



ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH ISO 14025 AND EN 15804

Knauf Performance Plus Plasterboard 12.5mm & 15mm

Declaration Number: S-P-04944

Issued on: 2022-01-24

Valid until: 2027-01-23

Programme: The International EPD® System

Programme operator: EPD International AB

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com.

The environmental impacts of this product have been assessed from cradle-to-grave.

This Environmental Product Declaration has been verified by an independent third party.

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INTRODUCTION

This EPD provides environmental performance indicators for Knauf Performance Plus Plasterboard manufactured by Knauf UK GmbH.

This is a cradle-to-grave EPD in accordance with the requirements of EN 15804, covering all modules except B6 & B7 defined in that standard.

The EPD is based on a life cycle assessment (LCA) study which used production data for 2019 and 2020 from Knauf UK GmbH's manufacturing facilities in Sittingbourne/Immingham, UK. Background data was taken from the ecoinvent database (v3.6).

The EPD presents details of the LCA, a description of the product life cycle it covers, values for the environmental indicators specified by EN 15804 and a brief explanation of those results.

 **EPD**[®]



Programme: The International EPD[®] System

Programme operator: EPD International AB

Knauf UK GmbH Performance Plus Plasterboard EPD

Programme Information	
EPD programme	The International EPD® System
EPD programme operator	EPD International AB - Box 210 60 - SE 100 31 Stockholm - Sweden www.environdec.com - info@environdec.com
EPD based on product category rules	The CEN standard EN 15804 serves as the core PCR
	The International EPD® System's PCR 2019:14 Construction products, Version 1.11, 2021-02-05
PCR review conducted by	The Technical Committee of the International EPD® System Chair: Claudia Peña; contact via info@environdec.com
EPD verification	Independent verification of this EPD and data, according to ISO 14025:2006: <input type="checkbox"/> EPD process certification <input checked="" type="checkbox"/> EPD verification
Third party verifier	Ugo Pretato / Studio Fieschi & soci Srl
Approved by	The International EPD® System
Procedure for data follow-up during EPD validity	Involves third party Verifier: <input type="checkbox"/> yes <input checked="" type="checkbox"/> no
Declaration No	S-P-04944
Date of publication	2022-01-26
EPD valid until	2027-01-23
EPD owner	Knauf UK GmbH Kemsley Fields Business Park - Sittingbourne - Kent ME9 8SR - UK
Product name	Knauf Performance Plus
UN CPC code	314 boards and panels
Declared unit	1 square metre of board
System boundaries	Cradle-to-grave
EPD geographical scope	Europe
LCA conducted by	EuGeos Limited, UK - +44 (0)1625 434423 www.eugeos.co.uk
LCA software	openLCA
Background database	ecoinvent V3.6

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

EPDs within the same product category, but from different programmes may not be comparable.

EPDs of construction products may not be comparable if they do not comply with EN 15804. For further information about comparability, see EN 15804 and ISO 14025.

KNAUF

Knauf is one of the world's leading manufacturers of modern insulation materials, drylining systems, plasters and accessories, thermal insulation composite systems, paints, floor screed, floor systems, construction equipment and tools.

With more than 250 production facilities and sales organisations in over 86 countries, 35,000 employees worldwide, and sales of 10 billion Euro (in 2019), the Knauf Group is without doubt one of the big players in the market – in Europe, the USA, South America, Russia, Asia and Africa.

The Company's headquarters in the UK is in Sittingbourne (Kent). Constructed in 1988, the Sittingbourne Plasterboard Plant was up and running from a greenfield site to working factory in less than twelve months.

The production system, which was engineered and designed using the most modern manufacturing technologies, enables the production of Knauf's superior quality Standard and High Performance Plasterboards, Foil-backed Plasterboards and Insulating Laminates.

Following the success of the Sittingbourne Plant, construction on a second UK Plasterboard manufacturing facility commenced in 1990. Based on the banks of the River Humber, the Immingham Plasterboard Plant services the North of England, Scotland and the Irish market. Built to the same modern technical specification as the Sittingbourne Plant, Immingham also has the capability to produce the complete range of Knauf Plasterboards, Insulating Laminates and Foil-backed Plasterboards.



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[Knauf UK & Ireland](https://www.linkedin.com/company/KnaufUKIreland)



[@Knauf_UK](https://www.instagram.com/Knauf_UK)



PRODUCT INFORMATION

This EPD applies to Knauf Performance Plus Plasterboard produced at Knauf plants in Sittingbourne and Immingham, UK.

Product Description

Knauf Performance Plus has a high-density core with added Performance -enhancing ingredients. The result is a board with extremely high levels of sound, moisture, fire and impact resistance, ideally suited to schools, hospitals and other large commercial projects.

This EPD applies to 12.5mm & 15mm of Knauf Performance Plus Plasterboard.



Knauf's boards are classified 314 boards and panels under the UN CPC classification system v2.1.

Performance Plus



Edge Type

TE

Thickness (mm)

12.5, 15

Width (mm)

1200

Lengths (mm)

2400, 3000

Weight (kg/m²)

11.5, 12.8

Density (kg/m³)

920, 853

Thermal Conductivity (W/mK)

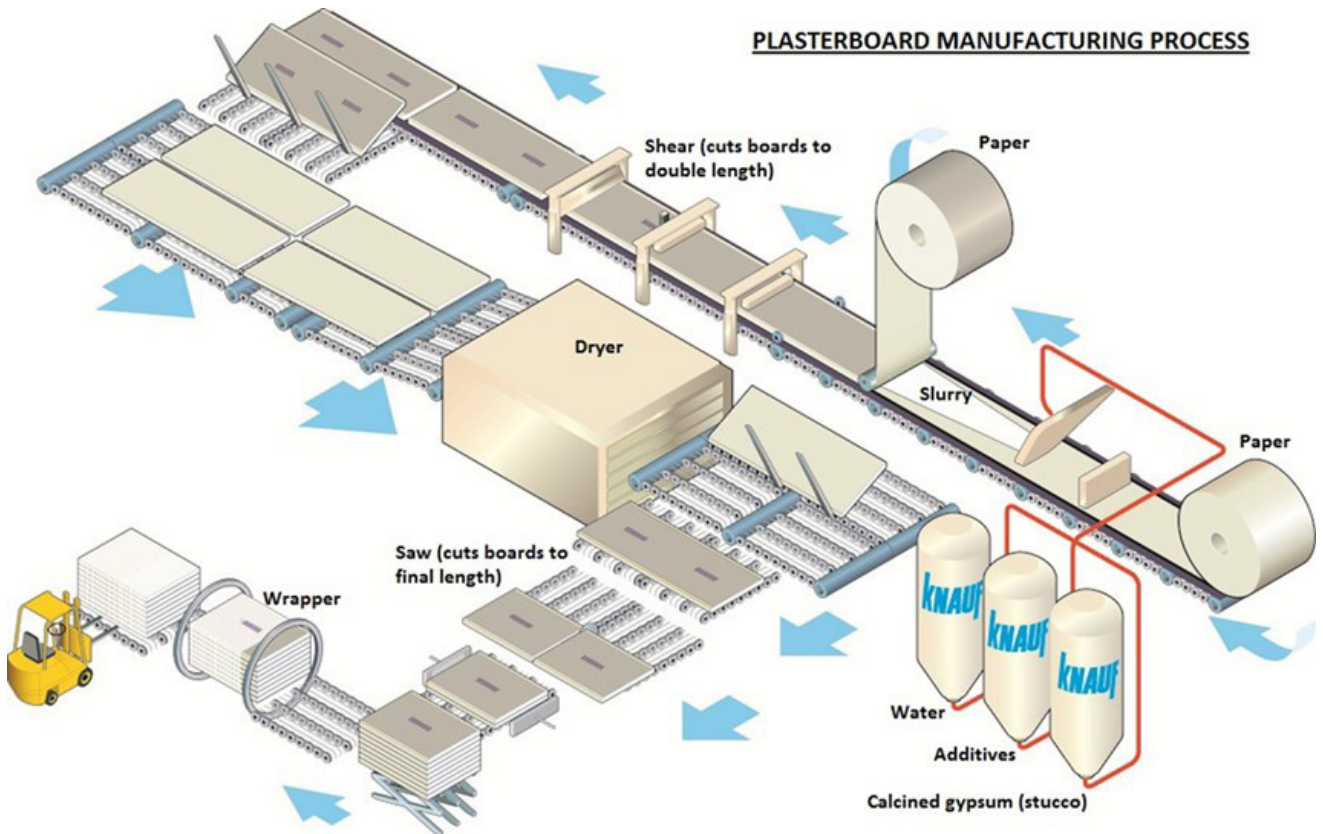
0.24

Standards Designation

BS EN 520 A, D, F, H1, I & R

MANUFACTURING

Knauf Performance Plus Plasterboard are manufactured using a continuous production process, shown in the image below.



Raw materials are homogeneously mixed to form a gypsum slurry that is spread via hose outlets onto a paper liner on a moving belt conveyor. A second paper line is fed onto the production line from above to form the plasterboard. The plasterboard continues along the production line where it is finished, dried and cut to size.

Knauf plants are managed through ISO 9001 certified Quality Management Systems.

Environment and Health during Manufacture

At Knauf, Health and Safety is a core value. The Company's aim is always to be injury-free. A target of zero accidents at work for employees, visitors and contractors is set by the business. In all aspects of the Company's activities, the Health and Safety rules and relevant regulations must be complied with. In addition, there are a number of definitive Company Safety Procedures and together these determine the minimum standards expected by the Company. In order to achieve this, close co-operation with representatives of the relevant enforcement agencies is ensured. To ensure that the Company's objectives are achieved, documented safety management systems are employed at site and within the central functions. These include a systematic identification of hazards, assessment of the risks and the development of safe systems of work to eliminate or reduce any risks to an acceptable level. Audits and Inspections are used to monitor standards of safety management, adherence to the law and Company procedures. Knauf plants are managed through BES 6001, ISO 14001, ISO 9001 and OHSAS 18001 which has now changed to ISO 45001 certified systems and ISO 50001 Energy Management Systems.





PACKAGING & TRANSPORTATION

Knauf Performance Plus is stacked on returnable 100% recyclable bearers and are protected against damage.

The boards are transported by road, and - since early 2021 - also by rail.

INSTALLATION

Knauf Plasterboards are typically installed as Knauf partition, wall lining and ceiling systems with Knauf Jointing Products and Fixings. The type and number of layers of Knauf plasterboards used influences the structural, fire, acoustic and thermal performance of the system.

All products must be installed in accordance with Knauf's recommendations and the current recommendations of BS 8212: 1995 and BS 8000-8:1994 Part 8.

PRODUCT USE & MAINTENANCE

When used in partition, wall lining and ceiling systems, Knauf Plasterboards provide a smooth face, ideal for direct decoration or application of a plaster finish.

In normal use, no maintenance is required, during the 60-year reference service life.

Knauf plasterboards are sufficiently durable to remain in place for the lifetime of a building.

END OF LIFE

At the end of the building's life, it is anticipated that Knauf plasterboards will be removed from the building.

As waste, Knauf plasterboards fall under European Waste Catalogue (EWC) WC/:17 08 02 gypsum-based construction materials.

REFERENCE SERVICE LIFE

Service life is 60 years for this EPD.

CONTENTS INFORMATION

The material composition of Knauf Performance Plus Plasterboard, including delivery packaging, is shown below:

Material	% of mass per declared functional unit	Post-consumer material, weight-%	Renewable material weight-%
Gypsum & calcium carbonate	>93	7	0
Paper	2 – 6	100	100
Additives: organic surfactants, cementitious materials, glass fibres and silicones	<1	0	0

Packaging	Weight (Kg)	% of mass per declared functional unit
Wood	0.035	<1
Plastic film	0.004	<1

No substance included in the Candidate List of Substances of Very High Concern for authorisation under the REACH Regulations is present in the protection materials, either above the threshold for registration with the European Chemicals Agency or above 0.1% (wt/wt).

TECHNICAL DATA

Produced in compliance with the Construction Products Regulations EU 305/2011.

Performance Plus



Edge Type

TE

Thickness (mm)

12.5, 15

Width (mm)

1200

Lengths (mm)

2400, 3000

Weight (kg/m²)

11.5, 12.8

Density (kg/m³)

920, 853

Thermal Conductivity (W/mK)

0.24

Standards Designation

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LCA INFORMATION

This section of the EPD records key features of the LCA on which it is based. The LCA was carried out by EuGeos using openLCA software.

Scope

This EPD covers the production stage (modules A1-A3), transport to site and installation (A4 & A5), the use phase (B1-B5) and end-of-life management (C & D) – see below; as permitted by EN 15804, modules A1-A3 are declared in aggregated form.

Product stage			Construction process stage		Use stage							End of life stage				Benefits & loads beyond the system boundaries
Raw material supply	Transport	Manufacturing	Transport to	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Water treatment	Disposal	Reuse- recovery- recycling - potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
<p style="text-align: center;">Modules declared X included in LCA – ND: module not declared – NR: module not relevant</p>																
X	X	X	X	X	X	X	X	X	X	NR	NR	X	X	X	X	X
<p style="text-align: center;">Geography</p>																
GL	GL	GB	GB	GB	GB	GB	GB	GB	GB	-	-	GB	GB	GB	GB	GB
O	O															
<p style="text-align: center;">Specific data used</p>																
>90%			>90%		-	-	-	-	-	-	-	-	-	-	-	-
<p style="text-align: center;">Variation – products</p>																
n/a			n/a		-	-	-	-	-	-	-	-	-	-	-	-
<p style="text-align: center;">Variation – sites</p>																
+/- 30%			n/a		-	-	-	-	-	-	-	-	-	-	-	-

DECLARED UNIT

The declared unit is one square metre of board.

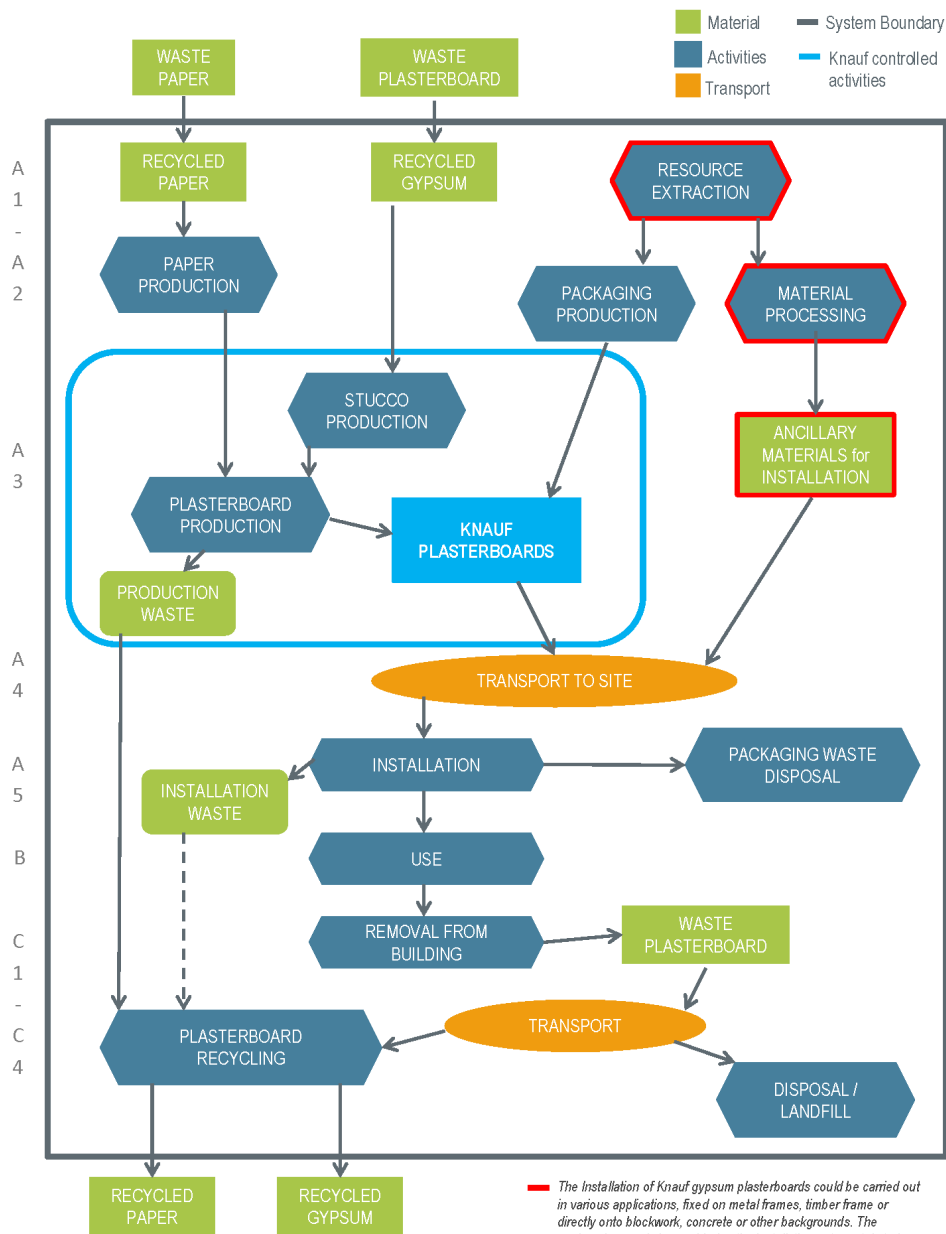
SYSTEM BOUNDARIES

The system boundary of the EPD is defined using the modular approach set out in EN 15804.

As well as the core processes which cover board manufacture at Knauf's sites, the system includes production of all raw materials and components from basic resources; transport of those materials at all stages up to users' sites; subsequent installation and end-of-life management; the production of fuels and energy carriers, and their delivery to manufacturing sites; the treatment of all wastes.

The upstream processing of recycled material inputs that have passed the end-of-waste state is outside the system boundary.

The product life cycle covered by this EPD is illustrated below.



The installation of Knauf gypsum plasterboards could be carried out in various applications, fixed on metal frames, timber frame or directly onto blockwork, concrete or other backgrounds. The enclosed example is considering the installation onto metal stud framing.

CUT-OFF CRITERIA

The collected data covered all raw materials, consumables and packaging materials; associated transport to the manufacturing site; process energy and water use; direct production wastes; emissions to air and water.

According to EN 15804 and the PCR, flows can be omitted (cut off) from a core process in the LCA up to a maximum of 1% of the total mass of material inputs or 1% of the total energy content of fuels and energy carriers; some ancillary materials used in small quantities within the process and amounting, in combination, to <0.1% of total input materials were omitted from the LCA underpinning this EPD.

DATA SOURCES AND DATA QUALITY

Data characterising Knauf's core processes (see above figure) were collected for a continuous 12-month period between 2019 and 2020. The data has therefore been updated within the last 5 years.

This data was checked to ensure that sufficient materials and water are included within the inputs to account for all products, wastes and emissions.

Background Data

Background (generic) data was taken from the ecoinvent database (v3.6); this fulfills the EN 15804 requirement that generic data used in the LCA have been updated within the last 10 years. The quality of generic data has been reviewed and datasets adjusted to better reflect actual operations in Knauf's supply chain using specific data.

Product-specific data accounts for >90% of the GWP total values reported for the product stage (A1-A3).

ALLOCATION

In the background data, the ecoinvent default allocation is applied to all processes except those in which secondary materials are used, where the "cut-off" allocation is applied. This ensures that secondary materials are free of upstream burdens that arise prior to their reaching the "end of waste" state, in accordance with Section 6.3.4.2 of EN 15804.

ASSUMPTIONS AND ESTIMATES

Inputs to and outputs from the system are accounted for over a 100-year time period; long-term emissions are therefore omitted from the impact assessment part of the LCA, except for biogenic carbon-containing flows, which are accounted for on an indefinite timeframe.

The “primary energy used as material” indicators (PERM; PENRM) are calculated using - as characterisation factors - published values for constituent materials which can yield energy on combustion, where available, and from published calorific values where PE(N) RM values are not available. In this study PERM is calculated from the paper content applying a calorific value of 16MJ/kg, omitting wood in packaging which accounts for <1% of the declared unit. “Primary energy as fuel” indicators (PENRE, PERE) are calculated as the total primary energy demand minus primary energy used as material. Module D calculations exclude any third-party recycling of packaging or process wastes arising in Module D.

Electricity supplied to Knauf UK is modelled as the residual mix for 2018 as declared by the Association of Issuing Bodies. The GWP total associated with this is 0.43kgCO₂e/kWh.

The installation scenario is modelled as a manual operation without use of power tools. 0.7kg of galvanised steel sheet and 7g steel screws are used per square metre of plasterboard installed. A plasterboard loss of 10% as offcuts is assumed, with 25% of this recycled and the remainder sent for segregated landfill disposal. No water or other resources are used. Transport of ancillary materials is modeled within module A5 using the same parameters used for module A4.

Installation, transport to site and to waste processing, waste treatment and final disposal are modelled using scenarios. The relevant parameters for the transport scenarios are shown in the tables below.

Scenario Parameters – Transport

Parameter	A4	C2
	Quantity and unit	Quantity and unit
Vehicle type	Lorry	Lorry
Vehicle load capacity	28t	9t; 15t
Fuel type and consumption	Diesel, 0.3 l/km	Diesel, 0.2; 0.3 l/km
Volume capacity utilisation factor	1	1
Capacity utilisation (including empty returns)	50%	33%; 38%
Distance to site	235 km	25 km; 225km
Bulk density of transported products	As for product technical data	As for product technical data

Following EN15804, the use phase scenario is divided into 5 modules, B1 – B5:
There are no releases of substances during use to report in B1
The product requires no maintenance, repair or refurbishment, therefore no ancillary material, water or energy inputs are required in B2, B3 or B5, nor is any waste generated in these modules.
Plasterboard does not require replacement during the Reference Service Life; therefore no energy or material inputs are required in B4.
Waste treatment (module C3) is modeled using generic data for recycling of waste plasterboard. A recycling rate of 4% is assumed, based on reported rates of plasterboard material re-use and to ensure internal consistency in the LCA model. Steel used in Module A5 is assumed to be recycled and included in Module C3
Final disposal (module C4) is modeled as the disposal of 96% of the functional unit as segregated material in an inert material landfill.
Module D is also assessed on the basis of a 10% recycling rate for plasterboard from all stages of the life cycle.

ENVIRONMENTAL INDICATORS

This EPD contains environmental information about Knauf Performance Plus Plasterboard in the form of quantitative indicator values for a number of parameters, which encompass calculated environmental impact potentials, resource and energy use, waste generation and material and energy outputs from the product system that may be reused, recycled or recovered into other, unspecified product life cycles.

Environmental impact potentials are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

Environmental Indicator Results (per declared unit) for Knauf UK GmbH Performance Plus 12.5mm

Environmental indicator results for all declared modules are shown in the following tables for the declared unit of one square metre of Knauf UK GmbH's Performance Plus Plasterboard; the A1 - A3 modules are shown on an aggregated basis.

KNAUF UK GMBH PERFORMANCE PLUS 12.5MM														
ENVIRONMENTAL IMPACTS EN 15804 + A2	Unit	A1 - A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4	D
Climate change – GWP fossil	kg CO ₂ eq	3.79E+00	2.61E-01	2.18E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.93E-01	2.66E-02	5.81E-02	0.00E+00
Climate change – GWP biogenic	kg CO ₂ eq	2.09E-02	8.90E-06	1.58E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.79E-02	7.99E-05	0.00E+00
Climate change – GWP land transformation	kg CO ₂ eq	4.61E-03	8.21E-05	1.65E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.85E-04	2.97E-05	1.73E-05	0.00E+00
Climate change – GWP total	kg CO ₂ eq	3.81E+00	2.61E-01	2.20E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.93E-01	5.45E-02	5.82E-02	0.00E+00
Climate change - GWP fossil & land transformation ¹	kg CO ₂ eq	3.86E+00	2.61E-01	2.21E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.93E-01	5.60E-02	5.81E-02	0.00E+00
Acidification potential	mol H ⁺ eq	1.36E-02	6.39E-04	1.54E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.14E-03	2.00E-04	2.70E-04	0.00E+00
Eutrophication – freshwater	kg P eq	5.36E-05	2.22E-06	1.20E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.20E-06	1.82E-06	7.01E-07	0.00E+00
Eutrophication – freshwater	kg PO ₄ ⁻³ eq	1.64E-04	6.80E-06	3.68E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.29E-05	5.58E-06	2.15E-06	0.00E+00
Eutrophication – marine	kg N eq	3.45E-03	8.81E-05	2.07E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.56E-04	4.85E-05	5.27E-05	0.00E+00
Eutrophication – terrestrial	mol N eq	3.60E-02	9.80E-04	4.45E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.66E-03	2.20E-04	5.82E-04	0.00E+00
Photochemical ozone formation	kg NMVOC eq	9.29E-03	5.40E-04	7.99E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.23E-04	8.92E-05	2.41E-04	0.00E+00
Ozone depletion	kg CFC-11 eq	5.56E-07	6.42E-08	1.58E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.12E-07	3.63E-09	2.39E-08	0.00E+00
Depletion of abiotic resources – minerals & metals ²	kg Sb eq	4.60E-04	4.65E-06	1.99E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.39E-05	1.33E-06	5.31E-07	0.00E+00
Depletion of abiotic resources – fossil fuels ²	MJ, ncv	6.49E+01	4.20E+00	3.12E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.33E+00	3.58E-01	1.62E+00	0.00E+00
Water (user) deprivation potential ²	m ³ world-eq deprived	5.39E+01	3.25E+00	1.04E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.30E+00	1.99E+00	5.01E-01	0.00E+00

1 - GWP-GHG includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013

2 - The results of this environmental impact indicator shall be used with care because either the uncertainties associated with the results are high or there is limited experience with the indicator

KNAUF UK GMBH PERFORMANCE PLUS 12.5MM

RESOURCE USE		Unit	A1 - A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4	D
Renewable primary energy as energy carrier	PERE	MJ	3.13E+00	5.34E-02	2.03E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.07E+01	6.12E-02	1.31E-02	0.00E+00
Renewable primary energy resources as material utilisation	PERM	MJ	6.10E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total renewable primary energy use	PERT	MJ	9.23E+00	5.34E-02	2.03E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.07E+01	6.12E-02	1.31E-02	0.00E+00
Non-renewable primary energy as energy carrier	PENRE	MJ	7.07E+01	4.28E+00	3.26E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.48E+00	4.23E-01	1.64E+00	0.00E+00
Non-renewable primary energy resources as material utilisation	PENRM	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total non-renewable primary energy use	PENRT	MJ	7.07E+01	4.28E+00	3.26E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.48E+00	4.23E-01	1.64E+00	0.00E+00
Use of secondary material	SM	kg	5.77E-01	0.00E+00	1.85E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.30E-04	4.40E-04	0.00E+00
Use of renewable secondary fuels	RSF	MJ	4.69E-02	1.87E-03	2.03E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.85E-03	1.41E-03	3.12E-04	0.00E+00
Use of non-renewable secondary fuels	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water	FW	m ³	2.17E-02	2.98E-04	1.33E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.54E-04	1.50E-04	1.68E-03	0.00E+00
WASTES		Unit	A1 - A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4	D
Hazardous waste disposed	HWD	kg	5.95E-02	4.12E-03	6.27E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.68E-03	1.92E-03	1.52E-03	0.00E+00
Non-hazardous waste disposed	NHWD	kg	2.01E+00	4.56E-01	7.25E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.14E-01	1.29E-01	1.11E+01	0.00E+00
Radioactive waste disposed	TRWD	kg	1.70E-04	2.93E-05	5.79E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.11E-05	2.36E-06	1.08E-05	0.00E+00

OUTPUT FLOWS		Unit	A1 - A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4	D
Components for re-use	CRU	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	MFR	kg	4.66E-01	1.26E-03	1.85E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.54E-03	3.60E-04	4.12E-04	0.00E+00
Materials for energy recovery	MER	kg	1.27E-03	2.05E-05	2.80E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.27E-05	1.54E-05	3.34E-06	0.00E+00
Exported energy - electrical	EEE	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy - thermal	EET	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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For information, indicator values calculated using the methods prescribed in the earlier version of EN 15804 (EN 15804+A1:2013) are provided in the table below for the declared unit of one square metre of board; modules A1 - A3 are shown on an aggregated basis.

ENVIRONMENTAL IMPACTS EN 15804 + A1		Unit	A1 - A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4	D
Global warming potential	GWP	kg CO ₂ -eq	3.75E+00	2.59E-01	2.11E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.89E-01	4.60E-02	5.71E-02	0.00E+00
Depletion potential of the stratospheric ozone layer	ODP	kg CFC11-eq	4.55E-07	5.10E-08	1.50E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.89E-08	3.14E-09	1.90E-08	0.00E+00
Acidification potential of land and water	AP	kg SO ₂ -eq	1.09E-02	5.54E-04	1.90E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.80E-04	1.80E-04	2.27E-04	0.00E+00
Eutrophication potential	EP	kg PO ₄₃ -eq	1.54E-03	5.58E-05	1.71E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.70E-05	2.76E-05	2.71E-05	0.00E+00
Formation potential of tropospheric ozone photochemical oxidants	POCP	kg ethene-eq	5.00E-04	3.19E-05	1.05E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.53E-05	1.39E-05	1.69E-05	0.00E+00
Abiotic depletion potential for non-fossil resources	ADPE	kg Sb-eq	4.60E-04	4.65E-06	1.99E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.39E-05	1.33E-06	5.31E-07	0.00E+00
Abiotic depletion potential for fossil resources	ADPF	MJ	6.49E+01	4.20E+00	3.12E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.33E+00	3.58E-01	1.62E+00	0.00E+00

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Environmental Indicator Results (per declared unit) for Knauf UK GmbH Performance Plus 15mm

Environmental indicator results for all declared modules are shown in the following tables for the declared unit of one square metre of Knauf UK GmbH's Performance Plus Plasterboard; the A1 - A3 modules are shown on an aggregated basis.

ENVIRONMENTAL IMPACTS EN 15804 + A2		Unit	A1 - A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4	D
Climate change – GWP fossil	GWP-fossil	kg CO ₂ eq	3.84E+00	2.91E-01	2.19E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.49E-01	2.71E-02	6.47E-02	0.00E+00
Climate change – GWP biogenic	GWP-biogenic	kg CO ₂ eq	1.12E-02	9.91E-06	1.79E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.12E-02	8.90E-05	0.00E+00
Climate change – GWP land transformation	GWP-land	kg CO ₂ eq	4.66E-03	9.13E-05	1.66E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.05E-04	3.00E-05	1.92E-05	0.00E+00
Climate change – GWP total	GWP-total	kg CO ₂ eq	3.86E+00	2.91E-01	2.21E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.49E-01	5.83E-02	6.48E-02	0.00E+00
Climate change - GWP fossil & land transformation ¹	GWP-GHG	kg CO ₂ eq	3.91E+00	2.91E-01	2.21E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.48E-01	5.98E-02	6.47E-02	0.00E+00
Acidification potential	AP	mol H ⁺ eq	1.46E-02	7.11E-04	1.55E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.26E-03	2.00E-04	3.00E-04	0.00E+00
Eutrophication – freshwater	EP-freshwater	kg P eq	5.43E-05	2.47E-06	1.20E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.68E-06	1.84E-06	7.80E-07	0.00E+00
Eutrophication – freshwater	EP-freshwater	kg PO ₄ ⁻³ eq	1.67E-04	7.56E-06	3.68E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.43E-05	5.63E-06	2.39E-06	0.00E+00
Eutrophication – marine	EP-marine	kg N eq	3.67E-03	9.81E-05	2.07E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.74E-04	5.22E-05	5.86E-05	0.00E+00
Eutrophication – terrestrial	EP-terrestrial	mol N eq	3.84E-02	1.09E-03	4.45E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.85E-03	2.20E-04	6.48E-04	0.00E+00
Photochemical ozone formation	POFP	kg NMVOC eq	9.90E-03	6.00E-04	8.00E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.17E-04	9.13E-05	2.69E-04	0.00E+00
Ozone depletion	ODP	kg CFC-11 eq	5.60E-07	7.14E-08	1.60E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.24E-07	3.71E-09	2.66E-08	0.00E+00
Depletion of abiotic resources – minerals & metals ²	ADPMM	kg Sb eq	5.00E-04	5.18E-06	1.99E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.55E-05	1.33E-06	5.91E-07	0.00E+00
Depletion of abiotic resources – fossil fuels ²	ADPFF	MJ, ncv	6.57E+01	4.67E+00	3.13E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.16E+00	3.65E-01	1.80E+00	0.00E+00
Water (user) deprivation potential ²	WDP	m ³ world-eq deprived	5.38E+01	3.62E+00	1.06E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.12E+00	2.01E+00	5.57E-01	0.00E+00

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1 - GWP-GHG includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013

2 - The results of this environmental impact indicator shall be used with care because either the uncertainties associated with the results are high or there is limited experience with the indicator

RESOURCE USE		Unit	A1 - A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4	D
Renewable primary energy as energy carrier	PERE	MJ	3.16E+00	5.94E-02	2.03E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E+01	6.21E-02	1.46E-02	0.00E+00
Renewable primary energy resources as material utilisation	PERM	MJ	6.10E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total renewable primary energy use	PERT	MJ	9.26E+00	5.94E-02	2.03E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E+01	6.21E-02	1.46E-02	0.00E+00
Non-renewable primary energy as energy carrier	PENRE	MJ	7.17E+01	4.76E+00	3.27E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.33E+00	4.32E-01	1.82E+00	0.00E+00
Non-renewable primary energy resources as material utilisation	PENRM	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total non-renewable primary energy use	PENRT	MJ	7.17E+01	4.76E+00	3.27E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.33E+00	4.32E-01	1.82E+00	0.00E+00
Use of secondary material	SM	kg	5.72E-01	0.00E+00	1.86E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.30E-04	4.90E-04	0.00E+00
Use of renewable secondary fuels	RSF	MJ	4.71E-02	2.09E-03	2.04E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.28E-03	1.41E-03	3.48E-04	0.00E+00
Use of non-renewable secondary fuels	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water	FW	m ³	2.26E-02	3.32E-04	1.33E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.16E-04	1.60E-04	1.86E-03	0.00E+00
WASTES		Unit	A1 - A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4	D
Hazardous waste disposed	HWD	kg	6.12E-02	4.58E-03	6.27E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.55E-03	1.94E-03	1.69E-03	0.00E+00
Non-hazardous waste disposed	NHWD	kg	2.01E+00	5.07E-01	7.35E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.72E+01	1.32E+01	1.23E+01	0.00E+00
Radioactive waste disposed	TRWD	kg	1.80E-04	3.26E-05	5.86E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.68E-05	2.42E-06	1.20E-05	0.00E+00

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OUTPUT FLOWS		Unit	A1 - A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4	D
Components for re-use	CRU	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	MFR	kg	4.61E-01	1.41E-03	1.85E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.83E-03	3.60E-04	4.58E-04	0.00E+00
Materials for energy recovery	MER	kg	1.29E-03	2.29E-05	2.80E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.75E-05	1.54E-05	3.72E-06	0.00E+00
Exported energy - electrical	EEE	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy - thermal	EET	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

For information, indicator values calculated using the methods prescribed in the earlier version of EN 15804 (EN 15804+A1:2013) are provided in the table below for the declared unit of one square metre of board; modules A1 - A3 are shown on an aggregated basis.

ENVIRONMENTAL IMPACTS EN 15804 + A1		Unit	A1 - A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4	D
Global warming potential	GWP	kg CO2-eq	3.80E+00	2.88E-01	2.12E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.44E-01	4.87E-02	6.35E-02	0.00E+00
Depletion potential of the stratospheric ozone layer	ODP	kg CFC11-eq	4.59E-07	5.68E-08	1.51E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.89E-08	3.21E-09	2.11E-08	0.00E+00
Acidification potential of land and water	AP	kg SO2-eq	1.17E-02	6.16E-04	1.90E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.09E-03	1.80E-04	2.53E-04	0.00E+00
Eutrophication potential	EP	kg PO43--eq	1.62E-03	6.21E-05	1.71E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.08E-04	2.93E-05	3.01E-05	0.00E+00
Formation potential of tropospheric ozone photochemical oxidants	POCP	kg ethene-eq	5.20E-04	3.55E-05	1.05E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.26E-05	1.45E-05	1.88E-05	0.00E+00
Abiotic depletion potential for non-fossil resources	ADPE	kg Sb-eq	5.00E-04	5.18E-06	1.99E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.55E-05	1.33E-06	5.91E-07	0.00E+00
Abiotic depletion potential for fossil resources	ADPF	MJ	6.57E+01	4.67E+00	3.13E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.16E+00	3.65E-01	1.80E+00	0.00E+00

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Interpretation of the LCA Results

Indicator values obtained for resource depletion (ADPMM, ADPFF), stratospheric ozone depletion (ODP) and water deprivation (WDP) potential should be used with caution; all are subject to uncertainties in data or method which limit the scope for their use as the basis for comparisons.

No untreated wastes leave the modelled system, which includes waste treatment activities as required by EN 15804. The waste indicators HWD, NHWD and TRWD presented in this EPD therefore represent waste flows within the modelled system.

ADDITIONAL ENVIRONMENTAL INFORMATION

Biogenic Carbon

Carbon dioxide (CO₂) is absorbed from the atmosphere by trees, so any wood-based product contains some carbon from this source. This carbon is considered as a negative emission in some carbon accounting systems.

Biogenic carbon content per declared unit	Unit	Quantity
Biogenic carbon content in product	kg C	0.01 - 0.02
Biogenic carbon content in packaging	kg C	0.02

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

References

BES 6001 - Responsible Sourcing of Construction Products - British Standards Institute, London

ecoinvent database (v3.6) - www.ecoinvent.ch

EN 15804:2012 + A1:2013 and EN 15804:2012 + A2:2019 - Sustainability of construction works - Environmental Product Declarations - Core rules for the product category of construction products

General Program Instructions, V3.01 2019-09-18 - The International EPD® System - EPD International AB

ISO 14001:2015 - Environmental management systems – Requirements with guidance for use

ISO 14025:2009-11 - Environmental labels and declarations - Type III environmental declarations - Principles and procedures

PCR 2019:14 Construction products Version 1.11, 2021-02-05 - The International EPD® System - EPD International AB

BS EN 520 Gypsum plasterboards. Definitions, requirements and test method

ISO 9001 Quality management systems - Requirements

ISO 50001 Energy Management Systems

OHSAS 18001/ISO 45001 Occupational Health and Safety Management

Board LCA (2021) - Report for Knauf UK GmbH- EuGeos Limited

Glossary

The International EPD® System: a programme for Type III environmental declarations, maintaining a system to verify and register EPDs as well as keeping a library of EPDs and PCRs in accordance with ISO 14025. (www.environdec.com)

Life cycle assessment (LCA): LCA studies the environmental aspects and quantifies the potential impacts (positive or negative) of a product (or service) throughout its entire life. ISO standards ISO 14040 and ISO 14044 set out conventions for conducting LCA.

REACH Regulation: REACH is the European Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals. It entered into force in 2007, replacing the former legislative framework for chemicals in the EU.

SE: Square Edge

TE: Tapered Edge



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