

# ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804+A2

Owner of the Declaration

Programme holder

Publisher

Declaration number

Issue date

Valid to

Institut Bauen und Umwelt e.V. (IBU)

Institut Bauen und Umwelt e.V. (IBU)

EPD-USG-20220126-IAA1-EN

07.07.2022

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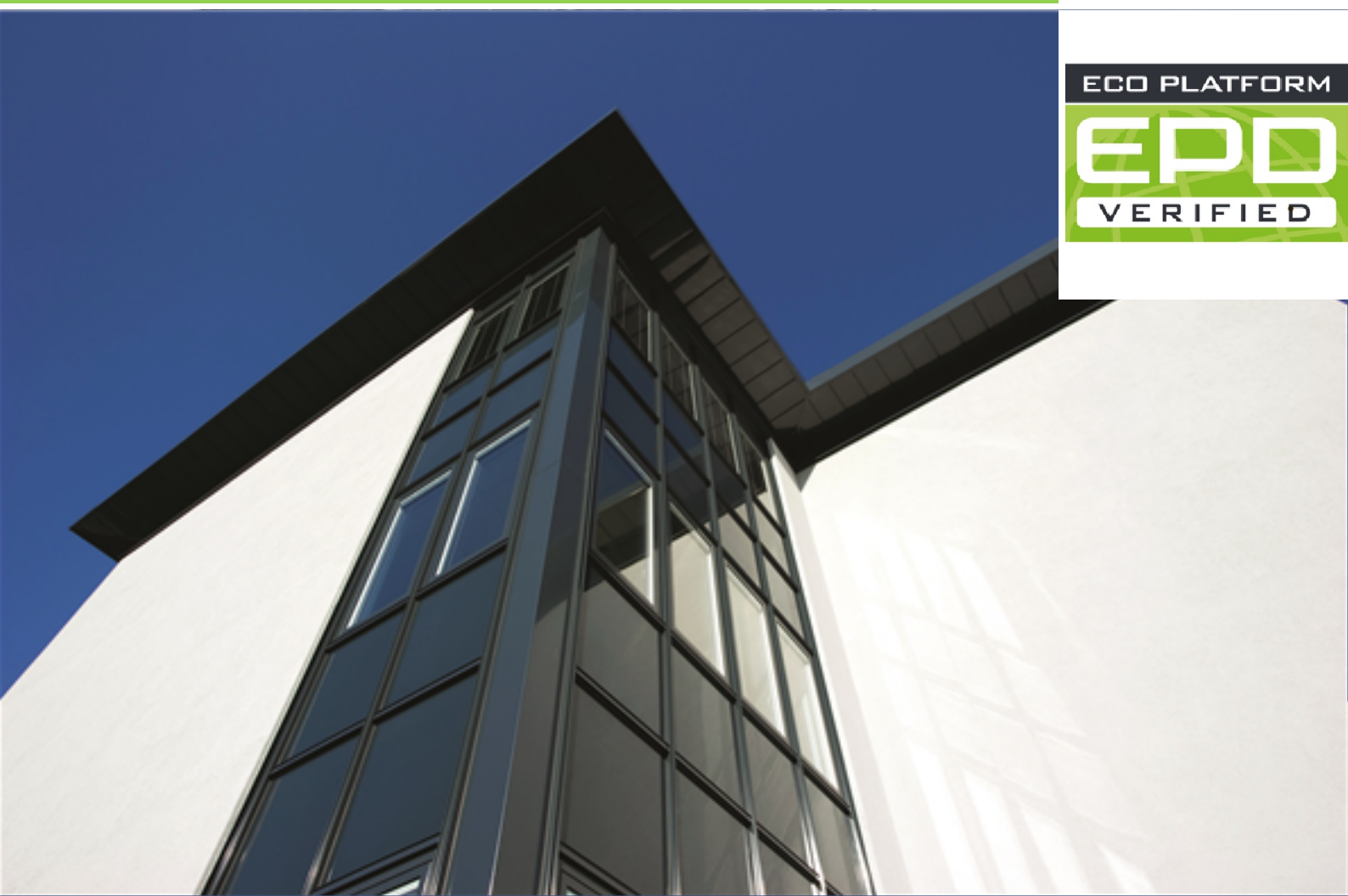
AQUAPANEL® Cement Board Outdoor - Site Volos (GR)  
Knauf AQUAPANEL GmbH & Co. KG

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ECO PLATFORM

**EPD**  
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## 1. General Information

<b>Knauf AQUAPANEL GmbH &amp; Co. KG</b>	<b>AQUAPANEL® Cement Board Outdoor</b>
<b>Programme holder</b> IBU – Institut Bauen und Umwelt e.V. Hegelplatz 1 10117 Berlin Germany	<b>Owner of the declaration</b> Knauf AQUAPANEL GmbH & Co. KG Zur Helle 11 58638 Iserlohn Deutschland
<b>Declaration number</b> EPD-USG-20220126-IAA1-EN	<b>Declared product / declared unit</b> 1 m² AQUAPANEL® Cement Board Outdoor with a thickness of 12.5 mm.
<b>This declaration is based on the product category rules:</b> Fibre cement / Fibre concrete, 01.2019 (PCR checked and approved by the SVR)	<b>Scope:</b> This Environmental Product Declaration refers to AQUAPANEL® Cement Board Outdoor from the production facility in Volos, Greece.
<b>Issue date</b> 07.07.2022	The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences. The EPD was created according to the specifications of EN 15804+A2. In the following, the standard will be simplified as EN 15804.
<b>Valid to</b> 06.07.2027	<b>Verification</b>
 Dipl. Ing. Hans Peters (chairman of Institut Bauen und Umwelt e.V.)   Dr. Alexander Röder (Managing Director Institut Bauen und Umwelt e.V.)	The standard EN 15804 serves as the core PCR Independent verification of the declaration and data according to ISO 14025:2011 <input type="checkbox"/> internally <input checked="" type="checkbox"/> externally   Prof. Dr. Birgit Grahl (Independent verifier)

## 2. Product

### 2.1 Product description/Product definition

Cement-bound, mineral building panel with twodimensional lattice structures consisting of longitudinal and transverse glass fibres for outdoor use.

The AQUAPANEL® Cement Board Outdoor is a CPR product with European Technical Assessment (ETA). The placing on the market of the product in the European Union/European Free Trade Association (EU / EFTA) (with the exception of Switzerland) is also subject to Regulation (EU) No 305/2011 (CPR). The product requires a declaration of performance in consideration of ETA-07/0173, dated 11.10.2017 and the CE marking.

For the use of the product, the respective national regulations apply.

### 2.2 Application

The "AQUAPANEL® Cement Board Outdoor" building board is used as a non-load-bearing wall element in exteriors

### 2.3 Technical Data

### Constructional data

Name	Value	Unit
Thermal conductivity acc to ISO 10456	0.35	W/(mK)
Water vapour diffusion resistance factor acc. to ISO 12572	66	-
Swelling (air-dry to water-saturated) acc. to EN 318	0.23	mm/m
Gross density acc. to /EN 12467/	1150	kg/m³
Tensile strength acc. to EN 319	0.65	N/mm²
Flexural strength acc. to EN 12467	≥7	N/mm²
Coefficient of thermal expansion	7	10 <sup>-6</sup> K <sup>-1</sup>

Product according to the CPR, based on an ETA:

- Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to ETA-07/0173, 11.10.2017.
- Voluntary data: source, *Technical Data Sheet, 08/17* ([www.aquapanel.com](http://www.aquapanel.com)).

(not part of CE-marking)

## 2.4 Delivery status

The panels are sold in widths of 900 mm and in lengths of 1200/1250/2400/2500 mm. The layer thickness is 12.5 mm.

## 2.5 Base materials/Ancillary materials

Name	Value	Unit
Cement	20-30	Mass-%
Limestone	30-50	Mass-%
Perlite	5-20	Mass-%
Recyclate	0-10	Mass-%
Glas fibre scrim	<2	Mass-%
Hydrophobic agent	<1	Mass-%

The product contains substances on the ECHA Candidate List of Substances of Very High Concern (SVHC) (date 04.05.2021) above 0.1% by mass: no. The product contains other carcinogenic, mutagenic, reprotoxic (CMR) substances of category 1A or 1B, which are not on the candidate list, above 0.1% by mass in at least one sub-product: no. Biocidal products have been added to the present construction product or it has been treated with biocidal products (it is therefore a treated product in the sense of the *Biocidal Products Regulation* (EU) No 528/2012): no.

## 2.6 Manufacture

The aggregates and binders are stored in silos outside the production hall. The raw materials for the panel core are dosed over belt scales and loss-in-weight feeders according to formula and transported to the weighing container via a central conveyor. The binder for the production of the cover layer is transported directly via a screw conveyor to the slurry production unit. The glass fabrics required for production are stored in the basement of the production hall. The expansion of the perlite rock takes place at the Volos site. The dry mixture in the weighing container is emptied into the compulsory mixer underneath and water is added according to the formula. The core mixture is mixed homogeneously and earth-moist and then conveyed by belt to the forming station. At the same time, the slurry for the surface layer is premixed homogeneously and conveyed by screw pumps through hoses to the forming station. In the forming station, the 3-layer element is produced by continuous extrusion and cut in the subsequent cutting apparatus to the appropriate length. The tailored boards are hardened in the shelf storage. The production process is *DIN EN ISO 9001* certified.

## 2.7 Environment and health during manufacturing

According to Regulation (EC) No 1907/2006, cement and cement-containing mixtures may not be used or placed on the market if the content of soluble chromium(VI) in the dry mass of the cement after hydration is more than 2 mg/kg (0.0002 %). Only lowchromate cements are used in the production process.

Apart from the legal requirements, no further special measures are necessary.

Further environmental protection measures in the production process:

a) Minimization of waste: Both manufactured slabs that

do not meet the requirements as well as any edge trimmings produced during the final processing of the slabs are returned to the manufacturing process as raw material.

b) Optimization of energy consumption: A high degree of automation in production enables optimal process parameters to be maintained, thus minimizing unnecessary energy consumption. This applies in particular to the expansion of the perlite raw material

## 2.8 Product processing/Installation

Knauf Aquapanel GmbH & Co. KG provides technical data sheets for the cement-bonded building boards. This information is available in printed form as well as at [www.aquapanel.com](http://www.aquapanel.com).

The boards can be mechanically fastened or glued. The processing can be carried out with commercially available tools.

## 2.9 Packaging

The cement-bonded building board with glass grid reinforcement is delivered on a returnable Euro pallet secured with metal strapping

## 2.10 Condition of use

No changes in material composition occur during service life.

## 2.11 Environment and health during use

During the service life, there are no environmental and health effects. The results of the Volatile Organic Compound (VOC) analysis all remained below the respective detection limit (see chapter 7.3). There is no release of chromium (VI)-containing substances. There are no hazards to water, air or soil. In use, the ingredients of the products are firmly bound. Dust emissions are not possible.

## 2.12 Reference service life

From experience, a service life of approximately 50 years can be achieved when used as intended.

Description of the influences on the ageing of the product when applied in accordance with the rules of technology.

## 2.13 Extraordinary effects

### Fire

Non-combustible building material of building material class A1 acc to *EN 13501-1*.

### Fire protection

Name	Value
Building material class	A1

### Water

Chromium elution is to be expected in case of unforeseen effects of water in non-relevant quantities (see chapter 7.2). Further elutions of other heavy metals are not expected.

### Mechanical destruction

No sharp break edges are created upon mechanical destruction.

## 2.14 Re-use phase

Once used, the products are practically un-reusable, but are suitable for recycling as filling material if fully separated.

## 2.15 Disposal

According to AVV AQUAPANEL® Cement Board Rooftop, the waste code 170904 mixed construction

and demolition waste other than those falling under 170901, 170902 and 170903 is recommended.

## 2.16 Further information

For further information visit: [www.aquapanel.com](http://www.aquapanel.com).

# 3. LCA: Calculation rules

## 3.1 Declared Unit

The declared unit of the study is 1 m<sup>2</sup> AQUAPANEL® Cement Board Outdoor with a thickness of 12.5 mm.

### Declared unit

Name	Value	Unit
Declared Unit	1	m <sup>2</sup>
Gross density *	1150	kg/m <sup>3</sup>
Grammage	16	kg/m <sup>2</sup>
Layer thickness	0.0125	m

\* The density according to EN 12467 is the density after complete drying. Therefore, the data in the above table on surface weight at delivery and the bulk density do not correlate,

## 3.2 System boundary

Within the scope of the conducted LCA, the production or provision and transport of the preliminary products/raw materials as well as the production of the final product (A1-A3) are taken into account. Furthermore, the end-of-life phase (C1-C4) is considered using technical scenarios. The data of the cement board production was determined at the production site. The recipe and the raw materials used, the electrical energy used and all direct production waste were taken into account in the balancing. Within phase A2, all specific transport routes of the educts were stored.

## 3.3 Estimates and assumptions

With the exception of the technical scenarios (Chapter 4), no estimates or assumptions were made in the study.

## 3.4 Cut-off criteria

In the LCA, the cut-off criteria for a release agent was applied in the area of production. The material corresponds to <0.08 % of the mass input for the declared unit. The use of the wooden pallets used for storage and transport is also cut off within the

consideration. Due to the frequent reuse, the proportion to be taken into account for a declared unit is very low and does not have a significant share in the result. Furthermore, the section of metal strapping occurs during pallet loading. In relation to a declared unit, the share is <0.1% of the total mass input. An application of the cut-off criteria beyond the abovementioned processes was not necessary.

## 3.5 Background data

The background data used was completely obtained from the *GaBi-ts* software or can be traced back to it. *GaBi* (Content Version 2021.2, Service Pack 40) was used to calculate the LCA.

## 3.6 Data quality

All background data records relevant for the calculation were provided by the declaration holder and processed with the database of the accounting software *GaBi ts*. The manufacturer-specific data used is from 2020. All material and energy flows were recorded in full and were taken into account in the processes described in chapter 3.2.

## 3.7 Period under review

The review period for the data collection is 2020.

## 3.8 Allocation

Allocation in the factory. The data specification was made regarding the actual output in the reference period based on the produced area. Regarding the offcut material there is a closed loop.

## 3.9 Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to EN 15804 and the building context, respectively the product-specific characteristics of performance, are taken into account.

The background data was taken from the *GaBi ts* software (Content Version 2021.2, Service Pack 40).

# 4. LCA: Scenarios and additional technical information

## Characteristic product properties

### Information on biogenic Carbon

AQUAPANEL® Cement Board Outdoor is almost exclusively composed of inorganic materials. The proportion of biogenic carbon in the total mass of the product is less than 1 %.

## Module C1 - Deconstruction and demolition

The deconstruction is carried out mechanically and unspecifically with an excavator (100 kW), related to the product under consideration. The scenario considers the impacts caused by the operation of the

excavator (incl. diesel), depending on the mass to be moved (declared unit).

## Module C2 – Transport for waste management

The transport of the deconstructed material is assumed to take place with one truck as a German fleet average to an inert material landfill as mixed construction waste. The transport distance is assumed to be 100 km.

## Module C3 - Waste management for reuse, recovery and/or recycling

The product under consideration can be used as bulk and fill material if separated by type. In practice, the deconstructed structure is not separated by type, so

that a pure inert material landfill is assumed in this scenario.

**Module C4 - Disposal**

The product under consideration is disposed of as part of mixed construction waste in an inert landfill. No consideration is given to energy credits from possible landfill gas use, as the product consists almost exclusively of inorganic materials.

**Module D - Reuse, recovery and/or recycling potentials**

Due to the assumed landfilling of inert materials, a consideration of credits is not possible.



## 5. LCA: Results

The results of the life cycle assessment of the AQUAPANEL® Cement Board Outdoor for the life cycle phases considered (A1-A3, C1-C4, D) are presented below. The characterisation factors of EK-JRC specified by EN 15804 were used.

**DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; ND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)**

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	ND	ND	ND	ND	MNR	MNR	MNR	ND	ND	X	X	X	X	X

**RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 m<sup>2</sup> AQUAPANEL® Cement Board Outdoor**

Core Indicator	Unit	A1	A2	A3	C1	C2	C3	C4	D
GWP-total	[kg CO <sub>2</sub> -Eq.]	3.73	0.09	0.62	0.01	0.10	0.00	0.23	0.00
GWP-fossil	[kg CO <sub>2</sub> -Eq.]	3.70	0.09	0.62	0.01	0.10	0.00	0.25	0.00
GWP-biogenic	[kg CO <sub>2</sub> -Eq.]	3.00E-2	-9.09E-5	1.40E-3	-4.42E-4	4.00E-5	0.00E+0	-1.97E-2	0.00E+0
GWP-luluc	[kg CO <sub>2</sub> -Eq.]	1.63E-3	6.78E-4	1.09E-4	4.18E-5	4.16E-4	0.00E+0	7.17E-4	0.00E+0
ODP	[kg CFC11-Eq.]	1.52E-14	2.02E-17	4.62E-15	2.45E-18	2.44E-17	0.00E+0	9.91E-16	0.00E+0
AP	[mol H <sup>+</sup> -Eq.]	8.79E-3	5.41E-4	1.13E-3	4.92E-5	5.73E-4	0.00E+0	1.78E-3	0.00E+0
EP-freshwater	[kg P <sub>e</sub> -Eq.]	2.90E-6	2.48E-7	1.83E-7	2.17E-8	2.16E-7	0.00E+0	4.26E-7	0.00E+0
EP-marine	[kg N-Eq.]	2.43E-3	2.65E-4	2.19E-4	2.32E-5	2.81E-4	0.00E+0	4.58E-4	0.00E+0
EP-terrestrial	[mol N-Eq.]	2.66E-2	2.92E-3	2.39E-3	2.57E-4	3.12E-3	0.00E+0	5.03E-3	0.00E+0
POCP	[kg NMVOC-Eq.]	7.19E-3	5.32E-4	6.67E-4	6.49E-5	5.37E-4	0.00E+0	1.39E-3	0.00E+0
ADPE	[kg Sb-Eq.]	3.04E-7	7.54E-9	7.27E-8	8.29E-10	8.25E-9	0.00E+0	2.23E-8	0.00E+0
ADPF	[MJ]	29.30	1.16	8.50	0.13	1.32	0.00	3.25	0.00
WDP	[m <sup>3</sup> world-Eq deprived]	2.60E-1	8.12E-4	1.12E-1	4.30E-5	4.28E-4	0.00E+0	2.60E-2	0.00E+0

Caption: GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential

**RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 m<sup>2</sup> AQUAPANEL® Cement Board Outdoor**

Indicator	Unit	A1	A2	A3	C1	C2	C3	C4	D
PERE	[MJ]	4.34	0.06	1.12	0.01	0.08	0.00	0.43	0.00
PERM	[MJ]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PERT	[MJ]	4.34	0.06	1.12	0.01	0.08	0.00	0.43	0.00
PENRE	[MJ]	29.50	1.16	8.50	0.13	1.32	0.00	3.26	0.00
PENRM	[MJ]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PENRT	[MJ]	29.50	1.16	8.50	0.13	1.32	0.00	3.26	0.00
SM	[kg]	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RSF	[MJ]	2.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NRSF	[MJ]	3.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	[m <sup>3</sup> ]	7.22E-2	7.52E-5	1.78E-3	6.91E-5	6.88E-5	0.00E+0	8.20E-4	0.00E+0

Caption: PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy 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 resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

**RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 m<sup>2</sup> AQUAPANEL® Cement Board Outdoor**

Indicator	Unit	A1	A2	A3	C1	C2	C3	C4	D
HWD	[kg]	3.38E-8	6.21E-11	1.66E-9	4.95E-9	4.93E-8	0.00E+0	4.96E-8	0.00E+0
NHWD	[kg]	6.56E-2	1.82E-4	2.58E-3	2.33E-5	2.32E-4	0.00E+0	1.64E+1	0.00E+0
RWD	[kg]	8.79E-4	2.16E-6	2.76E-5	1.40E-7	1.39E-6	0.00E+0	3.70E-5	0.00E+0
CRU	[kg]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MFR	[kg]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MER	[kg]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EEE	[MJ]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EET	[MJ]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Caption: HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EEE = Exported thermal energy

## RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional: 1 m<sup>2</sup> AQUAPANEL® Cement Board Outdoor

Indicator	Unit	A1	A2	A3	C1	C2	C3	C4	D
PM	[Disease Incidence]	ND	ND	ND	ND	ND	ND	ND	ND
IRP	[kBq U235-Eq.]	ND	ND	ND	ND	ND	ND	ND	ND
ETP-fw	[CTUe]	ND	ND	ND	ND	ND	ND	ND	ND
HTP-c	[CTUh]	ND	ND	ND	ND	ND	ND	ND	ND
HTP-nc	[CTUh]	ND	ND	ND	ND	ND	ND	ND	ND
SQP	[-]	ND	ND	ND	ND	ND	ND	ND	ND
Caption	PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic); SQP = Potential soil quality index								

Disclaimer 1 – for the indicator “Potential Human exposure efficiency relative to U235”. 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 or radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, radon and from some construction materials is also not measured by this indicator.

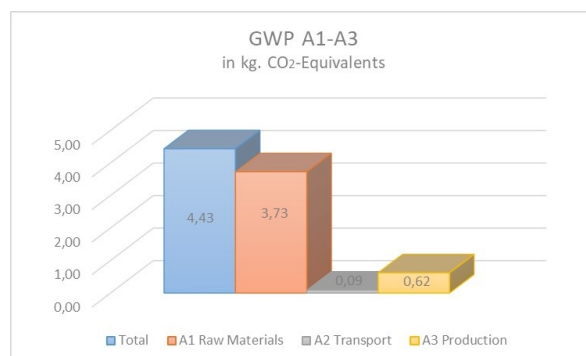
Disclaimer 2 – for the indicators “abiotic depletion potential for non-fossil resources”, “abiotic depletion potential for fossil resources”, “water (user) deprivation potential, deprivation-weighted water consumption”, “potential comparative toxic unit for ecosystems”, “potential comparative toxic unit for humans – cancerogenic”, “Potential comparative toxic unit for humans - not cancerogenic”, “potential soil quality index”. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high as there is limited experience with the indicator.

## 6. LCA: Interpretation

Based on the dominance analysis of the use of resources, it can be seen that the most climate effective impact in the case of AQUAPANEL® cement panels is the raw material procurement/raw material processing (module A1). The mineral raw materials used for this are extracted as a non-regenerative resource and in some cases also thermally treated (glass melting, cement burning). The CEM I cement used in the product contributes approx. 60 % of the Global Warming Potential (GWP) and is due to the energy-intensive burning process. The second major influence on the global warming potential represents the use of glass fabric. The impact in relation to the overall result was calculated at 20 %. The production process is responsible for 14 % and consists of both the electrical energy demand (6.3 %) and the thermal energy demand for the perlite expansion process (7.6 %).

In the other impact categories considered, raw material procurement and raw material processing (A1), especially that of mineral raw materials, also stand out as relevant processes in the overall system, whereas the transport of raw materials and production at the

plant have only minor impacts. The effects of the production process in the plant itself are rather subordinate in terms of life cycle assessment and are largely due to the electrical energy demand. The processes used here are largely mixing and moulding processes that have hardly any environmental impact. The drying process in the curing warehouse takes place without the use of additional thermal energy due to exothermic processes.



## 7. Requisite evidence

### 7.1 Radioactivity

The Activity Concentration Index (ACI) was determined to be 0.18. The tested product meets the official guideline value of ACI <1 as well as the test condition ACI <0.75 of the Institut für Baubiologie Rosenheim (IBR). Institute for Building Biology Rosenheim GmbH Test Report No. 3020-1166 of December 2020.

### 7.2 Leaching

A determination of the heavy metal concentration both in the original substance and in the eluate was carried

out by the Institut für Baubiologie Rosenheim (IBR) in August 2020. The determination in the original substance was carried out according to ISO 17294-2, in the eluate according to DIN 38414-4. Institut für Baubiologie Rosenheim GmbH Test Report No. 3020-1166.

### Heavy metal concentrations in the original substance

Name	Value	Unit
Arsenic	1,6	mg/kg
Cadmium	<0,3	mg/kg

Chromium	22,1	mg/kg
Copper	35,1	mg/kg
Mercury	<0,05	mg/kg
Nickel	9,61	mg/kg
Lead	6,0	mg/kg
Zinc	<30	mg/kg

#### Heavy metal concentration in the eluate

Name	Value	Unit
Arsenic	<0,01	mg/l
Cadmium	<0,0005	mg/l
Chromium	0,0231	mg/l
Copper	<0,005	mg/l
Mercury	<0,0001	mg/l
Nickel	<0,005	mg/l
Lead	<0,005	mg/l
Zinc	0,072	mg/l

#### 7.3 VOC emissions

The analysis of emissions of volatile organic compounds (VOC) starting from the AQUAPANEL® Cement Board Rooftop was carried out in December 2020 by the Institut für Baubiologie Rosenheim (IBR) and the results were documented in test report No. 3020-1166.

#### AgBB overview of results (28 days [µg/m³])

Name	Value	Unit
TVOC (C6 - C16)	862	µg/m³
Sum SVOC (C16 - C22)	<5	µg/m³
R (dimensionless)	0.21	-
VOC without NIK	<5	µg/m³
Carcinogenic Substances	<1	µg/m³

#### AgBB overview of results (3 days [µg/m³])

Name	Value	Unit
TVOC (C6 - C16)	808	µg/m³
Sum SVOC (C16 - C22)	<5	µg/m³
R (dimensionless)	0.27	-
VOC without NIK	23	µg/m³
Carcinogenic Substances	<1	µg/m³

Based on the measurement results and the comparison of the specifications of the AgBB scheme and the DIBt approval principles, no contamination of the tested product by emissions of volatile organic compounds and in particular by formaldehyde is to be expected; therefore, the use of the cement boards in interior rooms of buildings is harmless in terms of VOC emissions.

## 8. References

#### AgBB

Committee for Health-related evaluation of building products/Ausschuss zur gesundheitlichen Bewertung von Bauprodukten

#### AVV

Ordinance on the European list of waste (Abfallverzeichnis-Verordnung - AVV), 10.12.2001.

#### Biocidal Products Regulation

Regulation (EU) No 528/2012 of the European Parliament and of the Council of 22 May 2012 concerning the making available on the market and use of biocidal products Text with EEA relevance.

#### DIN 38414-4

DIN 38414-4:1984-10, German standard methods for the examination of water, wastewater and sludge; sludge and sediments (group S); determination of leachability by water (p 4).

#### DIBt

Deutsches Institut für Bautechnik

#### ECHA Kandidatenliste

Liste der für eine Zulassung in Frage kommenden besonders besorgniserregenden Stoffe (Stand: 07/22) gemäß Artikel 59 Absatz 10 der REACH-Verordnung. European Chemicals Agency.

#### EN 318

Wood-based panels - Determination of dimensional changes associated with changes in relative humidity; German version EN 318:2002

#### EN 319

Particleboards and fibreboards; determination of tensile strength perpendicular to the plane of the board; German version EN 319:1993

#### EN 12467

Fibre-cement flat sheets - Product specification and test methods; German version EN 2467:2012+A2:2018

#### EN 13501-1

DIN EN 13501-1:2010-01 Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests

#### EN 15804

EN 15804:2012+A2:2019, Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products

#### ETA-07/0173

declaration of performance in consideration of ETA-07/0173 and the CE marking, dated 11.10.2017.

#### GaBi ts

GaBi ts: Software und Datenbank zur Ganzheitlichen Bilanzierung, Professional Datenbank, Content Version 2021.2, Service Pack 40. LBP, Universität Stuttgart und thinkstep, 2021. Dokumentation der Datensätze unter <http://www.gabisoftware.com/deutsch/my-gabi/gabidocumentation/>.

#### IBU 2021

Institut Bauen und Umwelt e.V.: General Instructions for the EPD programme of Institut Bauen und Umwelt e.V., Version 2.0, Berlin: Institut Bauen und Umwelt e.V., 2021 [www.ibu-epd.com](http://www.ibu-epd.com)

#### ISO 9001

DIN EN ISO 9001:2015-11, Qualitätsmanagementsysteme - Anforderungen (ISO 9001:2015); Deutsche und Englische Fassung EN ISO 9001:2015

#### ISO 10456



DIN EN ISO 10456:2010-05, Building materials and products - Hygrothermal properties - Tabulated design values and procedures for determining declared and design thermal values (ISO 10456:2007 + Cor.1:2009).

**ISO 12572**

ISO 12572:2016-08, Hygrothermal performance of building materials and products - Determination of water vapour transmission properties - Cup method

**ISO 14025**

DIN EN ISO 14025:2011-10, Environmental labels and declarations - Type III environmental declarations - Principles and procedures

**ISO 17294-2**

DIN EN ISO 17294-2:2017-01, Water quality - Application of inductively coupled plasma mass spectrometry (ICP-MS) - Part 2: Determination of selected elements including uranium isotopes

**Product Category Rules for Building-Related Products and Services – Part A:**

Product Category Rules for Building-Related Products and Services. Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report, V2.1, 11/2021.

**PCR: Fibre Cement/Fibre Concrete**

Product category rules for building-related products and services. Part B: Environmental Product Declaration Requirements for Fibre Cement/Fibre Concrete. Berlin: Institut Bauen und Umwelt e.V. (ed.), 01/2019.

**Regulation (EC) No 1907/2006**

Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006

concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Council Regulation (EC) No 1488/2006.

establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC (OJ L396, 30.12.2006, p. 1. Corrected version in OJ L 136, 29.5.2007, p. 3).

**Regulation (EU) No 305/2011**

Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC Text with EEA relevance.

**Regulation (EU) No 528/2012**

Regulation (EU) No 528/2012 of the European Parliament and of the Council of 22 May 2012 1

**Test report No. 3020-1166**

Institute for Building Biology Rosenheim, Test report Nr. 3020-1166 for AQUAPANEL® Cement Board Indoor/Outdoor, 09-12-2020.

**Technical datasheet 08/17**

Technical datasheet AQUAPANEL® Cement Board Outdoor, 08/17.

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