : Ecosystem toxic unit comparative potential - freshwater; HTP-c : Ecosystem toxic unit comparative potential - carcinogenic effects; HTP-nc : Ecosystem toxic unit comparative potential - non-carcinogenic effects; SQP : Soil quality potential index; NR: Not relevant

Note 1: This impact category deals mainly with 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 or occupational exposure due to disposal of radioactive waste in underground facilities. Ionising radiation potential of soil, due to radon or some building materials is also not measured by this parameter.

Note 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

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	23.6	5.6E-01	2.5	0	7.3	0	0	0	0	0	0	2.1E-01	0	2.1E-01	-5.6
PERM	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PERT	MJ	23.6	5.6E-01	2.5	0	7.3	0	0	0	0	0	0	2.1E-01	0	2.1E-01	-5.6
PENRE	MJ	157.0	9.1	10.9	0	2.0	0	0	0	0	0	0	2.9	0	1.8	-2.9
PENRM	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PENRT	MJ	157.0	9.1	10.9	0	2.0	0	0	0	0	0	0	2.9	0	1.8	-2.9
SM	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FW	m^3	2.5E-02	6.2E-04	3.4E-03	0	2.8E-01	0	0	0	0	0	0	2.3E-04	0	3.4E-04	-1.6E-03

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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water.

Waste categories

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	1.9E-03	2.8E-11	5.8E-05	0	1.0E-11	0	0	0	0	0	0	8.8E-12	0	2.8E-08	-4.2E-08
NHWD	kg	2.3	1.3E-03	4.1E-01	0	7.8E-02	0	0	0	0	0	0	4.3E-04	0	8.2	-1.3E-03
RWD	kg	3.2E-03	1.6E-05	3.3E-04	0	2.5E-05	0	0	0	0	0	0	5.3E-06	0	2.4E-05	-2.3E-05

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

Output flows

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MFR	kg	1.42E-02	0	8.95E-01	0	0	0	0	0	0	0	0	0	18.4	0	0
MER	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EE	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

CRU: Components for reuse; MFR: Materials for recycling; MER: Materials for energy recovery; EE: Energy exported; NR: Not relevant.

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Una declaración ambiental verificada

GlobalEPD