Declaration of Environmental and health Standards NF P 01-010

Porotherm R25Th+

June 2013

This statement is presented according to the sheet model Environmental and Health Declaration validated by AIMCC (FDE & S Version 2005)

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Please note that this is the translated Version. For the original French Document please contact Stellaria NZ Ltd

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Building Value

Introduction

The framework used for the presentation of the environmental and health declaration of the brick POROTHERM R25 Th + is the Environmental and Health Declaration Sheet developed by AIMCC (FDE & S Version 2005).

This sheet is a suitable framework for the presentation of environmental and health characteristics of construction products according to the requirements of the NF P 01-010 standard and the provision of additional comments and useful information respecting the spirit of this standard of sincerity and transparency (NF P 01-010 § 4.2).

An accompanying report of the declaration has been established, it can be accessed under confidentiality agreement, the headquarters of the company Wienerberger.

Any use, total or partial, of the information provided and should at least be constantly accompanied by the full reference of the original statement: "full title, publication date, sender's address" that will deliver an authentic copy.

Data producer (NF P 01-010 4)

The information in this statement is provided under the responsibility of the Wienerberger according to NF P 01-010 § 4.6.

The industrial site used for the realization of this EPD is the industrial site of the group located in Achenheim.

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Reading Guide

Details on the format for displaying data

Some values are displayed in scientific format in accordance with the following example:

5.837 E-06 = 5.837 x 10-6

Display rules

The display of the results of inventory calculations complies with the recommendations of §4.7.1

NF P 01-010.

Abbreviations used

DVT: Typical lifetime

UF: Functional Unit

Units used

Kilogram (kg)

Gram (g)

Litre (l)

Kilowatt hour (kWh)

Megajoule (MJ)

1. **Product Characterisation according to NF P 01-010**

1.1 Definition of the Functional Unit

Ensure the bearing wall function on 1m² wall and thermal insulation (thermal resistance of 1.61 m².K.W-1) for an annuity.

1.2 Masses and database for the calculation of the functional unit (UF)

Amount of product, distribution packaging and complementary products contained in UF on the basis of a Typical Lifetime (DVT) of 100 years.

Product: the product is considered a brick POROTHERM R25 Th base + (500x250x249). The interior and exterior coatings are not considered in the study. To ensure the assembly baseline scenario of a wall of 1 m², the required amount of product is 165 kg of bricks POROTHERM R25 Th + (excluding breaks).

Breakage rate during implementation: 2%

Reference Flow: the reference flow of the Life Cycle Analysis (LCA) is 168.3 kg bricks POROTHERM R25 Th + for a 100-year life is: 1,683 kg brick wall per m2 by annuity.

Distribution packaging:

1.28g polyethylene / m² / in either 128g / m² / DVT

0.00503 g paper / m² / or in 0.503 g / m² / DVT,

11.90 g wood / m² / in either 1190 g / m² / DVT.

Additional products for implementation are:

2.2 kg of thin mortar masonry joints,

0.77 l of mixing water,

3.47110 to -4 kWh of electricity consumption for mixing.

Maintenance: The product used does not need maintenance or replacement during its life span.

Justification of information: Data was provided by Wienerberger

The necessary amount of mortar is 0.022 kg of dry mortar per m² of wall in annual instalments according to EPD "thin mortar joints for mounting masonry units," published by the SNMI, water consumption is 0.0077 litres per m² per annuity wall surface (including losses) for mixing mortar, electricity consumption is 3.47110 to -6 kWh per m² per annuity surface (including losses) for mixing mortar.

1.3 Helpful technical features not contained in the definition of the functional unit

Useful technical features not contained in the definition of the functional unit is an assurance of sound insulation and fire resistance. Concerning resistance to fire, complex, brick POROTHERM R25 th+ and dubbing Labelrok 10 + 100, is classified REI 120 under a load of 130 KN / ml.

Source : PV Effectis n°09-V-473 Extension 10-2

2. Inventory data and other data according to NF P01-010 § 5 and comments on the environmental and health effects of the product according to NF P 01-010 § 4.7.2

The life cycle inventory data presented below were calculated for the functional unit defined in 1.1 and 1.2

A reading guide table is available on page 4.

2.1 Consumption of natural resources (NF P01-010 § 5.1)

2.1.1 Consumption of energy and natural resources indicators energy (NF P 01-010 §

	Unit	Production	Transport	Installation	Life used	End of life	Total life cycle	
Flow							Per Year	For DVT
Consumption of natural energy resources								
Wood	kg	0.0251	3.77 E-08	5.07 E-08		6.27 E-09	0.0251	2.51
Coal	kg	0.00369	6.57 E-06	9.85 E-06		1.09 E-06	0.00370	0.370
Lignite	kg	0.000244	3.43 E-07	1.22 E-08		5.70 E-08	0.000244	0.0244
Natural Gas	kg	0.0516	0.000164	4.76 E-06		2.73 E-05	0.0518	5.18
Oil	kg	0.00400	0.00705	1.38 E-06		0.00117	0.0122	1.22
Uranium	kg	1.86 E-09	3.68 E-09	6.22 E-09		6.12 E-10	1.87 E-06	0.000187
Energy indicators								
Total Primary Energy	MJ	4.42	0.308	0.00396		0.0513	4.79	479
Renewable Energy	MJ	0.790	0.000118	0.000198		1.96 E-05	0.790	79.0
Non Renewable Energy	MJ	3.64	0.308	0.00376		0.0512	4.00	400
Energy Process	MJ	3.91	0.308	0.00396		0.0513	4.27	427
Material Energy	MJ	0.515	1.05 E-06	1.78 E-06		1.74 E-07	0.515	51.5
Electricity	kWh	0.109	0.000220	1.38 E-05		3.65 E-05	0.109	10.9

Comments regarding the use of natural energy resources and energy indicators

The total primary energy consumed during the life cycle of the brick POROTHERM R25 Th + is equal to 4.79 MJ / annuity. 16% of this energy is renewable. The total primary energy consists of process energy (89%) and material energy (11%).

The main energy source is natural gas used as fuel for the kilns and dryers

The residues of the paper industry and sawdust, contributing to energy production are of recovered materials. Their values are indicated in § 2.1.4.

The quantities of timber indicated above correspond to the consumption for the production of pallets. These are collected on site and borrow the traditional recycling circuit of the wooden pallet.

Energy indicators should be used with caution because they add different origin of energy that do not have the same environmental impacts (refer preferably to the elementary streams).

2.1.2 Consumption of non-energy natural resources (NF P01-010 § 5.1.2)

A reading guide table is available on page 4.

	Unit	Production	Transport	Installation	Life used	End of life	Total life cycle	
Flow							Per Year	For DVT
Antimony (Sb)	kg	2.78 E-17	0	0		0	2.78 E-17	2.78 E-15
Silver (Ag)	kg	4.41 E-10	1.05 E-12	3.46 E-14		1.74 E-13	4.43 E-10	4.43 E-08
Clay	kg	1.76	3.11 E-07	1.05 E-07		5.17 E-08	1.76	176
Arsenic	kg	0	0	0		0	0	0
Bauxite (Al2O3)	kg	0.000120	2.06 E-07	6.45 E-10		3.43 E-08	0.00121	0.0121
Bentonite	kg	0	0	0		0	0	0
Bismuth (Bi)	kg	0	0	0		0	0	0
Boron (B)	kg	1.49 E-11	0	0		0	1.49 E-11	1.49 E-09
Cadmium (Cd)	kg	7.98 E-13	0	0		0	7.98 E-13	7.98 E-11
Limestone	kg	0.0127	1.94 E-06	6.27 E-07		3.22 E-07	0.0127	1.27
Sodium Carbonate	kg	0	0	0		0	0	0
Potassium chloride	kg	7.73 E-06	2.33 E-10	3.96 E-10		3.88 E-11	0.000187	0.0187
Sodium Chloride	kg	0.000186	9.62 E-07	4.53 E-08		1.60 E-07	0.000187	0.0187
Chromium	kg	4.54 E-08	4.15 E-11	1.37 E-12		6.90 E-12	4.55 E-08	4.55 E-06
Cobalt	kg	4.78 E-14	0	0		0	4.78 E-14	4.78 E-12
Copper	kg	1.20 E-07	2.11 E-10	6.97 E-12		3.51 E-11	1.20 E-07	1.20 E-05
Dolomite	kg	0	0	0		0	0	0
Tin	kg	5.99 E-11	0	0		0	5.99 E-11	5.99 E-09
Feldspar	kg	1.36 E-10	0	0		0	1.36 E-10	1.36 E-08
Iron	kg	0.000329	6.90 E-07	1.13 E-07		1.15 E-07	0.0003300	0.0330
Fluorite	kg	8.45 E-09	0	0		0	8.45 E-09	8.45 E-07
Gravel	kg	1.57 E-05	5.13 E-06	3.80 E-08		8.54 E-07	2.18 E-05	0.00218
Lithium	kg	0	0	0		0	0	0
Kaolin	kg	0	0	0		0	0	0
Magnesium	kg	2.57 E-09	0	0		0	2.57 E-09	2.57 E-07
Manganese	kg	1.80 E-08	2.42 E-11	7.99 E-13		4.02 E-12	1.80 E-08	1.80 E-06
Mercury	kg	1.63 E-12	0	0		0	1.63 E-12	1.63 E-10
Molybdenum	kg	5.23 E-10	0	0		0	5.23 E-10	5.23 E-08
Nickel	kg	6.01 E-08	1.41 E-11	4.64 E-13		2.34 E-12	6.01 E-08	6.01 E-06
Or	kg	1.22 E-12	0	0		0	1.22 E-12	1.22 E-10
Palladium	kg	5.84 E-14	0	0		0	5.84 E-14	5.84 E-12
Platinum	kg	8.83 E-16	0	0		0	8.83 E-16	8.83 E-14
Lead	kg	3.19 E-08	6.59 E-11	2.18 E-12		1.10 E-11	3.20 E-08	3.20 E-06
Rhodium	kg	4.01 E-16	0	0		0	4.01 E-16	4.01 E-14
Rutile	kg	9.90 E-10	0	0		0	9.90 E-10	9.90 E-08
Sand	kg	0.0125	1.56 E-07	1.13 E-07		2.60 E-08	0.0125	1.25
Silica	kg	5.93 E-45	0	0		0	5.93 E-45	5.93 E-43
Sulphur	kg	8.24 E-07	1.03 E-11	1.75 E-11		1.71 E-12	8.24 E-07	8.24 E-05
Barium Sulfate	kg	9.04 E-05	2.16 E-07	7.14 E-09		3.59 E-08	9.06 E-05	0.00906
Titanium	kg	8.64 E-11	0	0		0	8.64 E-11	8.64 E-09
Tungsten	kg	0	0	0		0	0	0

Vanadium	kg	0	0	0		0	0	0
Zinc	kg	6.35 E-09	1.53 E-12	5.07 E-14		2.55 E-13	6.35 E-09	6.35 E-07
Zirconium	kg	1.62 E-12	0	0		0	1.62 E-12	1.62 E-10
Raw materials unspecified plant before	Kg	0	0	0		0	0	0
unspecified animal raw materials before	kg	0	0	0		0	0	0
Non-reassembled intermediates (total)	kg	7.98 E-06	3.21 E-09	5.40 E-09		5.34 E-10	7.99 E-06	0.000799

Comments regarding the use of non-energy natural resources

The consumption of clay, limestone and sand are mainly related to the production of bricks POROTHERM R25 Th +. A fraction of these materials is also related to the mortar joint necessary for the implementation step.

Despite their quantity, these resources are not involved in the depletion of non-renewable resources. Indeed, resource depletion indicator is 0.00127 kg eq. Sb / UF, see §3. While the depletion of clay resources indicator, limestone and sand is equal to 6.19 x 10-11 eq. Sb / UF.

No classified substance (T, T +, Xn, N) is intentionally introduced into the manufacture or during implementation of the product. Wienerberger

2.1.3 Water consumption (withdrawals) (NF P01-010 § 5.1.3)

A reading guide table is available on page 4.

	Unit	Production	Transport	Installation	Life used	End of life	Total life cycle	
							Per Year	For DVT
Water: Lake	litre	0.000326	0	0		0	0.000326	0.0326
Water: Sea	litre	0.000158	6.39 E-11	1.08 E-10		1.06 E-11	0.000158	0.0158
Water: Groundwater	litre	0.00141	3.15 E-13	5.35 E-13		5.25 E-14	0.00141	0.141
Water: Origin Unspecified	litre	0.253	0.0294	0.00868		0.00488	0.296	29.6
Water: River	litre	0.000709	5.95 E-13	1.01 E-12		9.89 E-14	0.000709	0.0709
Drinking Water (network)	litre	0.366	1.38 E-08	2.34 E-08		2.29 E-09	0.366	36.6
Consumed water (total)	litre	0.621	0.0294	0.00868		0.00488	0.664	66.4

Comments related to water use (withdrawals):

The brick the production step POROTHERM R25 Th + uses 94% of the total water consumption.

The water of unspecified origin, representing 43% of total water consumption, is mainly used for the production of electricity and certain raw materials.

The amount of water consumed by the production site is 50% of the total water consumption.

2.1.4 Energy consumption and the recovered materials (NF P01-010 § 5.1.4)

A reading guide table is available on page 4.

	Unit	Production	Transport	Installation	Life used	End of life	Total life cycle	
							Per Year	For DVT
Retrieved energy	MJ	0	0	0		0	0	0
Retrieved material: Total	kg	0.0493	8.25 E-18	1.40 E-17		1.37 E-18	0.0493	4.93
Retrieved Material: Steel	kg	7.25 E-05	0	0		0	7.25 E-05	0.00725
Retrieved Material: Aluminium	kg	0	0	0		0	0	0
Retrieved material: Metal (unspecified)	kg	1.54 E-10	8.25 E-17	1.40 E-17		1.37 E-18	1.54 E-10	1.54 E-08
Retrieved material: Paper Carton	kg	3.39 E-05	0	0		0	3.39 E-05	0.00339
Retrieved material: Plastic	kg	0.00223	0	0		0	0.00223	0.223
Retrieved	kg	0	0	0		0	0	0

material: cullet								
Retrieved material: Biomass	kg	0.0465	0	0		0	0.0465	4.65
Retrieved material: Mineral	kg	8.29 E-05	0	0		0	8.29 E-05	0.00829
Retrieved material: unspecific	kg	0.000406	0	0		0	0.000406	0.0406

Comments related to energy consumption and recovered materials:

The production site values the residues of the paper industry and sawdust.

These materials are recorded as inventory: only the impacts of their transportation is included in the environmental report

2.2 Emissions to air, water and soil (NF P 01-010 § 5.2)

2.2.1 Emissions to air (NF P 01-010 § 5.2.1)

A reading guide table is available on page 4.

	Unit	Production	Transport	Installation	Life used	End of life	Total life cycle	
							Per Year	For DVT
Hydrocarbons (unspecified except methane)	g	0.134	0.0801	3.15 E-05		0.0133	0.227	22.7
HAPa (unspecified)	g	1.66 E-06	8.75 E-08	2.06 E-09		1.45 E-08	1.76 E-06	0.000176
Methane	g	0.157	0.0313	7.25 E-05		0.00521	0.194	19.4
Volatile Organic Compounds (e.g. acetone, acetate, etc.)	g	0.152	1.45 E-06	2.11 E-07		2.42 E-07	0.152	15.2
Carbon Dioxide	g	261	23.0	0.0314		3.82	288	28753
Carbon monoxide	g	0.215	0.0594	3.45 E-05		0.00987	0.284	28.4
Nitrogen oxides	g	1.23	0.272	7.85 E-05		0.0453	1.54	154
Nitrous oxide	g	0.000907	0.00296	1.11 E-06		0.000492	0.00436	0.436
Ammonia	g	0.000454	1.62 E-07	7.80 E-08		2.69 E-08	0.000454	0.0454
Dust (not specified)	g	0.124	0.0157	1.91 E-05		0.00262	0.142	14.2
Sulfur Oxides	g	1.61	0.00999	0.000129		0.00166	1.62	162
Hydrogen Sulfur	g	0.000931	2.17 E-06	2.85 E-07		3.62 E-07	0.000934	0.0934
Hydrogen Cyanide	g	4.31 E-06	4.48 E-10	4.63 E-10		7.44 E-11	4.32 E-06	0.000432
Organic Chlorine Compounds	g	1.66 E-05	4.39 E-15	3.24 E-15		7.30 E-16	1.66 E-05	0.00166
Hydrochloric acid	g	0.0129	1.67 E-05	8.06 E-06		2.78 E-06	0.0129	1.29
Inorganic Chlorine Compounds	g	1.49 E-06	1.58 E-11	8.06 E-06		2.78 E-06	1.49 E-06	0.000149

unspecified chlorine compounds	g	3.23 E-06	5.84 E-12	9.91 E-12		9.71 E-13	3.23 E-06	0.000323
organic fluorine compounds	g	2.07 E-07	5.46 E-07	6.56 E-11		9.08 E-08	8.44 E-07	8.44 E-05
inorganic fluorine compounds	g	0.00936	1.59 E-09	2.73 E-10		2.64 E-10	0.00936	0.935
halogenated compounds (unspecified)	g	2.73 E-05	2.45 E-08	3.94 E-08		4.08 E-09	2.73 E-05	0.00273
unspecified fluorochemicals	g	0	0	0		0	0	0
Metals (unspecified)	g	0.000763	2.95 E-06	2.45 E-06		4.91 E-07	0.000769	0.0769
Antimony and its compounds	g	3.05 E-07	1.91 E-10	3.20 E-10		3.18 E-11	3.06 E-07	3.06 E-05
Arsenic and its compounds	g	1.37 E-06	1.06 E-07	3.61 E-09		1.77 E-08	1.50 E-06	0.000150
Cadmium and its compounds	g	7.23 E-07	5.87 E-07	1.19 E-09		9.76 E-08	1.41 E-06	0.000141
Chromium and its compounds	g	2.09 E-06	1.33 E-07	4.39 E-09		2.22 E-08	2.25 E-06	0.000225
Cobalt and its compounds	g	9.96 E-07	2.61 E-07	1.51 E-09		4.34 E-08	1.30 E-06	0.000130
Copper and its compounds	g	2.64 E-06	3.93 E-07	3.97 E-09		6.54 E-08	3.10 E-06	0.000310
Tin and its compounds	g	6.23 E-08	6.25 E-11	1.05 E-10		1.04 E-11	6.25 E-08	6.25 E-06
Magnesium and its compounds	g	1.38 E-05	3.18 E-08	4.48 E-09		5.28 E-09	1.39 E-05	0.00139
Mercury and its compounds	g	1.43 E-06	1.34 E-08	5.28 E-10		2.23 E-09	1.44 E-06	0.000144
Nickel and its components	g	1.24 E-05	5.21 E-06	2.32 E-08		8.64 E-07	1.85 E-05	0.000144
Lead and its compounds	g	7.85 E-06	1.92 E-06	1.49 E-08		3.19 E-07	1.01 E-05	0.00101
Selenium and its compounds	g	2.00 E-06	1.08 E-07	3.58 E-09		1.79 E-08	2.13 E-06	0.000213
Tellurium and its compounds	g	0	0	0		0	0	0
Zinc and its compounds	g	1.62 E-05	0.000887	1.17 E-08		0.000147	0.00105	0.105
Vanadium and its compounds	g	3.71 E-05	2.08 E-05	8.57 E-08		3.46 E-06	6.15 E-05	0.00615
Silicon and its compounds	g	0.000800	1.53 E-06	2.49 E-06		2.54 E-07	0.000804	0.0804
a HAP : Polycyclic Aromatic Hydrocarbons								

NOTE: Concerning radioactive emissions, this table should be completed as soon as the transposition of European Directive Euratom on radioactive emissions will be published.

Comments on air emissions:

Air emissions come primarily from the brick production site POROTHERM R25 Th + and transportation of product from that site to the implementation site.

The carbon dioxide is equal to 288 g / UF.

Emissions of carbon dioxide are divided as follows;

- manufacturing process (91%);
- transporting step (8%);
- end of life stage (1%).

Emissions of carbon dioxide on the production site by two sources:

- CO2 emissions from combustion of natural gas during the drying and firing of the brick
- CO2 emissions due to the partial combustion residues of the paper industry and sawdust;
- CO2 emissions from decarbonisation of raw materials when cooking.

The nitrogen oxide emissions are equal to 1.54 g / UF.

They are mainly divided as follows

- Manufacturing process (79%)
- Transporting (18%)
- End of life stage (3%)

Emissions of sulfur oxides are equal to 1.62 g / UF.

They are mainly divided as follows

- Manufacturing process (99%)
- Transportation (1%)

2.2.2 Water emissions (NF P01-010 § 5.2.2)

A reading guide table is available on page 4.

	Unit	Production	Transport	Installation	Life used	End of life	Total life cycle	
							Per Year	For DVT
Chemical Oxygen Demand	g	0.00277	0.00104	2.18 E-07		0.000173	0.00399	0.399
Biochemical oxygen demand in 5 days	g	0.000439	3.15 E-05	2.29 E-08		5.25 E-06	0.000476	0.0476
Suspended matter	g	0.0628	0.000175	1.71 E-05		2.91 E-05	0.0631	6.31
Cyanide	g	6.36 E-06	1.49 E-06	1.27 E-08		2.47 E-07	8.11 E-06	0.000811
Halogenated organic compounds absorbable	g	1.01 E-06	1.47 E-06	1.50 E-10		2.45 E-07	2.72 E-06	0.000272
Hydrocarbons (unspecified)	g	0.00470	0.00527	1.46 E-06		0.000876	0.0108	1.08
nitrogen compounds	g	0.000608	0.000873	8.11 E-07		0.000145	0.00163	0.163
phosphorus compounds	g	4.82 E-05	2.90 E-06	4.41 E-09		4.83 E-07	5.16 E-07	0.00516
organic fluorine compounds	g	0	0	0		0	0	0
inorganic fluorine compounds	g	0.000339	1.46 E-05	0.000660		0.0334	0.0345	3.45
unspecified fluorochemicals	g	0	0	0		0	0	0
organic chlorine compounds	g	7.62 E-06	1.60 E-08	5.80 E-10		2.66 E-09	7.64 E-06	0.000764
Inorganic chlorine compounds	g	0.173	0.358	0.0266		1.40	1.96	196
Chlorine compounds (unspecified)	g	0.00260	6.21 E-06	2.05 E-07		1.03 E-06	0.00261	0.261
HAP (unspecified)	g	2.78 E-06	9.02 E-06	1.13 E-09		1.50 E-06	1.33 E-05	0.00133
Metal (unspecified)	g	0.0186	0.00600	0.00266		0.136	0.163	16.3
Aluminium and its compounds	g	0.00115	4.02 E-06	2.09 E06		6.68 E-07	0.00115	0.115
Arsenic and its compounds	g	2.83 E-06	2.93 E-07	1.65 E-05		0.000836	0.000856	0.0856
Cadmium and its compounds	g	3.71 E-07	4.86 E-07	1.32 E-06		6.70 E-05	6.91 E-05	0.00691
Chromium and its compounds	g	1.48 E-05	1.71 E-06	1.65 E-05		0.000836	0.000869	0.0869
Copper and its compounds	g	5.92 E-06	9.89 E-07	6.60 E-05		0.00334	0.00342	0.342
Tin and its compounds	g	4.03 E-08	2.59 E-11	4.38 E-11		4.30 E-12	4.04 E-08	4.04 E-06
Iron and its compounds	g	0.00130	8.69 E-05	2.53 E-06		1.45 E-05	0.00141	0.141
Mercury and its compounds	g	8.08 E-07	2.89 E-09	3.30 E-07		1.67 E-05	1.79 E-05	0.00179
Nickel and its compounds	g	7.38 E-06	1.68 E-06	4.10 E-09		2.80 E-07	9.35 E-06	0.000935
Lead and its	g	4.25 E-05	3.76 E-07	1.66 E-05		0.000836	0.000896	0.0896

compounds								
Zinc and its compounds	g	2.74 E-05	2.94 E-06	0.000132		0.00669	0.00685	0.685
water discharged	litre	0.00544	0.00120	1.29 E-05		0.000199	0.00684	0.684

Comments on emissions to water:

Discharges to water are low. The production site does not reject process water in the environment.

Most of the water used on the site is used to make clay blends and evaporates into the air during the drying and firing bricks.

2.2.3 Emissions into the ground (NF P01-010 § 5.2.3)

A reading guide table is available on page 4.

	Unit	Production	Transport	Installation	Life used	End of life	Total life cycle	
							Per Year	For DVT
Arsenic and its compounds	g	4.61 E-07	1.10 E-09	3.64 E-11		1.83 E-10	4.62 E-07	4.62 E-05
biocides	g	1.72 E-09	0	0		0	1.72 E-09	1.72 E-07
Cadmium and its compounds	g	2.19 E-10	4.89 E-13	1.65 E-14		8.29 E-14	2.19 E-10	2.19 E-08
Chromium and its compounds	g	5.79 E-06	1.38 E-08	4.55 E-10		2.29 E-09	5.81 E-06	0.000581
Copper and its compounds	g	2.92 E-09	2.53 E-12	8.35 E-14		4.21 E-13	2.93 E-09	2.93 E-07
Tin and its compounds	g	5.69 E-13	0	0		0	5.69 E-13	5.69 E-11
Iron and its compounds	g	0.00230	5.50 E-06	1.82 E-07		9.15 E-07	0.00231	0.231
Lead and its compounds	g	4.88 E-09	1.16 E-11	3.82 E-13		1.92 E-12	4.90 E-09	4.90 E-07
Mercury and its compounds	g	3.86 E-11	9.18 E-14	3.03 E-15		1.53 E-14	3.87 E-11	3.87 E-09
Nickel and its compounds	g	1.66 E-09	3.80 E-12	1.25 E-13		6.31 E-13	1.66 E-09	1.66 E-07
Zinc and its compounds	g	1.73 E-05	4.14 E-08	1.37 E-09		6.88 E-09	1.74 E-05	0.00174
Heavy metals (unspecified)	g	4.61 E-05	1.10 E-07	3.64 E-09		1.83 E-08	4.63 E-05	0.00463
Biocides: eg pesticides, herbicides, fungicides, insecticides, bactericides, etc.								

Comments on emissions in soil:

Emissions in the soil due to the availability of fossil fuels (natural gas for the production site and heating oil for equipment career and stockyard).

2.3 Waste production (NF P01-010 § 5.3)

2.3.1 Recycled Waste (NF P01-010 § 5.3)

A reading guide table is available on page 4.

	Unit	Production	Transport	Installation	Life used	End of life	Total life cycle	
							Per Year	For DVT
Retrieved energy	MJ	1.24 E-05	0	0		0	1.24 E-05	0.00124
Retrieved material: Total	kg	0.000400	1.23 E-07	0.000389		2.04 E-08	0.000789	0.0789
Retrieved Material: Steel	kg	1.34 E-06	2.78 E-09	4.71 E-09		4.62 E-10	1.35 E-06	0.000135
Retrieved Material: Aluminium	kg	0	0	0		0	0	0
Retrieved material: Metal (unspecified)		0	0	0		0	0	0
Retrieved Material: Paper	kg	0.000102	0	6.26 E-07		0	0.000103	0.0103
Retrieved material: Plastic	kg	3.79 E-05	0	1.36 E-05		0	5.16 E-05	0.00516
Retrieved material: cullet	kg	0	0	0		0	0	0
Retrieved material: Biomass	kg	0.000206	0	0.000306		0	0.000512	0.0512
Retrieved material: Mineral	kg	3.22 E-05	0	0		0	3.22 E-05	0.00322
Retrieved Material: Unspecified	kg	2.00 E-05	1.20 E-07	6.93 E-05		1.99 E-08	8.95 E-05	0.00895

2.2.2 Waste disposed (NF P01-010 § 5.3)

A reading guide table is available on page 4.

	Unit	Production	Transport	Installation	Life used	End of life	Total life cycle	
							Per Year	For DVT
Dangerous waste	kg	6.47 E-05	6.92 E-06	3.36 E-09		1.15 E-06	7.28 E-05	0.00728
Non dangerous waste	kg	0.00103	6.93 E-06	3.01 E-06		1.15 E-06	0.00104	0.104
inert waste	kg	0.0137	4.04 E-05	0.0337		1.67	1.72	172
Radioactive waste	kg	1.45 E-05	4.93 E-06	4.65 E-08		8.21 E-07	2.03 E-05	0.00203

Comments relating to the production and waste management procedures

The waste recovered are mainly packaging waste. The majority of waste is disposed of inert waste, which come from the end of life of the brick POROTHERM R25 Th +. They are put in landfills for inert waste after building demolition. Radioactive waste exclusively from the use of the French electricity.

3. Representative environmental impacts of construction products according to NF P 01-010 § 6

All these impacts are informed or calculated as indicated in § 6.1 of the standard NF P01-010, from the data of § 2 and the functional unit by reference annuity defined in § 1.1 and 1.2 of this Declaration and for the business unit reported any DVT (Typical Lifetime)

No.	Environmental Impact	Indicator value for the functional unit	Indicator value for all DVT
1	Consumption of energy resources - Total Primary Energy - Renewable Energy - Non-renewable Energy	 4.79 MJ/UF 0.79 MJ/UF 4.00 MJ/UF	 479 MJ 79 MJ 400 MJ
2	Exhaustion of resources (ADP)	0.00127 kg antimony equivalent (Sb) / UF	0.127 kg antimony equivalent (Sb)
3	Total water consumption	0.664 litre/UF	66.4 litre
4	Solid Waste - Recycled Waste (total) - Waste Disposed: - Dangerous waste - Non dangerous waste - Inert waste - Radioactive Waste	 0.000789 kg/UF 7.28 E-05 kg/UF 0.00104 kg/UF 1.72 kg/UF 2.03 E-05 kg/UF	 0.0789 kg 0.00728 kg 0.104 kg 172 kg 0.00203 kg
5	Climate Change	0.293 kg equivalent CO_2/UF	29.3 kg equivalent CO_2
6	Atmospheric Acidification	0.00273 kg equivalent SO_2/UF	0.273 kg equivalent SO_2
7	Air Pollution	21.15 m^3/UF	2115 m^3
8	Water Pollution	0.231 m^3/UF	23.1 m^3
9	Destruction of the stratospheric ozone layer	0 kg CFC equivalent R11/UF	0 kg CFC equivalent R11
10	Photochemical Ozone Creation	2.27 E-07 kg equivalent ethylene/UF	2.27 E-05 kg equivalent ethylene
11	Eutrophication	*$9,29*10^{-4}$ g éq. PO_4^{3-} / UF*	*$9,29*10^{-2}$ g éq. PO_4^{3-}*

4. Contribution of the product to health risk assessment and quality of life within the building according to NF P 01-010 § 7

Product Contribution		Paragraph Concerned	Expression (value measurements, calculations)
Assessment of health risks	sanitary quality of interior spaces	§ 4.1.1	VOC emissions testing and formaldehyde has been made following the AFSSET protocol (test report SB 11-127 and SB 11-132 Test report Excell 2007-09-120). The product has sustained behaviour towards characterization tests to fungal growth (test report No. SB-2009-051 CSTB). natural radioactive emissions of the product (report CTMNC RADON). The product does not release respirable fibres, mineral or vegetable, suspended in the air. (CTTB Study 1999-2000).
	sanitary water quality	§ 4.1.2	Not applicable because this is not in contact neither with water intended for human consumption or with runoff, seepage, ground water or even with surface water.
A quality of life	Hydrothermal comfort	§ 4.2.1	This product claims a thermal resistance of 1.61 m2.K.W-1. (Record CE POROTHERM R25 Th + 500x250x249 Base)
	Acoustic comfort	§ 4.2.2	This product claims a reduction index to inside noise Rw (C; Ctr) of 60 (-3; -9) dB and 61 (-1; -7) dB by doubling the wall (CSTB report AC08-26012563).
	visual comfort	§ 4.2.3	Not applicable because in its normal use, the product is not visible in either interior spaces or from outside
	Olfactory comfort	§ 4.2.4	No odor emission test was conducted. Nevertheless, the product being covered in most cases, is not in direct contact with the air inside buildings, so it is not directly involved in the olfactory comfort *(clay building materials - Manufacture and properties [p. 180]. Mr. Kornmann. SEPTIMA 2005 Edition).*

4.1 Information relevant to the assessment of health risks (NF P 01-010 § 7.2)

4.1.1 Contribution to the health quality of interior spaces (NF P 01-010 § 7.2.1)

Brick POROTHERM R25 Th + participates in the development of a health quality inside the building. Brick POROTHERM R25 Th + is the same family as the brick POROTHERM GFR20 + Th.

VOC and formaldehyde

VOC emissions testing and formaldehyde has been made following the AFSSET protocol (test report SB 11-127 and SB 11-132 Test report Excell 2007-09-120).

VOC emissions and POROTHERM R25 Th + of aldehydes to the implementation stage of life are below the thresholds set by the AFSSET protocol. The measurements are made after 3 days and 28 days.

Attitude to fungal and bacterial growth

The product has undergone characterization tests of his behaviour towards fungal growth (Protocol AFFSET GF R20 Th +)

Tests carried out on the ground 20 bricks bonded thin seal showed no mould growth according to standards NF EN 846 and NF V 18-112. The products are therefore considered fungistatic.

Natural radioactive emissions

natural radioactive emissions of the product (report CTMNC RADON).

Natural radioactivity test campaign conducted on clay brick structure showed that the radionuclide content of the clay is close to the average concentrations of the earth's crust (Ra 45 Bq / kg; Th 48 Bq / kg ; K 698 Bq / kg). The campaign raised no risk of exposure to radon and gamma radiation. The product, implemented according to the scenario "walls", is considered very low emissivity from the viewpoint of radioactive emissions (excess of actual annual dose <0.3 mSv).

Emissions of particles and fibres

The product does not release respirable fibres, mineral or vegetable, suspended in the air. (CTTB Study 1999-2000). These products have natural compositions, excluding toxic products such as fungicides and / or insecticides

Sources:

Assessment of VOC and formaldehyde according to protocol AFSSET - Test report SB SB 11-127 11-132

Report CTMNC RADON

CTTB study 1999-2000

Protocol AFFSET GF R20 Th +

Test report Excell 2007-09-120

4.1.2 Contribution to the sanitary quality of water (NF P 01-010 § 7.2.2)

Not applicable because this is not in contact neither with water intended for human consumption or with runoff, seepage, ground water or even with surface water. Indeed, brick POROTHERM R25 Th + does not interact with the water supply systems and water recovery.

4.2 Contribution of the product to the quality of life within the building (NF P 01-010 § 7.3)

4.2.1 Product features involved in creating hydrothermal comfort conditions in the building (NF P 01-010 § 7.3.1)

This product claims a thermal resistance of 1.61 m2.K.W-1. (Record CE POROTHERM R25 Th + 500x250x249 Base)

The clay has a strong structural capillarity. It allows a "breathing" Natural home, thereby controlling the humidity of the ambient air cleaner thus avoiding the proliferation of microorganisms. Brick POROTHERM R25 Th + removes any risk of condensation and creates a healthy frame, unalterable in time.

The terracotta brick wall POROTHERM R25 Th +, thanks to the multitude of air cells, reaches the thermal resistance of 1.61 m2.K.W-1.

This additive thermal resistance allows:

- or to substantially reduce the thickness of insulation to be used to meet the thermal regulations in force
- either identical insulation thickness to reduce the power of the heating installation. This asset has a direct impact on energy consumption.

Thanks to its high thermal performance and its ability to greatly limit the losses through the thermal bridges, brick POROTHERM R25 Th + saves energy for heating the home. Access to the BBC level is facilitated with a simple doubling stuck + 12 1 32 Ultra that provides resistance to the wall R = 5.41 m2.K.W-1.

Sources:

Sheet CE POROTHERM R25 Th + 500x250x249 Base

4.2.2 Product features involved in the creation of acoustic comfort conditions in the building (NF P 01-010 § 7.3.2)

This product claims a reduction index to inside noise Rw (C; Ctr) of 60 (-3; -9) dB and 61 (-1; -7) dB by doubling the wall (CSTB report AC08-26012563) .

Brick POROTHERM R25 Th + provides part of the acoustic insulating function.The index weakened to inside noise Rw (C; Ctr) of:

60 (-3; -9) dB in the case of a masonry wall POROTHERM R25 Th + corrected for laying thin seal coated with a coating mortar of 1.5 cm on one side and a polystyrene liner elasticized TH32 and plasterboard 13 + 80 on the other side, 61 (-1; -7) dB in the case of a masonry wall POROTHERM R25 Th + corrected for laying thin seal coated with a mortar coating of 1.5 cm on one side and a mineral wool lining and plasterboard 10 + 80 on the other side.

Source:

CSTB report AC08-26012563

4.2.3 Product features involved in the creation of visual comfort conditions in the building (NF P 01-010 § 7.3.3)

Not applicable because in its normal use, the product is not visible in the interior spaces or from outside.

The structure of brick masonry is able to receive any type of coating to tailor the characteristics of visual comfort of the wall.

4.2.4 Product features involved in the creation of olfactory comfort conditions in the building (NF P 01-010 § 7.3.4)

No odour emission test was conducted. Nevertheless, the product being covered in most cases, is not in direct contact with the air inside buildings, so it is not directly involved in the olfactory comfort (clay building materials - Manufacture and properties [p. 180]. Mr. Kornmann. SEPTIMA 2005 Edition).

Brick POROTHERM R25 Th + hardly emit any VOC (see product's contribution to the health quality of interior spaces) or odorant. In effect, this product is a 100% mineral material after cooking.

Source:

Clay Building Materials - Manufacture and properties [p. 180]. Mr. Kornmann. 2005. Edition SEPTIMA.

5. Other contributions include the product in relation to the building of eco-management concerns, economic and global environmental policy

5.1 Eco Building Management

5.1.1 Energy Management

The terracotta brick wall POROTHERM R25 Th +, thanks to the multitude of air cells, reaches the thermal resistance of 1.61 m2.K.W-1.

This additive thermal resistance allows:

- or to substantially reduce the thickness of insulation to be used to meet the thermal regulations currently in force,
- Either identical insulation thickness to reduce the power of the heating installation. This asset has a direct impact on energy consumption.

Thanks to its high thermal performance and its ability to greatly limit the losses through the thermal bridges, brick POROTHERM R25 Th + saves energy for heating the home. Access to the BBC level is facilitated with a simple doubling stuck 12 + 1 Ultra 32 which gives the wall a resistance R = 5.41 m2.K.W-1.

Sources:

Sheet CE POROTHERM R25 Th + 500x250x249 Base

5.1.2 Water Management

Not applicable, indeed brick POROTHERM R25 Th + does not interact with the water supply systems and water recovery.

5.1.3 Care and Maintenance

Not applicable, indeed brick POROTHERM R25 Th + requires no maintenance

5.2 Economic Concern

Brick POROTHERM R25 Th + is involved in this aspect through its thermal characteristics.

Indeed, the use of this product allows an energy saving life stage implemented thus reducing the overall cost. It is important to remember that the overall cost includes those of the implementation, use, maintenance, maintenance and end of life.

Most of the overall cost of a building is related to its use.

5.3 Global Environmental Policy

5.3.1 Natural Resources

The base material used in the manufacture of clay bricks is clay, a traditional material, natural and present in abundance. This clay is extracted in open pits, closest to the brickworks that used to limit transportation. After extraction of clay, these careers are being redeveloped reconciling respect for biodiversity in the medium with and consistent with the expectations and objectives of the different stakeholders.

5.3.2 Emissions to air and water

Emissions to air

Special provisions are made in the design and operation of brick manufacturing facilities to reduce air pollution at source, particularly by optimizing energy efficiency. This optimization is achieved by including the recovery of the hot air produced by the brick kiln and reuse for example in the dryer, to significantly reduce the consumption of natural gas, reducing emissions of greenhouse gas greenhouse.

To increase the porosity of R25 Th bricks + during their production and thus obtain thermal resistances high wall, an addition treated as biomass in the National Allocation Plan for CO2 allowances, is incorporated into the mixture of land. This addition due to its calorific value is also a heat input, thereby enabling a reduction in natural gas consumption and therefore a limitation of the combustion gases.

As for air emissions generated during baking bricks, they are processed by a thermal oxidation unit operating Autotherm way (virtually no natural gas consumption), guaranteeing emission values which meet the objectives achieved by use of best available techniques.

Emissions to water

The brick manufacturing Th + R25 does not generate waste water related to the actual industrial process. Most of the water used on the site is used to make clay blends and evaporates into the air during the drying and firing bricks. The main site water discharges consist of rainwater from the roads or collected on roofs, collected and discharged into the environment respecting the receiving water quality objectives

5.3.3 Waste

The brick manufacturing process produces little waste and / or by-products, major (dust, raw and dry waste) being recovered and reincorporated in the basic mixtures used in manufacturing.

As for cooked waste with defects, they are mainly used to achieve the foundation of career paths but also for the same uses among farmers.

Other essentially represented by waste packaging waste is sorted to track material recovery chain.

Demolition brick waste is considered inert waste, stable and do not endanger the environment. They are accepted at landfills for inert waste after the publication of a ministerial decree in March 2006, without prior test.

6. Appendix: Characterization data for the calculation of the inventory life cycle (ICV)

This appendix is from the accompanying report of the declaration (see Introduction)

6.1 Definition of the LCA system (Life Cycle Analysis)

Description flows included in the product life cycle.

For each sub-stage of the life cycle of the brick POROTHERM R25 Th +, the flows considered are:

- the consumption of raw materials (clay, sand, water, etc.)
- energy consumption (electricity, natural gas, etc.)
- emissions to air,
- discharges into water,
- waste recovered and disposed of generations.

6.1.1 Stages and flows included

Production

The modelling of the manufacturing process takes into account, extraction, production and transportation of raw materials (particularly clay) the manufacture of the product on site and the associated emissions, the production of energy consumed by production facilities.

Transport

Transport modelling takes into account the production and consumption of the fuel used.

Implementation

This step takes into account the end of life-life packaging of the products studied, the mortar mixing energy and the end of life of brick breakages.

Use Life

This stage is considered no impact on the calculation of the ICV. Indeed, life stage implementation requires no maintenance or replacement of the products studied.

End of Life

Modelling the end of life stage takes into account the transport of waste from their lives out to their place of end of life as well as landfill.

6.1.2 Flow Omitted

NF P01-010 standard allows omit the boundaries of the following flow system:

- Lighting, heating and cleaning workshops,

- The administrative department,

- Transport employees,

- Manufacture of the production and transport systems tool (machines, trucks, etc. ....).

6.1.3 Rule of Boundary

The NF P01-010 set the cutoff at 98% according to section 4.5.1 of the standard.

Under this declaration, the percentage of the reassembled stream is greater than 99%

flows not included in the tables of results are:

NF P01-010 requires that substances labelled "very toxic" (T +), "toxic" (T) "harmful" (Xn) or "dangerous for the environment" (N) according to the decree of April 20 1994 and deliberately introduced in the product are taken into account for the calculation of the ICV.

No substance used is part of these categories.

6.2 Data Sources

6.2.1 Characterization of key data

<u>Manufacturing</u>

Year: 2011

Geographical representation: France, the production site of Achenheim, clay pits and Lixhausen Achenheim.

Technological representativeness: data used correspond to standard technologies used for making bricks

Source: Company Wienerberger

<u>Transport</u>

Year: 2011

Geographical representation: France

Technological representativeness: the data are representative of the transport sector in

France, in accordance with specification AFNOR FD P 01-015

Source: Society for Wienerberger distance, modeling was performed according to standard NF P 01-010

<u>Implementation</u>

Year: 2011

Geographical Area: France

Source: Company Wienerberger

<u>End of life</u>

Year: 2011

Geographical Area: France

Source: Wienerberger Company for the amount of waste, Issue AFNOR FD P 01-015 for the associated transport

6.2.2 Energy Data

To learn whether the data used are different from those contained in the booklet

Document AFNOR FD P 01-015.

PCI Data fuels of different fuels are those of AFNOR FD P 01-015 specification.

electrical model The electricity used in this study is that of the La France.

The modelling of electricity generation was compiled from data provided by the International Energy Agency.

6.2.3 Non-ICV data

Non-ICV data used in the study were provided by the company Wienerberger

6.3 Traceability

All of the information in these records is traceable by means of the accompanying report of the FDES.

The FDES was generated by the tool Solinnen made available to Wienerberger: https://outil.solinnen.pro/wienerberger.