

# E P D CERTIFICATION

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# **AMULET COLLECTION**



Environmental Product Declaration

EN ISO 14025:2010 EN 15804:2012+A1:2013 Ceramic tiles. Porcelain tiles (BIa clasification according to EN 14411:2016)

Date of issue: 2020-01-Expiry date: 28 2025-01-27

GlobalEPD Code: 002-025 renovation 1





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The EPD holder is responsible for the content of the Declaration. The holder is responsible for keeping the records and documents supporting the content of the Declaration



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## **LCA Study**

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AENOR is a founding member of ECO Platform, the European Association of Environmental Declarations verification Programmes

GlobalEPD-RCP-002 rev. 1 CEN standard EN 15804:2012+A1:2013 serves as the core RCP
Independent verification of the declaration and data, according to EN ISO 14025:2010
Internal External
Verification Body
AENOR





# 1 General information

## 1.1. The organization

INTHETILE is the company, which aims to be a leading benchmark in the design, manufacture and marketing of ceramic products that satisfies its customers' needs and guarrantees excellent quality, design and value for money.

## 1.2. Scope of the Declaration

This Environmental Product Declaration includes environmental information about a product aggrupation manufactured by INTHETILE S.L in the geographical and technological environment of Spain in the year 2021.

The results shown present the environmental beha-viour of the ceramic coverings belonging the average BIa group, as well as the environmental data of the tiles which present a minimum and maximum impact, thus delimitating the results obtained in the LCA for the average product. The scope of this Environmental Product Declaration (from now on EPD) is from cradle-togate.

# 1.3. Lyfe cycle and conformity

This EPD was drafted and verified in accordance with the EN ISO 14025:2010 and EN 15804:2012+A1:2013 Standards and the Product Category Rules (PCR) listed in table 1.

This EPD includes the lifecycle stages listed in table 2. The EPD type is cradle-to-gate.

TitleCeramic tiles	
Registration codeGlo	balEPD-RCP-002 rev. 1
Issue date2018/07/	11
ConformityUNE-EN 1	.5804
Programme GlobalEl	PD
Programme Operator AENOR	

Table 1. Information about the PCR

This EPD may not be comparable with those developed in other programs or under different reference documents; it may not be comparable with EPD that are not developed under EN 15804:2012+A1:2013 standard. In the same way, Environmental Product Declarations cannot be subject to comparison if the origin of the data is different (the databases, for example), if not all relevant information modules are included, or if they are not based on the same scenarios.

Comparison of construction products shall be based on the same function, using the same functional unit at building level (or architectural or civil engineering works), i.e. including the performance of the product during the life cycle and the requirements stated in EN ISO 14025:2010.

ct	A1	Raw material supply	Х
Product	A2	Transport to the manufacturer	х
4	A3	Manufacturing	Х
tib.	Α	Transport to the building site	MNA
386	4	Installation / construction	MNA
	Α	Use	NR
	5	Maintenance	MNA
90	В	Repair	NR
Use stage	1	Replacement	NR
Use	В	Refurbishment	NR
	2	Operational energy use	NR
	В	Operational water use De-	NR
	3	construction / demolition	NR
<u>i</u> fe	В	Transport	MNA
End of life	4	Waste processing	MNA
ш	В	Disposal	MNA
	5	Reuse, recovery and/or recycling	Х
	В	potentials	
	X 6 Mod	dule included in the LCA; NR = Not relevant module;	
	В	Priva = Produce not assessed	

Table 2. System boundary. Information modules included

-	
С	
1	
С	

2 C 3

C 4

D



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# 2 The product

#### 2.1. Identification of the product

This Environmental Product Declaration covers the ceramic tiles pertaining the water absorption group BIa (porcelain stoneware tiles), classification based on EN 14411:2016 (equivalent to ISO13006:2018), this is their water absorption is less than 0.5%.

The porcelain stoneware tiles included in the study cover different models with different formats. The thickness formats included in the scope of this EPD are from 8mm to 14mm, with an average weight of 22.5kg/m2.

The results of the formats included in the boundary of the present EDP are shown in the Annexes, they present the maximum and minimum environmental impact, and correspond with the 45x90 cm format of 10mm of thicknesses.

## 2.2. Intended use of the product

The function of the product is to cover surfaces. In this study the environmental behaviour of the porcelain stoneware tiles as indoor house surface covering has been assessed, however, the versatility of these pieces allows them to be installed in other places, such as offices, stores, hospitals, etc, in indoor and outdoor environments, as well as covering walls and other surfaces.

The product features are included in the technical datasheets which can be requested from the manufacturer, being them, the ones required by the EN 14411:2016 standard.

### 2.3. Composition of the product

None of the end-product components are included in the Candidate List of substances of very high concern for authorisation.

Raw materials	Content	Units
Clay, feldspar, sand, kaolin, deflocculant, unfired and fired tile scrap96%		kg/m2
Feldspar, carbonates, quartz, borates, silicates, kaolin, zirconium4% oxide, clays, zinc oxide, etc.		kg/m2

Table 3. Composition of the product



# 3 Information regarding the LCA

## 3.1. Life cycle analysis

The Life Cycle Analysis which is the base of the present EPD has been carried out from the data directly provided by the manufacturer INTHETILE, concerning its porcelain stoneware tiles manufactu- red in 2018 in six different production centers.

The Life Cycle Analysis in which this declaration is based has been carried out following the ISO 14040 and ISO 14044 standards and the GlobalEPD RCP-002 rev. 1 document of ceramic coverings of the Global EPD Programme administrated by AENOR, which meets the EN 15804:2012+A1:2013 standard.

The results associated to the ceramic tiles of highest and lowest environmental impact (which correspond with 30x30 cm and 8 mm of thickness, and 60x60 cm and 14 mm of thickness formats, respectively), are included in the Annexs I and II. The LCA has been carried out using GaBi 9.1.053 software and the data base version 8.007 (Thinkstep). The cha- racterization factors used are those included in EN 15804:2012+A1:2013 standard.

#### 3.2. Functional Unit

The functional unit considered is the covering of 1 m2 surface (floor) for 50 years with ceramic tiles of BIa group.

#### Reference service life

The Service Life of the product is the same as that of the building where it is installed if it is installed correctly, as it is a durable product which does not require substitution. A Reference Service Life of 50 years has been considered.

# 3.4. Allocation and cut-off criteria

In this cradle-to-gate 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.



Figure 1. Product installed



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The excluded dataset are:

- Diffuse particulate emissions generated by transport and storage of powdery raw materials.
- Non-regulated channelled emissions from combustion stage (spray drying, ceramic tiles drying and firing stage).
- The waste recycling and reuse processes generated throughout the life cycle of ceramic tiles based on Product Category Rules (PCR). However, the waste recycling process and their benefits are considered in module D.
- Industrial machinery and equipment manufacture, owing to the lack of currently available data, the cost/complexity of analysis and the relatively low environmental impact per FU compared to other processes in the case of building products. In addition, these processes are not included in the used databases. Waste generated during the maintenance of this machinery and equipment are also excluded due to the low impact caused.
- 3.5. Representativeness, quality and selection of datas

The raw data has been directly provided by INTHETILE, this data corresponds to six production centres of the enterprise property. The secondary data comes from GaBi database, 8007 compilation and it has been

modelized with GaBi 9.1.053 version. All data correspond to a 2018 geographical Spanish scene.

The results presented are representative of ceramic coverings, expressed as average values weighted by the production of the ceramic coverings pertaining BIa group, delimiting it by the products which present the minimum and maximum environmental impact.

## 3.6. Other calculation rules and hypotheses

The load assignments applied have been the necessary ones to make it possible to quantify the specific data of covering tiles, as well as to carry out the neces-sary calculations to assign the associated data to the products which present a maximum and a minimum environmental impact.



# 4 System boundaries, scenarios and additional technical information

4.1. Processes that precedes manufacturig (upstream) and manufactuing of the product (A1-A3)

The present environmental product declaration refers to the environmental behaviour of ceramic tiles manufactured by INTHETILE.

All the product stage modules relevant for the ceramic coverings according to the RCP have been included.

## PRODUCT STAGE

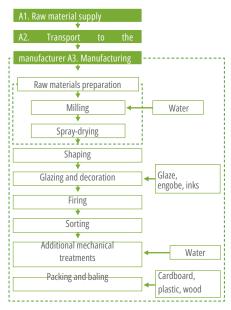


Figure 2. Product stage

Raw materials supply and transport (A1 and A2)

The raw materials required for the ceramic tiles manufacturing are classified as: plastic raw materials and non-plastic or degreasing raw materials. In general, it can be accepted that the proportion among these two

types of raw materials should be such that the mixture obtained is as plastic as necessary to correctly mould the piece, and at the same time, it confers the enough resistance on green tiles to process them. The key plastic raw materials are clays and kaolins. The more common non-plastic or degreasing raw materials are silica sands and alkaline feldspars. Other raw materials to consider are the residues of the own plant, these can be sludge or fired or unfired tile scrap, which are introduced into the raw materials milling stage.

Regarding glaze raw materials, the most used in the formulation are the following ones: quartz, kaolin, alkaline feldspars, nepheline, calcium carbonate, dolomite, zircon, wollastomita, calcined alumina and ceramic frits. Moreover, ceramic pigments prepared in an external comany are also used, generally by oxide calcination and additives, (deflocculants, bindings) in order to maintain the optimal rheologic properties of the suspension which would assist the glazing opera- tions and the obtention of the required aspect (texture and colour uniformity).

The ceramic frits are insoluble glasses, prepared in an external company by complete fusion of their original raw materials, called "frits". It is estimated that around 35% of the raw materials used in the glaze applied on porcelain stoneware tiles are submitted to fritting process.

The raw materials used have different origins according to their nature and properties. The raw materials coming from outside Spain are transported by freighter to the port of Castelló, and from there by truck to the production plants. For sea transport the freighter selected is a transoceanic one, whose distance traversed depends on the origin of each case, whereas for road transport a 27t truck which meets the Euro6 standard has been chosen. All raw materials are transported in bulk, that is, they do not require packaging material, except the decoration materials which are transported in a 17,3t payload truck which meets the Euro 5 standard, from the frits and glaze factory to INTHETILE plants.

Manufacturing (A3)

The raw material preparation of INTHETILE is carried out by enterprises of the same business group. In this process the origin and the proportion of raw materials is defined, adjusting it to the production



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process characteristics and the final performance required.

Once the spray – dried granule has been obtained, it is transported to the manufacturing plants. This process and the following treatments applied to the tiles are carried out in INTHETILE's facilities. The procedure is the following: the spry-dried powder is discharged in storage hoppers and with a feed system based in conveyor belts with weight control, this granule is sent to the forming stage by uniaxial dry pressing, carried out by hydraulic or oleodinamic presses. This is the most indicated method to control the pressing cycle.

The pieces formed are placed in a continuous dryer to reduce their humidity, duplicating or triplicating their mechanical resistance, which allows for their subsequent processing.

The tiles coming from the dryer are covered with one or more thin layers of engobe and glaze, which are applied over the ceramic body through spraying and digital glaze techniques. Then, they are decorated using different types of applications, where the most widespread is the inkjet one and to a lesser extent, the decoration using grains and photogravure. 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.

Firing is the most important stage of the ceramic tiles production process, as it is when the pieces, previously shaped, experience a fundamental modification of their features, resulting in a tough, water and chemical resistant product. The ceramic pieces are subject to a single firing single-deck roller kilns.

Once the quality controls are met, the classified pieces are packaged in primary cardboard packs and wood pallets. Finally, they are covered with film.

4.2. Benefits and loads beyond the system boundary

It has been considered that loads are avoided in the gestion of packing residues (cardboard, plastic and wood) generated during the manufacturing stage.

# 5 Declaration of the environmental parameters of the LCA and LCI

The following table includes the averaged data of the LCA parameters.  $\,$ 

The results associated with ceramic tiles that have agreater and lesser environmental impact are presented in Annexes I and II.

		A1	A2	А3	A4	A5	B1	B2	В3	B4	B5	В6	B7	C1	C2	C3	C4	D
CO2		2,1	4,3E-01	7,1														-3,3E- 03
		5,6E-08	2,2E-11	-2,2E-10														-3,0E-11
		8,5E-03	3,7E-03	8,9E-03														-1,9E-05
		1,7E-03	4,0E-04	7,7E-04	MNA	MNA	NR	MNA	NR	NR	NR	NR	NR	NR	MNA	MNA	MNA	-1,2E-06
<b>O</b> 3	РОСР	6,9E-04	2,3E-04	8,2E-04														-2,3E-06
	ADPE	1,7E-06	2,5E-08	1,8E-07														-2,5E-10
	ADFP	30,2	5,8	117,0														-1,1E-01
	GWP				Global warming potential													
	ODP		eq]		Depletion potential of the stratospheric ozone layer  Acidification potential of soil and water													
	AP	2							d water									
	EP POCP	[kg (PO)3- eq	]			hication			oric ozo	no								
	ADPE	[kg etileno	eq]		Formation potential of tropospheric ozone Abiotic depletion potential for non fossil resources													
	ADPF	[kg Sb eq] [MJ]			Abiotic depletion potential for fossil resources													

Table 4. Parameters describing environmental impacts defined in EN 15804



	A1	A2	А3	A4	A5	B1	B2	В3	В4	B5	В6	B7	C1	C2	C3	C4	D
PERE	13,6	2,5E- 01	1,7														-1,6E-01
ERM	0	0	0														0
PERT	13,6	2,5E-01	1,7														-1,6E-01
PENRE	34,8	5,8	118,0														-1,1E-01
PENRM	0	0	0														0
PENRT	34,8	5,8	118,0	MNA	MNA	NR	MNA	NR	NR	NR	NR	NR	NR	MNA	MNA	MNA	-1,1E-01
SM	0	0	0														0
RSF RSF	0	0	0														0
NRSF	0	0	0														0
FW FW	4,1	2,1E-02	3,8E-01														1,1E-04

Use of renewable primary energy excluding renewable primary energy resources used as raw materials PERM [MJ] Use of renewable primary energy resources used as raw materials PERT [MJ] Total use of renewable primary energy resources PENRE [MJ] Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials Use PERNRM [MJ] of non renewable primary energy resources used as raw materials PERNRT [MJ] Total use of non renewable primary energy resources SM [MJ] Use of secondary material RSF [MJ] Use of renewable secondary fuels

NRSF [MJ] Use of non renewable secondary fuels FW [m3] Net use of fresh water

Table 5. Parameters describing resource use



PERE [MJ]



GlobalEPD 002-025 renovation 1

													1			1		
		A1	A2	A3	A4	A5	B1	B2	В3	B4	B5	В6	В7	C1	C2	C3	C4	D
$\triangle$		2,5E - 03	0	1,8E - 02														1,7E - 06
Î		9,8	1,8E - 02	37,4														-1,4E- 04
A	RWD	1,5E - 03	7,7E - 06	0														-3,5E- 07
	CRU	0	0	0	MNA	MNA			N.D.									0
		0	0	0	MNA	MNA	NR	MNA	NR	NR	NR	NR	NR	NR	MNA	MNA	MNA	-1,1E- 02
		0	0	0														0
<b>7→</b>		0	0	0														0
```\\.		0	0	0														0
	HWD	[kg]			Hazaro	lous wast	te dispos	ed										
	NHWD	[kg]			Non ha	zardous	waste di	sposed										
	RWD	[kg]			Radioa	ctive was	ste dispo	sed										
	CRU	[kg]			Components for re-use													
	MFR	[kg]				als for red												
	MER	[kg]				als for en												
	EE	[kg]				ed electri												
	EET	[kg]			Export	ed therm	al energy	1										

Table 6. Parameters describing output flows and waste categories



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# 6 Additional environmental information

#### 6.1. Indoor emissions

During the manufacturing process of ceramic tiles, they are put through a thermal process that exceeds 1000 °C. At such temperatures, any organic compound present in the compositions breaks down, with the result of producing an inert end product that is free of volatile organic compounds that can be emitted in its use phase.

## 6.2. Release to soil and water

The ceramic tiles do not emit any compounds into the land or into water once installed by the customer in their end use stage, since the product is virtually inert and so does not undergo physical, chemical or biological transformations, is neither soluble nor com- bustible, does not react either physically or chemically or in any other way, is not biodegradable, does not negatively affect other materials with which it comes into contact in a way that may give rise to environ- mental pollution or to damage to human health. It is a non-leaching product, so that it does not endanger the quality of surface water or groundwater.



# ANNEX I Declaration of the environmental parameters of the LCA and the LCI for the format of MINIMUM environmental impact

		A1	A2	A3	A4	A5	B1	B2	В3	B4	B5	В6	В7	C1	C2	C3	C4	D
CO2		1,3	3,4E-01	5,9														-9,0E- 03
		3,2E-08	3,4E-12	-1,0E-10														-4,9E-11
		6,7E-03	2,5E-03	1,2E-02														-5,0E-05
		1,5E-03	2,6E-04	7,6E-04	MNA	MNA	NR	MNA	NR	NR	NR	NR	NR	NR	MNA	MNA	MNA	-2,9E-06
<b>Q</b> <sub>3</sub>	РОСР	5,2E-04	1,6E-04	8,7E-04														-6,0E-06
	ADPE	8,8E-07	2,1E-08	3,7E-07														-6,8E-10
		18,9	4,7	95,3														-2,9E-01
	GWP	[kg CO eg]			Globa	warmin	g potent	al										
	ODP	[kg CFC-11	eq]		Depletion potential of the stratospheric ozone layer													
	AP	[kg SO eq]			Acidification potential of soil and water													
	EP		]			hication												
	POCP	[kg etileno	eq]		Formation potential of tropospheric ozone													
	ADPE	[kg Sb eq]			Abiotic depletion potential for non fossil resources													
	ADPF	[MJ]			Abiotic depletion potential for fossil resources													

Table I.1. Parameters describing environmental impacts defined in EN 15804  $\,$ 



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	A1	A2	A3	A4	A5	B1	B2	В3	В4	B5	В6	B7	C1	C2	C3	C4	D
PERE	7,9	2,2E- 01	8,8														-2,6E-01
PERM	0	0	0														0
PERT	7,9	2,2E-01	8,8														-2,6E-01
PENRE	21,6	4,7	100,0														-3,2E-01
PENRM	0	0	0			NR											0
PENRT	21,6	4,7	100,0	MNA	MNA		MNA	NR	NR	NR	NR	NR	NR	MNA	MNA	MNA	-3,2E-01
SM	0	0	0														0
RSF	0	0	0														0
NRSF	0	0	0														0
FW FW	2,3	1,8E-02	7,2E-01														3,4E-04

 PERM
 [MJ]
 Use of renewable primary energy resources used as raw materials

 PENRE
 [MJ]
 Total use of renewable primary energy resources

 PENRE
 [MJ]
 Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials Use

 PERNRH
 [MJ]
 of non renewable primary energy resources used as raw materials

 PERNRT
 [MJ]
 Total use of non renewable primary energy resources

Use of renewable primary energy excluding renewable primary energy resources used as raw materials

RSF [M3] Use of secondary material
Use of renewable secondary fuels
NRSF [M3] Use of non renewable secondary fuels
FW [m3] Net use of fresh water

Table I.2. Parameters describing resource use



PERE [MJ]



GlobalEPD 002-025 repoyation 1

				ı	ı	ı			ı	ı								
		A1	A2	A3	A4	A5	B1	B2	В3	B4	B5	В6	В7	C1	C2	C3	C4	D
$\triangle$		1,1E - 03	0	4,3E - 02														4,4E - 06
		6,9	1,4E - 02	15,7														1,6E - 04
A	RWD	1,0E - 03	6,2E - 06	2,0E - 03														-1,5E- 06
	CRU	0	0	0		MNA			N.D.									0
		0	0	0	MNA	MNA	NR	MNA	NR	NR	NR	NR	NR	NR	MNA	MNA	MNA	-2,1E- 02
		0	0	0														0
<b>7→</b>		0	0	0														0
```\\.		0	0	0														0
	HWD	[kg]			Hazaro	lous wast	te dispos	ed										
	NHWD	[kg]			Non ha	zardous	waste di	sposed										
	RWD	[kg]			Radioa	ctive was	ste dispo	sed										
	CRU	[kg]			Components for re-use													
	MFR	[kg]				als for red												
	MER	[kg]				als for en												
	EE	[kg]				ed electri												
	EET	[kg]			Export	ed therm	al energy	/										

Table I.3. Parameters describing output flows and waste categories



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# ANNEX II Declaration of the environmental parameters of the LCA and the LCI for the format of MAXIMUM environmental

# impact

		A1	A2	А3	A4	A5	B1	B2	В3	B4	B5	В6	B7	C1	C2	C3	C4	D
	GWP	2,4	6,4E-01	10,8														-1,7E- 02
	ODP	5,9E-08	6,6E-12	-1,9E-10														-9,2E-11
	АР	8,8E-03	4,7E-03	2,1E-02														-9,3E-05
	EP	1,8E-03	4,9E-04	1,4E-03	MNA	MNA	NR	MNA	NR	NR	NR	NR	NR	NR	MNA	MNA	MNA	-5,5E-06
<b>Q</b> <sub>3</sub>	РОСР	7,6E-04	2,9E-04	1,6E-03														-1,1E-05
	ADPE	1,7E-06	3,9E-08	6,3E-07														-1,3E-09
	ADFP	35,3	8,7	175,0														-5,5E-01
	GWP				Global warming potential													
	ODP	[kg CFC-11	eq]					the strat		ozone l	ayer							
	AP	[kg SO eq]			Acidification potential of soil and water  Eutrophication potential													
	EP	[kg (PO)3- eq																
	POCP	[kg etileno	eq]		Formation potential of tropospheric ozone  Abiotic depletion potential for non fossil resources													
	ADPE	[kg Sb eq]			Abiotic depletion potential for fossil resources													
	7,011	[MJ]																

Table II.1. Parameters describing environmental impacts defined in EN 15804  $\,$ 





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		A1	A2	A3	A4	A5	B1	B2	В3	B4	B5	В6	B7	C1	C2	C3	C4	D
	PERE	14,8	4,0E- 01	14,0	MNA	MNA	NR	MNA	NR.	NR	NR	NR	NR	NR NR			MNA ·	-4,9E-01
		0	0	0														0
•	PERT	14,8	4,0E-01	14,0														-4,9E-01
	PENRE	40,3	8,7	183,0														-5,9E-01
乓	PENRM	0	0	0														0
•	PENRT	40,3	8,7	183,0														-5,9E-01
800		0	0	0														0
		0	0	0														0
	NRSF	0	0	0														0
	FW	4,3	3,3E-02	1,2														6,2E-04

PERE [MJ] Use of renewable primary energy excluding renewable primary energy resources used as raw materials PERM [MJ] Use of renewable primary energy resources used as raw materials PERT [MJ] Total use of renewable primary energy resources PENRE [MJ] Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials Use [MJ] of non renewable primary energy resources used as raw materials PERNRM PERNRT [MJ] Total use of non renewable primary energy resources [MJ] Use of secondary material SM [MJ] Use of renewable secondary fuels RSF [MJ] Use of non renewable secondary fuels NRSF [m3] Net use of fresh water FW

Table II.2. Parameters describing resource use



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			I					1			1		1			1		
		A1	A2	A3	A4	A5	B1	B2	В3	B4	B5	В6	В7	C1	C2	C3	C4	D
$\triangle$		2,1E - 03	0	8,1E - 02	- MNA MN/	MNA	NR	MNA	NR	NR	NR	NR	NR	NR	MNA	MNA	MNA	8,2E - 06
Î	NHWD	12,8	2,7E - 02	52,4														3,0E - 04
A	RWD	1,9E - 03	1,2E - 05	3,2E - 03														-2,7E- 06
	CRU	0	0	0														0
		0	0	0														-3,9E- 02
		0	0	0														0
<b>7→</b>		0	0	0														0
```\\.		0	0	0														0
	HWD	[kg]			Hazardous waste disposed													
	NHWD	[kg]			Non hazardous waste disposed													
	RWD	[kg]			Radioactive waste disposed													
	CRU	[kg]			Components for re-use													
	MFR	[kg]			Materials for recycling													
	MER	[kg]			Materials for energy recovery													
	EE	[kg]			Exported electric energy													
	EET	[kg]			Exported thermal energy													

 ${\bf Table~II.3.~Parameters~describing~output~flows~and~waste~categories}$ 







# References

- [1] General Instructions of the GlobalEPD Programme, 1st revision. AENOR. February 2016
- [2] EN ISO 14025:2010 Environmental labels and declarations Type III environmental declarations Principles and procedures (ISO 14025:2006)
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- [4] GlobalEPD-RCP-002 Ceramic coverings. AENOR. July 2018
- [5] Life cycle assessment according to GlobalEPD Programme for ceramic coverings. Annex I C194573 of Instituto de Tecnología Cerámica.

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