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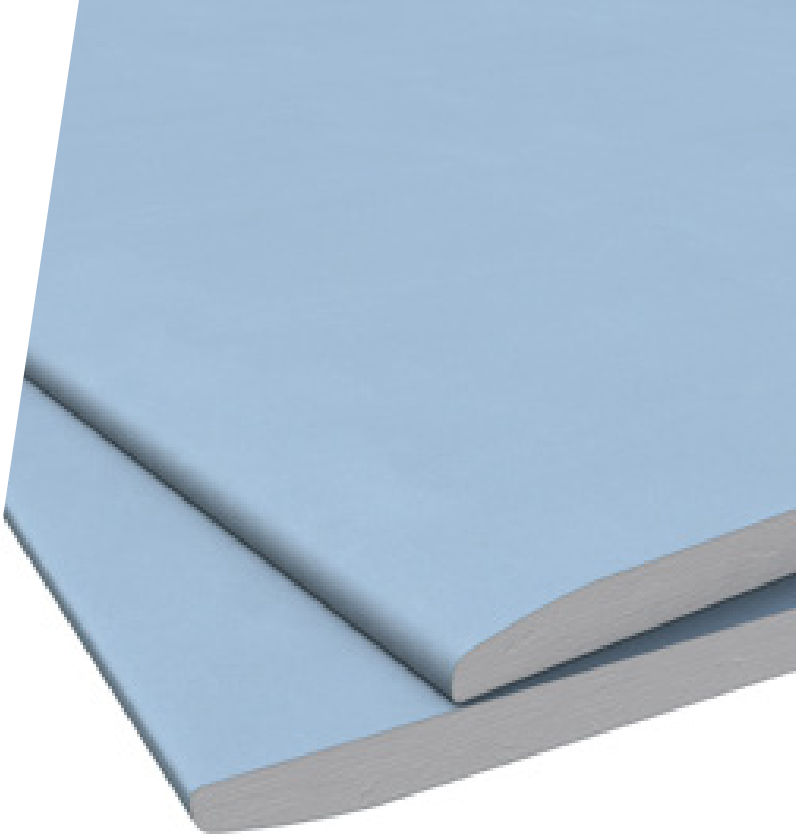

Environmental Product Declaration

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

12.5 mm Plasterboard Knauf DIAMANT

Manufacturer
Knauf di Knauf S.r.l. S.a.s.
Via Livornese 20
56040 Castellina Marittima (PI), Italy

Programme:	The International EPD® System www.environdec.com
Programme Operator	EPD International AB
EPD registration number:	EPD-IES-0001938:002 (S-P-01938)
Publication date:	2020-05-06
Revision date:	2025-06-20
Validity date:	2030-06-19

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

ECO PLATFORM EPD VERIFIED

EPD®

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1. General Information

Manufacturer: Knauf di Knauf S.r.l. S.a.s.
Programme used: The International EPD® System.
Address: EPD International AB Box 210 60 SE-100 31 Stockholm Sweden.
Website: www.environdec.com. E-mail: info@environdec.com
EPD registration number/declaration number: EPD-IES-0001938 (S-P-01938)
Product / product family name and manufacturer represented: DIAMANT 12.5 mm plasterboard, manufactured by Knauf di Knauf S.r.l. S.a.s.
Product description and use: DIAMANT plasterboard is made up of a gypsum core (calcium sulphate dihydrate) with additive and a paper liner. DIAMANT 12.5 mm plasterboard is a high-performance gypsum plasterboard designed for interior applications. Suitable for both new constructions and renovation projects, it meets high standards in acoustic insulation, fire safety, and mechanical strength. Additionally, it is suitable for use in humid environments.

Declaration issued: 2020/05/06
Revision date: 2025/06/20
Valid until: 2030/06/19
Owner of the declaration: Knauf di Knauf S.r.l. S.a.s. - Via Livornese 20, 56040 Castellina Marittima (PI), Italy. Tel. 050 69211 - Fax 050 692301, info.italia@knauf.com.
EPD prepared by: Ergo s.r.l - Tecno Group, www.ergosrl.net
Scope: The LCA is based on 2024 production data for Castellina Marittima manufacturing site in Italy for DIAMANT 12.5 mm. This EPD covers information modules A1 to C4 (cradle to gate with module C1-C4, module D and optional modules) as defined in EN 15804:2012+A2:2019 for DIAMANT 12.5 mm sold and used in Europe and non-European countries. The use stage (B1-B7) was not considered in this study.
Functional unit/declared unit: The declared unit (DU) is 1 m² of gypsum-based plasterboard with a weight of 13 kg/m².

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

CEN standard EN 15804 served as the core Product Category Rules–PCR

PCR:	PCR 2019:14 Construction products and construction services, Version 1.3.4
Product group classification:	The UN CPC code of the product is 314 Boards and panels.
PCR review was conducted by:	The Technical Committee of the International EPD® System. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact
LCA accountability:	Ergo s.r.l. - Tecno Group
Independent verification of the declaration and data, according to ISO 14025:	☐ EPD process certification ☒ EPD verification
Third party verifier:	RINA Services S.p.A.Via Corsica 12, Genova -Italy, Tel +39 010-5385306, www.rina.org ACCREDIA Registration number:00005 VV
Accredited or approved by:	The International EPD System
Procedure for follow-up of data during EPD validity involves third party verifier	☐ Yes ☒No

EPDs within the same product category but registered 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 version number up to the first two digits) 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 equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

2. About the Company

Knauf is one of the world's leading manufacturers of modern insulation materials, dry lining systems, plasters and accessories, thermal insulation composite systems, paints, floor screed, floor systems, and construction equipment and tools. The company's headquarter in Italy is in Castellina Marittima (Pisa). Currently, the Castellina Marittima plant has a global area of 90,000 square meters, covers an area of 30,000 square meters and owns more than 100 hectares of quarries. The products manufactured in Knauf plant in Castellina Marittima are plasterboard, steel profiles required for the implementation of the plasterboards, ceilings, stucco and impregnators.

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3. Product Information

3.1 Product Description

Knauf DIAMANT plasterboard is gypsum board consisting of an aerated gypsum core, armed with mineral fibers, encased in and firmly bonded to strong paper liners. Knauf DIAMANT plasterboards are extremely robust, moisture and fire resistant and are ideal for the construction of partitions, walls, attic coverings and internal coating. DIAMANT plasterboards are used for the residential area as well as for schools, hospitals and public places. Knauf DIAMANT plasterboard is available in size 12.5 mm.

3.2 Technical Data

Technical data referred to Knauf DIAMANT 12.5 mm plasterboard are given in Table 1.

Table 1 - Technical information.

Product identification	UNI EN 520: DFH2IR
Nominal density	The assumed density is 1040 kg/m³
Thermal conductivity	0.25 W/mK
Class of reaction to fire performance (accordingto EN 13501:1)	Building material class: A2 Burning droplets: s1 Smoke gas development: d0

3.3 Delivery Status

The EPD refers to 12.5 mm thick Knauf DIAMANT plasterboard.

3.4 Base materials / Ancillary materials

The average composition of gypsum-based plaster, including the packaging materials, is reported in Table 2

Table 2- Content declaration of plasterboard and relative packaging.

Product components	Weight, kg	Post-consumer material*, weight %	Biogenic material**, weight-% of product	Biogenic material, kg C/Declared Unit
Gypsum	12.48	0	0	0
Cardboard	0.39	89%	3%	0.18
Additives[1]	0.13	0	0	0
Total	13	2,67%	3%	0.18

Packaging materials	Weight, kg	Weight-% (versus the product)	Biogenic material, kg C/Declared unit
Paper label	0.00002	0.0002%	8.46E-06
Polyethylene film	0.00155	0.0119%	0
Wooden bearers	0.03376	0.2590%	0.0167
Total	0.035	0.27%	0.017

[1]including starch, glass fibers and foaming agent, additive for core cohesion

**The estimated recycled content percentage for the cardboard is 89%, calculated using a weighted average of data retrieved from the suppliers' Environmental Product Declarations (EPDs)*

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

Knauf DIAMANT 12.5 mm plasterboard does not contain substances on the ECHA Candidate List of Substances of Very High Concern (SVHC) above 0.1% by mass.

3.5 Packaging

Plasterboards Knauf DIAMANT 12.5 mm are piled up on bearers and are protected against damage by strapping tape (polyethylene). Paper label is also considered as packaging. Packing materials are externally recovered/disposed of.

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3.6 Recycled material
Board liner for the covering of gypsum core is produced from 89% recycled waste paper, which is certified by FSC and is supplied by truck from German manufacturing sites. The DIAMANT manufacturing process uses a part of recovered gypsum derived from production wastes and dust from the filtration plants.

3.7 Re-use phase
Once plasterboards Knauf DIAMANT 12.5 mm are installed, they are not suited for re-use in an unchanged way. Prior to collection, plasterboards Knauf DIAMANT 12.5 mm should be separated from other used building materials.

3.8 Disposal
Knauf DIAMANT 12.5 mm plasterboards have to be disposed of in compliance with the following waste codes of the European Waste Catalogue /EWC/:17 08 02 gypsum-based construction materials.

3.9 Further information
Further information can be found through the enquiry desk:
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http://www.knauf.com/it-IT

3.10 Manufacture
Knauf DIAMANT plasterboard is manufactured using a continuous production process, showed in the Figure 1 below:

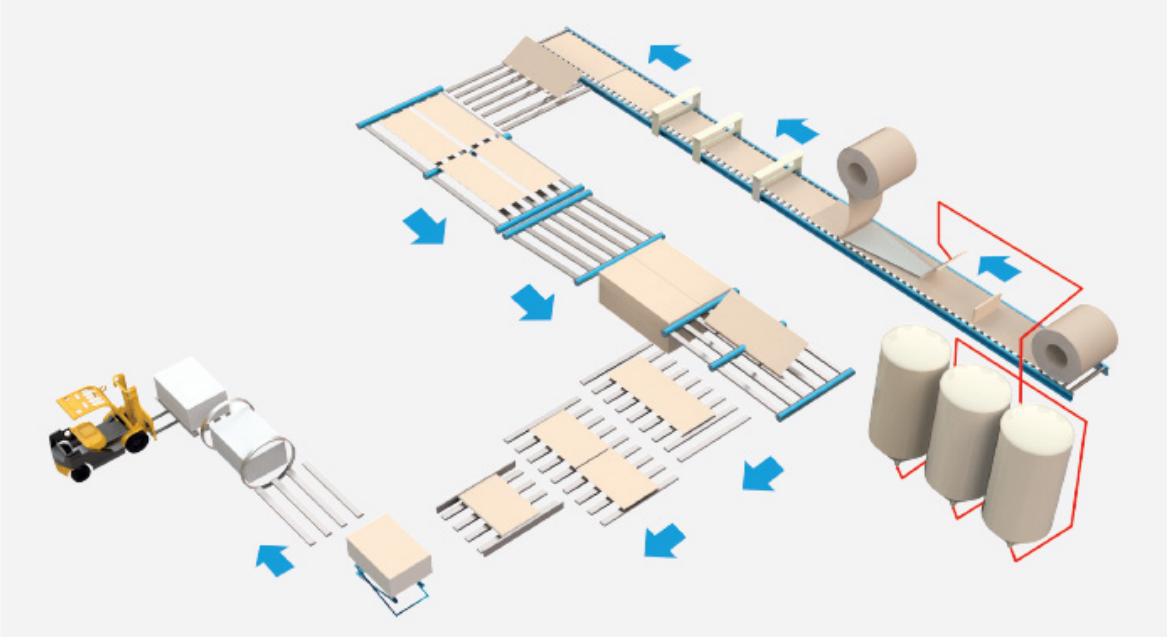

Figure 1 - Gypsum board manufacturing process.

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.

3.11 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 ISO 14001, ISO 9001 and ISO 45001:2018 certified systems.

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4. LCA Information

Figure 2 shows a flow diagram of the system under study. The system boundary covers A1 - A3 product stages referred as 'Raw material supply', 'Transport' and 'Manufacturing'. In addition to the manufacturing phase (modules A1-A3), this EPD contains the transport from the manufacturing to the building site (A4) and the installation into the building site (A5) as well as the End-of-life stage (de-construction and demolition as C1; transport to waste processing as C2; waste processing for reuse, recovery and/or recycling as C3; disposal as C4; benefits and loads beyond the system boundary, as module D). Accordingly, the EPD is a cradle-to-gate declaration with module C1-C4, module D and optional modules A4 and A5. The system boundaries in tabular form for all modules are shown in the Table 3 below.

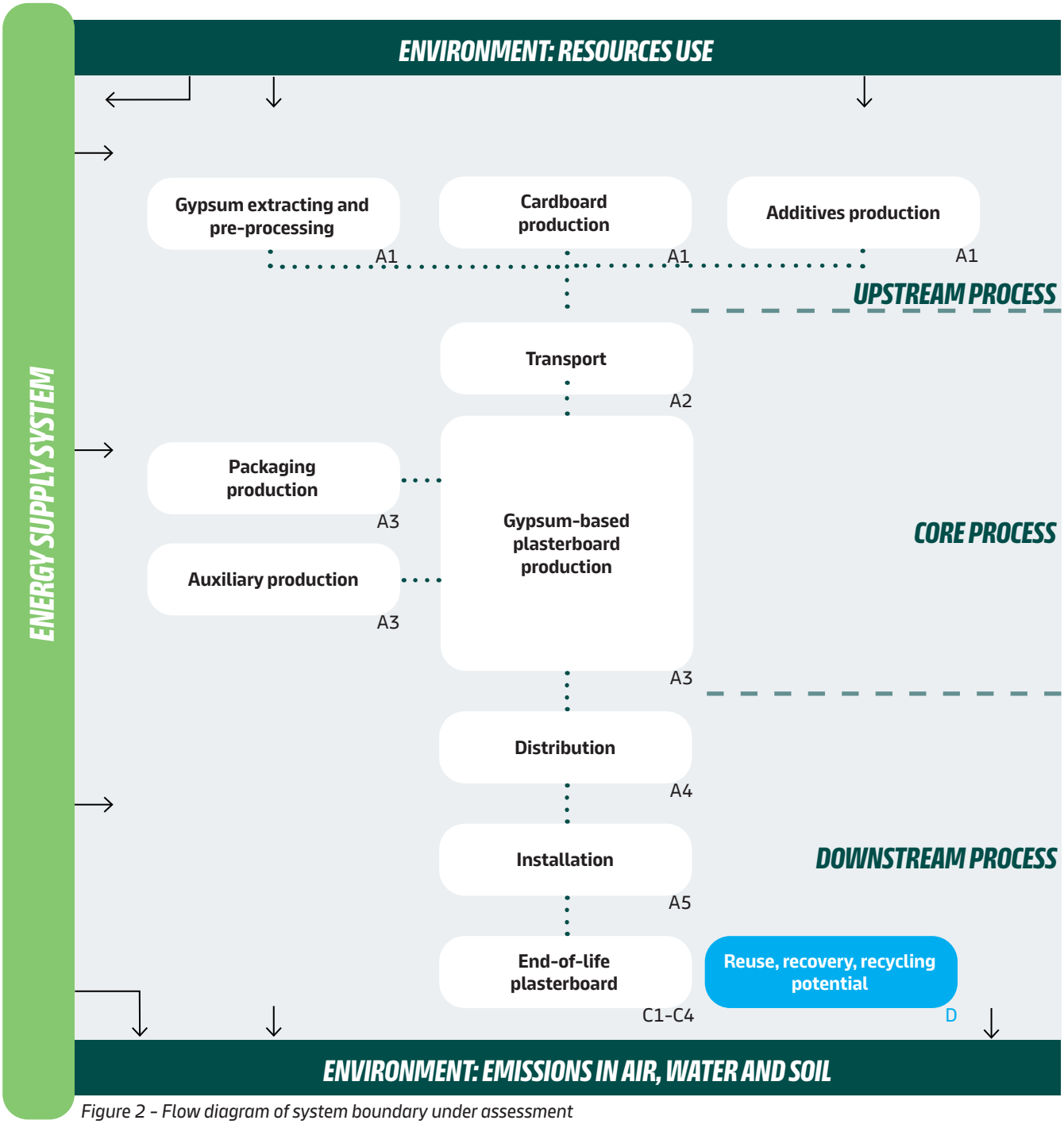

Figure 2 - Flow diagram of system boundary under assessment

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Table 3 - System boundaries chosen for the LCA (X-module included in LCA. MND – module not included. N/A-Not Applicable).

	Product stage			Construction process stage		Use stage							End of life stage				Benefits and loads beyond the system boundaries
	Raw material supply	Transport	Manufactoring	Transport from the gate to the site	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demo	Transport	Waste processing	Disposal	Reuse-Recovery-Recyclingpotential
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Module declared	X	X	X	X	X	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X
Geography	EU/GLO	EU/GLO	EU	EU	EU								EU	EU	EU	EU	EU
Share of specific data	39% on GWP - GHG																
Variation products	N/A																
Variation sites	N/A																

The use of the results for modules A1-A3 should not be used without considering the results of module C.

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5. LCA Calculation Rules

LCA calculation rules are reported in Table 4.

Table 4 - LCA calculation rules.

5.1	**Functional unit/ declared unit**	The declared unit is 1 m² of gypsum-based plasterboard with a weight of 13 kg/m²
5.2	**System boundaries**	The study is from cradle to gate, with module C1-C4, module D and optional modules A4, A5
5.3	**Estimates and assumptions**	The use stage (module B1-B7) was assumed have no impacts. The DIAMANT 12.5 mm product has a reference service life of 50 years. This assumes that the product will last in situ with no requirements for maintenance, repair, replacement or refurbishment throughout this period. For the production of additives and packaging materials (and their disposal), generic data have been used, since their mass flow in relation to the declared unit is limited. All transports of raw materials, additives and packaging purchased have been included in the LCA considering real distances travelled by materials used in the year 2024. The electricity mix of the Castellina Marittima plant of Knauf S.r.l. S.a.s. consists of 61% self-generated electricity through cogeneration and 39% electricity purchased from an external energy supplier. The externally purchased electricity is 100% renewable, sourced entirely from hydroelectric power. Its renewable origin is certified through Guarantees of Origin (GOs). An average transport distance of 50 km from the production site to waste processing and disposal facilities has been assumed for module A3. Additionally, a transport distance of 100 km to the recovery treatment site is considered. End-of-life stage (C modules): an average transport distance of 50 km from the construction site to waste processing and disposal facilities (C2) has been assumed. Since there is no waste processing at the end of life, module C3 is not applicable. The declared plasterboard is typically disposed of as construction waste, which is declared in module C4, therefore module D is not applicable. Module D is only applied to packaging material. The potential impacts and avoided burdens resulting from the recycling of end-of-life packaging are assigned to Module D.
5.4	**Cut-off rules**	All major raw materials and all the essential energy is included. General cut-off criteria are given in standard EN 15804:2012+A2:2019/AC:2021 Clause 6.3.6. In compliance with these criteria, the infrastructure of the manufacturing site and personnel related activities (travel, office operations and supplies) are excluded from the study.
5.5	**Background data**	All primary product data was provided by Knauf S.r.l. S.a.s. - Castellina Marittima plant. All secondary data was retrieved using SimaPro 10.2 software, with Ecoinvent 3.10 database.

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5.6	Data quality	Primary data refer to 2024 and have been collected at Knauf S.r.l. S.a.s. plant located in Castellina Marittima (IT), whereas selected generic data have been retrieved from Ecoinvent 3.10 database and using the most updated datasets and - as far as possible - those representatives for at least 5 years into the future. Manufacturing facility specific data from Knauf are based on 1 year average for process data. The following rules for time scope of data were applied: < 10 years for background data and < 2 years for manufacturer's data. The quality level concerning datasets used in the EPD can be considered as "very good" according to Annex E of the EN 15804. Moreover, as required by the General Programme Instructions, the environmental impacts associated to proxy data do not exceed 10% of the overall environmental impact from the product system.
5.7	Period under review	The data is representative of the manufacturing processes of 2024.
5.8	Allocations	According to ISO 14040 and 14044, for the allocation procedure physical properties are used to drive flow analysis.
5.9	Comparability	A comparison or an evaluation of EPD data is only possible where EN 15804 has been followed, the same building context and product-specific characteristics of performance are taken into account, and the same stages have been included in the system boundary. According to EN 15804, EPD of construction products may not be comparable if they do not comply with this standard. According to ISO 21930, EPD might not be comparable if they are from different programmes.

Description of system boundaries
This EPD evaluates the environmental impacts of 1 m² of gypsum-based plasterboard from cradle to gate, with module C1-C4, module D and optional modules A4, A5. Within the Life Cycle Assessment of the declared board, the following processes are considered:

Product Stage, A1-A3

Description of the stage
The product stage of the plasterboard products is subdivided into three modules: A1, A2 and A3 respectively "raw material supply", "transport" and "manufacturing".

A1, raw material supply
This includes raw material extraction and processing and energy production. The declared Knauf gypsum board consists of a gypsum core, which also contains additives for easier processing and/or a fine adjustment of the respective properties of the individual board. The natural gypsum is mainly extracted from open-cast mining in close vicinity to the manufacturing site. Natural gypsum is calcinated to stucco prior to the mixing with other components. Board liner for the covering of gypsum core is produced from recycled waste paper, with an average recycled content of 89%.

A2, transport to the manufacturer
Natural gypsum is extracted from mines close to the manufacturing sites. Accordingly, transport distances are short and trucks can be used. Further raw materials are supplied by truck from manufacturers within Italy or from other European countries.

A3, manufacturing
The module includes the manufacture of product. Stucco and additives are suspended in water and spread on a continuous sheet of board liner (visible face, lower layer). Beforehand, the board liner is cut at the sides for edge shaping. The slurry is covered with a second sheet of board liner (back surface) in the forming station and the edges of the visible face board liner are flipped upwards. On the subsequent board liner, the gypsum sets continuously and the boards are dried in a multi-level drier to the permitted residual moisture level. Drying is followed by the cutting of the boards to the desired lengths. Finally, gypsum boards are piled up on bearers. All other packaging materials are externally recycled/disposed of (external recycling is beyond the applied system boundaries). When recycled materials are being used, such as post-consumer recycled cardboard, burdens associated with the collection, processing and transport of these materials were included in the assessment.

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Construction process stage, A4-A5

Description of the stage
The construction process is divided into 2 modules: A4, transport to the building site and A5, installation into the building.

A4, transport to the building site
Table 5 below quantifies the parameters for transporting the product from the production gate to the building site. The distance shown is a weighted average, calculated using company data and the quantity of product transported. For the distribution of the finished products, an average scenario involving EURO 5 and EURO 6 articulated trucks has been considered, based on sales figures in Italy and across Europe during the reference year. Maritime transport with freight ships is also considered. Specific data was not available for capacity utilisation or fuel consumption, therefore generic European values from Ecoinvent database have been assumed.

Table 5 - Parameters for transporting the product from production gate to the building site.

Parameter	Value (expressed per functional/declared unit)
Type of vehicle	Truck 16-32 tons. EURO5, EURO 6 Boat, freight ship
Distanceto central warehouse	357 km weighted average by truck to all markets 63 km weighted average by boat to all markets
Distance to construction site	29 km
Fuel/energy consumption	0.04L diesel fuel per tkm (truck) 0.0002L diesel fuel per tkm (boat)
Capacity utilization	70%
Bulk density of transported products	1040 kg/m³

A5, installation into the building
The plasterboard is considered installed when it is attached in its designated place in the building. The accompanying Table 6 quantifies the parameters for installing the product at the building site. All installation materials and their waste processing and packaging waste of plasterboard are included.

Table 6 - Parameters for installing the product at the building site.

Parameter	Value (expressed per functional/declared unit)
Ancillary materials for installation(specified by materials)	Jointing compound: 0.350 kg Jointing tape: 0.00065 kg (1.5 m) Screw: 0.013 kg
Water use	0.00165 m³
Other resource use	None
Quantitative description of energy type (regional mix) and consumption during the installation process	None required

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Wastage of materials on the building site before waste processing, generated by the product's installation (specified by type)	Knauf Diamant 12.5 mm: 0.65 kg Jointing compound: 0.0175 kg Wooden bearers: 33.76 g (waste from packaging) Polyethylene film: 1.554 g (waste from packaging) Paper label: 0.02 g (waste from packaging)
Output materials (specified by type) as results ofwaste processing at the building site e.g. of collection for recycling, for energy recovery, disposal (specified by route)	Knauf Diamant 12.5 mm: 0.65 kg to landfill Jointing compound: 0.0175 kg to landfill Wooden bearers: 33.76 g to landfill, incineration and material recovery Polyethylene film: 1.554 g to landfill, incineration and material recovery Paper label: 0.02 g to landfill, incineration and material recovery

Use Stage (excluding potential savings), B1-B7

Description of the stage
The use stage is divided into the following:

B1, use or application of the installed product;
B2, maintenance;
B3, repair;
B4, replacement;
B5, refurbishment;
B6, operational energy use;
B7, operational water use.

Description of scenarios and additional technical information
The product has a reference service life of 50 years. This assumes that the product will last in situ with no requirements for maintenance, repair, replacement or refurbishment throughout this period. Knauf DIAMANT plasterboard is a passive building product; therefore, it has no impact at this stage.

End-of-life stage, C1-C4

Description of the End-of-life stage
The end-of-life stage includes:

C1, de-construction, demolition
Deconstruction includes dismantling or demolition of the product from the construction. No on-site sorting of the materials occurs.
C2, transport to waste processing
Once the product is uninstalled, the construction mixed waste is transported for 50 km to the landfill disposal.
C3, waste processing for reuse, recovery and/or recycling
Since there is no waste processing at the end of life, modules C3 is not applicable.
C4, disposal
Product residues (e.g. plasterboard scraps, jointing tapes, jointing compound) are considered to be deposited in a landfill.

In modeling this EPD, it was assumed that all material was landfilled. In any case, once selective demolition has been carried out, the material can be sent to recovery centers, depending on current national legislation and common recycling practices.

Table 7 - End-of-life stage.

Parameter	Value (expressed per functional/declared unit)
C1) Collection process specified by type	13 kg collected and transported by truck for landfill
C2) Assumption for scenario development (e.g. transportation)	Truck 16-32 tons. EURO4, EURO5, EURO 6. Diesel consumption 0.04L per tkm; 50 km from demolition site to landfill site
C3) Recovery system specified by type	None
C4) Disposal specified by type	100% of waste is landfilled

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Reuse/recovery/recycling potential, D

Description of the stage
Module D, relating to information on the potential for reuse/recovery/recycling, is assessed considering the benefits of the avoided impact of future extractions and production of raw materials, brought about by the recycling of the packaging materials. The processes necessary to make the materials of the product (at the end of life) new raw materials for subsequent life cycles are considered. Module D is applied only to packaging material and not to the plasterboard sheet since this is entirely disposed of in landfill.

6. LCA Results

In following tables, the environmental impacts per declared unit are reported for the environmental categories recommended by the EPD's General Programme Instruction (version 4.0, March 2021) and those indicated in PCR 2019:14 version 1.3.4 for Construction products and construction services. The LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

The calculation of impact categories has been carried out according to https:// www.environdec.com, with specific reference to the EN 15804+A2 LCIA & LCI method implemented in Sima Pro. The EN 15804+A2 method is based on the EC-JRC characterization factors as specified in EN 15804+A2 6.5.2 Core environmental indicators. In addition to the core environmental indicators, the SimaPro method "EN 15804 +A2 LCIA & LCI indicators" contains LCI indicators as mentioned in EN 15804 - Parameters describing resource use, other environmental information describing waste categories, and environmental information describing output flows. Additionally, the method includes two indicators on biogenic carbon content in the product and in the packaging.

7. LCA Results Interpretation

The product stage (Modules A1–A3) represents the main contributor to the overall environmental impact for most indicators, with contributions ranging between 67% and 99%.

The distribution of finished product (transport in module A4) influences the LCA results with a medium percentage of 12%. The categories in which Module A4 is most significant are Climate Change - Total (21%), Photochemical Ozone Formation (19%), and Resource Use, Fossil (19%).
As for transport in Modules A2 and C2, the average contribution to impacts does not exceed 3.5%.

The installation phase (Module A5) has an average contribution to impact categories of less than 4%. The category most affected by the installation phase is Water use (10%). The average impacts related to Module C1 (De-construction) and Module C4 (Final disposal) are residual, amounting to less than 2.5%.

Regarding energy-related indicators, product stage (Modules A1–A3) contributes the most, with a share ranging from 73% to 100%. A similar trend is observed for Net use of fresh water, where Modules A1–A3 are also the main contributors, with a share of over 87%. Finally, waste generation follows the same pattern: the majority of the impacts, ranging from 72% to 87%, are attributed to Modules A1-A3.

ADDITIONAL INFORMATION
Information about energy mix used in the manufacturing process
The electricity mix of the Castellina Marittima plant of Knauf S.r.l. S.a.s. consists of 61% self-generated electricity through cogeneration and 39% electricity purchased from an external energy supplier. The externally purchased electricity is 100% renewable, sourced entirely from hydroelectric power. Its renewable origin is certified through Guarantees of Origin (GOs).

Greenhouse gas emissions: 0.214 kg CO2 eq/kWh.

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Environmental Impact Indicators

Table 8 - LCA results of potential environmental impact referred to the declared unit.

Impact category DIAMANT 12.5	Unit	Product stage	Transport	Installation	End of life stage				Benefits and loads beyond the system boundary
		A1-A3	A4	A5	C1	C2	C3	C4	D
Climate change - GWP-GHG	kg CO2 eq	2.62	0.78	0.08	0.04	0.11	0	0.04	-5.19E-4
Climate change - Total	kg CO2 eq	2.54	0.78	1.58E-01	0.04	0.11	0	0.09	0.01
Climate change - Fossil	kg CO2 eq	2.57	0.78	0.08	0.04	0.11	0	0.04	-5.55E-4
Climate change - Biogenic	kg CO2 eq	-5.93E-2	2.48E-4	0.075	6.7E-6	4.93E-5	0	0.05	0.01
Climate change - Land use and LU change	kg CO2 eq	0.03	1.92E-5	6.12E-5	1.51E-6	1.53E-5	0	1.74E-6	-2.76E-6
Ozone depletion	kg CFC11 eq	9.13E-8	1.59E-8	9.29E-10	6.9E-10	2.19E-9	0	5.24E-10	-3.19E-11
Acidification	mol H+ eq	0.01	1.56E-3	3.9E-4	4.1E-4	2.88E-4	0	3.2E-4	-1.3E-6
Eutrophication, freshwater	kg P eq	3.26E-4	5.62E-6	2.52E-5	3.58E-7	3.27E-6	0	1.04E-6	-5.85E-8
Eutrophication, marine	kg N eq	2.95E-3	4.79E-4	1.07E-4	1.93E-4	1.03E-4	0	1.46E-4	-2.55E-7
Eutrophication, terrestrial	mol N eq	0.03	0.01	1.03E-3	2.11E-3	1.13E-3	0	1.6E-3	-3.09E-6
Photochemical ozone formation	kg NMVOC eq	0.01	2.7E-3	3.34E-4	6.28E-4	4.81E-4	0	4.83E-4	-5.44E-6
Resource use, minerals and metals	kg Sb eq	2.4E-5	2.56E-8	1.82E-7	1.83E-9	1.36E-7	0	1.4E-9	-4.75E-11
Resource use, fossils	MJ	39.06	10.28	1.02	0.58	1.47	0	0.45	-2.28E-2
Water use	m3 depriv.	0.72	0.01	0.08	7.51E-4	4.2E-3	0	6.49E-4	-2.44E-4

[1]GWP-GHG: This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 6 (IPCC 2021). This indicator is almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

EN 15804+ A2 disclaimers for Resource use and Water use indicators. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

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Resource Use

Table 9 - LCA results of use of resources referred to the declared unit.

Impact category DIAMANT 12.5	Unit	Product stage	Transport	Installation	End of life stage				Benefits and loads beyond the system boundary
		A1-A3	A4	A5	C1	C2	C3	C4	D
Use of renewable primary energy (PERE)	MJ (LHV)	2.25	0.04	0.11	1.29E-3	0.01	0	2.55E-3	-2.72E-2
Primary energy resources used as raw materials (PERM)	MJ (LHV)	6.52	0	0	0	0	0	0	0
Total use of renewable primary energy resources (PERT)	MJ (LHV)	8.77	0.04	0.11	1.29E-3	0.01	0	2.55E-3	-2.72E-2
Use of non-renewable primary energy (PENRE)	MJ (LHV)	38.62	10.28	1.02	0.58	1.47	0	0.45	-2.28E-2
Non-renewable primary energy resources used as raw material (PENRM)	MJ (LHV)	0.61	0	0	0	0	0	0	0
Total use of non-renewable primary energy resources (PENRT)	MJ (LHV)	39.22	10.28	1.02	0.58	1.47	0	0.45	-2.28E-2
Use of secondary material (SM)	kg	0.48	5.09E-6	0.01	1.04E-6	2.69E-4	0	9.16E-7	6.16E-4
Use of renewable secondary fuels (RSF)	MJ (LHV)	0.05	4.43E-7	7.32E-6	2.06E-7	3.44E-6	0	1.75E-7	-1.43E-8
Use of non-renewable secondary fuels (NRSF)	MJ (LHV)	0	0	0	0	0	0	0	0
Net use of fresh water (FW)	m³	0.02	2.63E-4	2.01E-3	1.81E-5	1.03E-4	0	1.57E-5	-5.79E-6

Caption: **PERE** = Use of renewable primary energy excluding the renewable primary energy resource used as raw materials; **PERM** = Use of renewable primary energy as raw materials; **PERT** = Total use of renewable primary energy resources; **PENRE** = Use of non-renewable primary energy excluding the non-renewable primary energy resources used as raw materials; **PENRM** = Use of non-renewable primary energy 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** = Net use of fresh water

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End of Life - Waste

Table 10 - LCA results of waste categories referred to the declared unit.

Impact category DIAMANT 12.5	Unit	Product stage	Transport	Installation	End of life stage				Benefits and loads beyond the system boundary
		A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste disposed	kg	0.06	5.15E-4	0.01	6.24E-5	8.89E-4	0	2.1E-4	-2.15E-6
Non-hazardous waste disposed	kg	1.45	0.04	0.48	2.1E-3	0.02	0	0.01	-1.15E-2
Radioactive waste disposed	kg	2E-5	9.61E-7	1.48E-6	2.95E-8	2.7E-7	0	2.8E-8	-2.46E-9

End of Life - Outflows

Table 11 - LCA results of output flows referred to the declared unit.

Impact category DIAMANT 12.5	Unit	Product stage	Transport	Installation	End of life stage				Benefits and loads beyond the system boundary
		A1-A3	A4	A5	C1	C2	C3	C4	D
Components for re-use	kg	0	0	0	0	0	0	0	0
Materials for recycling	kg	0.06	2.5E-7	2.99E-3	1.47E-8	4.42E-6	0	1.28E-8	1.35E-5
Materials for energy recovery	kg	8.05E-5	2.55E-9	5.07E-7	8.17E-10	3.75E-8	0	1.55E-9	-9.56E-10
Exported energy - electricity	MJ	0.02	5.62E-4	7.93E-4	1.08E-5	1.48E-4	0	1.02E-5	-1.18E-6
Exported energy - heat	MJ	0.01	9.72E-4	1.72E-3	4.36E-6	2.29E-4	0	3.73E-6	-1.22E-6
Recovered energy	MJ	0.03	1.53E-3	2.52E-3	1.52E-5	3.77E-4	0	1.39E-5	-2.4E-6

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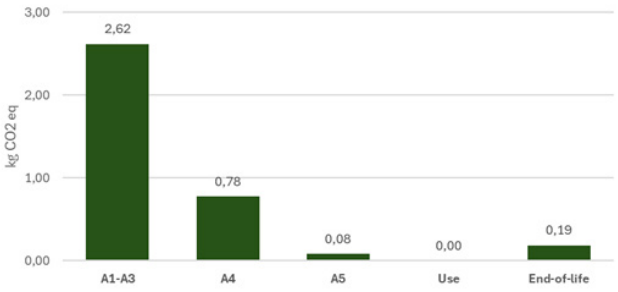
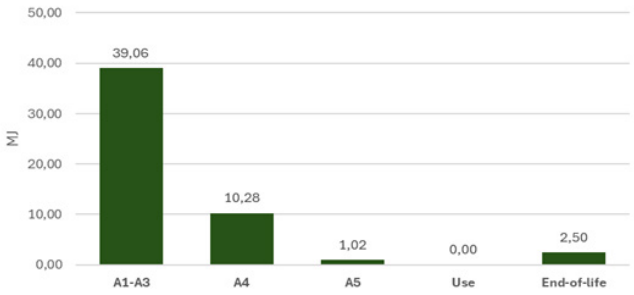
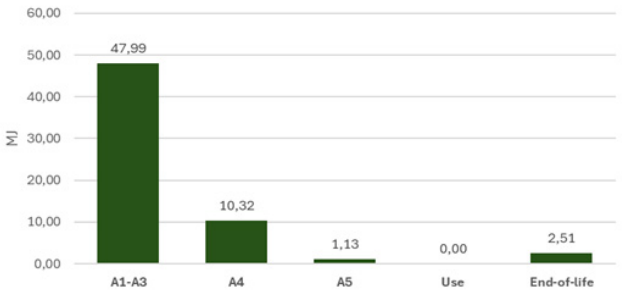
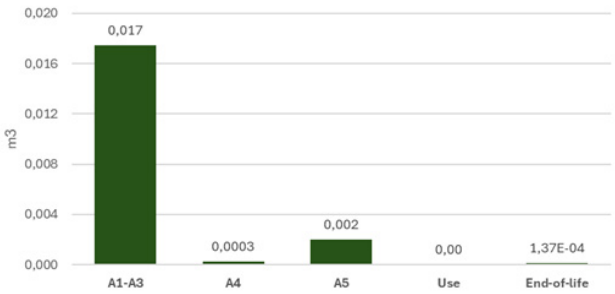
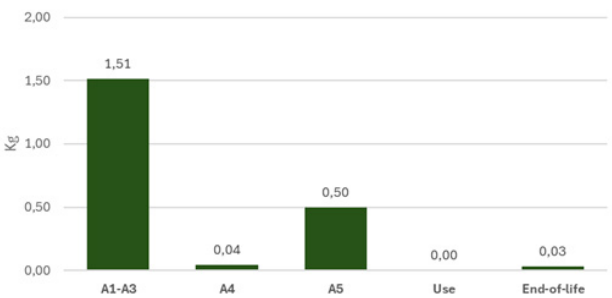
The images below demonstrate the impact of each life cycle stage on 5 key parameters, producing a clear view of how each stage contributes to the overall environmental impacts of 12.5 mm Knauf DIAMANT plasterboard.

DIAMANT 12.5 mm - Overall environmental impacts		TOTAL
Global Warming		**3.67** kg CO_2equiv/DU
Non renewable resources consumption[1]		**52.86** MJ/DU
Energy Consumption[2]		**61.95** MJ/DU
Water consumption[3]		**0.020** m^3/DU
Waste Production[4]		**2.08** kg/DU

[1] This indicator corresponds to the abiotic depletion potential of fossil resources.
[2] This indicator corresponds to the total use of primary energy.
[3] This indicator corresponds to the net use of fresh water.
[4] This indicator corresponds to the sum of hazardous, non- hazardous and radioactive waste disposed

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8. References

Ecoinvent, 2023. Swiss Centre for Life Cycle Assessment, supplier of Ecoinvent v3.10 database (www.ecoinvent.ch).

General principles. EPD International (2021) General Programme Instructions for the International EPD® System. Version 4.0

LCA study. Report tecnico di Life Cycle Assessment (LCA) delle lastre in cartongesso GKB, GKI, GKF, A-ZERO, F-ZERO, DIAMANT, KASA; prodotta da Knauf di Knauf S.r.l. S.a.s. Castellina Marittima (PI), Italia (06/06/2025)

PCR. PCR 2019:14 version 1.3.4 for Construction Products and construction services.
IVL Swedish Environmental Research Institute, Swedish Environmental Protection Agency, SP Trä. Swedish Wood Preservation Institute, Swedisol, SCDA. Svenskt Limträ AB. SSAB (2019).

Standards:

15804:2012+A2:2019/AC:2021. "Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products"

ISO 14025:2010. Environmental labels and declarations – Type III environmental declarations – Principles and procedures.

ISO 45001:2018. Occupational Health and Safety Management

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

ISO 9001:2015. Quality management systems – Requirements

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

ISO 14044:2021. Environmental management – Life cycle assessment – Requirements and guidelines

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For the realisation of this EPD and the LCA study, which constitutes its scientific basis, Knauf di Knauf S.r.l. S.a.s., Castellina Marittima manufacturing plant availed itself of the technical and methodological support of Ergo s.r.l., a spin off company of the School of Advanced Studies Sant'Anna of Pisa. Ergo s.r.l operates under the direction and coordination of Tecno Srl.

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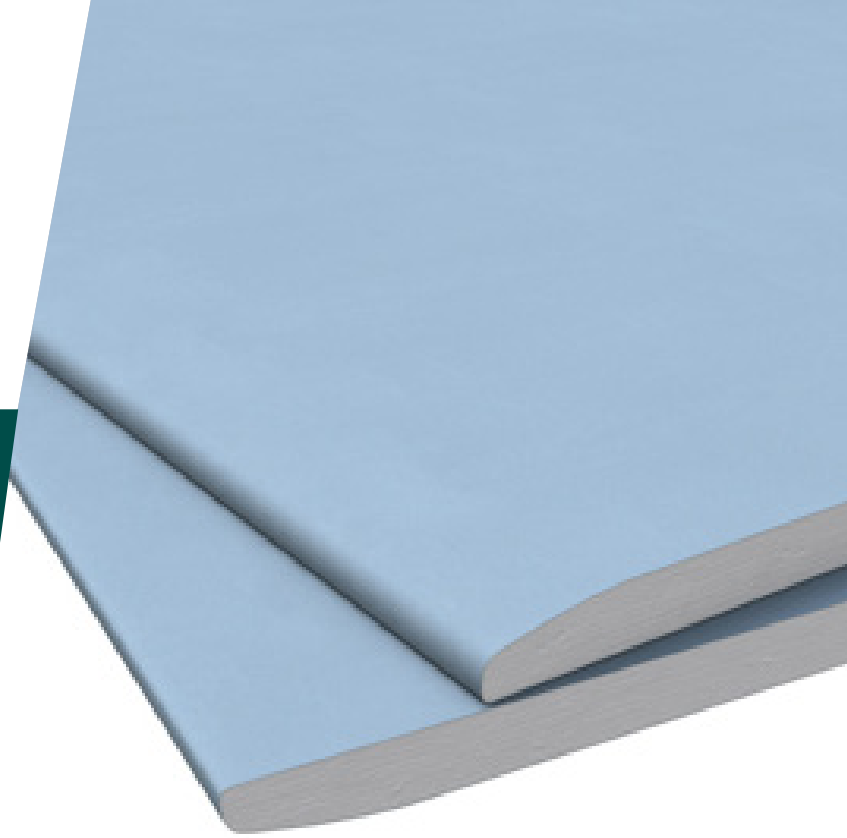

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