epd-norway

Global Program Operator

ENVIRONMENTAL PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A2*

Owner of the Declaration	James Hardie Europe GmbH
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	The Norwegian EPD Foundation
Declaration number	EPD-JAM-20220071-CBD1-EN
Registration number	NEPD-4384-3608-EN
Issue date	17.10.2022
Valid to	16.10.2027

fermacell® gypsum fibre board

James Hardie Europe GmbH

Institut Bauen und Umwelt e.V.

www.ibu-epd.com | https://epd-online.com

1. General Information

James Hardie Europe GmbH	gypsum fibre board
Programme holder IBU – Institut Bauen und Umwelt e.V. Hegelplatz 1 10117 Berlin Germany	**Owner of the declaration** James Hardie Europe GmbH Bennigsen-Platz 1 40474 Düsseldorf
Declaration number EPD-JAM-20220071-CBD1-EN	**Declared product / declared unit** 1 m² fermacell® gypsum fibre board
This declaration is based on the product category rules: Plasterboard, 11.2017 (PCR checked and approved by the SVR)	**Scope:** This Environmental Product Declaration refers to gypsum fibre boards of James Hardie Europe GmbH. Specific data from 4 plants (Münchehof, Siglingen, Wijchen/Netherlands and Orejo/Spain) were averaged as a data basis. The LCA includes raw material and energy extraction, raw material transports, the actual manufacturing phase of the gypsum fibre boards, and the post-use phase. 1 m² of an average fermacell® gypsum fibre board with an average density of 1.18 t/m³ is considered.
Issue date 17.10.2022	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*.
Valid to 16.10.2027	**Verification** The standard *EN 15804* serves as the core PCR Independent verification of the declaration and data according to *ISO 14025:2011* ☐ internally ☒ externally
 Dipl. Ing. Hans Peters (chairman of Institut Bauen und Umwelt e.V.)	 Dr. Stefan Diederichs (Independent verifier)
 Dr. Alexander Röder (Managing Director Institut Bauen und Umwelt e.V.))	

2. Product

2.1 Product description/Product definition

fermacell® gypsum fibre boards (coated) are special building boards made of gypsum and cellulose fibres.

Regulation (EU) No. 305/2011 (CPR) applies to the placing of the product on the market in the EU/EFTA (with the exception of Switzerland). The product requires a declaration of performance under consideration of the European Technical Approval ETA-03/0050 dated 31.1.2020 and the CE marking.

2.2 Application

fermacell® gypsum fibre boards are used for planking and cladding structural components.
The respective national regulations apply to their use.

2.3 Technical Data

Performance values of the product according to the Declaration of Performance in relation to its essential characteristics according to ETA-03/0050 of 31.1.2020, among others:

Technical data

Name	Value	Unit
Gross density	1180	kg/m³
Bending strength (longitudinal)	5.8	N/mm²
Modulus of elasticity	3000 - 4500	N/mm²
Thermal conductivity	0.32	W/(mK)
Specific heat capacity	1.1	kJ/kgK
Water vapour diffusion resistance factor	13	-
Moisture content at 20 °C, 65% humidity	1.3	M.-%
Elongation/Vibration when humidity changes by 30% (20°C) nach EN 318	0.25	mm/m
Swelling (air-dry to water-saturated)	0 - 2	%
Brinell hardness	30	N/mm²

2.4 Delivery status

The dimensions/quantities must be declared for the products covered in this EPD in their delivery status.

2.5 Base materials/Ancillary materials

Raw materials:

- Beta hemihydrate: 80-85 % (approx. 18 % from returns).

- cellulose fibers: 15-20 %

Auxiliaries/additives:

- Retarders: < 0.2 %

- Accelerator: 2-4 %

- Coating agent: total approx. 90-110 g/m² (both sides)

Packaging materials (polyethylene shrink films, disposable and reusable wooden pallets) are used as auxiliary materials. No other additives are used.

Substance Explanations:

Beta hemihydrate: Beta hemihydrate ($CaSO_4$ *1/2 H_2O) is formed when gypsum ($CaSO_4$ * 2 H_2O) is burned under normal atmosphere and temperatures of 130 °C to 170 °C with splitting off of the water of crystallization. Gypsum or calcium sulfate dihydrate is a mineral from the class of hydrous sulfates. Gypsum occurs naturally and can also be produced industrially, e.g. by desulfurizing the flue gases from burning coal.

Furthermore, beta hemihydrate is produced from production residues (grinding dust, hemming waste or also from returned material from customers) by calcination in the returned material plant. On average, the recycled material content is approx. 18%. No other building materials, e.g. construction waste, are contained in the returned material.

Cellulose fibers: Cellulose fibers are produced by processing waste paper. The waste paper is first pre-shredded in a special shredding machine and then defibered in a fiber mill.

Retarders: The setting of the beta hemihydrate takes place immediately after the press and is adjusted accordingly. Various fruit acids (e.g. citric acid $C_6H_8O_7$) and modified protein hydrolisates (e.g. Retardan) can be used as retarders. Citric acid is nowadays obtained by means of a transgenic variant of "Aspergillus niger".

Accelerator: Sanding dust from production (i.e. calcium sulfate) is used as an accelerator.

Coating agent: The coating agent is intended to bind the dust and at the same time provide a slightly water-repellent impregnation of the surface. The coating agent is an aqueous solution containing, among other things, a biological hydrocolloid made from renewable plant seeds.

1) The product/at least a part of the product contains substances on the candidate list of Substances of Very High Concern (SVHC) (date 17.01.2022) above 0.1 mass%: no

2) The product/at least one sub-product contains further CMR substances of category 1A or 1B, which are not on the candidate list, above 0.1 mass% in at least one sub-product: no

3) Biocidal products have been added to the present construction product or it has been treated with biocidal products (it is thus a treated product in the sense of the Biocidal Products Regulation (EU) No. 528/2012): no

2.6 Manufacture

The manufacturing process must be described and can be illustrated using a simple graphic. If the EPD applies for several locations, the production processes must be described for all sites in case they differ.

Quality management systems can be referred to.

2.7 Environment and health during manufacturing

Presentation of measures relating to health protection during the manufacturing process extending beyond national guidelines (of the production country).

Presentation of measures relating to environmental protection during the manufacturing process extending beyond national guidelines or plant-specific requirements, e.g. description of special environmentally-friendly dealings with waste air, waste water, and waste as well as noise emissions.

Information on the Environment Management System or similar (if available).

2.8 Product processing/Installation

Description of the type of processing, machinery and tools used, dust extraction etc., auxiliary materials needed for installation as well as measures for noise reduction.
Information on the rules of technology as well as on workers safety and environmental protection is possible.

2.9 Packaging

Information on product-specific packaging:
type, composition, and possible reuse, recycling, energy recovery, and disposal of packaging materials (paper, pallets, foils, etc.).

2.10 Condition of use

Information should be provided here regarding changes in material composition over the service life of the product and/or regarding environmentally relevant material inherent properties over the service life of the product.

2.11 Environment and health during use

Information on the relationships between the product, the environment and health.

Information on the possible content of harmful substances or emissions.

Note: recommendations concerning cleaning, maintenance, etc. for the declared product should be

listed in the corresponding section in 4 “Technical information on scenarios”.

2.12 Reference service life

The service life of building products depends on the respective construction, use and maintenance of the building.

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

2.13 Extraordinary effects

Fire

Information on the fire performance according to *EN 13501:1* or established national standards. According to *EN 13501:1*:

- The classes of building products regarding their fire performance are predefined as: A1, A2, B, C, D, E, and F;
- The classes of flaming droplets/particles are pre-defined as: d0, d1, or d2;
- The classes for smoke density are pre-defined as: s1, s2, or s3

Brandschutz

Name	Value
Building material class	-
Burning droplets	-
Smoke gas development	-

Water

Information on the product performance including possible impacts on the environment following the unforeseeable influence of water, e.g. flooding.

Mechanical destruction

If relevant: information on the product performance including possible impacts on the environment following unforeseeable mechanical destruction.

2.14 Re-use phase

The possibilities of re-use, recycling, and energy recovery must be described.

2.15 Disposal

The possible disposal channels must be indicated. The waste code in accordance with the European Waste Index must be described.

2.16 Further information

Possible sources of additional information, e.g. website, a reference source for safety data sheet.

3. LCA: Calculation rules

3.1 Declared Unit

This core EPD refers to 1 m² of gypsum fibre board from James Hardie Europe GmbH.
Multiplying the results for the declared unit of 14.75 kg/m² by a factor of 80, the results are representative for 1 m³ with a bulk density of 1180 kg/m³.

Declared Unit

Name	Value	Unit
Declared unit	1	m^2
Gross density	14,75	kg/m²
Thickness	12,5	mm

The LCA values obtained are robust with respect to the variability of the production process, geographic representativeness, and the influence of background data and precursors compared to the environmental impacts caused by the actual production.

3.2 System boundary

Type of EPD: cradle to factory gate with options.

The selected system boundaries include the following modules:

Modules A1-A3 - Production Stage
Modules A1-A3 include in detail:
- Raw material supply, energy supply, transportation to manufacturing plant, packaging production, waste disposal at mill level.
- Waste paper fibres are considered to be free of encumbrances

Modules A4-A5 - Installation stage
Modules A4-A5 include in detail:
- transport to installation site, 100 km via truck (A4)
- thermal disposal of packaging (A5)

Modules C1-C4 - Post-use stage
Modules C1-C4 include:
- a manual dismantling (C1)
- transport to the after-use phase, 50 km via truck (C2)
- crushing and preparation for gypsum recycling (C3)
- landfilling of residual materials: Auxiliary materials, fibers, etc (C4).

There are potential credits as a result of the thermal disposal of the packaging and as a result of the gypsum recycling.

Credits are only awarded for the remaining "net gypsum quantity", i.e. all secondary materials used for product manufacture are deducted beforehand, thus reducing the remaining quantity.

Likewise, auxiliary materials and fibres as separate material flows are already deducted here beforehand and considered in module C4.

Because of the wide range of possible applications and and constructions, utilisation is not included in the included in the calculation.

On the input side, all material flows that enter the system and are greater than 1% of their total mass or contribute more than 1% to primary energy consumption are considered. On the output side, all material flows leaving the system and whose environmental impact is greater than 1% of the total impact of an impact category considered are included.

3.3 Estimates and assumptions

Key assumptions and estimates for interpretation of the life cycle assessment should be listed here,

provided that they are not dealt with in other sections of the main clause 3 “LCA: Calculation rules”.

3.4 Cut-off criteria
The use of cut-off criteria as per the PCR, Part A: “Calculation Rules for the Life Cycle Assessment and Requirements on the project report” must be documented here.

3.5 Background data
The sources for background data in the LCA used must be provided.

3.6 Data quality
An estimate should be made as regards data quality (addressing both foreground and background data), whereby the age of background data used must be indicated.

For average EPDs, an estimate of the robustness of the LCA values must be made, e.g. concerning variability of the production process, geographical representatively and the influence of background data and preliminary products compared to the environmental impacts caused by the actual production.

3.7 Period under review
The period under review for the collection of production data and the resulting averages (if applicable) shall be documented.

3.8 Allocation
The allocations of relevance for calculation (appropriation of expenses across various products) must be indicated,
at least:

- Allocation of energy, auxiliary and operating materials used for individual products in a factory;
- Allocation of co-production processes;
- Allocation in the use of recycled and/or secondary raw materials;
- Loads and benefits beyond the system boundary from recycling or energy recovery of packaging materials and production waste;
- Loads and benefits beyond the system boundary from recycling or energy recovery from the end of life of the product.

whereby reference must be made to the modules in which the allocations are performed.

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 used background database has to be mentioned
The background database used is *GaBi ts.*

4. LCA: Scenarios and additional technical information

Characteristic product properties
Information on biogenic carbon

Information describing the biogenic carbon content at the plant gate

Name	Value	Unit
Biogenic carbon content in product	0.91	kg C
Biogenic carbon content in accompanying packaging	0.016	kg C

The proportion of biogenic carbon in the product results from the cellulose fibers of the gypsum fibre board. A carbon content of approx. 0.43 kg per kg of paper/cellulose fibres is assumed.

Transport to construction site (A4)
The EPD declares a transport distance of 100 km for A4. This allows easy conversion of specific transport distances on building level.

Name	Value	Unit
Litres of fuel	0.04	l/100km
Transport distance	100	km
Capacity utilisation (including empty runs)	60	%
Gross density of products transported	1180	kg/m³

Installation in the building (A5)
The thermal recycling of the packaging is considered here. The following quantities are produced per m² of gypsum fibre board:

Name	Value	Unit
Holzpaletten	0,037	kg
Polyethylenfolie	0,0002	kg

End of life path (C1-C4)
Modules C1-C4 include a manual deconstruction (C1), the transport to the after-use phase (50 km via truck (C2)) as well as the consideration of a gypsum recycling (C3) based on data of the Bundesverband der Gipsindustrie e.V. (Federal Association of the Gypsum Industry).
Residual materials (auxiliary materials, fibres, etc.) are landfilled (C4).

Name	Value	Unit
Collected separately Waste type	14.75	kg
Recycling (C3)	10.72	kg
Landfilling (C4)	4.03	kg
Sekundärmaterialien (unencumbered, sink)	2.5	kg

In Module D, potential credits result from thermal disposal of the packaging and from gypsum recycling. The material credits are only awarded for the remaining "net gypsum quantity", i.e. all secondary materials used for product manufacture are deducted beforehand, thus reducing the remaining quantity.

5. LCA: Results

The following table shows the LCA results for the life cycle of 1 m² of gypsum boards.

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	X	X	ND	ND	MNR	MNR	MNR	ND	ND	X	X	X	X	X

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

Core Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	[kg CO_2-Eq.]	-4.58E-1	1.16E-1	7.21E-2	0.00E+0	5.81E-2	1.96E-1	3.44E+0	-8.57E-2
GWP-fossil	[kg CO_2-Eq.]	3.12E+0	1.11E-1	3.87E-3	0.00E+0	5.55E-2	1.96E-1	6.10E-2	-8.55E-2
GWP-biogenic	[kg CO_2-Eq.]	-3.58E+0	5.13E-3	6.83E-2	0.00E+0	2.56E-3	1.10E-4	3.38E+0	6.45E-5
GWP-luluc	[kg CO_2-Eq.]	1.07E-3	2.64E-6	1.31E-6	0.00E+0	1.32E-6	3.36E-5	1.79E-4	-2.27E-4
ODP	[kg CFC11-Eq.]	2.49E-14	1.17E-17	1.61E-17	0.00E+0	5.84E-18	2.21E-15	2.37E-16	-9.93E-17
AP	[mol H^+-Eq.]	3.12E-3	1.04E-4	1.30E-5	0.00E+0	5.17E-5	3.17E-4	4.34E-4	-1.94E-4
EP-freshwater	[kg P-Eq.]	1.15E-6	2.38E-8	2.21E-9	0.00E+0	1.18E-8	7.89E-8	1.02E-7	-1.07E-7
EP-marine	[kg N-Eq.]	1.15E-3	3.16E-5	3.60E-6	0.00E+0	1.58E-5	8.39E-5	1.13E-4	-6.97E-5
EP-terrestrial	[mol N-Eq.]	1.27E-2	3.51E-4	6.24E-5	0.00E+0	1.75E-4	8.99E-4	1.24E-3	-7.83E-4
POCP	[kg NMVOC-Eq.]	3.32E-3	9.27E-5	9.45E-6	0.00E+0	4.62E-5	2.38E-4	3.42E-4	-1.84E-4
ADPE	[kg Sb-Eq.]	1.95E-7	3.33E-9	2.30E-10	0.00E+0	1.66E-9	2.43E-8	5.76E-9	-4.66E-9
ADPF	[MJ]	5.07E+1	1.57E+0	1.71E-2	0.00E+0	7.85E-1	4.07E+0	8.09E-1	-1.15E+0
WDP	[m^3 world-Eq deprived]	3.47E-1	2.18E-4	7.34E-3	0.00E+0	1.08E-4	1.57E-2	6.55E-3	-3.95E-3

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 m² Gipsplatten

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	[MJ]	3.62E+0	4.96E-3	3.92E-3	0.00E+0	2.48E-3	4.19E-1	1.09E-1	-4.96E-2
PERM	[MJ]	3.23E+1	0.00E+0	-5.58E-1	0.00E+0	0.00E+0	-3.17E+1	0.00E+0	0.00E+0
PERT	[MJ]	3.59E+1	4.96E-3	-5.55E-1	0.00E+0	2.48E-3	-3.13E+1	1.09E-1	-4.96E-2
PENRE	[MJ]	5.07E+1	1.58E+0	1.71E-2	0.00E+0	7.86E-1	4.07E+0	8.10E-1	-1.15E+0
PENRM	[MJ]	8.00E-3	0.00E+0	-8.00E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PENRT	[MJ]	5.07E+1	1.58E+0	9.16E-3	0.00E+0	7.86E-1	4.07E+0	8.10E-1	-1.15E+0
SM	[kg]	2.52E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	8.19E+0
RSF	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	[m^3]	1.25E-2	8.90E-6	1.73E-4	0.00E+0	4.44E-6	9.16E-4	2.00E-4	-1.40E-4

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 m² Gipsplatten

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	[kg]	9.09E-9	1.53E-10	3.81E-12	0.00E+0	7.62E-11	4.89E-10	8.60E-11	-2.11E-8
NHWD	[kg]	1.98E-2	1.61E-4	4.84E-4	0.00E+0	8.04E-5	7.64E-4	4.04E+0	-3.05E-4
RWD	[kg]	1.73E-3	1.69E-6	4.81E-7	0.00E+0	8.44E-7	6.58E-4	8.50E-6	-3.14E-5
CRU	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MFR	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.07E+1	0.00E+0	0.00E+0
MER	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EEE	[MJ]	0.00E+0	0.00E+0	8.91E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EET	[MJ]	0.00E+0	0.00E+0	2.09E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0

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; EET = Exported thermal energy

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

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	[Disease Incidence]	1.15E-7	5.63E-10	6.97E-11	0.00E+0	2.81E-10	2.89E-9	5.40E-9	-5.11E-8
IRP	[kBq U235-Eq.]	1.26E-1	2.42E-4	4.45E-5	0.00E+0	1.21E-4	9.62E-2	8.94E-4	-3.15E-3
ETP-fw	[CTUe]	7.53E+0	1.12E+0	6.79E-3	0.00E+0	5.57E-1	1.25E+0	4.61E-1	-4.08E-1
HTP-c	[CTUh]	4.84E-10	2.10E-11	4.84E-13	0.00E+0	1.05E-11	2.09E-11	6.80E-11	-1.06E-11
HTP-nc	[CTUh]	3.19E-8	8.92E-10	1.82E-11	0.00E+0	4.45E-10	1.15E-9	7.51E-9	-6.25E-10
SQP	[-]	3.16E+1	4.05E-3	5.04E-3	0.00E+0	2.02E-3	3.37E-1	1.63E-1	-1.38E-1

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

Limitation note 1 - applies to the indicator "Potential effect from human exposure to U235". This impact category mainly addresses the potential effect of low dose ionizing radiation on human health in the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents and occupational exposure, nor does it consider effects due to radioactive waste disposal in underground facilities. Potential ionizing radiation emitted from soil, radon, and some building materials is also not measured by this indicator.

Limitation Note 2 - applies to the indicators: "Potential for Abiotic Resource Depletion for Non-Fossil Resources," "Potential for Abiotic Resource Depletion for Fossil Resources," "Water Depletion Potential (User), Depletion-Weighted Water Use," "Potential Ecosystem Toxicity Comparison Unit," "Potential Human Toxicity Comparison Unit - Carcinogenic Effect," "Potential Human Toxicity Comparison Unit - Non-Carcinogenic Effect," "Potential Soil Quality Index." The results of this environmental impact indicator must be used with caution, as the uncertainties in these results are high or because there is limited experience with the indicator.

6. LCA: Interpretation

To facilitate comprehension of the life cycle assessment, both the relevant indicators of the life cycle inventory and the indicators of the impact assessment declared in section 5 “LCA results” have to be interpreted in a dominance analysis.
An illustration of the results with figures is recommended, e.g. for the dominance analysis, the distribution of impacts across the modules, the CO_2-balance, etc. as appropriate for a reader to understand the environmental profile of the declared product.
The interpretation shall also include a description of the time frame and/or variability of the LCIA results (in qualitative or quantitative terms) if the EPD is valid for several products or producers.

7. Requisite evidence

As a general rule, all statements must be documented with measured data (presented by the corresponding test certificates). The methods of evidence and the test conditions have to be described together with the results.

If substances are not detected, the limit of detection must be included in the declaration.

Interpreting statements such as “… free of …” or “… are entirely harmless …” are not allowed.

If evidence required by the specific PCR part B is not provided, this has to be justified under the respective title for the required evidence.

If relevant for the scope of application of the declared product, or if derivable from its material composition, it is recommended to provide additional adequate evidence.

Information and explanation on the representativeness of requisite evidence has to be given in the project report for all members of the association.

7.1 Leaching (sulphate + heavy metals)
Eluate analysis to DIN 38414, Part 4 or the trough method as per the LAGA Directive EW 98 T as regards the allocation criteria for landfill classes as per DepV and VVerDR (2009). The procedure applied must be documented.
Measuring agency / Protocol / Date / Result

7.2 Radioactivity
Measurement of the nuclide content in Bq/kg for Ra-226, Th-232, K-40. In Germany, there are currently no statutory limit values specified for assessing the radioactivity of building materials. Assessment can be performed on the basis of:
- EU Commission "Radiation Protection 112" document
- OENORM 5200
- Nordic Countries' Recommendation 2000.

7.3 VOC emissions
Optional for products which are exclusively used in outdoor applications.
Test procedure in line with the AgBB diagram indicating the measuring agency, date and results as a range of values. At least the following must be declared:

AgBB-Ergebnisüberblick (28 Tage [µg/m³])

Name	Value	Unit
TVOC (C6 - C16)	-	µg/m³
Sum SVOC (C16 - C22)	-	µg/m³
R (dimensionless)	-	-

VOC without NIK	-	µg/m³
Carcinogenic Substances	-	µg/m³

AgBB-Ergebnisüberblick (3 Tage [µg/m³])

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

8. References

Standards

EN 318
DIN EN 318:2002, Wood-based materials - Determination of dimensional changes in connection with changes in relative humidity.

EN 15804
EN 15804+A2:2019+AC:2021, Sustainability of construction
works — Environmental Product Declarations — Core rules for the product category of construction products.

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

Software

GaBi ts
GaBi 10.5 dataset documentation for the softwaresystem and databases, Sphera Solutions GmBH, Leinfelden-Echterdingen, 2021 (http://documentation.gabi-software.com/)

PCR

PCR Part A
Institut Bauen und Umwelt e.V., Berlin (Hrsg.): Product Category Rules for Building-Related products and services. Part A: Calculation rules for life cycle assessment and requirements for the Project report according to EN 15804+A2:2019 (v1.2). 17.11.2021.

PCR Part B
Institut Bauen und Umwelt e.V., Berlin (Hrsg.): Product Category Rules for Building-Related products and services. Part B: Requirements for the EPD for gypsum boards, v1.7, 2019.

Further literature

IBU 2021
Institut Bauen und Umwelt e.V.: Allgemeine Anleitung für das EPD-Programm des Institut Bauen und Umwelt e.V., Version 2.0, Berlin: Institut Bauen und Umwelt e.V., 2021 www.ibu-epd.com.

REGULATION (EU) No. 305/2011
REGULATION (EU) No. 305/2011 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 9 March 2011 laying down harmonized conditions for the marketing of construction products and repealing Council Directive 89/106/EEC; and Council; OJ EU L88/5, 4.4.2011.

ECHA 2021
European Chemicals Agency (ECHA)
Candidate List of Substances of Very High Concern for Authorisation (published in accordance with Article 59(10) of the REACH Regulation)
http://echa.europa.eu/de/candidate-list-table , Stand: 16. April 2021.

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

Tel +49 (0)30 3087748- 0
Fax +49 (0)30 3087748- 29
Mail info@ibu-epd.com
Web **www.ibu-epd.com**

Programme holder
Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

Tel +49 (0)30 - 3087748- 0
Fax +49 (0)30 – 3087748 - 29
Mail info@ibu-epd.com
Web **www.ibu-epd.com**

Author of the Life Cycle Assessment
Sphera Solutions GmbH
Hauptstraße 111- 113
70771 Leinfelden-Echterdingen
Germany

Tel +49 711 341817-0
Fax +49 711 341817-25
Mail info@sphera.com
Web **www.sphera.com**

Owner of the Declaration
James Hardie Europe GmbH
Bennigsen-Platz 1
40474 Düsseldorf
Germany

Tel 0800 3864001
Fax -
Mail Kontakt@jameshardie.de
Web **www.jameshardie.eu**

ANNEX 1: Self declaration from EPD owner

Specific requirements

1 Applied electricity data set used in the manufacturing phase

The electricity mix for the electricity used in manufacturing (A3) is the electricity grid mix

<xxxxxx CO_2 eqv/MJ>

2 Transport from the place of manufacture to a central warehouse

Transport distance, and CO_2-eqv./DU from transport of the product from factory gate to central warehouse in Oslo shall be given. The following table shall be included in the EPD:

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy use	Unit	Value (l/t)	Kg CO2-eqv./DU
Boat							
Truck	60	Truck EURO 6, 16- 32 t	100	Diesel	l/100km	0,04 l/tkm	1.16E-1
Railway							
Rail							
Air							
Total							

3 Impact on the indoor environment

- [x] Indoor air emission testing has been performed; specify test method and reference; M1, Yes, by ECO institute – see Certificate in the annex.
- [ ] No test has being performed
- [ ] Not relevant; specify _____