

Environmental Product Declaration



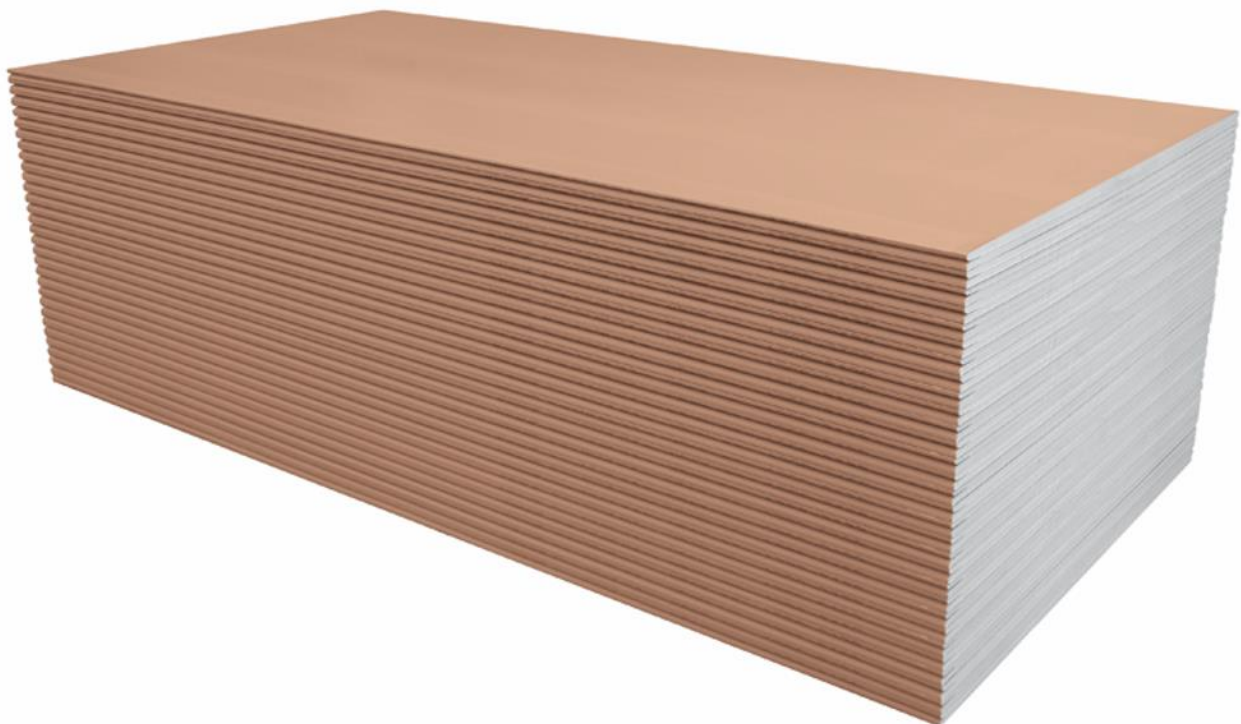
In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

Knauf Brown 12.5mm

from

Programme:	The International EPD System, www.environdec.com
Programme operator:	EPD International AB
Type of EPD:	EPD of a single product from a manufacturer
EPD registration number:	EPD-IES-0025227
Version date:	2025-07-30
Validity date:	2030-07-30

An EPD may be updated or depublished if conditions change. To find the latest version of the EPD and to confirm its validity, see www.environdec.com



GENERAL INFORMATION

Programme Information	
Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	support@environdec.com

Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): <i>Construction Products, PCR 2019:14 Version 2.0.1</i>
PCR review was conducted by: <i>The Technical Committee of the International EPD System. See www.environdec.com for a list of members. Review chair - Rob Rouwette, co-chair - Noa Meron</i>
c-PCR: <i>c-PCR-031 Gypsum-based construction products (EN 17328:2024) Version 1.0.0</i>

Third-party Verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:
☒ Individual EPD verification without a pre-verified LCA/EPD tool Third-party verifier: <i>Elisabet Amat Guasch, GREENIZE</i> Approved by: International EPD System
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but published in different EPD programmes, may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit version number) or be based on fully aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterisation factors); and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

INFORMATION ABOUT EPD OWNER

Owner of the EPD:

KNAUF SIA

Address:

Institūta iela 108, Saurieši, Stopiņu pag., Ropažu nov., Latvija, LV-2118

Contact:

Arturs Prieditis, Quality manager

+371 29164434, Arturs.Prieditis@knauf.com

Address and contact information of the LCA practitioner commissioned by the EPD owner, if applicable:

Aleksandrs Šiškins, Bureau Veritas Latvia SIA, riga@bureauveritas.com

Description of the organisation:

Knauf is one of the world's leading manufacturers of building materials, operating in more than 60 countries with over 300 production facilities and employing more than 23000 people. In 2023, the company's turnover reached €15.4 billion.

Knauf offers a wide range of products, including gypsum boards, plasters, insulation materials, and other construction materials that meet the highest quality standards. The company actively engages in sustainable construction, providing eco-friendly materials with "Green Certificates" and supporting the BREEAM sustainable construction assessment method.

The Knauf Latvia plant in Saurieši, opened in 1997. 1997 opened profile production, 1998 gypsum plasters, 2000 gypsum plasters. 2006 Cement base powder products, 2011 perlite production, now plant produces high-quality perlite, significantly reducing production costs and offering customers competitive prices. 2017 company invest in gypsum recycling equipment. And 2018 build ready mix line. The company has been recognized for its excellent reputation, ranking first in the Latvian Company Reputation Top for the mining and manufacturing industry in 2007. In 2024 company win "Export champion" award.

Knauf Latvia continues to develop while implementing energy-efficient production processes and reducing CO₂ emissions, demonstrating its commitment to environmental protection.

Product-related or management system-related certifications:

Company has following Management systems and Product certificates:

- Quality management system, according to ISO 9001:2015
- Environmental management system, according to ISO 14001:2015
- Energy management system, according to ISO 50001:2018
- Occupational health and safety management system, according to ISO 45001:2018
- EN 520:2004+A1:2009. Gypsum plasterboards - Definitions, requirements and test methods
- DIN 18180:2014-09. Gypsum plasterboards - Types and requirements.

PRODUCT INFORMATION

Product name:

Knauf Brown 12.5mm gypsum plasterboard for floor

UN CPC code:

314 – Boards and panels

Product description:

Gypsum plasterboard is a lightweight, durable construction material consisting of a gypsum core encased in high-quality paper. It is designed for creating walls, ceilings, and partitions in residential and commercial buildings. It provides a smooth surface for decorative finishes such as plaster or paint, while offering excellent sound insulation and fire resistance.

Knauf Brown is especially durable gypsum plasterboard for floors with increased core strength. Gypsum plasterboard for floors Knauf pre-fab floor screed consists of two layers of special gypsum plasterboard with high strength that are glued and stapled to each other on site. Knauf Brown is suitable for:

- rooms and halls in residential buildings, hospital wards, hotel rooms including their kitchens and bathrooms
- halls in office buildings, offices, surgeries w/o heavy equipment, station waiting rooms, recreation rooms including halls, salesroom areas up to 50 m², ground floor areas in residential buildings, office buildings and similar facilities.

Suitable for:

- Underfloor heating
- Chair roll resistance with ≥ 2 mm Knauf N 410
- Pre-fabricated parquet flooring and mosaic parquet flooring
- Carpets
- PVC and linoleum
- Parquet flooring on insulation layer
- Tiles, max. 330 mm x 330 mm.

For indoor use.

Technical parameters

Board type:		GKF DFIR	DIN 18180 EN 520
Reaction to fire EN 13501-1:		A2-s1,d0 (B)	EN 520
Thermal conductivity λ:	W/(m.K)	0.25	EN ISO 10456
Density:	kg/m ³	≥ 960	EN 520
Board weight:	kg/m ²	≥ 10	EN 520

Name and location of production site(s):

Institūta iela 108, Saurieši, Stopiņu pag., Ropažu nov., Latvija, LV-2118

References to any relevant websites for more information or explanatory materials:

<https://knauf.com/lv-LV>

CONTENT DECLARATION

Product content and packaging materials in the Tables below are displayed per Declared unit (1 m²):

Product content	Mass, kg	Post-consumer recycled material, mass-% of product	Biogenic material	
			mass-% of product	kg C/DU
Plasterboard liner	0,5	92,8%	100,0%	0,23 kg C
Stucco	10,7	0%	0,0%	0 kg C
Additives	0,2	0%	0,0%	0 kg C
Water	1,4	0%	0,0%	0 kg C
TOTAL	12,7	3,3%	1,8%	0,23 kg C

Packaging materials	Mass, kg	Mass-% (versus the product)	Biogenic material, kg C/DU
Wooden pallets	0,3	2,4%	0,14
Steel corners	<0,01	<0,01%	0,00
Plastic straps	<0,01	<0,01%	0,00
Cardboard corners	<0,01	<0,01%	<0,01
Packaging film	<0,01	<0,01%	0,00
Stretch film	<0,01	<0,01%	0,00
TOTAL	0,3	2,4%	0,14

1 kg biogenic carbon in the product/packaging is equivalent to the uptake of 44/12 kg of CO₂.

During the life cycle of the product any hazardous substance listed in the "Candidate List of Substances of Very High Concern (SVHC) for authorization" has not been used in a percentage higher than 0,1% of the weight of the product.

LCA INFORMATION

Declared unit:

1m² of installed Knauf Brown 12.5mm gypsum plasterboard

Weight of the declared unit – 12.7 kg, conversion factor to 1 kg – 0.0786

Reference service life:

According to EN 17328:2024, there are no influences on ageing when the recognized codes of application are followed for gypsum products. Therefore, the technical performance characteristics of gypsum-based products are usually based on a minimum service life of 50 years.

Time representativeness:

Data represents the manufacturing of the product in 2023. The database used for proxy data is Ecoinvent v3.10. This database data is compiled in March 2024, i.e., no data is older than ten years.

Geographical scope:

This EPD has a European Scope.

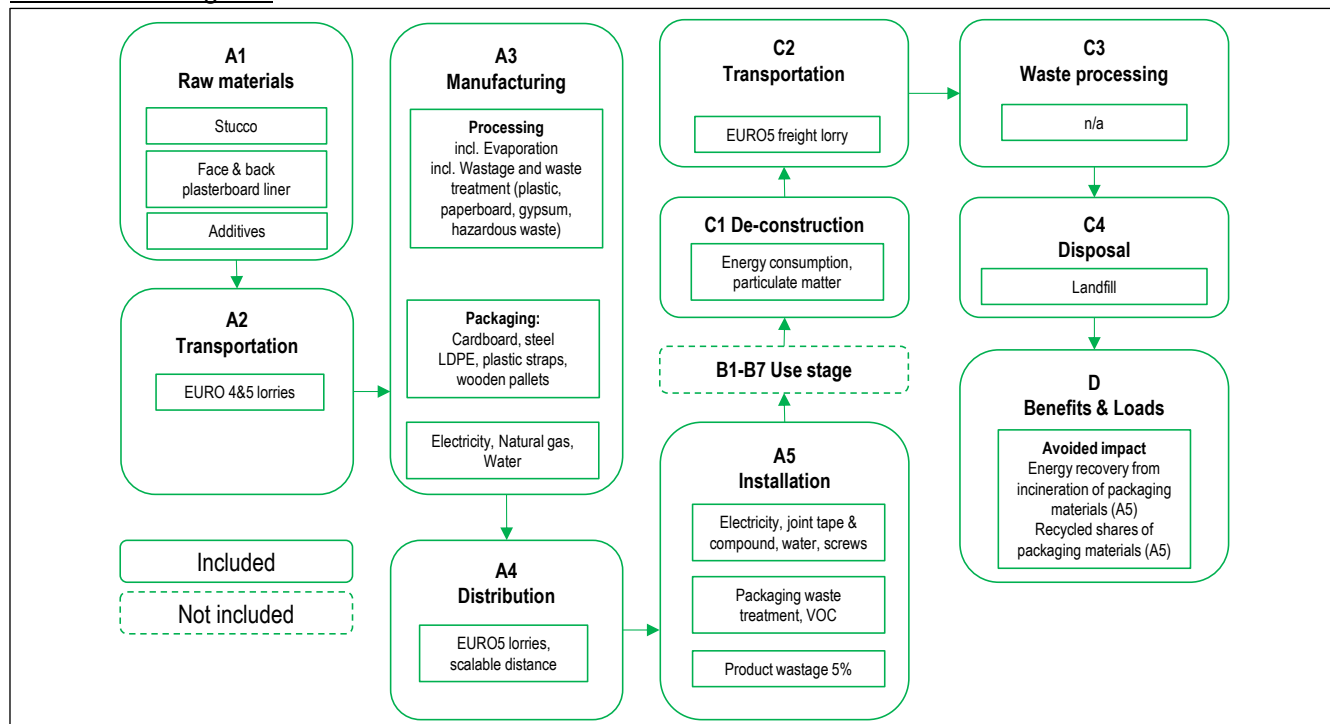
Database(s) and LCA software used:

Ecoinvent v3.10 has been used to conduct the quantitative evaluation in this study. This database provided the background system's life cycle inventory data for raw and processed materials. The LCA software used - SimaPro 9.6.

Description of system boundaries:

This LCA study has been performed as “Cradle to gate with options, modules C1–C4, module D and with optional modules”, also considering Transportation module A4 and Installation module A5.

Process flow diagram:



Data quality:

The foreground data has been collected internally, considering the latest available average production amounts and measurements during the time period of 2023. Data regarding waste processing has been taken from waste scenarios for closest locations in Ecoinvent v3.10. The quality level in this study is qualified as Very good. Data quality rating procedure has been performed using a rating system where “1” means Excellent quality, and “5” means Poor quality.

Technological Representativeness, TeR	Geographic representativeness, GeR	Time Representativeness, TiR	Precision, P	Average DQR
1,4	1,8	2,0	2,3	1,9

Process	Source type	Source	Reference year	Data category	Share of primary data, of GWP-GHG results for A1-A3
Transport of raw materials and packaging to the production site	Collected data	EPD owner, Ecoinvent v3.10	2023-2024	Primary data, secondary data	6%
SpreeGips Plasterboard Liner from Hamburger Containerboard GmbH	EPD	S-P-12187	2024	Primary data, secondary data	2%
UNIPLAC Plasterboard Liner from Moritz J. Weig GmbH	EPD	S-P-08304	2023	Primary data, secondary data	6%
Manufacturing of product	Collected data	EPD owner	2023	Primary data	44%
Generation of electricity used in manufacturing of product	Database	Ecoinvent v3.10	2024	Primary data	
Production of packaging	Database	Ecoinvent v3.10	2023-2024	Primary data, secondary data	
Other processes	Database	Ecoinvent v3.10	2024	Secondary data	0%
Total share of primary data, of GWP-GHG results for A1-A3					58%

Cut-off criteria:

To LCA practitioner knowledge there is no missing data for processes within the system boundaries. All the materials and processes which have been accounted for by the manufacturing company for the relevant manufacturing process are included in the LCI. The cut-off in LCA is according to PCR:” General cut-off criteria are given in standard EN 15804:2012+A2, clause 6.3.6.

The processes related to infrastructure, construction, and production of equipment, as well as tools that are not directly consumed in the production process, have been excluded. Personnel-related activities, such as transportation to and from work, have also been excluded.

Allocation:

General allocation principles have been applied according to ISO 14044:2006 4.3.4 and in line with the provisions of EN 15804:2012+A2. Inputs and outputs are allocated equally among all products using production volumes. The methodological choices for allocation for reuse, recycling and recovery have been set according to the polluter pays principle (PPP).

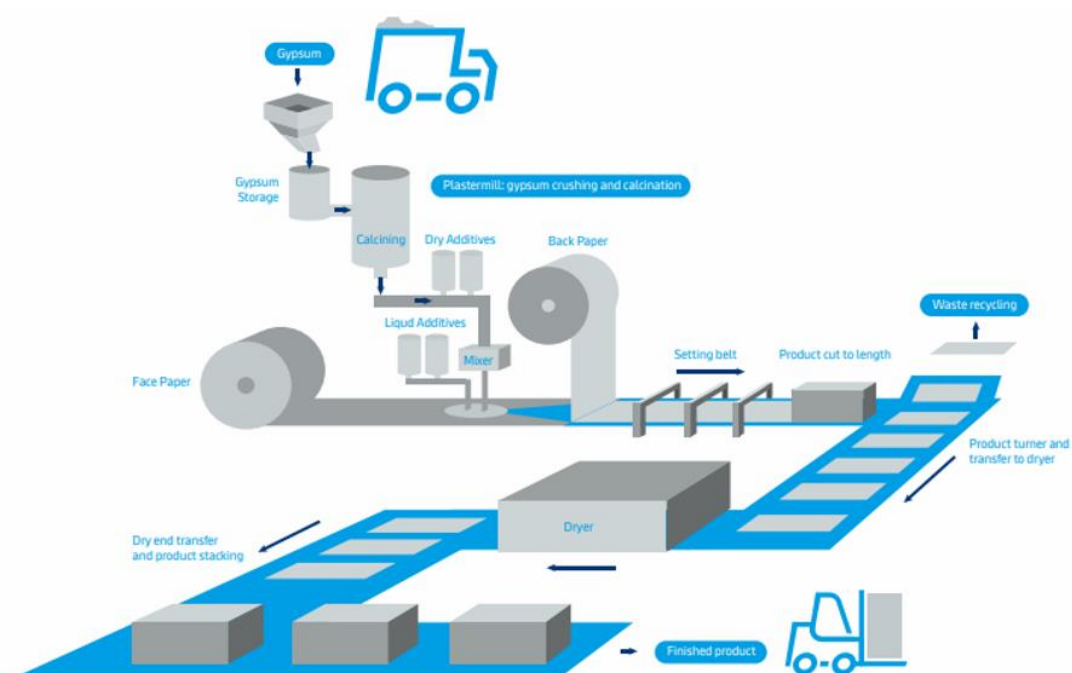
Stages and Production description

Product Stage

In **module A1** extraction and processing of raw materials and generation of electricity and heat from primary energy resources, used to produce these raw materials, are included. Gypsum plasterboards consist of a gypsum core which also contains additives. These additives in total add up to 1.6% of the overall mass of the declared plasterboard. The natural gypsum is mainly extracted from open-cast mining in close vicinity (7 km) to the manufacturing site. After extraction it is pre-processed, i.e., crushed, dried, milled and converted to stucco. Plasterboard liner used as a cover of gypsum core from both sides is produced from post-consumer scrap wastepaper, as per EPD from supplier.

For **module A2**, the transportation of raw materials and product's packaging materials to the production plant has been considered. Following conservative approach, EURO5 16-32t freight lorry has been assumed as a road transportation mode. One of the additives is supplied from Asia, therefore, it requires the use of Sea containership as well. Other additives, face and back liner are supplied from European countries, while Gypsum itself is supplied from quarry near (7 km) production plant.

Natural gypsum that has been calcinated to stucco is mixed (**module A3**) with other dry components. Afterwards stucco and additives are mixed with water and spread on a continuous sheet of plasterboard liner (face paper). The slurry is covered with a second sheet of plasterboard liner (back paper) and the edges of the liner are glued together. On the subsequent board production line, the gypsum sets continuously, and the boards are dried using heat from Natural gas. Drying is followed by the cutting of the boards to the desired length, while off-cuts are sent back to the calcination step as a substitute of virgin material. Finally, gypsum boards are piled up on wooden pallets, protected against damage by steel angles and cardboard corners, fastened with plastic straps and wrapped with plastic packaging film. Electricity consumed during manufacturing is modelled as National residual grid mix of Latvia. GWP-GHG of this particular dataset is 0.625 kg CO₂eq/kWh. Waste treatment of the disposed part of gypsum (landfill) and the packaging of raw materials is also considered in module A3, following manufacturer declared scenarios and national waste scenarios per each waste type.



Construction process Stage

Product is intended for Baltic states and, therefore, a distance of 100 km has been assumed. This allows the user of EPD to extrapolate results of module A4 to the distance from the production site to any construction site. Table below describes considered scenario for **module A4** transportation of the final product with its respective packaging.

Vehicle	kg per DU	Distance, km	Fuel consumption, l/tkm	Value, l/t
Lorry 16-32t, EURO5	1,30E+01	100	0,0441	4,41

Module A5 in this type of LCA study is optional but for the purpose of declaring product wastage, consumed resources, energy and waste treatment of product's packaging, it has been declared as well.

According to EN 17328:2024, material wastage of gypsum-based products should be estimated based on information from the manufacturer and information of relevance for the intended market. Since no estimate is available due to the lack of data, **5% product wastage has been considered**.

The following assumptions on installation materials and resources have been made, per declared unit of 1 m²:

Jointing compound	kg	0,280
Water	l	0,168
Jointing tape	kg	0,006
Screws	kg	0,018
Electricity for tools	kWh	0,003
VOC	g	0,383
Product wastage	%	5,0

Product wastage is considered for Landfill, while packaging materials have been modelled in accordance with EU-27 municipal waste treatment scenario as follows:

Material	Recycling	Incineration	Disposal
Paperboard	82.3%	9.3%	8.4%
Plastics	41.0%	31.2%	27.8%
Steel	78.0%	11.6%*	10.4%
Wood	n/a	100%	n/a

*Incineration without energy recovery

Use Stage:

Modules B1-B7, that define use stage of the product, are not declared for this study – these are not mandatory for LCA “Cradle-to-gate with options” form.

The product has a reference service life of 50 years, assuming no specific requirements for maintenance, repair, replacement, or refurbishment throughout this period. Therefore, no impact is generated at this stage.

End of Life Stage:

Modules C1-C4 and Module D are mandatory for LCA type considered, therefore, have also been considered for the purpose of this study. According to EN 17328:2024, if no data for recycling is available, **landfilling** shall be modelled as default end-of-life option. Default data for modelling modules C1-C4 has been considered in accordance with PCR 2019:14 v.2.0.1.

For the purpose of declaring **module C1**, both consumption of energy (1.1 kWh/t) and the impact of demolition (particulate emissions) have been considered.

Plasterboards are assumed to be sent (**module C2**) to the closest waste treatment facilities, assuming 80km distance between sites that is covered by 16-32t EURO5 Freight lorry.

Waste processing, **module C3**, generates no impact since the common waste treatment scenario for gypsum plasterboard is Landfill.

Disposal of the gypsum plasterboard, **module C4**, has been assumed to be conducted via landfilling. Shares of both gypsum and plasterboard liner have been considered to represent the environmental impact of these activities more accurately. Energy necessary for compacting of waste has been considered using default value of 1.6 kWh/t.

Benefits and loads beyond the system boundaries:

Module D considers the benefit of recovered energy from incineration of plastic, paper, cardboard and wooden pallets, i.e., respective shares of the product packaging waste flows declared in Installation module A5. Net Energy generated from Incineration activities has been considered for product's market split (Estonia 23%, Lithuania 49%, Latvia 28%) as follows:

- for Electric energy (3.93 MJ/kg for plastic, 1.99 MJ/kg for cardboard and paper, 1.74 MJ/kg for wood)
- Natural gas for thermal energy (7.67 MJ/kg for plastic, 3.99 MJ/kg for cardboard and paper, 3.50 MJ/kg for wood).

Modules declared, geographical scope, share of primary data (in GWP-GHG results) and data variation (in GWP-GHG results):

	Product stage			Distribution/ installation stage		Use stage							End-of-life stage				Beyond product life cycle
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling- potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	EU	EU	LV	EU	EU	ND	ND	ND	ND	ND	ND	ND	EU	EU	EU	EU	EU
Share of primary data	>58%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

ENVIRONMENTAL PERFORMANCE

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks. The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3).

Mandatory impact category indicators according to EN 15804 (EF 3.1 reference package)

Results per declared unit – 1 m ² of installed Knauf Brown 12.5mm gypsum plasterboard									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq.	2,58E+00	2,02E-01	2,41E-01	4,72E-03	1,58E-01	0,00E+00	4,13E-02	-1,59E-01
GWP-fossil	kg CO ₂ eq.	2,57E+00	2,02E-01	2,40E-01	4,72E-03	1,58E-01	0,00E+00	4,13E-02	-1,59E-01
GWP-biogenic	kg CO ₂ eq.	5,52E-04	7,61E-06	1,38E-04	2,03E-07	5,94E-06	0,00E+00	3,28E-06	-3,51E-05
GWP-luluc	kg CO ₂ eq.	5,12E-03	4,97E-06	4,49E-04	1,64E-07	3,88E-06	0,00E+00	1,68E-06	-3,64E-05
ODP	kg CFC 11 eq.	9,80E-08	4,12E-09	6,13E-09	7,43E-11	3,22E-09	0,00E+00	6,20E-10	3,31E-12
AP	mol H ⁺ eq.	6,44E-03	5,03E-04	8,32E-04	4,41E-05	3,93E-04	0,00E+00	3,77E-04	-3,22E-04
EP-freshwater	kg P eq.	6,80E-05	1,69E-07	8,56E-06	4,46E-09	1,32E-07	0,00E+00	1,28E-07	-2,81E-06
EP-marine	kg N eq.	1,87E-03	1,93E-04	2,35E-04	2,08E-05	1,51E-04	0,00E+00	1,73E-04	-7,00E-05
EP-terrestrial	mol N eq.	2,20E-02	2,11E-03	2,65E-03	2,27E-04	1,65E-03	0,00E+00	1,89E-03	-7,72E-04
POCP	kg NMVO C eq.	8,33E-03	8,77E-04	1,01E-03	6,76E-05	6,85E-04	0,00E+00	5,70E-04	-3,43E-04
ADP-minerals&metals*	kg Sb eq.	9,96E-06	6,67E-09	7,50E-07	1,97E-10	5,21E-09	0,00E+00	1,65E-09	-1,07E-09
ADP-fossil*	MJ	4,07E+01	2,67E+00	3,33E+00	6,22E-02	2,08E+00	0,00E+00	5,33E-01	-2,47E+00
WDP*	m ³	8,12E-01	1,13E-03	8,19E-02	4,91E-05	8,85E-04	0,00E+00	4,71E-04	-1,27E-02
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption								

* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

Biogenic CO₂ emissions and uptakes are balanced out in each individual module.

Additional mandatory and voluntary impact category indicators

Results per declared unit – 1 m ² of installed Knauf Brown 12.5mm gypsum plasterboard									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-GHG ¹	kg CO ₂ eq.	2,58E+00	2,02E-01	2,40E-01	4,72E-03	1,58E-01	0,00E+00	4,13E-02	-1,59E-01
PM	Disease inc.	7,31E-08	1,33E-08	1,22E-08	9,57E-08	1,04E-08	0,00E+00	1,07E-08	-1,63E-09
IRP	kBq U-235 eq.	4,37E-02	3,63E-04	3,66E-03	5,56E-06	2,84E-04	0,00E+00	5,53E-05	-5,69E-03
ETP-fw	CTUe	1,27E+01	9,05E-02	2,29E+00	2,15E-03	7,06E-02	0,00E+00	2,38E-02	-5,77E-01
HTP-c	CTUh	2,69E-08	1,52E-11	5,88E-09	3,29E-13	1,19E-11	0,00E+00	7,81E-12	-1,46E-09
HTP-nc	CTUh	9,50E-09	1,33E-09	2,03E-09	4,69E-12	1,04E-09	0,00E+00	5,27E-11	-3,98E-10
SQP	dimensionless	4,40E+01	5,97E-03	3,51E+00	1,32E-04	4,66E-03	0,00E+00	5,24E-01	-1,05E-01
Acronyms	PM = Particulate matter emissions; IRP = Ionising radiation, human health; ETP-fw = Ecotoxicity, freshwater; HTP-c = Human toxicity, cancer effects; HTP-nc = Human toxicity, non-cancer effects; SQP = Potential Soil quality index								

Resource use indicators

Results per declared unit – 1 m ² of installed Knauf Brown 12.5mm gypsum plasterboard									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	1,42E+00	8,27E-03	1,26E-01	1,23E-04	6,46E-03	0,00E+00	1,32E-03	-8,39E-02
PERM	MJ	8,24E+00	9,87E-04	6,01E-01	1,35E-05	7,71E-04	0,00E+00	1,14E-03	-1,46E-02
PERT	MJ	9,66E+00	9,26E-03	7,27E-01	1,37E-04	7,23E-03	0,00E+00	2,46E-03	-9,86E-02
PENRE	MJ	4,07E+01	2,67E+00	3,33E+00	6,22E-02	2,08E+00	0,00E+00	5,33E-01	-2,47E+00
PENRM	MJ	1,42E-02	3,33E-07	9,67E-04	1,45E-07	2,60E-07	0,00E+00	1,57E-06	-4,30E-06
PENRT	MJ	4,08E+01	2,67E+00	3,33E+00	6,22E-02	2,08E+00	0,00E+00	5,33E-01	-2,47E+00
SM	kg	4,59E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m ³	3,04E-02	6,84E-05	2,72E-03	1,95E-06	5,34E-05	0,00E+00	1,82E-05	-1,45E-03
Acronyms	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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water								

¹ This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO₂ is set to zero.

Waste indicators

Results per declared unit – 1 m ² of installed Knauf Brown 12.5mm gypsum plasterboard									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste disposed	kg	1,67E-03	1,77E-05	9,21E-05	4,27E-07	1,38E-05	0,00E+00	3,55E-06	-8,70E-06
Non-hazardous waste disposed	kg	7,71E-01	7,93E-05	6,76E-01	1,78E-06	6,19E-05	0,00E+00	1,27E+01	-5,24E-04
Radioactive waste disposed	kg	3,60E-05	2,51E-07	2,80E-06	3,18E-09	1,96E-07	0,00E+00	3,20E-08	-3,75E-06

Output flow indicators

Results per declared unit – 1 m ² of installed Knauf Brown 12.5mm gypsum plasterboard									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
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	0,00E+00
Material for recycling	kg	6,83E-05	0,00E+00	8,91E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+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	0,00E+00
Exported energy, electricity	MJ	3,07E-06	0,00E+00	5,67E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, thermal	MJ	6,08E-06	0,00E+00	1,14E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Biogenic carbon content

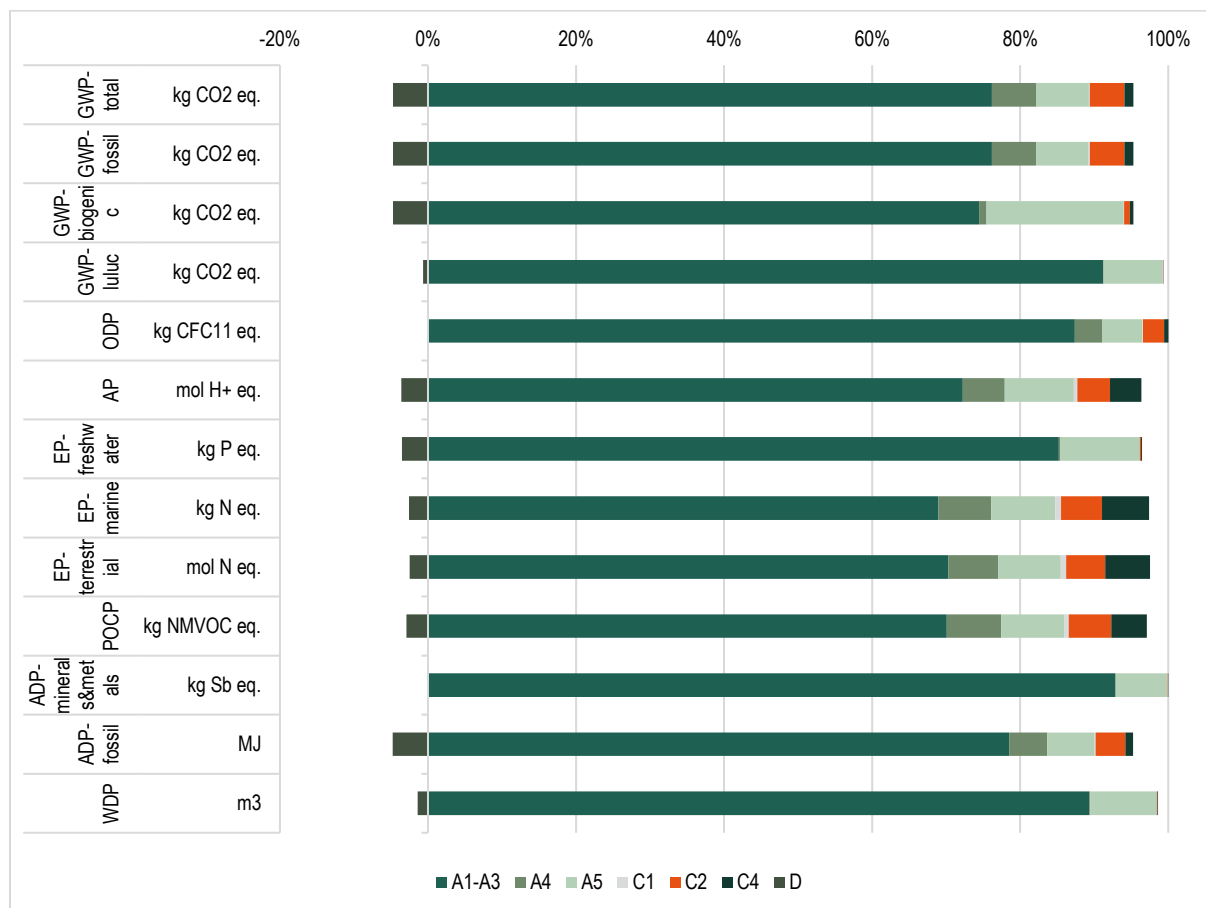
Results per declared unit – 1 m ² of installed Knauf Brown 12.5mm gypsum plasterboard	
Biogenic carbon content	Quantity
Carbon content in product, kg C	2,30E-01
Carbon content in accompanying packaging, kg C	1,41E-01

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

LCA Interpretation

The estimated impact assessment results are only relative statements that do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins, or risks.

Contribution to environmental impact per each module for the declared unit of **1 m² of installed Knauf Brown 12.5mm gypsum plasterboard** is displayed in following Figure:



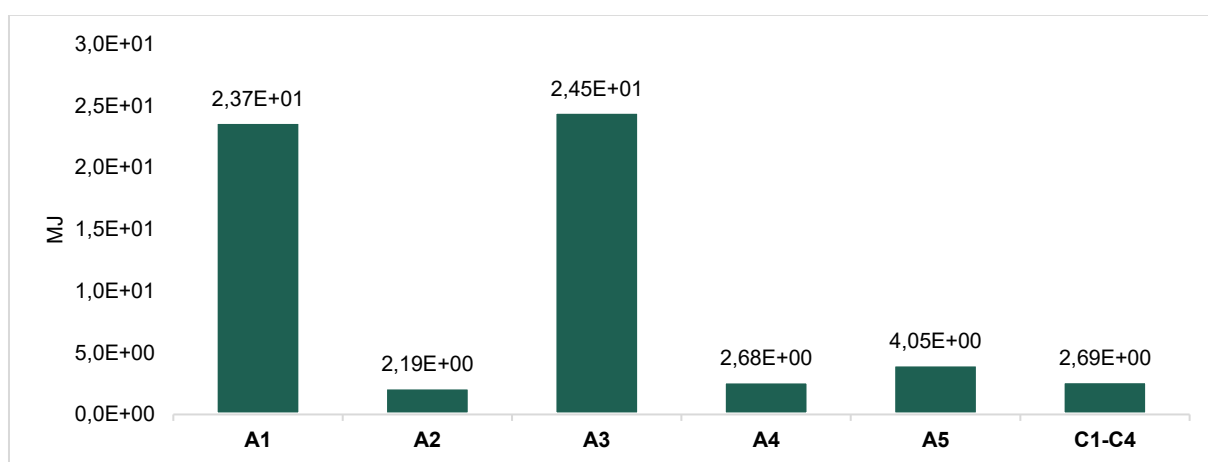
Contribution to environmental impact per each module for 1 m² of installed Knauf Brown 12.5mm gypsum plasterboard

With regard to Climate change, the highest impact is generated in Raw material module A1 and Manufacturing module A3, resulting in respective 40% and 35% shares of the total impact, while whole **Product stage A1-A3 is generating 80%**. Since considered product is intended for Baltic states, Installation/Construction stage A4-A5 is generating less significant share, resulting only in 14% of the total Global warming potential. End-of-Life stage C1-C4 is generating 6% of the total GWP impact, representing demolition, transportation and landfilling activities. Without any exclusions **Product stage A1-A3 is the main driver** for all considered impact categories.

Nevertheless, it is necessary to note that there is a positive impact of module, especially in such impact categories as Global warming potential, Abiotic depletion potential (fossil) and Eutrophication potential (freshwater). Module D accounts for avoided impact of generated energy, both Electric and Thermal, from incineration of packaging materials (A5) and partial recycling of such packaging materials as steel, paperboard and plastic.

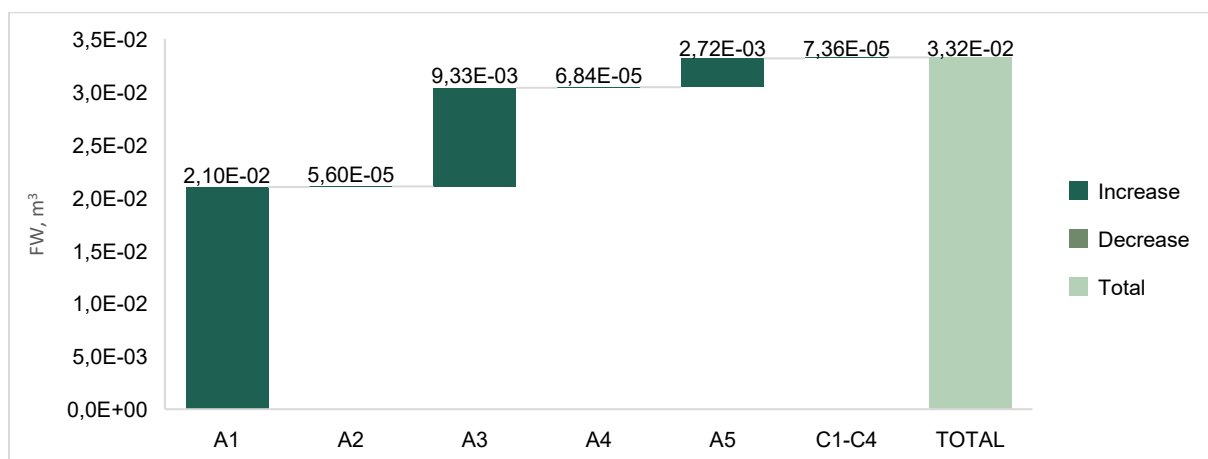
Considering total demand of primary energy per declared unit, that has been calculated using Cumulative Energy Demand (LHV) V1.01 impact assessment method, demand of primary energy is displayed in following Figure. With 84.3% resulting in Product stage (A1-A3), demand of primary energy for **1 m² of installed Knauf Brown 12.5mm gypsum plasterboard** is distributed as follows:

- 39.6% for Raw material (A1)
- 3.7% for Transport (A2)
- 41.0% for Manufacturing (A3)
- 4.5% for Transport (A4)
- 6.8% for Installation module (A5)
- 4.5% for End-of-Life stage (C1-C4)



Primary energy demand per 1 m² of installed Knauf Brown 12.5mm gypsum plasterboard

Other key effect factor is Freshwater consumption, that is displayed in following Figure as a Waterfall chart. A waterfall chart shows a running total as values are added or subtracted. It's useful for understanding how an initial value of net Freshwater use is affected by a series of positive and negative values. In case of **1 m² of installed Knauf Brown 12.5mm gypsum plasterboard**, no decrease has been observed in any of considered stages. Similarly to Primary energy demand, in terms of freshwater use level Product stage (A1-A3) is also responsible for most of its demand. Second biggest contributor is Manufacturing module A3, with other declared modules generating less insignificant impact.



Net freshwater use for 1 m² of installed Knauf Brown 12.5mm gypsum plasterboard

VERSION HISTORY

Original Version of the EPD, 2025-07-30

ADDITIONAL ENVIRONMENTAL, SOCIAL AND ECONOMIC INFORMATION

The Knauf factory in Saurieši, Latvia, uses natural gypsum sourced from a quarry located just 7 km away from the production site. This proximity significantly reduces the environmental impact of transportation and associated GHG emissions. The production process incorporates sustainable practices, including the recycling of gypsum boards, enabling the return of materials into the production cycle and minimizing waste.

The factory is certified under ISO 14001:2015, demonstrating the company's commitment to reducing environmental impact and efficiently managing resources and energy. Additionally, Knauf actively participates in the CO₂ emissions trading system, supporting global efforts to combat climate change.

Our products comply with EU REACH regulations and do not contain hazardous substances exceeding 0.1% of the product's weight. Furthermore, the products feature very low levels of volatile organic compounds (VOC) (<0.2 mg/m².h), in line with EN ISO 16000 classification, contributing to a healthier indoor environment.

The Knauf factory in Saurieši employs 200 staff members, providing stable employment in the local region. The company's annual turnover amounts to 100 million euros, underscoring its significant contribution to the Latvian economy.

Knauf invests actively in employee education and development, offering training programs and workplace safety initiatives that comply with ISO 45001:2018 standard. As part of its corporate social responsibility, Knauf supports local community projects, including educational initiatives and environmental protection activities.

The company's core values include sustainability, innovation, and collaboration, ensuring the delivery of high-quality building materials with added value for both local and international customers.

ABBREVIATIONS

Abbreviation	Definition
C	Carbon
CO ₂	Carbon dioxide
CPA	Statistical classification of products by activity
CPC	Central product classification
c-PCR	Complementary Product Category Rules
CPV	Common Procurement Vocabulary code
DIN	Deutsche Industrie Norm
DQR	Data quality ratio
DU	Declared unit
EF	Environmental footprint
EN	European Norm
EPD	Environmental Product Declaration
EU	European Union
GHG	Greenhouse gas
GLO	Global
GPI	General Programme Instructions
GWP	Global warming potential
ISO	International Organization for Standardization
LCA	Life Cycle Assessment
LCI	Life cycle inventory
LHV	Lower heating value
LV	Latvia
ND	Module not declared
PCR	Product Category Rules
PP	Polypropylene
PPP	Polluter pays principle
REACH	Regulation on the registration, evaluation, authorization and restriction of chemicals
SVHC	Substances of Very High Concern
UN	United Nations
UNSPSC	United Nations Standard Products and Services Code
VOC	Volatile organic compounds

REFERENCES

EN 15804+A2:2019/AC:2021. Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products

EPD International (2025) General Programme Instructions of the International EPD System. Version 5.0.1 dated 2025-02-27. www.environdec.com

EPD International (2025) PCR 2019:14 Construction products, version 2.0.1. www.environdec.com

EPD International (2025) C-PCR-031 (TO PCR 2019:14 Gypsum-based construction products (EN 17328:2024), version 1.0.0 dated 2025-04-24. www.environdec.com

SpreeGips Plasterboard Liner from Hamburger Containerboard GmbH, S-P-12187

UNIPLAC Plasterboard Liner from Moritz J. Weig GmbH, S-P-08304

EN 17328:2024:2024. Complementary product category rules for gypsum-based construction products

LCA software SimaPro 9.6

Ecoinvent v3.10

ISO 14040:2006. Environmental management – Life cycle assessment – Principles and framework

ISO 14044:2006. Environmental management – Life cycle assessment – Requirements and guidelines

Šiškins A., (2025) LCA background report for Gypsum plasterboards by Knauf SIA v2.0

