

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804+A2

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|--------------------------|--------------------------------------|
| Owner of the Declaration | Swisspearl Group AG |
| Publisher | Institut Bauen und Umwelt e.V. (IBU) |
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| Valid to | 23/10/2028 |

Corrugated Sheets Swisspearl Group AG

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General Information

Swisspearl Group AG

Programme holder

IBU – Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

Declaration number

EPD-SWP-20230359-CCA1-EN

This declaration is based on the product category rules:

Fibre cement / Fibre concrete, 01/08/2021
(PCR checked and approved by the SVR)

Issue date

24/10/2023

Valid to

23/10/2028



Dipl.-Ing. Hans Peters
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Corrugated Sheets

Owner of the declaration

Swisspearl Group AG
Eternitstrasse 3
8867 Niederurnen
Switzerland

Declared product / declared unit

1m² of fibre cement Corrugated sheets

Scope:

This EPD refers to fibre cement corrugated sheets on behalf of Swisspearl Group AG, produced in the factories located in Trzemeszno (Poland) and Šumperk (Czech Republic) and are based on the production volumes of the year 2021.

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*.

Verification

The standard EN 15804 serves as the core PCR

Independent verification of the declaration and data according to ISO 14025:2011

internally

externally



Dr. Matthew Fishwick,
(Independent verifier)

Product

Product description/Product definition

Swisspearl Corrugated sheets are used as roofing material on wooden or metal sub construction. This declaration is based on the average of the various types of Corrugated sheets produced both in Trzemeszno (Poland) and Šumperk (Czech Republic). These include the product names: W130, W146, W172, W177, coated and uncoated, and with reinforcing possibilities. Swisspearl Corrugated sheets are available in 6mm and 6,5mm thicknesses. For the placing on the market of the product in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland) Regulation (EU) No. 305/2011 (CPR) applies. The product needs a declaration of performance taking into consideration EN 494:2012+A1 'Fibre-cement profiled sheets and fittings - Product specification and test methods' and the CE-marking.

Application

Swisspearl Corrugated sheets are intended for installation as roofing and/or cladding on wooden or metal sub constructions

Technical Data

The technical specifications of Swisspearl Corrugated sheets can be seen in the following table:

Constructional data

| Name | Value | Unit |
|---|-----------|----------------------------------|
| Thermal conductivity | 0.4 | W/(mK) |
| Gross density dry | min 1600 | kg/m ³ |
| Moisture content at 23 °C, 80% humidity | 11 | M.-% |
| Coefficient of thermal expansion | 10 | 10 ⁻⁶ K ⁻¹ |
| Min. breaking load | Min. 4250 | N/m |
| Min. breaking moment | Min. 55 | NM/m |
| Water vapour permeability | 10 | mmHg*hr*m ² /g |
| Moisture expansion | 0 | mm/m |

Further information can be found in the Download Center on the Swisspearl website

Product according to the CPR, based on a hENJ: Performance data of the product in accordance with the Declaration of Performance (DoP) with respect to its essential characteristics according to EN 494:2012+A1 'Fibre-cement profiled sheets and fittings - Product specification and test methods' and the CE-marking.

Base materials/Ancillary materials

The main constituents of the Swisspearl Corrugated sheets are as followed:

- Portland cement (grey): 70-85%
- Inert filler (limestone, mica, silica): 5-15%
- Cellulose: 3-8%
- Polyvinyl alcohol (PVA): 0-2%
- Paint: 0-2%

Material explanation

- Portland Cement: Manufactured according to /DIN EN 197-1/ from limestone, marl and sand. The material is crushed, dried, calcinated to clinker and ground to cement.
- Inert filler: a filler to optimize deformation properties and material bonding.
- Cellulose Fibres (0.5-3mm): To assure collection of powder during filtration.
- PVA fibres (4-6mm): Synthetic Polyvinyl alcohol fibre used as reinforcement.

There are no substances of very high concern (SVHC) present in the product according to according to Regulation (EC) No. 1907/2006 (REACH).

Manufacturing

Swisspearl Corrugated sheets are manufactured with Hatschek technology at both factories.

A very thin slurry of water, binder and fibres is mixed and introduced into each of the vats of the Hatschek machine. The rotating sieve cylinder in the vats collects a thin layer of solid material that is further dewatered as it is transferred to a felt and further on to an accumulating format roller. At the required thickness, the accumulated layers are automatically cut into the required product size, corrugated, and transferred into the pre-curing area, and waste is returned to the manufacturing process. After pre-curing, the products are stored under continued control of temperature and humidity. Swisspearl Corrugated sheets are delivered in natural grey and coated versions in various colours with a smooth and even surface. The backside has an anti-blocking treatment.

Reference service life

The current type of Swisspearl Corrugated sheets was introduced in the beginning of the 2000s. There are therefore no substantiated data on the reference service life (RSL). However, it is estimated that the RSL of Swisspearl Corrugated sheets is 50 years or higher. This is in accordance with the table published by the *Bundesinstitut für Bau-, Stadt- und Raumforschung (BBSR) (code 335.511)*, which estimates the RSL of facade and roofing products produced from fibrecement.

LCA: Calculation rules

Declared Unit

In this EPD the declared unit is defined as the production of 1m² of Swisspearl Corrugated sheets, with an expected lifetime of 50 years or higher, and its related impacts over the 'cradle to grave' life-cycle modules.

The EPD results are based on 1m² of corrugated sheets with a thickness of 6mm, however Swisspearl Corrugated sheets are also available in thicknesses of 6,5mm. In order to obtain the EPD results for 6,5 mm sheets, the results need to be multiplied by 1,085 (conversion factor).

Declared unit and mass reference

| Name | Value | Unit |
|--------------------|----------|-------------------|
| Declared Unit | 1 | m ² |
| Gross density ,dry | min 1600 | kg/m ³ |
| Layer thickness | 0.006 | m |
| Grammage | 14 | kg/m ² |

Data from production sites

Data is gathered for the production process of at the factory sites in Poland and Czech Republic for the year 2021. This EPD quantifies the average environmental impact of the different corrugated sheets variants produced in these factories

(W130, W146, W172, W177), including coated and uncoated versions.

The average is calculated by collecting all production data per declared unit of product and weigh them based on their production volume. Differences between the product variants are considered to be small.

System boundary

The modules considered in this EPD follow a cradle to grave assessment: A1-A5, B1-B7, C1-C4, D.

A1 -The system boundaries include the provision and processing of raw materials. These include in particular cement, plastic fibres, pulp and packaging materials.

A2 -The transports to the manufacturer were specifically collected for all starting materials.

A3 -The production includes also all in-plant energy consumption (gas + electricity), as well as water used in the production process, and production waste.

A4 -The transport, part of the construction process, is an average of the total distance of all products delivered to the point of installation. This is calculated to be 1964 km.

A5 -All environmental impacts associated with the disposal of packaging handled at the construction site are accounted for. It is assumed incinerated at an incineration plant. Disposal of product waste is assumed to be landfilled. Furthermore, environmental impacts associated with trucks and fuel for the construction installation are included.

B1-B7 modules are included, however, no significant environmental impact is associated with the use phase of the product.

C1 -Accounts for the environmental impacts associated with dismantling and demolition of the fibre cement boards. Fuel used for demolition equipment and transport on-site vehicles.

C2 -Transportation of the discarded products from the construction site to a landfilling site. The transport is estimated to be 100 km in an average truck.

C3 -The fibre cement boards are sent to landfill and therefore there are no environmental impacts associated with waste processing of materials flows intended for reuse, recycling or energy recovery.

C4 -Environmental impacts associated with the processes at the landfill.

D -The fibre cement boards are sent to landfill after use. The product has therefore no impact during this stage and no associated environmental impacts. The boards are expected to

be reusable over time, but this is not included in this assessment. Incineration credits for the packaging material have been considered.

Background data and data quality

Modelling of the production of 1m² of Swisspearl Corrugated sheets is done with GaBi Software System and Database for Life Cycle Engineering. The model has been developed by Sphera Solutions GmbH. Each background dataset has been reviewed on geographical, technological, and temporal scale.

Technological: All primary and secondary data are modelled to be specific to the technology mixes under study. Proxy data are used where technology-specific data are unavailable. The technological representativeness is considered to be good.

Geographical: All primary and secondary data are collected specific to the countries/regions under study. Where country/region specific data are unavailable, proxy data are used. The geographical representativeness is considered to be good.

Temporal: All primary data collected is based on the year 2021. All secondary data come from the GaBi 2020.1 databases and are representative for the years 2020-2025. Temporal representativeness is considered to be very good.

Allocation in foreground data

The production process does not deliver any co-products. Therefore, the applied model does not contain any allocation.

Allocation for waste materials

Pre-processing waste (plastics) is sent to a waste incineration plant. The resulting electrical and thermal energy is credited in module A1. For the waste incineration plant an R1-value of above 0.6 is assumed. The resulting credits based on the incineration of the packaging of the product are declared in module D.

Cut-off criteria

All raw materials used, utilized thermal energy, and electric power consumption of the production process are considered in this assessment. This means that all material and energy flows contributing less than 1% are considered.

Geographic Representativeness

Land or region, in which the declared product system is manufactured, used or handled at the end of the product's lifespan: Europe

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. GaBi Software System and Database for Life Cycle Engineering CUP Version: 2022.2

LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

The biogenic carbon containing material (cellulose) in Swisspearl Corrugated sheets is required to be listed separately. The following table shows the biogenic carbon content in the product and accompanying packaging:

Information on describing the biogenic Carbon Content at factory gate

| Name | Value | Unit |
|---|-------|------|
| Biogenic carbon content in product | 0.02 | kg C |
| Biogenic carbon content in accompanying packaging | 0.01 | kg C |

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO₂.

Transport to the building site (A4)

Estimating the transport to each individual construction site is rather complex. However, an educated estimate is made for the distance to the installation point by averaging the total distance of all products delivered to Swisspearl's warehouses and adding 100 km, representing the distance from the warehouse to the installation point. Swisspearl's warehouses for which the distance has been calculated are located in Denmark, Sweden, Norway, Netherlands, Belgium, Ireland and the United Kingdom.

| Name | Value | Unit |
|---------------------------------------|-------|-------------------|
| Transport distance | 1964 | km |
| Gross density of products transported | 1600 | kg/m ³ |

Installation into the building (A5)

Installation of the boards is carried out by use of an automatic screwdriver. It is estimated that 12 screws are used for the installation of the declared unit of Swisspearl Corrugated sheets.

PE film and wooden pallets are used as packaging materials. Polyethylene foils can be recycled locally, and reusable pallets can be returned to the building material suppliers.

| Name | Value | Unit |
|---------------|-------|------|
| Plastic waste | 0.008 | kg |
| Pallets | 0.007 | kg |
| Screws | 12 | pcs |

In case a reference service life according to applicable ISO standards is declared then the assumptions and in-use conditions underlying the determined RSL shall be declared. In addition, it shall be stated that the RSL applies for the reference conditions only. The same holds for a service life declared by the manufacturer. Corresponding information related to in-use conditions needs not be provided if a service life taken from the list on service life by BNB is declared.

Reference service life

| Name | Value | Unit |
|--|-------|------|
| Reference service life (according to ISO 15686-1, -2, -7 and -8) | 0 - 0 | a |
| Life Span (according to BBSR) | >50 | a |
| Life Span according to the manufacturer | 0 - 0 | a |

End of life (C1-C4)

| Name | Value | Unit |
|-------------|-------|------|
| Reuse | - | kg |
| Landfilling | ~14 | kg |

LCA: Results

The following tables show the results of life-cycle assessment indicators, resource use and waste related to 1m2 of Swisspearl Corrugated fibre cement sheets. The data is representative of the products of Swisspearl.

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = 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 | X | X | X | X | X | X | X | X | X | X | X | X | X | X |

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 m² Swisspearl Corrugated sheets

| Parameter | Unit | A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|----------------|----------------------------------|----------|----------|-----------|----------|----------|----|----|----|----|----|----|----|----------|----------|-----------|----------|-----------|
| GWP-total | kg CO ₂ eq | 8.41E+00 | 1.37E-01 | 1.61E+00 | 1.37E+00 | 1.14E+00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3.18E-04 | 6.98E-02 | -2.19E-01 | 1.03E+00 | -1.26E-01 |
| GWP-fossil | kg CO ₂ eq | 8.39E+00 | 1.33E-01 | 1.95E+00 | 1.31E+00 | 7.78E-01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3.15E-04 | 6.67E-02 | 6.44E-01 | 1.66E-01 | -1.26E-01 |
| GWP-biogenic | kg CO ₂ eq | 1.36E-02 | 4.01E-03 | -3.36E-01 | 6.03E-02 | 3.64E-01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.68E-06 | 3.07E-03 | -8.65E-01 | 8.67E-01 | -6.08E-04 |
| GWP-luluc | kg CO ₂ eq | 2E-03 | 3.01E-06 | 3.73E-04 | 3.11E-05 | 5.48E-04 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4.46E-07 | 1.58E-06 | 1.58E-03 | 4.89E-04 | -8.25E-05 |
| ODP | kg CFC11 eq | 1.67E-14 | 1.47E-17 | 4.25E-15 | 1.5E-16 | 5.38E-15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7.54E-18 | 7.65E-18 | 9.71E-15 | 6.46E-16 | -1.36E-15 |
| AP | mol H ⁺ eq | 1.5E-02 | 1.71E-03 | 3.77E-03 | 1.08E-03 | 1.88E-03 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6.55E-07 | 5.49E-05 | 5.47E-03 | 1.18E-03 | -1.6E-04 |
| EP-freshwater | kg P eq | 4.38E-06 | 2.87E-08 | 4.34E-06 | 2.78E-07 | 1.43E-06 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8.45E-10 | 1.42E-08 | 1.69E-05 | 2.79E-07 | -1.56E-07 |
| EP-marine | kg N eq | 5.03E-03 | 4.78E-04 | 8.59E-04 | 3.41E-04 | 4.3E-04 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.56E-07 | 1.73E-05 | 1.72E-03 | 3.07E-04 | -4.6E-05 |
| EP-terrestrial | mol N eq | 5.5E-02 | 5.24E-03 | 9.18E-03 | 3.77E-03 | 4.67E-03 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.63E-06 | 1.92E-04 | 1.82E-02 | 3.38E-03 | -4.93E-04 |
| POCP | kg NMVOC eq | 1.7E-02 | 1.34E-03 | 3.89E-03 | 1.03E-03 | 1.37E-03 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4.22E-07 | 5.24E-05 | 4.9E-03 | 9.32E-04 | -1.29E-04 |
| ADPE | kg Sb eq | 3.39E-07 | 4.42E-09 | 8.16E-08 | 4.58E-08 | 3.91E-05 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9.26E-11 | 2.33E-09 | 2.12E-07 | 1.57E-08 | -2.01E-08 |
| ADPF | MJ | 5.28E+01 | 1.79E+00 | 2.13E+01 | 1.85E+01 | 7.91E+00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5.6E-03 | 9.44E-01 | 1.02E+01 | 2.21E+00 | -2.18E+00 |
| WDP | m ³ world eq deprived | 3.01E-01 | 2.14E-04 | 6.89E-02 | 2.17E-03 | 5.63E-02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5.05E-05 | 1.11E-04 | 1.3E-02 | 1.79E-02 | -9.13E-03 |

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 m² Swisspearl Corrugated sheets

| Parameter | Unit | A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|-----------|----------------|-----------|----------|----------|----------|----------|----|----|----|----|----|----|----|----------|----------|----------|-----------|-----------|
| PERE | MJ | -8.26E-01 | 5.97E-03 | 5.01E+00 | 6.11E-02 | 1.76E+00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.58E-03 | 3.11E-03 | 2.74E+01 | 7.79E+00 | -4.68E-01 |
| PERM | MJ | 7.49E+00 | 0 | 1.4E-01 | 0 | -1.4E-01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | -7.49E+00 | 0 |
| PERT | MJ | 6.66E+00 | 5.97E-03 | 5.15E+00 | 6.11E-02 | 1.62E+00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.58E-03 | 3.11E-03 | 2.74E+01 | 2.97E-01 | -4.68E-01 |
| PENRE | MJ | 5.28E+01 | 1.79E+00 | 2.09E+01 | 1.86E+01 | 8.29E+00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5.6E-03 | 9.46E-01 | 1.02E+01 | 2.21E+00 | -2.18E+00 |
| PENRM | MJ | 0 | 0 | 3.4E-01 | 0 | -3.4E-01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PENRT | MJ | 5.28E+01 | 1.79E+00 | 2.13E+01 | 1.86E+01 | 7.95E+00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5.6E-03 | 9.46E-01 | 1.02E+01 | 2.21E+00 | -2.18E+00 |
| SM | kg | 1.24E-01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| RSF | MJ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| NRSF | MJ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FW | m ³ | 1.73E-02 | 9.63E-06 | 4.11E-03 | 9.82E-05 | 2.69E-03 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.51E-06 | 5E-06 | 7.2E-03 | 5.45E-04 | -4.57E-04 |

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 m² Swisspearl Corrugated sheets

| Parameter | Unit | A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|-----------|------|----------|----------|----------|----------|----------|----|----|----|----|----|----|----|----------|----------|----------|----------|-----------|
| HWD | kg | 6.46E-09 | 1.28E-11 | 3.36E-09 | 1.28E-10 | 1.02E-09 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.48E-12 | 6.5E-12 | 8.38E-09 | 2.34E-10 | -4.86E-10 |
| NHWD | kg | 4.39E-02 | 1.79E-04 | 4.71E-01 | 1.86E-03 | 1.89E-02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3.97E-06 | 9.46E-05 | 3.29E-02 | 1.1E+01 | -9.84E-04 |
| RWD | kg | 1.47E-03 | 1.94E-06 | 5.17E-04 | 1.99E-05 | 3.08E-04 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8.34E-07 | 1.01E-06 | 7.32E-04 | 2.32E-05 | -1.5E-04 |
| CRU | kg | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MFR | kg | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MER | kg | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EEE | MJ | 0 | 0 | 0 | 0 | 3.82E-04 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EET | MJ | 0 | 0 | 0 | 0 | 2.27E-04 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

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; EET = Exported thermal energy

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional: 1 m² Swisspearl Corrugated sheets

| Parameter | Unit | A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|-----------|-------------------|----------|----------|----------|----------|----------|----|----|----|----|----|----|----|----------|----------|----------|----------|-----------|
| PM | Disease incidence | 1.83E-07 | 2.85E-08 | 7.6E-08 | 5.99E-09 | 2.24E-08 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5.52E-12 | 3.05E-10 | 3.48E-07 | 1.47E-08 | -1.38E-09 |
| IR | kBq U235 eq | 2.29E-01 | 2.75E-04 | 4.89E-02 | 2.82E-03 | 3.83E-02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.37E-04 | 1.43E-04 | 1.19E-01 | 2.44E-03 | -2.47E-02 |
| ETP-fw | CTUe | 2.35E+01 | 1.3E+00 | 6.54E+00 | 1.34E+01 | 2.18E+00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.36E-03 | 6.84E-01 | 6.59E+00 | 1.26E+00 | -4.34E-01 |
| HTP-c | CTUh | 1.12E-09 | 2.41E-11 | 1.97E-10 | 2.5E-10 | 7.8E-10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6.67E-14 | 1.27E-11 | 3.46E-10 | 1.85E-10 | -2.05E-11 |
| HTP-nc | CTUh | 1.17E-07 | 1.04E-09 | 1.1E-08 | 1.04E-08 | 9.25E-09 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.52E-12 | 5.32E-10 | 2.19E-08 | 2.05E-08 | -8.12E-10 |
| SQP | SQP | 4.46E+00 | 4.63E-03 | 5.25E+01 | 4.75E-02 | 1.33E+00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.77E-03 | 2.42E-03 | 4.15E+02 | 4.46E-01 | -3.2E-01 |

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.

This EPD was created using a software tool.

References

Standards

DIN EN 197-1

DIN EN 197-1, Cement - Part 1: Composition, specifications and conformity criteria for common cements.

EN 494

EN 494:2012+A1, Fibre-cement profiled sheets and fittings — Product specification and test methods.

ISO 14025

EN ISO 14025:2011, Environmental labels and declarations — Type III environmental declarations — Principles and procedures.

ISO 15686-1, -2, -7 and -8

ISO 15686-1:2011

Part 1 General principles and framework

Part 2 Service life prediction procedures

Part 7 Performance evaluation for feedback of service life data from practice

Part 8 Reference service life and service-life estimation

EN 15804

EN 15804:2012+A1:2013, Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products.

EN 15804

EN 15804:2012+A2:2019+AC:2021, Sustainability of

construction works — Environmental Product Declarations —
Core rules for the product category of construction products.

REACH

Regulation (EC) No 1907/2006, Registration, Evaluation,
Authorisation and Restriction of Chemicals (REACH)

Further References

BBSR

Bundesinstitut für Bau-, Stadt- und Raumforschung
(BBSR): Nutzungsdauer von Bauteilen für
Lebenszyklusanalyse nach Bewertungssystem
Nachhaltiges Bauen (BNB), 2011

GaBi documentation

GaBi life cycle inventory data documentation
www.gabisoftware.com/support/gabi/gabidatabase2020lcidocumentation

GaBi software

Sphera Solutions GmbH
GaBi Software System and Database for Life Cycle
Engineering
CUP Version: 2022.2
University of Stuttgart
Leinfelden Echterdingen

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

PCR Part A

Calculation Rules for the Life Cycle Assessment and
Requirements on the Project Report, Berlin: Institut Bauen und
Umwelt e.V., www.ibu-epd.com, Version 2.2, 2022

PCR Part B

Requirements of the EPD for Fibre Cement/Fibre Concrete,
version 1.7, Institut Bauen und Umwelt e.V., www.bau-umwelt.com, 2019

REGULATION (EU) No 305/2011 Harmonised conditions for
the marketing of construction products and repealing Council
Directive 89/106/EEC

Swisspearl Group A/G

Swisspearl Group A/G: Information on technical data and
downloads.
Downloads - Swisspearl

The literature referred to in the Environmental Product
Declaration must be listed in full. Standards already fully quoted
in the EPD do not need to be listed here again.
The current version of PCR Part A and PCR Part B of the PCR
document on which they are based must be referenced.



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