GlobalEPD

A VERIFIED ENVIRONMENTAL DECLARATION

AENOR

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Environmental Product Declaration

EN ISO 14025:2010

EN 15804:2012+A1:2013

Ceramic tiles. Porcelain tiles (BIa clasification according to EN 14411:2016)

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EQUIPE

EQUIPE CERÁMICA S.L.

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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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

EQUIPE CERÁMICAS SL, was founded on September 27, 1999 and, after great growth in the ceramic tile industry in recent years, is currently the reference company in the sector of small format for floor and wall tiles.

EQUIPE provides as an added value a product with a high level of design and quality, a real commitment to its client and a transparency, closeness and flexibility that make EQUIPE a company adapted to its times and in constant evolution.

So much so that in 2017 EQUIPE was included by Cepyme in Cepyme500 programme, that identifies, selects and promotes the 500 Spanish companies that lead business growth and where the added value, employment, innovation and international projection is rewarded.

Currently EQUIPE has more than 150 employees and its products are present worldwide, with its main markets being Europe and America.

1.2. Scope of the Declaration

This Environmental Product Declaration contains complete environmental information along the life cycle of grouping products produced by EQUIPE CERÁMICAS SL. in a geographical and technological environment of Spain in the year 2018.

This environmental product declaration describes the environmental information related to the life cycle of ceramic tiles (BIa group). This EPD represents an average product, since it includes different product families (BIa group). This LCA is "cradle-to-gate.

1.3. Lyfe cycle and conformity

This EPD was drafted and verified in accordance with the EN ISO 14025:2010 and EN15804:2012+A1:2013 Standards and the Product Category Rules (PCR) listed in table 1.

This EPD includes the life cycle stages indicated in table 2.

Title	Ceramic tiles
Registration code	GlobalEPD-RCP-002 rev. 1
Issue date	2018/07/11
Conformity	UNE-EN 15804
Programme	GlobalEPD
Programme Operator	AENOR

Table 1. Information about the PCR

This Declaration cannot be subject to comparison with others as drawn up in other Programmes or in accordance with different reference documents. This EPD is not comparable with other EPD not developed according to the standard EN 15804. In the same way, environmental Declarations cannot be subject to comparison if the origin of the data is different (the data sets, for example), if not all the 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, 6.7.2.

Product stage	A1	Raw material supply	X
	A2	Transport to the manufacturer	X
	A3	Manufacturing	X
Const.	A4	Transport to the building site	MNE
	A5	Installation / construction	MNE
Use stage	B1	Use	NR
	B2	Maintenance	MNE
	B3	Repair	NR
	B4	Replacement	NR
	B5	Refurbishment	NR
	B6	Operational energy use	NR
	B7	Operational water use	NR
End of life	C1	De-construction / demolition	NR
	C2	Transport	MNE
	C3	Waste processing	MNE
	C4	Disposal	MNE
	D	Reuse, recovery and/or recycling potentials	X

X = Module included in the LCA; NR = Not relevant module; MNA = Module not assessed

Table 2. System boundary. Information modules included

2 The product

2.1. Identification of the product

The ceramic tiles included in this study are those belonging to the BIa water absorption group in accordance with the EN 14411:2016 Standard (equivalent to ISO 13006:2018), their waterabsorption is ≤ 0.5% (porcelain tiles).

Porcelaine tiles include in this EPD have large-format ceramic tiles. The product sizes that lie within the scope of the study have a thickness between 8,3 mm and 8,8 mm, with an average weight of 18,3 kg/m^2.

The results of the sizes included within the scope of this EPD which exhibit the maximum and minimum values of the declared impacts are declared in Annexes, corresponding to format 20x20 cm of 8,8 mm of thickness and 43cm de diameter (round piece) with 8,8mm of thickness, respectivily.

2.2. Intended use of the product

The product's function is to cover surfaces. The versatility of the ceramic tile allows this type of coverings to be installed in different environments (houses, offices, shops, hospitals, etc.) in interior and exterior environments, as well as covering floors, walls or other surfaces.

Technical specifications of ceramic tiles are listed in EN 14411:2016 Standard. This information will be provided by the manufacturer.

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, defloccu-lant, unfired and fired tile scrap	93%	kg/m^2
Feldspar, carbonates, quartz, borates, silicates, kaolin, zirconium oxide, clays, zinc oxide, etc.	7%	kg/m^2

Table 3. Composition of the product

3 Information regarding the LCA

3.1. Life cycle analysis

The Life Cycle Assessment (LCA) study on which this EPD is based has been drawn up from data provided by EQUIPE CERÁMICA S.L. of its ceramic tiles produced in 2018 in two diferent facilities.

The LCA on which this declaration is based has been conducted according to the ISO 14040 and ISO 14044 standard, and the GlobalEPD-RCP-002 revision 1 for ceramic tiles of the GlobalEPD Programme of AENOR.

The LCA was developed with the life cycle analysis software GaBi 9.1.053 and database 8.007 (Thinkstep). The characterization factors used are the factors included in EN 15804:2012+A1:2013.

3.2. Functional Unit

The Functional Unit is "covering 1 m^2 of a surface (floors) during 50 years" with BIa group ceramic tiles.

3.3. Reference service life

The Reference Service Life (RSL) is the same as that of the building where it is installed, if it is properly installed. It is a long-lasting product that does not require replacement. It has been considered a reference service life of 50 years.

3.4. Allocation and cut-off criteria

In this "cradle-to-gate" LCA study, a cut-off rule of 1% has been applied for the energy use (renewable and non-renewable) and for the mass in all single processes whose data are insufficient. More than 95% of inputs and outputs from energy and matter have been included, excluding not available and not quantifiable dataset.

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 primary data have been obtained through questionnaires filled in by EQUIPE CERÁMICA S.L., corresponding to two facilities.

For secondary data, GaBi databases have been used, compilation 8007 and modelled with GaBi version 8.0.7.18. All datasets provided belong to a geographical scenario of Spain 2018.

The results includes are representative of ceramic tiles, expressed as an average by the production of BIa group tiles, limiting said average for the products that they have the minimum and maximum environmental impact.

3.6. Other calculation rules and hypotheses

The load assignments applied have been the necessary to quantify specific data of the ceramic tiles, as well as the calculations necessary to be able to assign the associated data to products that have a minimum and maximum environmental impact.

4 System boundaries, scenarios and additional technical information

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

This environmental product declaration refers to the environmental behaviour of the ceramic tile product manufactured by EQUIPE CERÁMICA S.L.

All Life Cycle modules applicable to ceramic tiles according to PCR (cradle-to-gate) have been included.

PRODUCT STAGE

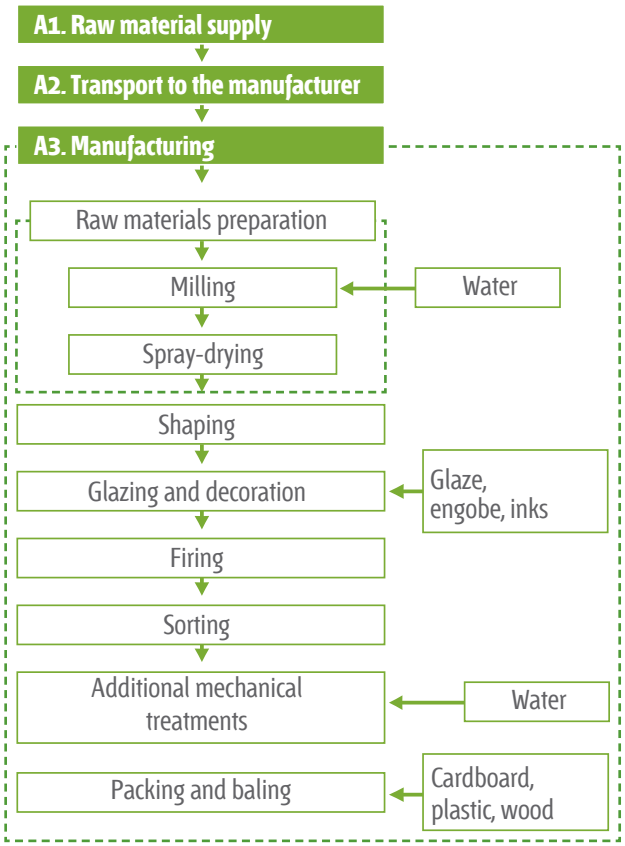

Figure 2. Product stage

Raw materials supply and transport (A1 and A2)

The basic materials for the manufacture of ceramic tiles are classified in plastic raw materials and non-plastic or degreasing raw material. Their proportion should be appropriate to form the tile and to provide enough raw strength to allow it to be processed.

The main plastic raw materials are clays and kaolins. The most common non-plastic raw materials or degreasers are: siliceous sands and alkaline feldspars.

Other raw materials are the waste from the factory itself i.e. sludge, unfired tile scrap and fired tile scrap. These wastes are introduced in the milling stage of the raw materials.

The most common glaze raw materials are quartz, kaolin, alkaline feldspars, calcium carbonate, borates, zircon, clay, calcined alumina, ceramic frits, pigments, and additives such as suspending agents, deflocculants, or binders. The glaze raw materials come from different sources and are transported in bulk by truck and transoceanic freighter.

Ceramic frits are insoluble glass, prepared "ex process" by complete fusion of its original raw materials, called "frits.". It has been estimated as an average that 35% of the raw materials used in the enamels applied on porcelain tiles are subjected to the "fritting" process.

Raw materials have different sources according to their nature and properties. Raw materials that have its origin outside Spain are transported to the Castellón harbour by ship and then by truck to the manufacturing plants.For transport by sea, a type of transoceanic freighter has been chosen, whose distance travelled differs in each case depending on the origin, while a 27t freight truck has been chosen for road transport that complies with Euro 6 regulations. All raw materials are transported in bulk, i.e. with no packing, except for decorative materials that are transported in a 17.3t payload truck that complies with Euro 5 regulations directly from the factory of frits and glazes to the plants of EQUIPE CERÁMICA S.L. A distance of 17 km has been considered.

Manufacturing *(A3)*

Preparing raw materials takes place at the plant of the spray-dried granule supplier of EQUIPE. In this process the proportion of raw materials is defined and adjusted to the characteristics of the production process and final performances required.

The atomized granules, once manufactured, are transported to the EQUIPE facilities. In the factory the spray-dried powder is stored in storage hoppers. Using a feed system of conveyor belts with weight control, the granules are conveyed to the forming stage by dry unidirectional pressing, made with hydraulic or oleodynamic presses. This method is the most suitable for controlling the pressing cycle. The formed pieces are introduced into a continuous drier to reduce tile moisture content, thus doubling or tripling tile mechanical strength for subsequent processing, thus allowing next processing.

Once the tiles are removed from the dryer they are decorated with one or more thin layers of ceramic glaze or engobe with applying on the body techniques such as bell glazing and airbrushes. After, the body is also decorated with applying different techniques, being the majority, the injection of inks and to a lesser extent the decoration is made using chrused frits and rotogravure. This treatment is performed to confer on the surface of the fired product a series of technical and aesthetic properties, such as impermeability, ease of cleaning, gloss, color, surface texture, chemical and mechanical resistance.

The firing is the most important stage in the production process, as the materials have a fundamental change in the properties, obtaining a hard material, resistant to water and to chemical products. The products are fired in single-channel roller kilns.

After the quality control processes, also known as sorting, the pieces are packaged using cardboard, pallets and LPDE film.

4.2. Benefits and loads beyond the system boundary

It is assumed that there are avoided loads *(*such as cardboard, film and wood waste*)*, in the manufacturing stage.

5 Declaration of the environmental parameters of the LCA and LCI

The following table includes the averaged data of theLCA parameters.

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

	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP	3,3	1,6E-01	8,7	MNE	MNE	NR	MNE	NR	NR	NR	NR	NR	NR	MNE	MNE	MNE	-6,7E-03
ODP	1,0E-07	5,9E-11	-2,6E-10														-4,3E-10
AP	1,4E-02	3,4E-03	6,9E-03														-3,4E-05
EP	2,2E-03	3,4E-04	1,0E-03														-4,8E-06
POCP	9,9E-04	1,9E-04	8,6E-04														-4,2E-06
ADPE	6,6E-06	5,2E-09	3,9E-07														-5,3E-10
ADFP	44,2	2,1	145,0														-1,8E-01

GWP	*[kg CO_2 eq]*	Global warming potential
ODP	*[kg CFC-11 eq]*	Depletion potential of the stratospheric ozone layer
AP	*[kg SO_2 eq]*	Acidification potential of soil and water
EP	*[kg $(PO_4)^{3-}$ eq]*	Eutrophication potential
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 4. Parameters describing environmental impacts defined in EN 15804

	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	21,5	2,6E-02	6,8	MNE	MNE	NR	MNE	NR	NR	NR	NR	NR	NR	MNE	MNE	MNE	-1,8E-01
PERM	0	0	0														0
PERT	21,5	2,6E-02	6,8														-1,8E-01
PENRE	57,1	2,2	149,0														-2,1E-01
PENRM	0	0	0														0
PENRT	57,1	2,2	149,0														-2,1E-01
SM	0	0	0														0
RSF	0	0	0														0
NRSF	0	0	0														0
FW	6,7	5,1E-03	7,2E-01														4,4E-04

PERE [M)] Use of renewable primary energy excluding renewable primary energy resources used as raw materials

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

PERT [M)] Total use of renewable primary energy resources

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

PERNRM [M)] Use of non renewable primary energy resources used as raw materials

PERNRT [M)] Total use of non renewable primary energy resources

SM [M)] Use of secondary material

RSF [M)] Use of renewable secondary fuels

NRSF [M)] Use of non renewable secondary fuels

FW [m^3] Net use of fresh water

Table 5. Parameters describing resource use

	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	2,6E-03	0	0	MNE	MNE	MNE	MNE	MNE	MNE	MNE	MNE	MNE	MNE	MNE	MNE	MNE	5,6E-05
NHWD	6,2	5,3E-03	46,2														-5,1E-03
RWD	3,3E-03	2,8E-06	1,6E-03														2,2E-06
CRU	0	0	0														0
MFR	0	0	0														-2,3E-02
MER	0	0	0														0
EE	0	0	0														0
EET	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

Table 6. Parameters describing output flows and waste categories

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 ºC. 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 combustible, 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 environmental 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	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP	3,2	1,3E-01	7,8														-5,5E-03
ODP	9,8E-08	5,9E-11	-2,2E-10														-3,5E-10
AP	1,4E-02	2,7E-03	6,1E-03														-2,8E-05
EP	2,2E-03	2,8E-04	9,2E-04	MNE	MNE	NR	MNE	NR	NR	NR	NR	NR	NR	MNE	MNE	MNE	-3,9E-06
POCP	9,7E-04	1,5E-04	7,7E-04														-3,4E-06
ADPE	6,5E-06	4,3E-09	3,8E-07														-4,4E-10
ADFP	42,4	1,8	128,0														-1,5E-01

GWP	[kg CO_2 eq]	Global warming potential
ODP	[kg CFC-11 eq]	Depletion potential of the stratospheric ozone layer
AP	[kg SO_2 eq]	Acidification potential of soil and water
EP	[kg $(PO_4)^{3-}$ eq]	Eutrophication potential
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

TTable I.1. Parameters describing environmental impacts defined in EN 15804

	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	21,0	2,1E-02	6,9														-1,5E-01
PERM	0	0	0														0
PERT	21,0	2,1E-02	6,9														-1,5E-01
PENRE	55,0	1,8	133,0														-1,7E-01
PENRM	0	0	0														0
PENRT	55,0	1,8	133,0	MNE	MNE	NR	MNE	NR	NR	NR	NR	NR	NR	MNE	MNE	MNE	-1,7E-01
SM	0	0	0														0
RSF	0	0	0														0
NRSF	0	0	0														0
FW	6,5	4,1E-03	7,0E-01														3,6E-04

PERE *[M)]* Use of renewable primary energy excluding renewable primary energy resources used as raw materials

PERM *[M)]* Use of renewable primary energy resources used as raw materials

PERT *[M)]* Total use of renewable primary energy resources

PENRE *[M)]* Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials

PERNRM *[M)]* Use of non renewable primary energy resources used as raw materials

PERNRT *[M)]* Total use of non renewable primary energy resources

SM *[M)]* Use of secondary material

RSF *[M)]* Use of renewable secondary fuels

NRSF *[M)]* Use of non renewable secondary fuels

FW *[m³]* Net use of fresh water

Table I.2. Parameters describing resource use

	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	2,6E-03	0	0	MNE	MNE	NR	MNE	NR	NR	NR	NR	NR	NR	MNE	MNE	MNE	4,6E-05
NHWD	5,3	4,6E-03	31,7														-4,1E-03
RWD	3,2E-03	2,4E-06	1,6E-03														1,8E-06
CRU	0	0	0														0
MFR	0	0	0														-1,9E-02
MER	0	0	0														0
EE	0	0	0														0
EET	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

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

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

	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP	3,5	1,8E-01	11,5														-7,7E-03
ODP	1,1E-07	5,9E-11	-3,0E-10														-4,9E-10
AP	1,4E-02	4,0E-03	9,0E-03														-3,9E-05
EP	2,3E-03	3,9E-04	1,4E-03	MNE	MNE	NR	MNE	NR	NR	NR	NR	NR	NR	MNE	MNE	MNE	-5,6E-06
POCP	1,0E-03	2,2E-04	1,1E-03														-4,8E-06
ADPE	6,7E-06	6,1E-09	5,7E-07														-6,2E-10
ADFP	46,5	2,5	190,0														-2,1E-01

GWP	*[kg CO_2 eq]*	Global warming potential
ODP	*[kg CFC-11 eq]*	Depletion potential of the stratospheric ozone layer
AP	*[kg SO_2 eq]*	Acidification potential of soil and water
EP	*[kg $(PO_4)^{3-}$ eq]*	Eutrophication potential
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 II.1. Parameters describing environmental impacts defined in EN 15804

	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	22,7	3,1E-02	10,4	MNE	MNE	NR	MNE	NR	NR	NR	NR	NR	NR	MNE	MNE	MNE	-2,1E-01
PERM	0	0	0														0
PERT	22,7	3,1E-02	10,4														-2,1E-01
PENRE	59,7	2,5	196,0														-2,4E-01
PENRM	0	0	0														0
PENRT	59,7	2,5	196,0														-2,4E-01
SM	0	0	0														0
RSF	0	0	0														0
NRSF	0	0	0														0
FW	7,0	6,1E-03	1,0														5,0E-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

PERNRM *[MJ]* Use 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 II.2. Parameters describing resource use

	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	2,8E-03	0	0	6,4E-05	MNE	NR	MNE	NR	NR	NR	NR	NR	NR	MNE	MNE	MNE	8,2E-06
NHWD	7,0	6,1E-03	63,1														-5,8E-03
RWD	3,4E-03	3,2E-06	2,4E-03														2,5E-06
CRU	0	0	0														0
MFR	0	0	0														-2,6E-02
MER	0	0	0														0
EE	0	0	0														0
EET	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

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)*

[3] EN 15804:2012+A1:2013 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products

[4] GlobalEPD-RCP-002 Ceramic coverings. AENOR. July 2018

[5] Life cycle assessment according to GlobalEPD Programme for porcelain stoneware ceramic tile product of the BIa group. Annex I C195037 of Instituto de Tecnología Cerámica report.

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A verified enviromental declaration

GlobalEPD