GlobalEPD

A VERIFIED ENVIRONMENTAL DECLARATION

AENOR

ECO PLATFORM EPD VERIFIED

Environmental Product Declaration

EN ISO 14025:2010

EN 15804:2012+A2:2019

SCREEDS AND FLOOR FINISH MORTARS

Publication date: 01-02-2024

Validity date: 31-01-2029

The declared validity is subject to registration and publication on www.aenor.com

Registretion number: GlobalEPD EN15804-056 rev 1

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Grupo Puma España S.L.

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

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AENOR is a founding member of ECO Platform, the European Association of Environmental Declarations Verification Programs of product.

The European Standard EN 15804:2012+A2:2020 serves as the basis for Product Category Rules

Independent verification of the declaration and the data, according to the 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 Puma is a group of specialized companies in the world of construction materials. Its more than 40 years of experience and dedication in the sector allows it to offer a wide range of products of exceptional and recognized quality as a result of an exhaustive study of their components and qualities in the laboratories of each of the factories. Thanks to this, we launched products on the market with excellent quality-price ratio.

Grupo Puma España S.L. already has 37 production and distribution centres across 4 continents. Equipped with the most advanced technology to provide the best coverage and service for our range of products.

With a production capacity of over 1,000,000 tons per year, Grupo Puma España S.L. establishes itself as the largest mortar manufacturer in Spain.

Grupo Puma España S.L.is committed to sustainability and respect for the environment through its management, the development of modern technologies and new products aimed to achieve this objective.

All Grupo Puma España S.L. factories have implemented an Environmental Management System in accordance with the ISO 14001 Standard.

1.2. Scope of the declaration

The present Declaration is an individual EPD of family products.

This GlobalEPD Declaration for the family of mortars for screeds has been prepared using the annual production-weighted average data for each of the 26 mortar references for ceramic tile installation manufactured at the various production facilities of Grupo Puma España S.L. in Spain.

The is based on production data for the year 2022.

Data has been collected from centres located in Madrid, Alicante and Valencia.

1.3. Life cycle and compliance.

This EPD has been developed and verified according to the UNE-EN ISO 14025:2010 and UNE-EN 15804:2012+A2:2020 Standards.

This EPD includes the following stages of the life cycle.

Limits in the system. Information modules considered.

Product Stage	A1	Raw materials supply	X
	A2	Transportation to factory	X
	A3	Manufacturing	X
Construction	A4	Transport to construction site	X
	A5	Installation / construction	X
Product Stage	B1	Use	NR
	B2	Maintenance	NR
	B3	Repair	NR
	B4	Replacement	NR
	B5	Refurbishment	NR
	B6	Operational energy use	NR
	B7	Operational water use	NR
End of life stage	C1	Deconstruction / Demolition	X
	C2	Transport	X
	C3	Waste processing	X
	C4	Disposal	X
Benefits and Loads Beyond the system	D	Reuse, recovery and / or recycling potential	X

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

Therefore, this EPD is of the "cradle-to-grave" type (modules A1-3 + modules A4-A5 + modules B1-B7 + modules C1-C4 + module D).

This Declaration may not be comparable to those developed in other Programs or according to different reference documents; in particular, it may not be comparable to those Declarations which have not been established according to the UNE-EN 15804 Standard.

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

The comparison of construction products must be based on the same function, applying the same functional unit and at the building level (or architectural or engineering work). This includes considering the product's performance throughout its entire life cycle, as well as the specifications outlined in section 6.7.2 of the UNE-EN ISO 14025:2010 Standard.

1.4. Differences from previous versions of this EPD

This EPD is modified to correct an error in point 3.2.

2. The product

2.1. Identification of the product

The product covered in this Declaration is a mortar for screeds and floor finishing, according to the UNE-EN 13813 and 13318 standards for screeds and floor finishing mortar, which specify its properties and requirements. These materials are used for the regularisation, levelling, or rendering of floors, both indoors and outdoors.

CPC Classification: 37510 (Non-refractory mortars and concretes).

Products considered in this EPC are mentioned bellow:

- PAVILAND INDUSTRIAL EF
- PAVILAND INDUSTRIAL
- NIVELAND 10R
- NIVELAND 5
- PAVILAND PLUS
- PAVILAND IMPRESO
- NIVELAND 10
- PAVILAND INDUSTRIAL CR
- PAVILAND INDUSTRIAL MT
- NIVELAND 30R
- PAVILAND INDUSTRIAL 15R AUTONIVELANTE
- PAVILAND INDUSTRIAL 25 AUTONIVELANTE
- PAVILAND SOLERA AUTONIVELANTE
- PAVILAND TRAFFIC 15 AUTONIVELANTE
- PAVILAND SOLERA R AUTONIVELANTE
- PAVILAND TRAFFIC 15R AUTONIVELANTE
- PAVILAND ARQ BASE
- PAVILAND PRIMER R
- PAVILAND ARQ PRIMER
- PAVILAND TOP EPW
- PAVILAND EP MULTICAPA
- PAVILAND PRIMER EP
- PAVILAND ARQ ACABADO
- PAVILAND SPORT AC BASE
- PAVILAND SPORT AC ACABADO
- PAVILAND SPORT AC TOP

Product characteristics subject to the declaration:

- Reference service life: 50 years.
- Reference mass of material for final use: 7.12 kg/m_2
- Density of product: 1433.22 kg/m_3
- Common thickness per layer: 5 mm

There is a vast variety of floor types, and depending on its final use either one mortar product or another will be chosen, with special care being taken for floors that will be subjected to heavy loads, such as industrial floors These must have the appropriate strength to prevent cracking under loads and technical characteristics that make them durable against the destructive forces of traffic, weather, and water.

Floors can be classified according to their use: residential or industrial. According to their composition: cement-based, resin-based, or mixed.

2.2. Composition of the product

The screed mortar is composed of silica, cement, calcium carbonate, and other components.

The virtual screed mortar analysed corresponds to a weighted average based on the annual production of the different references manufactured at the various production facilities. The composition of this mortar is shown in the following table.

The manufacturer declares that none of the components of the final product are included in the Candidate list of substances of extremely high concern for authorization under the REACH Regulation.

The composition declared by the manufacturer is as follows:

Substance	Content	Unit
Silica	57	%
Cement	27	%
Calcium carbonate	14	%
Others	2	%

The packaging considered per square metre (m_2) of product is as follows:

Material	Content	Unit
Sack	2.28E-02	kg
Pallet	6.48E-03	kg
Cardboard	1.56E-03	kg
Plastic	2.69E-03	kg

3. Information regarding the LCA

3.1. Life cycle assessment

This EPD aims to evaluate and communicate the potential environmental impacts of the tile adhesive mortar.

The EPD is based on a life cycle assessment conducted in accordance with the UNE-EN ISO 15804 Standard. This$_2$ study adopts a "cradle-to-grave" perspective (modules A1-3 + modules A4-A5 + modules B1-B7 + modules C1-C4 + module D).

The EPDs prepared according to the Mortar Product Category Rules are based on information modules defined in the UNE-EN 15804 Standard. It specifically includes the product stage (modules A1-A3), the construction process stage (modules A4-A5), the use stage (modules B1-B7), the end-of-life stage (modules C1-C4) and the module D.

The life cycle assessment has been based on specific process data for the mortars included in the analysed range, collected through consumption and composition inventories filled out by Grupo Puma España S.L. Data from four production centres corresponding to the 2022 production year have been considered.

The Ecoinvent v3.9.1 data base has been used for non-specific data such as for example the production of raw materials. At least 95% of all the mass and energy inputs and outputs of the product system have been included.

This EPD shows the average behaviour of the 26 mortar references for screeds produced by Grupo Puma España S.L. In its production centres, so it was necessary to calculate the average inventory data. A weighted average was calculated based on the production of each reference to standardize the data to 1 m^2 of mortar. Subsequently, a weighted average was conducted between manufacturers based on their annual production for 2022.

For the life cycle assessment calculation, the SimaPro software from Pré Consultants (v.9.5.0.1) was used.

3.2. Functional Unit

1 m^2 of screed with an expected useful life of 50 years

3.3. Reference service life

The reference service life is defined as 50 years, as indicated in the applicable Product Category Rules (PCR).

3.4. Allocation Criteria

As specified in the UNE-EN 15804 standard, "most industrial processes produce more than one intended product. Normally, more than one input is needed to produce one product, and sometimes products are co-produced with other products. As a rule the material flows between them are not distributed in a simple way. Intermediate and discarded products can be recycled to become inputs for other processes. When dealing with systems involving multiple products and recycling processes, allocation should be avoided as far as possible. When unavoidable, allocation should be considered carefully and should be justified."

In this study, no allocations were necessary as no co-products are generated during the manufacturing process.

Following the "polluter pays" principle, the environmental burdens of secondary materials are assigned to the product system that provides them until they reach the waste state and are quantified based on the recycling content of the material assessed.

3.5. Representativeness, quality and selection of data

The inventory data was collected through surveys from Grupo PUMA ESPAÑA S.L., which provided the average composition of each reference and selected the highest production centres to provide production data. These data cover the entire process for the manufacturing of the mortar and correspond to the production data for the year 2022.

The entire product covered by this EPD has been manufactured and distributed in Spain and it represents the mortar for screeds produced by Grupo PUMA ESPAÑA S.L.

3.6. Other Calculation Rules and Assumptions

As per UNE-EN 15804, the cut-off criteria do not exceed 5% of the global environmental impact of the analysed product. Additionally, the following processes are not included in the scope of the study:

- Manufacture of equipment used in production, buildings, or any other capital goods.
- Business trips.
- Maintenance activities, research, and development at Grupo PUMA ESPAÑA S.L. plants.
- Transportation of personnel to and from the plant.
- Diffuse emissions of particles during transportation and storage of raw materials.
- Long-term emissions.

Below are the main assumptions and hypotheses made, as well as the most relevant calculations performed to conduct the study:

- All data used in this study corresponds to 2022.
- For both electricity consumption and other plant consumptions, including waste generation, a mass allocation. per kg of product manufactured has been applied.
- The impact calculation was made for the average weighted product by the production of the family, considering the set of references it contains.
- To represent the electricity consumption in the different manufacturing plants considered in this study, the national residual electricity mix of Spain available in the Ecoinvent 3.9.1 database was used.
- For the calculation of the environmental impact related to the cements in the different formulations, the Product Environmental Declarations (EPDs) published by AENOR for medium cements (AENOR, 2023) were considered. The EPDs used are mentioned in the references section.
- As for the transportation of raw materials (Module A2), specific distances for each supplier and material were considered.
- For the transportation of waste from the production plant, specific distances for each waste management location were provided by the company.
- According to the data provided by the company, 100% of the waste generated during the manufacturing process is recirculated within the company to be used in the production of other products.
- It was assumed that all truck transport complies with the Euro VI emissions standard, as it is conducted within the European territory.
- For the use stage (Modules B1-B7), no maintenance, repair, replacement, or render is required for the mortars. Furthermore, no energy or water consumption is needed during the product's service life. Therefore, the use stage has no impact on the life cycle of the products.

- For Module C1 of deconstruction, which includes the dismantling or demolition of the product from the building, based on the study "Model for Life Cycle Assessment (LCA) of Buildings" published in the JRC Publications Repository, a diesel amount per kg of product burned has been assumed (Gervasio and Dimova, 2018). This amount refers to the energy consumed by construction machinery to remove the products from their installed location once they have completed their life cycle.
- In Module C2 (transportation of discarded products as part of waste processing), a distance of 50 km was assumed for the transportation of waste from the product's deconstruction site to the waste management plant.
- In Module C3, a truck transport of 100 km was considered to the recycling site has been considered (FEDEREC & ADEME, 2017).
- For the installation of products (Module A5), an electricity consumption of 0.3 Wh (considering the Spanish national mix) and 0.2 litres of water per kg of installed product was assumed.
- The amount of waste generated during the installation of the mortars (i.e., Module A5) corresponds to the packaging material used to transport the palletized products from Grupo PUMA España S.L. facilities to the installation site. The waste processing assumed for this packaging waste generated during the installation process is based on the waste management scenario in Spain provided by the Eurostat database (Eurostat, 2023).

4. Limits of the system, scenarios and additional technical information.

4.1. Stage of Product, A1-A3

A1 Acquisition and Processing of Raw Materials

This module considers the extraction and processing of the raw materials used in the production of the products included in this study. Additionally, it includes the production of electricity required during the manufacturing process.

A2 Transport

The raw materials necessary for the production of the products are transported by truck to the manufacturing location.

A3 Manufacturing

The raw materials are unloaded into silos through a closed circuit using pneumatic transportation. Using an automatically controlled process, the raw materials are unloaded into a weighing hopper via a worm gear system.

Once the material is weighed in the necessary proportions for the production of the mortar, it is unloaded into a mixer to homogenize the mixture. At this stage, the additives are incorporated into the mixture.

Through a closed circuit, the mixed product is transported to a packaging hopper. Next, the product is packaged using automatic packers, and then it is palletized and wrapped in plastic film.

Dust generated at the packaging opening during the bag filling operation is vacuumed through a duct to a bag filter that retains the dust, allowing clean air to be released outside. Therefore, particle emissions have not been considered.

The waste generated during manufacturing mainly comes from the packaging of the additives used for the production of the mortar, waste from the product itself, or packaging remnants that have reached the end of their life.

This module also considers the energy required (diesel) for the production of the products.

4.2. Construction Process Stage, A4- A5

A4 Transportation to the construction site

The mortar is transported by tuck or boat, according to its final destination, to its installation area. It should be noted that Grupo Puma España S.L.'s production centres allow coverage of the Spanish territory from proximity.

The average distance corresponds to the measured average of the distribution of each of the production centres according to the quantity of product.

Scenario information	Unit
Vehicle type and fuel consumption, type of vehicles used for transportation	Truck > 32-ton EURO VI
Distance	180 km
Capacity utilization (including idle return)	61% from the total capacity, in volume
Apparent density of the products transported	1433.22 kg/m^3
Useful Capacity Factor (Factor: = 1 or < 1 or ≥ 1 for products that are packaged compressed or nested)	Not applicable

A5 Installation in the Building

For the application, it is necessary to mix the dry mortar with water using a mechanical stirrer with low agitation speed to obtain a homogeneous paste. Therefore, the energy and additional materials consumption (electricity and water) required to correctly install the product in the building has been considered.

It is assumed that the loss generated during installation is less than 0.1%, so no additional production processes are included to compensate for the discarded product loss.

Scenario information	Unit (expressed by FU)
Extra installation material (specifying each of the items)	-
Water usage	0.2 l
Quantitative description of the type of energy (regional mix) and consumption during the installation	0.3 Wh

4.3. Use stage, B1-B7

The useful life of the mortar once applied is considered to be 50 years, during which no significant maintenance, repair, or replacement interventions are required.

The use of mortars does not require any maintenance, repair, replacement, or render. Furthermore, no energy or water consumption is needed during the product's service life. Therefore, the use stage has no impact on the life cycle of the products.

4.4. End of life Stage, C1-C4

C1 Deconstruction, Demolition

Module C1 includes all the processes and activities used in the construction area for the demolition for the building structure. Ideally, this should include the use of equipment, fuel supply, and the quantification of other emissions due to activities performed on site. Currently, there is limited information on this stage of the life cycle that allows for a comprehensive evaluation of the corresponding environmental impacts. Since more precise data is not available, a value of 0.239 MJ of diesel burned per kilogram of product has been used (Gervasio and Dimova, 2018).

C2 Waste Transport

Module C2 includes the environmental impacts related to the transport of waste by truck from the site where it is generated to the waste management facility. The distance considered for the transport of the waste generated to the waste management facility is 50 km.

C3 *Waste processing*

Module C3 covers the process of treating construction waste through crushing, a key procedure in the sustainable waste management within the construction sector. This stage involves the reduction of waste volume through crushing, which significantly impacts the reduction of volume and prepares the waste for further management and reuse. The module includes an additional transport of 100 km to represent the transport from the collection point to the location where the material is recycled (FEDEREC & ADEME, 2017).

C4 Disposal

Module C4 includes the final disposal in a landfill, including physical pre-treatment and management at the disposal site for the part of the product that is not recycled and is used as filling material.

Parameter	Unit (expressed by functional unit)
Collecting system, specified by type	0 kg collected. Separately
	7.12 kg collected with Construction waste mix
Recovery system specified by type	0 kg to be reused
	5.17 kg to be recycled
	0 kg for energy recovery
Elimination, specified by type	1.94 kg product or material for its

4.5. Benefits and loads beyond System Boundaries, D

Module D accounts for the benefits of recycling beyond the system boundaries, representing the amount of virgin raw material replaced by recycled raw material. As such, it has a positive impact, but this impact is outside the system boundaries.

To logically assess this module, the criteria of UNE-EN 15804 are followed, applying the recyclability values recommended by the European Commission (Eurostat, 2023). Additionally, a parameter is considered to identify the quality of the outgoing waste as recyclable material in the market.

5. Declaration of the environmental parameters of the LCA and ICV.

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.

Environmental impacts

Parameter	Units	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq.	2,53E+00	1,71E-01	3,99E-02	2,74E+00	9,90E-02	1,82E-03	NR	NR	NR	NR	NR	NR	NR	4,76E-02	5,44E-02	6,81E-02	5,41E-03	1,13E-02
GWP-fossil	kg CO_2 eq.	2,51E+00	1,71E-01	3,91E-02	2,72E+00	9,90E-02	1,77E-03	NR	NR	NR	NR	NR	NR	NR	4,76E-02	5,44E-02	6,80E-02	5,41E-03	1,14E-02
GWP-biogenic	kg CO_2 eq.	9,37E-03	1,29E-05	5,68E-04	9,95E-03	7,44E-06	4,42E-05	NR	NR	NR	NR	NR	NR	NR	3,49E-06	3,96E-06	1,57E-05	6,97E-07	-6,94E-05
GWP-luluc	kg CO_2 eq.	2,81E-03	3,38E-06	2,75E-04	3,09E-03	1,96E-06	4,73E-06	NR	NR	NR	NR	NR	NR	NR	1,91E-06	1,04E-06	3,84E-05	2,65E-07	-1,50E-06
ODP	kg CFC11 eq.	2,13E-07	3,73E-09	5,81E-10	2,18E-07	2,16E-09	2,35E-11	NR	NR	NR	NR	NR	NR	NR	7,34E-10	1,15E-09	1,34E-09	7,80E-11	1,65E-10
AP	mol H^+ eq.	5,77E-03	2,15E-04	2,51E-04	6,23E-03	1,25E-04	4,64E-06	NR	NR	NR	NR	NR	NR	NR	4,45E-04	6,68E-05	2,90E-04	4,88E-05	1,21E-04
EP-freshwater	kg P eq..	2,17E-04	1,36E-07	4,09E-06	2,21E-04	7,85E-08	3,63E-08	NR	NR	NR	NR	NR	NR	NR	3,98E-08	4,18E-08	1,55E-07	1,85E-08	-5,70E-08
EP-marine	kg N eq.	1,91E-03	5,29E-05	7,94E-05	2,04E-03	3,06E-05	9,26E-07	NR	NR	NR	NR	NR	NR	NR	2,09E-04	1,66E-05	1,18E-04	2,22E-05	5,86E-05
EP-terrestrial	mol N eq.	1,31E-02	5,12E-04	7,81E-04	1,44E-02	2,96E-04	8,98E-06	NR	NR	NR	NR	NR	NR	NR	2,28E-03	1,61E-04	1,27E-03	2,41E-04	6,36E-04
POCP	Kg NMVOC eq.	5,13E-03	4,04E-04	2,43E-04	5,77E-03	2,34E-04	3,19E-06	NR	NR	NR	NR	NR	NR	NR	6,70E-04	1,25E-04	4,35E-04	7,22E-05	1,84E-04
ADP-minerals & metals [2]	kg Sb eq.	1,72E-06	5,93E-09	1,93E-08	1,75E-06	3,44E-09	8,97E-10	NR	NR	NR	NR	NR	NR	NR	1,96E-09	1,83E-09	2,62E-09	2,09E-10	-2,89E-09
ADP-fossil [2]	MJ	2,52E+01	2,30E+00	6,35E-01	2,81E+01	1,33E+00	2,33E-02	NR	NR	NR	NR	NR	NR	NR	6,12E-01	7,07E-01	9,72E-01	6,74E-02	9,09E-02
WDP [2]	m^3	5,28E-01	2,11E-03	5,23E-02	5,82E-01	1,22E-03	6,04E-02	NR	NR	NR	NR	NR	NR	NR	7,89E-04	6,50E-04	4,15E-03	9,36E-05	-2,31E-03

GWP - total: Global Warming Potential; **GWP - fossil:** Global warming potential from fossil fuels; **GWP - biogenic:** Global warming potential from biogenic sources; **GWP - luluc**: Global warming potential from land use and land-use change: **ODP** Stratospheric ozone depletion potential; **AP**: Acidification potential, accumulated surplus; **EP-freshwater:** Eutrophication potential, fraction of nutrients reaching the freshwater compartment; **EP-marine:** Eutrophication potential, fraction of nutrients reaching the marine compartment; **EP-terrestrial:** Eutrophication potential, accumulated surplus; **POCP:** Tropospheric ozone formation potential; **ADP-minerals & metals**: Abiotic resource depletion potential for non-fossil resources; **ADP-fossil:** Abiotic resource depletion potential for fossil resources; **WDP**: Water deprivation potential (user), water deprivation-weighted consumption **NR**: Not relevant

Additional environmental impacts

Parameter	Units	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PM	Incidence of diseases	2,13E-03	1,32E-08	5,32E-09	2,13E-03	7,62E-09	2,56E-11	NR	NR	NR	NR	NR	NR	NR	1,26E-08	3,20E-09	4,77E-08	1,35E-09	3,98E-08
IRP [1]	kBq U235 eq	1,51E-01	3,65E-04	1,35E-03	1,52E-01	2,12E-04	2,24E-04	NR	NR	NR	NR	NR	NR	NR	7,20E-05	1,12E-04	1,67E-03	9,01E-06	-1,60E-03
ETP-fw [2]	CTUe	2,14E+01	1,16E+00	2,55E-01	2,28E+01	6,69E-01	4,36E-03	NR	NR	NR	NR	NR	NR	NR	3,01E-01	3,45E-01	4,24E-01	3,24E-02	7,20E-02
HTP-c [2]	CTUh	1,52E-09	1,14E-11	2,40E-11	1,56E-09	6,61E-12	2,37E-13	NR	NR	NR	NR	NR	NR	NR	2,61E-12	3,38E-12	4,69E-12	4,11E-13	-3,69E-12
HTP-nc [2]	CTUh	5,06E-08	1,82E-09	7,00E-10	5,31E-08	1,05E-09	1,03E-11	NR	NR	NR	NR	NR	NR	NR	2,62E-10	4,74E-10	5,80E-10	5,54E-11	2,71E-11
SQP [2]	-	1,35E+01	4,36E-03	6,27E+00	1,97E+01	2,53E-03	2,02E-03	NR	NR	NR	NR	NR	NR	NR	1,16E-03	1,34E-03	1,17E-02	8,01E-02	-3,19E-01

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

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

Resource use

Parameter	Units	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	3,54E+00	6,03E-03	1,10E+00	4,65E+00	3,49E-03	5,02E-03	NR	NR	NR	NR	NR	NR	NR	1,19E-03	1,86E-03	3,74E-02	3,00E-04	-7,36E-02
PERM	MJ	0,00E+00	0,00E+00	5,83E-01	5,83E-01	0,00E+00	0,00E+00	NR	NR	NR	NR	NR	NR	NR	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	3,54E+00	6,03E-03	1,68E+00	5,23E+00	3,49E-03	5,02E-03	NR	NR	NR	NR	NR	NR	NR	1,19E-03	1,86E-03	3,74E-02	3,00E-04	-7,36E-02
PENRE	MJ	1,13E+01	2,44E+00	6,77E-01	1,44E+01	1,41E+00	2,43E-02	NR	NR	NR	NR	NR	NR	NR	6,51E-01	7,51E-01	1,03E+00	7,17E-02	1,00E-01
PENRM	MJ	2,93E+01	0,00E+00	1,16E-01	2,94E+01	0,00E+00	0,00E+00	NR	NR	NR	NR	NR	NR	NR	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	4,06E+01	2,44E+00	7,93E-01	4,38E+01	1,41E+00	2,43E-02	NR	NR	NR	NR	NR	NR	NR	6,51E-01	7,51E-01	1,03E+00	7,17E-02	1,00E-01
SM	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	NR	NR	NR	NR	NR	NR	NR	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	NR	NR	NR	NR	NR	NR	NR	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	NR	NR	NR	NR	NR	NR	NR	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m_3	1,35E-01	9,60E-05	1,29E-03	1,36E-01	5,56E-05	1,41E-03	NR	NR	NR	NR	NR	NR	NR	3,04E-05	2,96E-05	8,42E-05	3,53E-06	-1,71E-03

PERE: Use of renewable primary energy excluding primary renewable energy resources used as raw material. **PERM:** Use of renewable primary energy used as raw material; **PERT**: Total use of renewable primary energy; **PENRE**: Use of non-renewable primary energy excluding primary non- renewable energy resources used as raw material; **PENRM:** Use of non-renewable primary energy used as raw material; **PENRT:** Total use of non- renewable primary energy; **SM:** Use of secondary materials; **RSF:** Use of renewable secondary fuels; **NRSF:** Use of non-renewable secondary fuels**; FW:** Net use of tap water resources; **NR:** Not relevant

Waste categories

Parameter	Units	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	1,73E-04	1,52E-05	1,58E-06	1,89E-04	8,78E-06	4,53E-08	NR	NR	NR	NR	NR	NR	NR	4,09E-06	4,67E-06	5,75E-06	4,34E-07	1,03E-06
NHWD	kg	9,30E-02	1,13E-04	1,94E-03	9,50E-02	6,56E-05	6,83E-04	NR	NR	NR	NR	NR	NR	NR	4,55E-05	3,49E-05	1,42E-04	1,94E+00	-2,20E-04
RWD	kg	1,10E-04	1,97E-07	9,52E-07	1,11E-04	1,14E-07	1,60E-07	NR	NR	NR	NR	NR	NR	NR	2,98E-08	6,06E-08	1,12E-06	4,00E-09	-8,61E-07

HWD: Hazardous Waste Disposed of; **NHWD:** Non-Hazardous Waste Disposed of; **RWD**: Radioactive Waste Disposed of; **NR:** Not relevant.

Output flows

Parameter	Units	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for reuse	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	NR	NR	NR	NR	NR	NR	NR	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling	kg	0,00E+00	0,00E+00	2,23E-02	2,23E-02	0,00E+00	0,00E+00	NR	NR	NR	NR	NR	NR	NR	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy recovery	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	NR	NR	NR	NR	NR	NR	NR	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	NR	NR	NR	NR	NR	NR	NR	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported Thermal Energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	NR	NR	NR	NR	NR	NR	NR	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

NR: Not relevant

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