Porotherm

Solution for brickwork

Environmental Product Declaration

according to EN 15804 and ISO 14025

Porotherm KP 11.5 and KP 14.5 lintels
Porotherm KP 7 lintels
Porotherm KP VARIO lintels
Ceramic-concrete ceiling beams POT

Approval number: 3013-EPD-19-0347
Approval date: 03/2020
Valid until: 03/2025
Revision: 0

Wienerberger

1. General information

Manufacturing company	Wienerberger s.r.o. Registration No.: 00015253 VAT No.: CZ00015253
Production site	3216 - Řepov, Řepov 43, 293 01, Mladá Boleslav, Czech Republic
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Contacts	Phone: +420 383 826 111 E-mail: info@wienerberger.cz Web: https://wienerberger.cz/

EPD Program	National Environmental Labelling Program. For more information see www.cenia.cz CENIA, Czech Environmental Information Agency, Vršovická 1442/65, Prague 10, 100 10 Czech Republic
Approval number	3013-EPD-19-0347
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PCR identification	EN 15804:2012+A1:2013 Sustainability of construction works – Environmental product declarations (Core rules for the product category of construction products)
LCA prepared by	Lubos Nobilis, ECO trend s.r.o., Na Dolinach 128, 140 00 Prague 4, Czech Republic, nobilis@ecotrend.cz

CEN standard EN 15804+A1 serves as the core PCR		
Independent verification of the declaration and data, according to EN ISO 14025		
	Internal	**External**
	☐	X
Third party verifier: Mgr. Barbora Vlasatá Building Research Institute – Certification Company Ltd. Head of Certification Body for EPD Pražská 16, 102 21 Prague 10 – Hostivař, Czech Republic www.vups.cz; info@vups.cz		

About the company

Wienerberger s.r.o. is a part of the Wienerberger AG group, which is the world's largest manufacturer of clay blocks and Europe's largest manufacturer of clay tiles. The company's headquarters is in České Budějovice 1, Plachého 388/28, PSČ 370 01, Czech Republic. The company is registered in the Business Register kept by the Regional Court in České Budějovice, Section C, rider 27563 dated 29th December 1990.

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In its seven manufacturing plants / brickworks, Wienerberger s.r.o. makes a complex portfolio of Porotherm products, which consists of porous clay wall materials, ceiling clay blocks or other brick products required to manufacture ceramic-concrete prefabricated elements (brick shapes – U-shaped semi-products), i.e. lintels and ceiling beams.

The headquarters of the company is located in the historical centre of České Budějovice. The Porotherm brick product manufacturing plants are situated at Řepov (near Mladá Boleslav), Novosedly na Moravě, Týn nad Vltavou, Holice, Kostelec nad Orlicí, Šlapanice and Jezernice (at Lipník nad Bečvou). The Jezernice manufacturing plant, which is the only Wienerberger building in the Czech Republic built as a greenfield project, was commissioned in 2005 as one of the most advanced clay blocks manufacturing plants in Europe. Since 1995, the other manufacturing plants have been undergoing renovations and modernizations one by one in order to reduce the power demands of the manufacturing and the environmental impact. All the manufacturing plants are equipped with a stilling station used to process the fumes at the outlet of the manufacturing process and using the waste heat from the oven aggregate to dry pressings prior to the brick burning itself.

Brickworking has more than a hundred years of tradition in the Řepov facility. The brick plant manufactures transverse clay blocks, slab edge blocks, ceiling clay blocks and semi-products for the ceramic-concrete lintel and ceiling beam manufacturing plant N° 3216, which was built in 1999 in close proximity to the brick plant N° 3217.

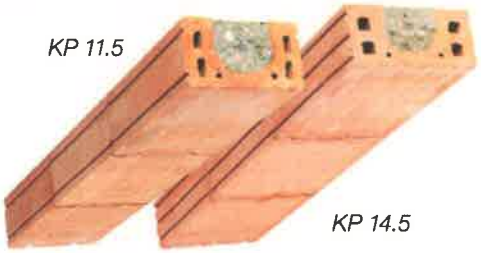
Photo 1 – Manufacturing plant 3216-Řepov

2. Product

2.1 Product description

Porotherm KP 11.5 and KP 14.5

The Porotherm KP 11.5 and 14.5 flat masonry lintel pieces are used as supporting elements above openings in wall structures. As very slim prefabricated elements, they are not suitable as support elements themselves. They only become support elements in combination with a clay block or concrete backing above them – the pressure zone. Such lintel is called a combined lintel.



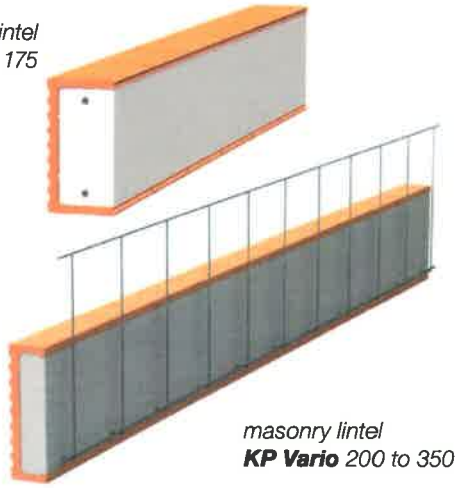
Porotherm KP 7

The Porotherm KP 7 masonry lintels are used as fully supporting elements above window and door openings in brick wall structures.

Porotherm KP Vario

Ceramic-concrete masonry lintel is used in combination with thermal insulation Vario boxes, Porotherm KP 7 lintels and potentially with wall-ring beams or as supporting elements above window and door opening in outer walls and walled structures for additional assembly of screening equipment – external shutters or louvre blinders. Since 2017, the KP Vario lintels are also supplied with the Porotherm Vario UNI universal box used to mount screening equipment.

masonry lintel ***KP Vario*** *100 to 175*



masonry lintel ***KP Vario*** *200 to 350*

Ceramic-concrete ceiling beams POT

The POT ceramic-concrete ceiling beams are reinforced with welded spatial reinforcements (lattice girders) and can be used in the common environment of enclosed buildings. Ceilings composed of beams and ceiling clay blocks must be covered with at least a 10 mm layer of plaster from the bottom and the floor must be made prior to actually starting the building operation.

The basic input of the production are U-shaped clay masonry units produced in the producer's brick factory (3217-Řepov). These form a concrete-filled mold to determine the shape and dimensions of the product. The lintels and beams are reinforced with steel reinforcement inserted into the concrete. The amount and method of reinforcement placement depends on the type, respectively. shape and dimensions of products. The amount of reinforcement increases with the length of the final products. The correct position of the reinforcement is ensured by the so-called reinforcement. plastic spacers made of recycled PVC.

The required placement of the concrete is ensured by product vibration. The concrete then matures to cure the product. Subsequently, it is taken to the warehouse, sorted and eventually reworked. The products are manufactured as strips of 15 m length and cut from them to the required lengths.

Technical lifetime of lintels and ceiling beams is 100 years.

2.2 Application

All types of Porotherm lintels have intended use in load bearing and also in non-load bearing masonry above the window and door openings. Required load bearing capacity or required thickness of the wall can be achieved by combination of all types of these lintels.

The ceiling beams POT are used for horizontal constructions – roofs and mainly ceilings. The construction with 6 cm thickness of concrete layer above ceiling inlays is possible to use for flat roofs, the construction without concrete layer above inlays is possible to use also for pitch roofs up to 45 degrees. In these cases the beams are used at horizontal position, not in the slope.

2.3 Technical Data

Lintel name	Lintel thickness [cm]	Min. / max. clear span [cm]
Porotherm KP 11.5 and 14.5	11.5 and 14.5	75 / 250
Porotherm KP 7	7	75 / 300
Porotherm KP Vario	min. 38, max. 50 (incl. Vario UNI box)	75 / 300

Ceiling beam name	Distance between beam axes [cm]	Ceiling thickness [cm]	Min. / max. clear span [cm]
POT 175-825/902	50	19 / 25 / 29	150 / 800
	62,5		

2.4 Base materials / Ancillary materials

The ratio of the individual components of the products varies according to their total length. The longer the product, the greater the amount of steel reinforcement per unit length it contains (due to larger diameter of reinforcement).

Product does not contain Substance of Very High Concern.

Products content declaration

Materials / components	Substances	KP 11.5	KP 14.5	KP 7	KP Vario	POT
Clay masonry units	-	55 – 54 %	62 – 60 %	31 – 30 %	30 – 22 %	28 – 24 %
Concrete*	-	42 – 40 %	36 – 35 %	68 – 67 %	68 – 73 %	64 – 55 %
Reinforcement steel	-	3 – 6 %	2 – 5 %	2 – 3 %	2 – 5 %	8 – 21 %
PVC spacer	-	0 %	0 %	0 %	0 %	0 %

** Concrete is prepared in a mixing center made of sand, aggregate, cement, plasticizer and mixing water.*

The values were rounded to whole numbers.

2.5 Manufacture

Manufacturing process diagram

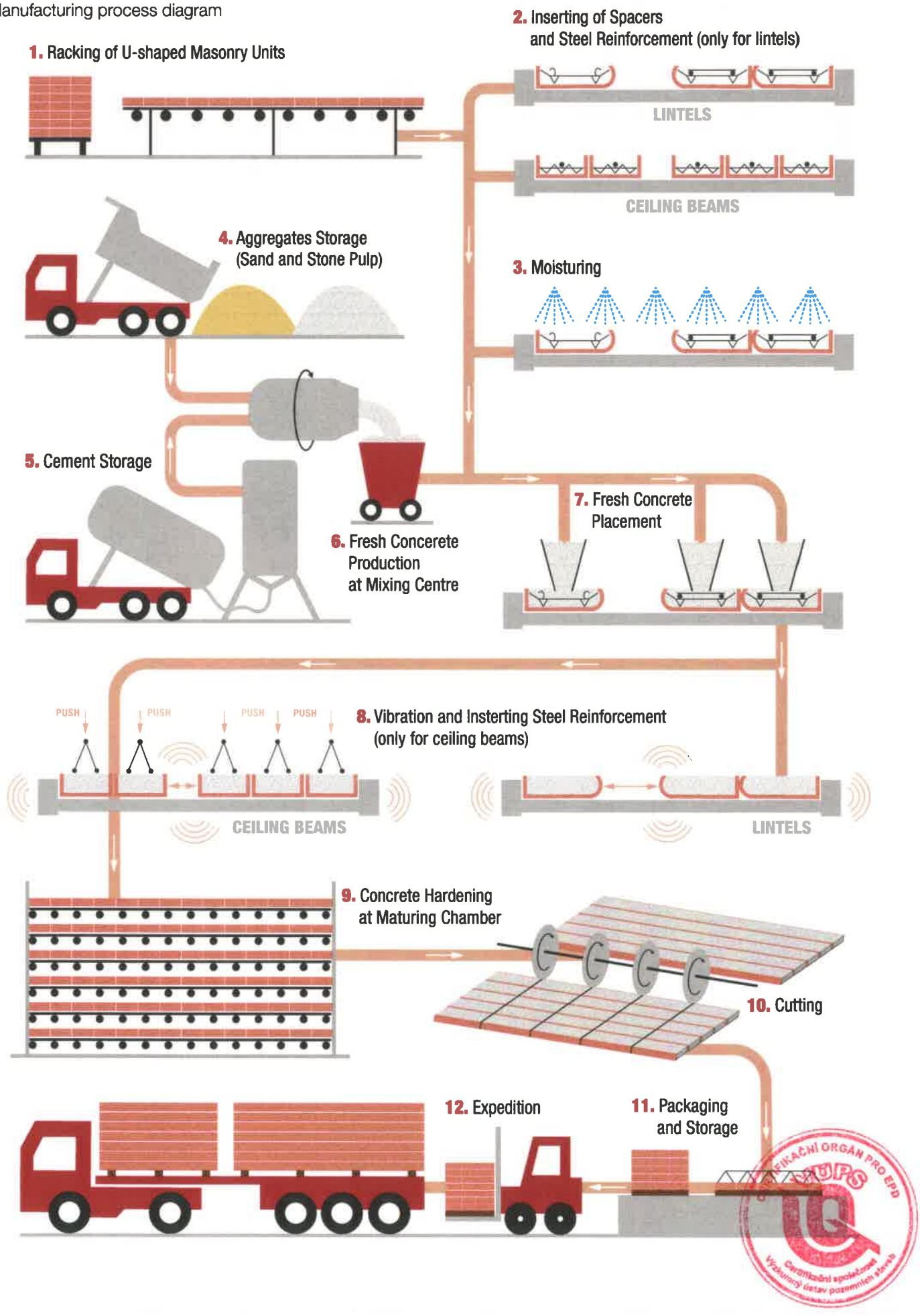


Photo 2 – Moistured U-shaped masonry units before concrete placement

Photo 3 - U-shaped masonry units after concrete placement

Photo 4 – Inserting steel reinforcement

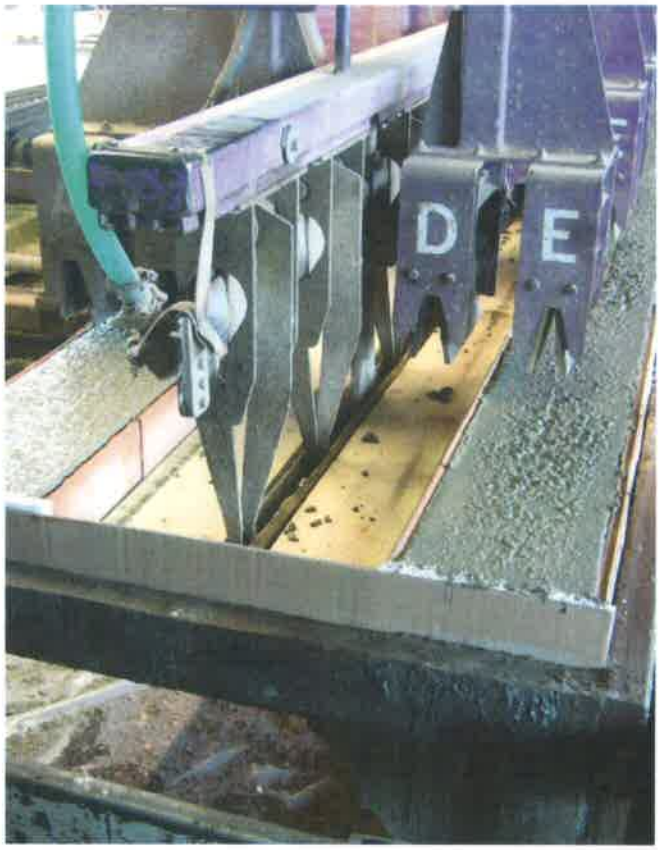


Photo 5 – Strutting during vibration

2.6 Environment and health during manufacturing

In face of the manufacturing conditions, no particular statutory or regulatory health protection measures are required.

Air form manufacturing is cleaned in accordance with statutory specifications. Emissions are significantly below the requisite limit values.

Production is free of waste water.

Waste products from production are internally recycled.

2.7 Product processing/Installation

In face of the mounting conditions, no particular statutory or regulatory health protection measures are required.

All horizontal elements - lintels and ceiling beams - are placed in a mortar bed of cement mortar M 10. These elements have the prescribed minimum bearing length in the masonry. The minimum bearing length in masonry of ceiling beams and Porotherm KP 11.5 and 14.5 lintels is the same for all lengths, namely 125 mm. For the rest of lintel types, this length ranges from 125 to 250 mm depending on the size of the clear span. They are described at lintels technical datasheets.

Ceiling constructions are made of POT ceiling beams, MIAKO ceiling clay blocks and monolithic with concrete of minimum class C 20/25.

2.8 Packaging

The cardboard, wooden prisms and steel tapes are used on packaging.

2.9 Condition of use

The arrows with inscriptions TOP indicating the position of lintels in the masonry are embossed from the side of the brick U-shaped semi-products - after incorporating the lintel into the masonry, the arrows must point up. More details on the correct use of the products can be found in its Technical sheets.

All fillers are burned or cured during manufacturing, and the brick is inert during the use phase (no emissions occur).

Photo 6 – Built-in KP Vario UNI lintels

2.10 Environment and health during use

No damage to health and environment can be anticipated if Wienerberger products are used as designated.

2.11 Reference service life

Technical life of Wienerberger products time is 100 years, when used correctly.

2.12 Extraordinary effects

Fire
Building material class according to EN 13501-1: A1

Water
No impact.

Mechanical destruction
No environmental or health consequences are to be anticipated in the event of mechanical destruction.

2.13 Re-use phase

Unbroken demolition lintels or ceiling beams can be re-used in new masonry.

As bricks, reinforcement and concrete emit no harmful substances to air, soil or water, they can be used as aggregates in building material. Steel reinforcement can be recycled.

2.14 Disposal

Wienerberger bricks and concrete comply with the European waste code 170101. If they cannot be re-used as stated in section 2.15, products can be disposed in landfills for inert material. They do not represent hazardous waste and there are no emissions to the environment to expect.

2.15 Further information

Further information is available at https://wienerberger.cz/.

Photo 7 – Ceiling beams POT used for building reconstruction

3. LCA calculation information

3.1 Declared Unit

The declared unit is **1 m of each type of lintels (KP 11.5 / KP 14.5 / KP 7 / KP Vario) or ceiling beam (POT)** manufactured by production facility in Řepov in Czech Republic. Differences among products of the same types, with difference length, are in content of reinforcement. The impacts for the same types of lintels of different type lengths are calculated for this reason.

3.2 System boundary

Type of EPD: cradle to gate

The systems comprise the following stages in accordance with EN 15804:

Product stage, A1 - A3

This product stage is subdivided into 3 modules A1 (raw material supply), A2 (transport) and A3 (manufacturing). The aggregation of the modules A1, A2 and A3 is a possibility considered by the EN 15 804 standard. This rule is applied in this EPD.

Raw material supply – A1

This part takes into account the extraction and processing of all raw materials and energy which occurs upstream to the studied manufacturing process.

Specifically, the raw material supply covers manufacturing of clay blocks and steel reinforcement.

Transport to manufacturer and internal transport – A2

The raw materials are transported to the manufacturing site. In this case, the modelling include road transportations (average values based on specific data) of each raw material.

Manufacture – A3

This module coverings manufacturing of products including concrete manufacturing, drying, storing, mixing, extruding and packing.

The manufacturing process also collect data on the combustion of natural gas, diesel and gasoline, related to the production process.

Use of electricity, fuels and auxiliary materials in the production is taken into account too. The environmental profile of these energy carriers is modeled for local conditions.

Packaging-related flows in the production process and all up-stream packaging are included in the manufacturing module, i.e. cardboard, wooden blocks and steel tapes (cradle-to-gate).

Based on EN 15804 the downstream module was not included into system boundaries. Transport of final product to a costumer is also excluded.

The entire life cycle A1-C4 is not declared. Only modules A1-A3 are evaluated. Therefore there is no documentation for calculating the reference life added.

Description of the system boundary (X = included in the LCA, MND = Module Not Declared)

Product stage			Construction stage		Use stage							End of life stage				Benefits and loads beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport	Construction-installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-recovery
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

3.3 Cut-off criteria

All operating data was taken into consideration in the analysis. Accordingly, material flows with a share of less than 1% were also balanced. It can be assumed that the total of all neglected processes does not therefore exceed 5% in the impact categories.

Accordingly, the cut-off criteria in line with EN 15804 are complied with.

3.5 Background data

All of the relevant background data sets were taken from the Ecoinvent 3 database. The data used was recorded under consistent conditions in terms of time and methods. The SimaPro 8 was used for modelling the lifecycle.

3.6 Data quality

Data on the product under review was collected directly at the production facilities and refers to the production processes in 2016.

3.7 Period under review

The data refers to the manufacturing processes between 01. 01. 2016 and 31. 12. 2016.

3.8 Allocation

The data used were collected in the separately production facilities. Energy and fuels consumption were calculated on the basis of volumes used per cubic metre of product.

3.9 Comparability

According to EN 15804, EPD of construction products may not be comparable if they do not comply with this standard.

Photo 8 – Ceiling beams POT used for building reconstruction

4. LCA results

4.1 Environmental impacts

Environmental impacts - Porotherm KP 11.5 a Porotherm KP 14.5

Impact category	Unit	KP 11.5 1-1.5 m	KP 11.5 1.75-2.25 m	KP 11.5 2.5-2.75 m	KP 14.5 1-1.5 m	KP 14.5 1.75-2.25 m	KP 14.5 2.5-2.75 m
Abiotic depletion	kg Sb eq	6.60E-06	8.63E-06	1.11E-05	7.14E-06	9.16E-06	1.16E-05
Abiotic depletion (fossil fuels)	MJ	3.19E+01	3.70E+01	4.31E+01	3.68E+01	4.19E+01	4.83E+01
Global warming (GWP100a)	kg CO2 eq	3.15E+00	3.64E+00	4.25E+00	3.51E+00	4.01E+00	4.67E+00
Ozone layer depletion (ODP)	kg CFC-11 eq	2.94E-07	3.23E-07	3.57E-07	3.49E-07	3.77E-07	4.10E-07
Photochemical oxidation	kg C2H4 eq	8.20E-04	1.11E-03	1.47E-03	8.70E-04	1.16E-03	1.53E-03
Acidification	kg SO2 eq	1.02E-02	1.23E-02	1.49E-02	1.12E-02	1.33E-02	1.62E-02
Eutrophication	kg PO4 eq	5.30E-03	6.36E-03	7.67E-03	6.07E-03	7.14E-03	8.45E-03

Environmental impacts - Porotherm KP 7

Impact category	Unit	KP 7 1 m	KP 7 1.25-1.5 m	KP 7 1.75-2 m	KP 7 2.25-2.5 m	KP 7 2.75-3.5 m
Abiotic depletion	kg Sb eq	9.48E-06	1.08E-05	1.25E-05	1.36E-05	1.61E-05
Abiotic depletion (fossil fuels)	MJ	5.27E+01	5.46E+01	5.91E+01	6.29E+01	6.91E+01
Global warming (GWP100a)	kg CO2 eq	6.86E+00	6.98E+00	7.42E+00	7.87E+00	8.48E+00
Ozone layer depletion (ODP)	kg CFC-11 eq	4.63E-07	4.89E-07	5.14E-07	5.21E-07	5.56E-07
Photochemical oxidation	kg C2H4 eq	1.27E-03	1.40E-03	1.66E-03	1.87E-03	2.23E-03
Acidification	kg SO2 eq	1.87E-02	1.89E-02	2.07E-02	2.31E-02	2.56E-02
Eutrophication	kg PO4 eq	8.12E-03	8.72E-03	9.67E-03	1.03E-02	1.16E-02

Environmental impacts - Porotherm KP VARIO

Impact category	Unit	KP Vario 1 m	KP Vario 1.25 m	KP Vario 1.5 m	KP Vario 1.75 m	KP Vario 2 m	KP Vario 2.25-2.5 m	KP Vario 2.75-3.5 m
Abiotic depletion	kg Sb eq	1.51E-05	1.89E-05	2.60E-05	3.25E-05	2.73E-05	3.14E-05	3.63E-05
Abiotic depletion (fossil fuels)	MJ	8.91E+01	9.77E+01	1.15E+02	1.31E+02	1.02E+02	1.12E+02	1.24E+02
Global warming (GWP100a)	kg CO2 eq	1.30E+01	1.38E+01	1.56E+01	1.72E+01	1.27E+01	1.37E+01	1.49E+01
Ozone layer depletion (ODP)	kg CFC-11 eq	7.93E-07	8.43E-07	9.43E-07	1.03E-06	7.92E-07	8.49E-07	9.18E-07
Photochemical oxidation	kg C2H4 eq	2.09E-03	2.61E-03	3.64E-03	4.58E-03	3.91E-03	4.50E-03	5.21E-03
Acidification	kg SO2 eq	3.06E-02	3.41E-02	4.15E-02	4.83E-02	3.71E-02	4.13E-02	4.64E-02
Eutrophication	kg PO4 eq	1.35E-02	1.53E-02	1.91E-02	2.25E-02	1.83E-02	2.05E-02	2.30E-02

Environmental impacts – ceiling beam POT (175 – 500 cm)

Impact category	Unit	POT 175-275	POT 300-375	POT 400-425	POT 450	POT 475	POT 500
Abiotic depletion	kg Sb eq	1.97E-05	2.37E-05	2.87E-05	3.07E-05	3.23E-05	3.43E-05
Abiotic depletion (fossil fuels)	MJ	6.49E+01	7.49E+01	8.72E+01	9.22E+01	9.69E+01	1.02E+02
Global warming (GWP100a)	kg CO2 eq	8.55E+00	9.54E+00	1.07E+01	1.12E+01	1.18E+01	1.22E+01
Ozone layer depletion (ODP)	kg CFC-11 eq	4.71E-07	5.28E-07	5.97E-07	6.26E-07	6.43E-07	6.71E-07
Photochemical oxidation	kg C2H4 eq	2.80E-03	3.39E-03	4.10E-03	4.39E-03	4.66E-03	4.95E-03
Acidification	kg SO2 eq	2.55E-02	2.97E-02	3.48E-02	3.70E-02	3.93E-02	4.15E-02
Eutrophication	kg PO4 eq	1.24E-02	1.45E-02	1.71E-02	1.82E-02	1.91E-02	2.01E-02

Environmental impacts – ceiling beam POT (525 – 825 cm)

Impact category	Unit	POT 525-575	POT 600-625	POT 650	POT 675	POT 700-750	POT 775-825
Abiotic depletion	kg Sb eq	3.68E-05	3.97E-05	4.36E-05	4.70E-05	5.08E-05	5.51E-05
Abiotic depletion (fossil fuels)	MJ	1.07E+02	1.15E+02	1.25E+02	1.33E+02	1.42E+02	1.53E+02
Global warming (GWP100a)	kg CO2 eq	1.27E+01	1.34E+01	1.45E+01	1.54E+01	1.62E+01	1.72E+01
Ozone layer depletion (ODP)	kg CFC-11 eq	7.11E-07	7.52E-07	8.02E-07	8.50E-07	9.09E-07	9.69E-07
Photochemical oxidation	kg C2H4 eq	5.27E-03	5.69E-03	6.30E-03	6.79E-03	7.31E-03	7.92E-03
Acidification	kg SO2 eq	4.33E-02	4.63E-02	5.12E-02	5.47E-02	5.80E-02	6.24E-02
Eutrophication	kg PO4 eq	2.14E-02	2.29E-02	2.50E-02	2.68E-02	2.88E-02	3.10E-02

4.2 Resource use

Resource use - Porotherm KP 11.5 a 14.5

Parameter	Units	KP 11.5 1-1.5 m	KP 11.5 1.75-2.25 m	KP 11.5 2.5-2.75 m	KP 14.5 1-1.5 m	KP 14.5 1.75-2.25 m	KP 14.5 2.5-2.75 m
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ, net calorific value	1.07E-01	1.07E-01	1.07E-01	1.12E-01	1.12E-01	1.12E-01
Use of renewable primary energy resources used as raw materials	MJ, net calorific value	4.16E+00	4.16E+00	4.16E+00	4.16E+00	4.16E+00	4.16E+00
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ, net calorific value	4.27E+00	4.27E+00	4.27E+00	4.28E+00	4.28E+00	4.28E+00
Use of non- renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ, net calorific value	3.18E+01	3.68E+01	4.30E+01	3.67E+01	4.17E+01	4.82E+01
Use of non- renewable primary energy resources used as raw materials	MJ, net calorific value	1.44E-01	1.44E-01	1.44E-01	1.44E-01	1.44E-01	1.44E-01
Total use of non- renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ, net calorific value	3.19E+01	3.70E+01	4.31E+01	3.68E+01	4.19E+01	4.83E+01
Use of secondary material	kg	3.25E-03	3.25E-03	3.25E-03	3.25E-03	3.25E-03	3.25E-03
Use of renewable secondary fuels	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m^3	7.00E-03	7.00E-03	7.00E-03	7.00E-03	7.00E-03	7.00E-03

Resource use - Porotherm KP 7

Parameter	Units	KP 7 1 m	KP 7 1.25-1.5 m	KP 7 1.75-2 m	KP 7 2.25-2.5 m	KP 7 2.75-3.5 m
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ, net calorific value	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01
Use of renewable primary energy resources used as raw materials	MJ, net calorific value	4.16E+00	4.16E+00	4.16E+00	4.16E+00	4.16E+00
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ, net calorific value	4.32E+00	4.32E+00	4.32E+00	4.32E+00	4.32E+00
Use of non- renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ, net calorific value	5.23E+01	5.43E+01	5.87E+01	6.26E+01	6.87E+01
Use of non- renewable primary energy resources used as raw materials	MJ, net calorific value	3.87E-01	3.87E-01	3.87E-01	3.87E-01	3.87E-01
Total use of non- renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ, net calorific value	5.27E+01	5.46E+01	5.91E+01	6.29E+01	6.91E+01
Use of secondary material	kg	8.77E-03	8.77E+00	8.77E-03	8.77E-03	8.77E-03
Use of renewable secondary fuels	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m^3	2.40E-03	2.40E-03	2.40E-03	2.40E-03	2.40E-03

Resource use – Porotherm KP Vario

Parameter	Units	KP Vario 1 m	KP Vario 1.25 m	KP Vario 1.5 m	KP Vario 1.75 m	KP Vario 2 m	KP Vario 2.25-2.5 m	KP Vario 2.75-3.5 m
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ, net calorific value	2.32E-01	2.32E-01	2.32E-01	2.32E-01	1.58E-01	1.58E-01	1.58E-01
Use of renewable primary energy resources used as raw materials	MJ, net calorific value	4.16E+00	4.16E+00	4.16E+00	4.16E+00	4.16E+00	4.16E+00	4.16E+00
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ, net calorific value	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.32E+00	4.32E+00	4.32E+00
Use of non- renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ, net calorific value	8.64E+01	9.55E+01	1.13E+02	1.29E+02	1.01E+02	1.12E+02	1.24E+02
Use of non- renewable primary energy resources used as raw materials	MJ, net calorific value	2.73E+00	2.18E+00	2.23E+00	1.91E+00	3.79E-01	3.23E-01	2.43E-01
Total use of non- renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ, net calorific value	8.91E+01	9.77E+01	1.15E+02	1.31E+02	1.02E+02	1.12E+02	1.24E+02
Use of secondary material	kg	6.17E-02	4.93E-02	5.20E-02	4.30E-02	8.58E-03	7.62E-03	5.00E-03
Use of renewable secondary fuels	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m^3	4.90E-03	4.90E-03	4.90E-03	4.90E-03	4.90E-03	2.50E-03	2.50E-03

Resource use – ceiling beam POT (175 – 500 cm)

Parameter	Units	POT 175-275	POT 300-375	POT 400-425	POT 450	POT 475	POT 500
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ, net calorific value	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01
Use of renewable primary energy resources used as raw materials	MJ, net calorific value	4.16E+00	4.16E+00	4.16E+00	4.16E+00	4.16E+00	4.16E+00
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ, net calorific value	4.29E+00	4.29E+00	4.29E+00	4.29E+00	4.29E+00	4.29E+00
Use of non- renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ, net calorific value	6.47E+01	7.47E+01	8.70E+01	9.20E+01	9.67E+01	1.02E+02
Use of non- renewable primary energy resources used as raw materials	MJ, net calorific value	1.80E-01	1.80E-01	1.80E-01	1.80E-01	1.80E-01	1.80E-01
Total use of non- renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ, net calorific value	6.49E+01	7.49E+01	8.72E+01	9.22E+01	9.69E+01	1.02E+02
Use of secondary material	kg	4.08E-03	4.08E-03	4.08E-03	4.08E-03	4.08E-03	4.08E-03
Use of renewable secondary fuels	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m^3	1.50E-03	1.50E-03	1.50E-03	1.50E-03	1.50E-03	1.50E-03

Resource use – ceiling beam POT (525 – 825 cm)

Parameter	Units	POT 525-575	POT 600-625	POT 650	POT 675	POT 700-750	POT 775-825
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ, net calorific value	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01
Use of renewable primary energy resources used as raw materials	MJ, net calorific value	4.16E+00	4.16E+00	4.16E+00	4.16E+00	4.16E+00	4.16E+00
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ, net calorific value	4.29E+00	4.29E+00	4.29E+00	4.29E+00	4.29E+00	4.29E+00
Use of non- renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ, net calorific value	1.07E+02	1.14E+02	1.25E+02	1.33E+02	1.42E+02	1.53E+02
Use of non- renewable primary energy resources used as raw materials	MJ, net calorific value	1.80E-01	1.80E-01	1.80E-01	1.80E-01	1.80E-01	1.80E-01
Total use of non- renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ, net calorific value	1.07E+02	1.15E+02	1.25E+02	1.33E+02	1.42E+02	1.53E+02
Use of secondary material	kg	4.08E-03	4.08E-03	4.08E-03	4.08E-03	4.08E-03	4.08E-03
Use of renewable secondary fuels	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m^3	1.50E-03	1.50E-03	1.50E-03	1.50E-03	1.50E-03	1.50E-03

4.3 Other environmental information describing waste categories and output flows

Waste categories - Porotherm KP 11.5 a 14.5

Parameter	Units	KP 11.5 1-1.5 m	KP 11.5 1.75-2.25 m	KP 11.5 2.5-2.75 m	KP 14.5 1-1.5 m	KP 14.5 1.75-2.25 m	KP 14.5 2.5-2.75 m
Hazardous waste	kg	1.75E-04	1.75E-04	1.75E-04	1.75E-04	1.75E-04	1.75E-04
Non-hazardous waste disposed	kg	3.53E-01	3.53E-01	3.53E-01	3.53E-01	3.53E-01	3.53E-01
Radioactive waste disposed/stored	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Output flows - Porotherm KP 11.5 a 14.5

Waste type	Units	KP 11.5 1-1.5 m	KP 11.5 1.75-2.25 m	KP 11.5 2.5-2.75 m	KP 14.5 1-1.5 m	KP 14.5 1.75-2.25 m	KP 14.5 2.5-2.75 m
Components for re-use	kg	0,00E-00	0,00E-00	0,00E-00	0,00E-00	0,00E-00	0,00E-00
Materials for recycling	kg	17,00	17,00	17,00	20,00	20,00	20,00
Materials for energy recovery	kg	0,00E-00	0,00E-00	0,00E-00	0,00E-00	0,00E-00	0,00E-00
Exported energy	MJ per energy carrier	0,00E-00	0,00E-00	0,00E-00	0,00E-00	0,00E-00	0,00E-00

Waste categories - Porotherm KP 7

Parameter	Units	KP 7 1.25-1.5 m	KP 7 1.75-2 m	KP 7 1 m	KP 7 2.25-2.5 m	KP 7 2.75-3.5 m
Hazardous waste	kg	1.75E-04	1.75E-04	1.75E-04	1.75E-04	1.75E-04
Non-hazardous waste disposed	kg	3.53E-01	3.53E-01	3.53E-01	3.53E-01	3.53E-01
Radioactive waste disposed/stored	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Output flows - Porotherm KP 7

Waste type	Units	KP 11.5 1-1.5 m	KP 11.5 1.75-2.25 m	KP 11.5 2.5-2.75 m	KP 14.5 1-1.5 m	KP 14.5 1.75-2.25 m
Components for re-use	kg	0,00E-00	0,00E-00	0,00E-00	0,00E-00	0,00E-00
Materials for recycling	kg	35,00	35,00	35,00	35,00	35,00
Materials for energy recovery	kg	0,00E-00	0,00E-00	0,00E-00	0,00E-00	0,00E-00
Exported energy	MJ per energy carrier	0,00E-00	0,00E-00	0,00E-00	0,00E-00	0,00E-00

Waste categories - Porotherm KP Vario

Parameter	Units	KP Vario 1 m	KP Vario 1.25 m	KP Vario 1.5 m	KP Vario 1.75 m	KP Vario 2 m	KP Vario 2.25-2.5 m	KP Vario 2.75-3.5 m
Hazardous waste	kg	1.75E-04	1.75E-04	1.75E-04	1.75E-04	1.75E-04	1.75E-04	1.75E-04
Non-hazardous waste disposed	kg	3.53E-01	3.53E-01	3.53E-01	3.53E-01	3.53E-01	3.53E-01	3.53E-01
Radioactive waste disposed/stored	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Output flows - Porotherm KP Vario

Parameter	Units	KP Vario 1 m	KP Vario 1.25 m	KP Vario 1.5 m	KP Vario 1.75 m	KP Vario 2 m	KP Vario 2.25-2.5 m	KP Vario 2.75-3.5 m
Components for re-use	kg	0,00E-00	0,00E-00	0,00E-00	0,00E-00	0,00E-00	0,00E-00	0,00E-00
Materials for recycling	kg	61,00	61,00	61,00	61,00	61,00	61,00	61,00
Materials for energy recovery	kg	0,00E-00	0,00E-00	0,00E-00	0,00E-00	0,00E-00	0,00E-00	0,00E-00
Exported energy	MJ per energy carrier	0,00E-00	0,00E-00	0,00E-00	0,00E-00	0,00E-00	0,00E-00	0,00E-00

Waste categories – ceiling beams POT (175 – 500 cm)

Parameter	Units	POT 175-275	POT 300-375	POT 400-425	POT 450	POT 475	POT 500
Hazardous waste	kg	1.75E-04	1.75E-04	1.75E-04	1.75E-04	1.75E-04	1.75E-04
Non-hazardous waste disposed	kg	3.53E-01	3.53E-01	3.53E-01	3.53E-01	3.53E-01	3.53E-01
Radioactive waste disposed/stored	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Output flows - ceiling beams POT (175 – 500 cm)

Waste type	Units	POT 175-275	POT 300-375	POT 400-425	POT 450	POT 475	POT 500
Components for re-use	kg	0,00E-00	0,00E-00	0,00E-00	0,00E-00	0,00E-00	0,00E-00
Materials for recycling	kg	21,70	21,70	21,70	21,70	21,70	21,70
Materials for energy recovery	kg	0,00E-00	0,00E-00	0,00E-00	0,00E-00	0,00E-00	0,00E-00
Exported energy	MJ per energy carrier	0,00E-00	0,00E-00	0,00E-00	0,00E-00	0,00E-00	0,00E-00

Waste categories - ceiling beams POT (525 – 825 cm)

Parameter	Units	POT 525-575	POT 600-625	POT 650	POT 675	POT 700-750	POT 775-825
Hazardous waste	kg	1.75E-04	1.75E-04	1.75E-04	1.75E-04	1.75E-04	1.75E-04
Non-hazardous waste disposed	kg	3.53E-01	3.53E-01	3.53E-01	3.53E-01	3.53E-01	3.53E-01
Radioactive waste disposed/stored	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Output flows - ceiling beams POT (525 – 825 cm)

Waste type	Units	POT 525-575	POT 600-625	POT 650	POT 675	POT 700-750	POT 775-825
Components for re-use	kg	0,00E-00	0,00E-00	0,00E-00	0,00E-00	0,00E-00	0,00E-00
Materials for recycling	kg	25,60	25,60	25,60	25,60	25,60	25,60
Materials for energy recovery	kg	0,00E-00	0,00E-00	0,00E-00	0,00E-00	0,00E-00	0,00E-00
Exported energy	MJ per energy carrier	0,00E-00	0,00E-00	0,00E-00	0,00E-00	0,00E-00	0,00E-00

5. References

1. EN 15804:2012+A1:2013 Sustainability of construction works – Environmental product declaration – Core rules of the product category of construction products
2. ISO 14025:2006 Environmental labels and declarations – Type III Environmental Declarations – Principles and procedures
3. ISO 14040:2006 Environmental management – Life Cycle Assessment – Principles and framework
4. ISO 14044:2006 Environmental management – Life Cycle Assessment – Requirements and guidelines

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