



# ENVIRONMENTAL PRODUCT DECLARATION

7-8 mm

# Floor Tiles

IN ACCORDANCE WITH ISO 14025:2006 and EN 15804:2012 - A2:2021 and  
ISO 21930

Programme:	The International EPD® System
Programme Operator:	EPD Turkey / EPD International AB
S-P Code:	S-P-08765
Publication Date:	2023-09-18
Validity Date:	2028-09-17
Geographical Scope:	Türkiye

**bien**

# Programme Information

ISO standard ISO 21930 and CEN standard EN 15804 serves as the core Product Category Rules (PCR)

## Product Category Rules (PCR):

2019:14 Version 1.2.5, 2024-12-20, Construction Products and CPC 54 Construction Services, EN 15804:2012 + A2:2019 Sustainability of Construction Works

## PCR review was conducted by:

The Technical Committee of the International EPD® System.

**Review chair:** Claudia A. Peña, University of Concepción, Chile

EPDs within the same product category but registered in different EPD programmes may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison.

## LCA Accountability:

Metsims Sustainability Consulting

## Third-party verification

Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:

EPD verification by individual verifier

**Third party verifier:** Prof. Ing. Vladimír Kočí, Ph.D., MBA, LCA Studio Šárecká 5,16000 Prague 6 - Czech Republic

**Approved by:** The International EPD® System

Procedure for follow-up of data during EPD validity involves third party verifier:

Yes      No

BİEN YAPI ÜRÜNLERİ SAN. TURİZM VE TİC. A.Ş. has the sole ownership, liability, and responsibility for this EPD.

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# About the Company

Bien Yapı Ürünleri Sanayi Turizm ve Ticaret Anonim Şirketi (hereinafter referred to only as Bien) is the establishment of Ercan Group of Companies. The factory was founded in 1980 by Bilser A.Ş. was established under the name of Serel between 1986-1997 and was acquired by the Ercan Group of Companies in 1997. The company, which produces under the title of İlkin Ercan Seramik, started to use the Bien brand in 2008 and adopted this brand as its trade name in 2012.

Bozüyük Seramik, which joined the Ercan Group of Companies in 1997, used the Bien brand first in 2008, and merged with Ercan Seramik under the trade name Bien in 2012.

In 2020, the Bilecik OSB wall facility, located in the Bilecik OIZ region, was put into service and joined the Ercan Group of Companies.



# About the Floor Tiles

# 7-8 mm

Floor tiles are fired between 1170-11900C. Floor tiles have a flexural strength of over 1100N for tiles with a tile thickness of over 7,5mm and over 700N for tiles with a tile thickness of less than 7,5mm. It shows water absorption between 0,5% and 3,0%.

Glossy floor tiles have a flexural strength of over 1000N for tiles with a tile thickness of over 7,5mm and over 600N for tiles with a tile thickness of less than 7,5mm. It shows water absorption between 3,0% and 6,0%. It is especially used as a floor covering due to its mechanical strength. It is generally preferred for interiors.

## Composition of Product & Packaging

Product Composition	Weight, %	Post Consumer Material Weight, %	Renewable Material Weight, %
Feldspat	30-50	0	0
Clay	30-50	0	0
Others	Rest	0	0

Packaging Composition	Weight, kg	Post Consumer Material Weight, %	Renewable Material Weight, %
Cardboard	0,243	0	0
Plastic	0,015	0	0
Paper	0.002	0	0

## Information on Biogenic Carbon Content According to EN15804+A2

Biogenic Carbon Content	Unit	Quantity
Biogenic carbon content in product	kg C	7,33E-3
Biogenic carbon content in packaging	kg C	5,38E-3



# Technical Specifications (Annex-H)

Theme	BIEN Standards	TS EN 14411 Annex-H		Test Method
Length and Width	± 0,5 %	± 0,6 %	± 2,0 mm	TS EN ISO 10545-2
Thickness	± 5 %	± 5 %	± 0,5 mm	TS EN ISO 10545-2
Straightness of Sides	± 0,3 %	± 0,5 %	± 1,5 mm	TS EN ISO 10545-2
Rectangularity	± 0,5 %	± 0,5 %	± 2,0 mm	TS EN ISO 10545-2
Center Curvature	± 0,3%	± 0,5 %	± 2,0 mm	TS EN ISO 10545-2
Edge Curvature	± 0,3%	± 0,5 %	± 2,0 mm	TS EN ISO 10545-2
Warpage	± 0,3%	± 0,5 %	± 2,0 mm	TS EN ISO 10545-2
Surface Quality	5 % defective	5 % defective		TS EN ISO 10545-2
Water Absorption	0,5 % < E ≤ 3,0 %	0,5 % < E ≤ 3,0 %		TS EN ISO 10545-3
Breaking Strength (≥ 7,5 mm)	Min 1100 N	Min 1100 N		TS EN ISO 10545-4
Breaking Strength (< 7,5 mm)	Min 700 N	Min 700 N		TS EN ISO 10545-4
Modulus of Rupture	Min. 30 N/mm <sup>2</sup>	Min. 30 N/mm <sup>2</sup>		TS EN ISO 10545-4
Impact Resistance	Resistant	Required		TS EN ISO 10545-5
Abrasion Class	Min II	as declared		TS EN ISO 10545-7
Thermal Shock Resistance	Resistant	Required		TS EN ISO 10545-9
Crazing Resistance	Resistant	Required		TS EN ISO 10545-11
Frost Resistance	Resistant	Required		TS EN ISO 10545-12
Resistance to Acids/Alkalis	Class LB-HB	as declared		TS EN ISO 10545-13
Resistance to Household Chem.	Min. Class B	Min. Class B		TS EN ISO 10545-13
Resistance to Staining	Min. Class 3	Min. Class 3		TS EN ISO 10545-14

# Technical Specifications (Annex-J)

Theme	BIEN Standards	TS EN 14411 Annex-J		Test Method
Length and Width	± 0,5 %	± 0,6 %	± 2,0 mm	TS EN ISO 10545-2
Thickness	± 5 %	± 5 %	± 0,5 mm	TS EN ISO 10545-2
Straightness of Sides	± 0,3 %	± 0,5 %	± 1,5 mm	TS EN ISO 10545-2
Rectangularity	± 0,5 %	± 0,5 %	± 2,0 mm	TS EN ISO 10545-2
Center Curvature	± 0,3%	± 0,5 %	± 2,0 mm	TS EN ISO 10545-2
Edge Curvature	± 0,3%	± 0,5 %	± 2,0 mm	TS EN ISO 10545-2
Warpage	± 0,3%	± 0,5 %	± 2,0 mm	TS EN ISO 10545-2
Surface Quality	5 % defective	5 % defective		TS EN ISO 10545-2
Water Absorption	3,0 % < E ≤ 6,0 %	3,0 % < E ≤ 6,0 %		TS EN ISO 10545-3
Breaking Strength (≥ 7,5 mm)	Min 1000 N	Min 1000 N		TS EN ISO 10545-4
Breaking Strength (< 7,5 mm)	Min 600 N	Min 600 N		TS EN ISO 10545-4
Modulus of Rupture	Min. 22 N/mm <sup>2</sup>	Min. 22 N/mm <sup>2</sup>		TS EN ISO 10545-4
Impact Resistance	Resistant	Required		TS EN ISO 10545-5
Abrasion Class	Min II	as declared		TS EN ISO 10545-7
Thermal Shock Resistance	Resistant	Required		TS EN ISO 10545-9
Crazing Resistance	Resistant	Required		TS EN ISO 10545-11
Frost Resistance	Resistant	Required		TS EN ISO 10545-12
Resistance to Acids/Alkalis	Class LB-HB	as declared		TS EN ISO 10545-13
Resistance to Household Chem.	Min. Class B	Min. Class B		TS EN ISO 10545-13
Resistance to Staining	Min. Class 3	Min. Class 3		TS EN ISO 10545-14

# System Boundary

## PRODUCT STAGE

A1. Raw Material Supply includes raw material extraction and pre-treatment processes before production. In this report, production for each product starts with raw material acquisition.

A2. Transport is relevant for delivery of raw materials to the plant and involves forklift usage within the factory.

A3. Manufacturing stages include production of granules by spray drying, forming, drying, glazing, firing and packaging. Transport is only relevant for delivery of raw materials to the plant and forklift usage within the factory. Packaging waste scenario is created separately depending on the geographic location of the installation process.

## CONSTRUCTION PROCESS STAGE

A4. Transport includes transportation of floor tiles to the construction site. Bien transport tiles by seaway, airway and road haulage to the distribution centres for export.

A5. Installation of the product stage includes the adhesive mortar and water usage in the construction site. For 1 m<sup>2</sup> floor tile installation; 4.2 kg mortar and 1.5 L water usage was assumed.

## USE STAGE

B1. Use stage concerns emissions into environment. Floor tiles are inert materials, so during the use stage, they do not cause any emissions. Hence, use phase is not relevant for the assessment.

B2. Maintenance includes cleaning of tiles. Bien advises to use 0.2 mL detergent which contains stain remover or neutral low-sulphate and rinse with 0.1 L tap water after cleaning. The results are given

for a one-time cleaning activity, as the activity will vary by user.

B3. Repair: Bien floor tiles require no repairing during the use phase and therefore no impacts has occurred in this module.

B4. Replacement: Bien floor tiles require no replacement during the use phase and therefore no impacts has occurred in this module.

B5. Refurbishment: Bien floor tiles require no refurbishment during the use phase and therefore no impacts has occurred in this module.

B6. Operational Energy Use: Operational energy use is not relevant for this product.

B7. Operational Water Use: Operational water use is not relevant for this product.

## END OF LIFE STAGE

C1. De-construction/demolition at the end of RSL is usually conducted with a selective deconstruction/demolition. The environmental impacts generated during this phase are very low and therefore can be neglected.

C2. Transport (Waste) includes the transportation of the discarded tiles, packaging material and adhesive mortar to final disposal. Average distance from demolition site to inert landfill site for final disposal is assumed to be 50 km.

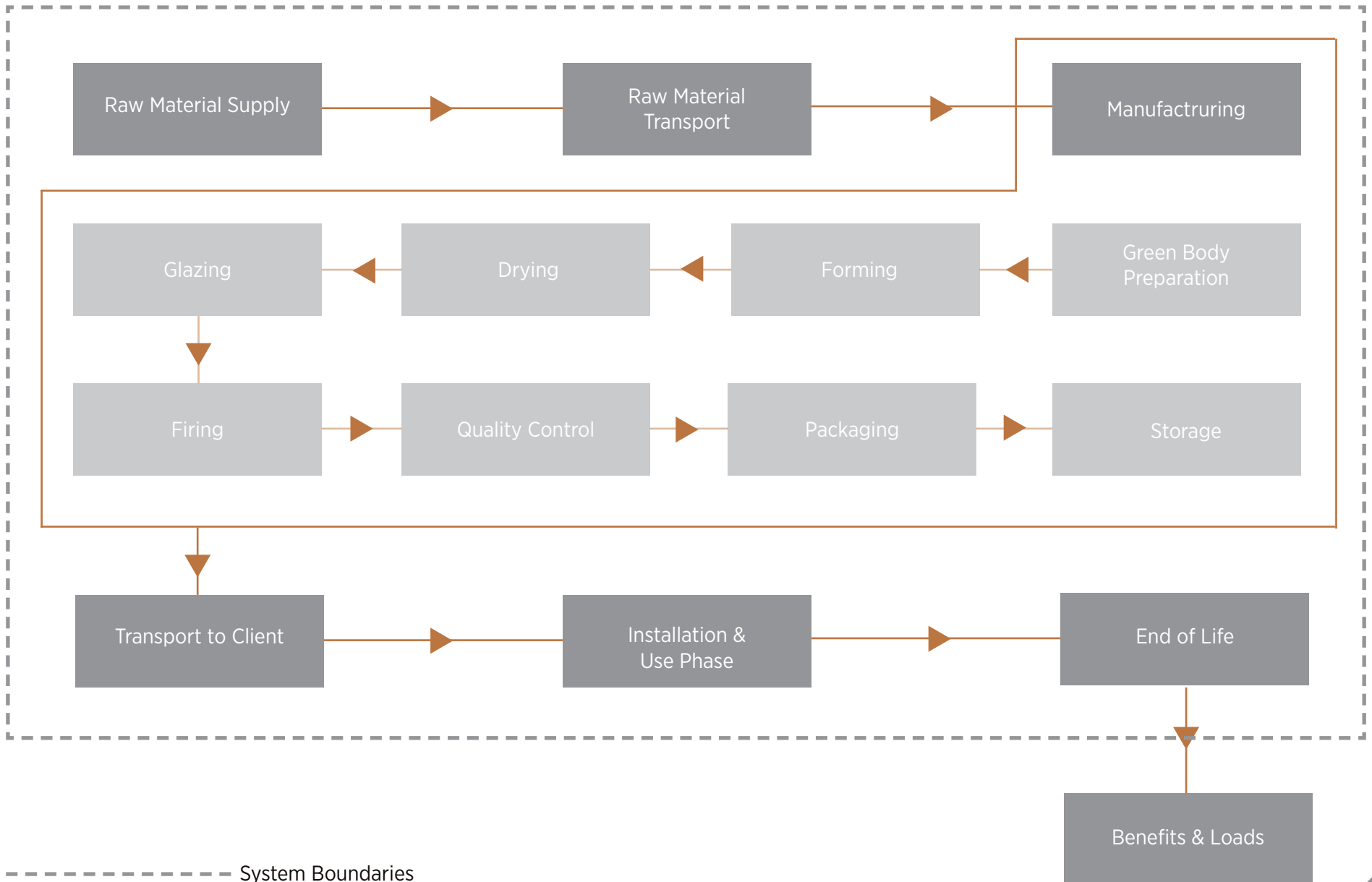
C3. Waste processing concerns processing of discarded porcelain tiles for recycle or reuse. The environmental impacts generated during this phase are very low and therefore can be neglected.

C4. Disposal is the final stage of product life. Bien floor tiles end up at construction and demolition waste landfills as their final fate and modelled as such in this LCA.

## BENEFITS AND LOADS

D. Benefits & Loads from the tiles are calculated in this stage.

# System Boundary





# LCA Information

<b>Functional Unit</b>	The functional unit is the production of 1 m <sup>2</sup> floor tile in 7 and 8 mm thickness with a mass of 15 kg
<b>Goal and Scope</b>	This EPD evaluates environmental impacts of 1 m <sup>2</sup> floor tile
<b>System Boundary</b>	The system boundary covers A1 - A3 product stages referred as 'Raw material supply', 'Transport' and 'Manufacturing', A4 - A5 'Construction', B1 - B7 'Use' and C1 - C4 'End of life' stages and D 'Benefits and Loads' Stage.
<b>Estimates and Assumptions</b>	There are no additional product scenarios developed for this EPD.
<b>Cut-Off Rules</b>	No cut-off is applied. All raw materials and energy inputs are included. Any inventory for which no data available is amount to less than 1% by mass.
<b>Background Data</b>	The LCA modeling was done SimaPro 9.3 LCA software using the Ecoinvent 3.9.1
<b>Geographical Scope</b>	The geographical scope of this EPD is Türkiye.
<b>Data Quality</b>	Raw materials, energy and water consumption, waste and raw upstream and downstream transport data is collected from production site.
<b>Period Under Review</b>	All primary data collected from Bien Bilecik Plant/Türkiye is for the period year of 2022.
<b>Allocations</b>	There are no co-products in the production of paint products. Hence, there is no need for co-product allocation.
<b>Reach Regulation</b>	The product does not contain any substance of very high concern (SVHC) and is subject to authorization under the REACH Regulation.
<b>Comparability</b>	A comparison or an evaluation of EPD data is only possible where EN 15804+A2 has been followed, and the same building context and product-specific characteristics of performance are taken into account and the same stages have been included in the system boundary. According to EN 15804+A2, EPD of construction products may not be comparable if they do not comply with this standard.
<b>Packaging</b>	Tile products produced by Bien is delivered to end users in carton, plastic and paper packagings

	Product Stage			Construction Process Stage		Use Stage							End of Life Stage				Benefits and Loads		
	Raw Material Supply	Transport	Manufacturing	Transport	Construction Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational Water Use	Deconstruction / Demolition	Transport	Waste Processing	Disposal	Future reuse, recycling or energy recovery potentials		
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D		
Modules Declared	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Geography	GLO	GLO	TR	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO		
Specific Data Used	>90%					-	-	-	-	-	-	-	-	-	-	-	-	-	
Variation - Products	NR					-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - Sites	NR					-	-	-	-	-	-	-	-	-	-	-	-	-	-

Description of the system boundary (X = Included in LCA, NR=Not Relevant)

The system boundaries in tabular form for all modules are shown in the table above. The results of the LCA with the indicators as per EPD requirement are given in the following tables for product stage (A1 - A3), construction process (A4, A5), use stage (B1 - B7), and end of life (C1 - C4). Life Cycle Inventory Analysis indicators describing the use of resources are determined respectively to the following impact categories, calculated using CML-IA Baseline (Ver. 3.5) method: Global Warming Potential (GWP) for time span of 100 years, Ozone Layer Depletion Potential (ODP) with time span of infinity, Formation Potential of Tropospheric Ozone Photochemical Oxidants (POCP) with time span of 5 days, Acidification Potential (AP) with time span of eternity, Eutrophication Potential (EP) with time span of eternity, Photochemical Oxidation (POCP) and Abiotic Depletion Potential for Fossil (ADPF) and Non-fossil (ADPE) resources. All energy calculations were done using Cumulative Energy Demand (LHV) methodology. The freshwater use value for manufacturing life cycle was taken from the manufacturer as the net freshwater consumption occurs during the manufacturing stage only.



# LCA Results

Environmental Impacts for 1 m<sup>2</sup> floor tile in floor tile in 7 and 8 mm thickness with a mass of 15 kg

Impact Category	Unit	A1-A3	A4	A5	B1	B2	B3-B7	C1	C2	C3	C4	D
GWP - Fossil	kg CO <sub>2</sub> eq	5,19E+0	1,44E+0	8,32E+0	000,0E+0	379E-3	000,0E+0	000,0E+0	210E-3	000,0E+0	278E-3	-615E-3
GWP - Biogenic	kg CO <sub>2</sub> eq	-371E-3	486E-6	71,1E-3	000,0E+0	-536E-3	000,0E+0	000,0E+0	193E-6	000,0E+0	1,77E-3	-749E-6
GWP - Luluc	kg CO <sub>2</sub> eq	20,1E-3	742E-6	8,70E-3	000,0E+0	651E-3	000,0E+0	000,0E+0	104E-6	000,0E+0	203E-6	-1,19E-3
GWP - Total	kg CO <sub>2</sub> eq	4,84E+0	1,44E+0	8,40E+0	000,0E+0	494E-3	000,0E+0	000,0E+0	211E-3	000,0E+0	280E-3	-616E-3
ODP	kg CFC-11 eq	134E-9	21,6E-9	328E-9	000,0E+0	20,5E-9	000,0E+0	000,0E+0	4,58E-9	000,0E+0	6,58E-9	-9,90E-9
AP	mol H+ eq	21,4E-3	5,10E-3	54,1E-3	000,0E+0	4,41E-3	000,0E+0	000,0E+0	460E-6	000,0E+0	1,98E-3	-5,14E-3
EP - Freshwater (P)	kg P eq	1,91E-3	117E-6	2,73E-3	000,0E+0	7,06E-3	000,0E+0	000,0E+0	15,0E-6	000,0E+0	73,0E-6	-67,2E-6
EP - Marine	kg N eq	5,02E-3	1,68E-3	8,95E-3	000,0E+0	4,91E-3	000,0E+0	000,0E+0	116E-6	000,0E+0	741E-6	-1,63E-3
EP - Terrestrial	mol N eq	49,3E-3	17,8E-3	93,1E-3	000,0E+0	16,3E-3	000,0E+0	000,0E+0	1,18E-3	000,0E+0	7,93E-3	-17,7E-3
POCP	kg NMVOC	17,7E-3	6,86E-3	34,6E-3	000,0E+0	2,69E-3	000,0E+0	000,0E+0	714E-6	000,0E+0	2,68E-3	-5,52E-3
ADPE	kg Sb eq	20,8E-6	4,61E-6	95,7E-6	000,0E+0	3,78E-6	000,0E+0	000,0E+0	688E-9	000,0E+0	565E-9	-2,38E-6
ADPF	MJ	70,0E+0	20,3E+0	123E+0	000,0E+0	3,96E+0	000,0E+0	000,0E+0	2,99E+0	000,0E+0	6,03E+0	-8,40E+0
WDP	m <sup>3</sup> depriv.	3,02E+0	89,8E-3	4,20E+0	000,0E+0	718,54E-3	000,0E+0	000,0E+0	12,3E-3	000,0E+0	255E-3	-705E-3
PM	disease inc.	201E-9	115E-9	542E-9	000,0E+0	71,7E-9	000,0E+0	000,0E+0	15,7E-9	000,0E+0	42,7E-9	-61,5E-9
IR	kBq U-235 eq	127E-3	17,3E-3	418E-3	000,0E+0	21,4E-3	000,0E+0	000,0E+0	4,05E-3	000,0E+0	7,95E-3	-12,8E-3
ETP - FW	CTUe	21,8E+0	11,3E+0	114E+0	000,0E+0	46,9E+0	000,0E+0	000,0E+0	1,48E+0	000,0E+0	2,64E+0	-5,11E+0
HTTP - C	CTUh	4,60E-9	1,30E-9	10,3E-9	000,0E+0	1,68E-9	000,0E+0	000,0E+0	192E-12	000,0E+0	311E-12	-915E-12
HTTP - NC	CTUh	80,6E-9	29,1E-9	248E-9	000,0E+0	38,2E-9	000,0E+0	000,0E+0	4,24E-9	000,0E+0	3,49E-9	-12,1E-9
SQP	Pt	52,1E+0	12,1E+0	43,7E+0	000,0E+0	37,9E+0	000,0E+0	000,0E+0	1,81E+0	000,0E+0	13,8E+0	-16,2E+0

Acronyms GWP-total: Climate change, GWP-fossil: Climate change- fossil, GWP-biogenic: Climate change - biogenic, GWP-luluc: Climate change - land use and transformation, ODP: Ozone layer depletion, AP: Acidification terrestrial and freshwater, EP-freshwater: Eutrophication freshwater, EP-marine: Eutrophication marine, EP-terrestrial: Eutrophication terrestrial, POCP: Photochemical oxidation, ADPE: Abiotic depletion - elements, ADPF: Abiotic depletion - fossil resources, WDP: Water scarcity, PM: Respiratory inorganics - particulate matter, IR: Ionising radiation, ETP-FW: Eco-toxicity freshwater, HTP-c: Cancer human health effects, HTP-nc: Non-cancer human health effects, SQP: Land use related impacts, soil quality.

Disclaimer 1 This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.



Resource Use for 1 m<sup>2</sup> floor tile in floor tile in 7 and 8 mm thickness with a mass of 15 kg

Impact Category	Unit	A1-A3	A4	A5	B1	B2	B3-B7	C1	C2	C3	C4	D
PERE	MJ	12,8E+0	258E-3	8,07E+0	000,0E+0	18,59E+0	000,0E+0	000,0E+0	47,0E-3	000,0E+0	104E-3	-174E-3
PERM	MJ	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0
PERT	MJ	12,8E+0	258E-3	8,07E+0	000,0E+0	18,59E+0	000,0E+0	000,0E+0	47,0E-3	000,0E+0	103,6E-3	-174E-3
PENRE	MJ	70,0E+0	20,3E+0	123E+0	000,0E+0	5E+0	000,0E+0	000,0E+0	2,99E+0	000,0E+0	6,03E+0	-8,41E+0
PENRM	MJ	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0
PENRT	MJ	70,0E+0	20,3E+0	123E+0	000,0E+0	5E+0	000,0E+0	000,0E+0	2,99E+0	000,0E+0	6,03E+0	-8,41E+0
SM	kg	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0
RSF	MJ	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0
NRSF	MJ	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0
FW	m <sup>3</sup>	57,5E-3	3,45E-3	108E-3	000,0E+0	125E-3	000,0E+0	000,0E+0	490E-6	000,0E+0	6,62E-3	-52,95E-3

Acronyms PERE: Use of renewable primary energy excluding resources used as raw materials, PERM: Use of renewable primary energy resources used as raw materials, PERT: Total use of renewable primary energy, PENRE: Use of non-renewable primary energy excluding 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, SM: Secondary material, RSF: Renewable secondary fuels, NRSF: Non-renewable secondary fuels, FW: Net use of fresh water.

Waste Output Flows for 1 m<sup>2</sup> floor tile in floor tile in 7 and 8 mm thickness with a mass of 15 kg

Impact Category	Unit	A1-A3	A4	A5	B1	B2	B3-B7	C1	C2	C3	C4	D
HWD	kg	1,66E-3	1,66E-3	94,2E-3	000,0E+0	94,2E-3	000,0E+0	000,0E+0	1,66E-3	000,0E+0	1,66E-3	1,66E-3
NHWD	kg	38,6E-3	38,6E-3	30,4E+0	000,0E+0	30,4E+0	000,0E+0	000,0E+0	38,6E-3	000,0E+0	38,6E-3	38,6E-3
RWD	kg	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0
CRU	kg	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0
MFR	kg	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0
MER	kg	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0
EE (Electrical)	MJ	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0
EE (Thermal)	MJ	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0	000,0E+0

Acronyms HWD: Hazardous waste disposed, NHWD: Non-hazardous waste disposed, RWD: Radioactive waste disposed, CRU: Components for reuse, MFR: Material for recycling, MER: Materials for energy recovery, EE (Electrical): Exported energy electrical, EE (Thermal): Exported energy, Thermal.

Climate Change Impact for 1 m<sup>2</sup> floor tile in floor tile in 7 and 8 mm thickness with a mass of 15 kg

Impact Category	Unit	A1-A3	A4	A5	B1	B2	B3-B7	C1	C2	C3	C4	D
*GHG-GWP	kg CO <sub>2</sub> eq	5,24E+0	1,44E+0	8,37E+0	000,0E+0	1,07E+0	000,0E+0	000,0E+0	211E-3	000,0E+0	279E-3	-616E-3

Acronyms GHG-GWP = Global Warming Potential total excl. biogenic carbon following IPCC AR5 methodology  
 \* The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus equal to the GWP indicator originally defined in EN 15804:2012+A1:2013

# Glossary

<b>Global Warming Potential, GWP</b>	Global warming is a concept expressing warming of the atmosphere leading to climate change. One of the human activities which has the greatest effect on global warming is the burning of fossil fuels such as petroleum, coal and natural gas. In LCA, global warming is expressed in terms of the equivalent weight of carbon dioxide (CO <sub>2</sub> ) emitted.
<b>Ozone Depletion Potential, ODP</b>	Ozone layer depletion is a concept expressing the reduction of ozone in the stratosphere and depletion of the ozone layer (the 'ozone hole') as a consequence of emissions of man-made resources such as CFCs, HCFCs, chlorine, bromine, etc. Damage to the ozone layer reduces its ability to prevent UV light entering the earth's atmosphere, increasing the amount of carcinogenic UVB light hitting the earth's surface. In LCA, ozone layer depletion is expressed in terms of the equivalent weight of CFC-11 emitted.
<b>Acidification Potential, AP</b>	Acidification is an impact category expressing the toxic impact that acidifying substances have on soil, underground water-courses, ground water, organisms, ecosystems and materials. Reaction of acidic gases with water in the atmosphere creates 'acid rain'. The formation of acid rains causes a reduction in biodiversity. In LCA, acidification is expressed in terms of the equivalent weight of sulphur dioxide (SO <sub>2</sub> ) emitted.
<b>Eutrophication Potential, EP</b>	It is an abnormal proliferation of vegetation in the aquatic ecosystems caused by the addition of nutrients into rivers, lakes or ocean which determinates a lack of oxygen. The eutrophication potential is mainly influenced by emission into water of phosphates and nitrates. Its occurrence can lead to damage to ecosystems, increasing mortality of aquatic fauna and flora and to loss of species that are dependent on low-nutrient environments. In LCA, EP is expressed in mass of PO <sub>4</sub> <sup>3-</sup> eq.
<b>Formation potential of tropospheric ozone photochemical oxidants, POCP</b>	POCP is the formation of reactive substances (mainly ozone) which are injurious to human health and ecosystems and which also may damage crops. This problem is also indicated with "summer smog". In LCA, POCP is expressed in kg C <sub>2</sub> H <sub>4</sub> eq.
<b>Abiotic Depletion Potential, ADP</b>	In LCA, resource depletion is one of the impact categories expressing how much of the world's natural resources (petroleum, iron ore, etc.) are used up. It has global, regional and local aspects of impact and expresses the amount of mineral/ fossil fuel used. In LCA, fossil and non-fossil resource depletion are expressed in terms of the MJ and Sb eq. respectively.

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/The International EPD® System/ The International EPD® System is a programme for type III environmental declarations, maintaining a system to verify and register EPD®s as well as keeping a library of EPD®s and PCRs in accordance with ISO 14025. [www.environdec.com](http://www.environdec.com)

/Ecoinvent / Ecoinvent Centre, [www.ecoinvent.org](http://www.ecoinvent.org)

/SimaPro/ SimaPro LCA Software, Pré Consultants, the Netherlands, [www.pre-sustainability.com](http://www.pre-sustainability.com)

/Metsims/ [www.metsims.com](http://www.metsims.com)

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