

# ENVIRONMENTAL PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A1*

Owner of the Declaration	KNAUF Bulgaria EOOD
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-KNB-20190071-IAC1-EN
Issue date	23.07.2019
Valid to	22.07.2024

**GYPSUM PLASTERBOARD**  
Type A, Type H, Type DF, Type DFH2 and type DFH2IR  
**KNAUF Bulgaria EOOD**

[www.ibu-epd.com](http://www.ibu-epd.com) | <https://epd-online.com>



## 1. General Information

### KNAUF Bulgaria EOOD

#### Programme holder

IBU – Institut Bauen und Umwelt e.V.  
Panoramastr. 1  
10178 Berlin  
Germany

#### Declaration number

EPD-KNB-20190071-IAC1-EN

#### This declaration is based on the product category rules:

Plasterboard, 07.2014  
(PCR checked and approved by the SVR)

#### Issue date

23.07.2019

#### Valid to

22.07.2024



Dipl. Ing. Hans Peters  
(chairman of Institut Bauen und Umwelt e.V.)



Dr. Alexander Röder  
(Managing Director Institut Bauen und Umwelt e.V.)

### KNAUF GYPSUM PLASTERBOARDS Type A, Type H, Type DF, Type DFH2 and type DFH2IR

#### Owner of the declaration

KNAUF Bulgaria EOOD  
27 Angelov vrah Str.  
1618 Sofia, Bulgaria

#### Declared product / declared unit

Gypsum plasterboard in accordance with BDS EN 520:2004+A1:2009 and BDS EN 520:2004+A1:2009/NA:2014.  
1 m<sup>2</sup> with thickness 12.5 mm.

#### Scope:

This is an EPD for an average product of the following products:

- KNAUF gypsum plasterboard type A;
- KNAUF gypsum plasterboard type H;
- KNAUF gypsum plasterboard type DF
- KNAUF gypsum plasterboard type DFH2;
- KNAUF gypsum plasterboard type DFH2IR.

These plasterboards are produced by:

#### KNAUF Bulgaria EOOD

Gypsum Plasterboards Plant  
6294 Mednikarovo  
Galabovo municipality, Bulgaria

The LCA considers specific information provided by the manufacturer and suppliers of components exclusively for the cradle-to-gate production stage.

The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

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The EPD was created according to the specifications of EN 15804+A1. In the following, the standard will be simplified as EN 15804.

#### Verification

The standard EN 15804 serves as the core PCR

Independent verification of the declaration and data according to ISO 14025:2010

☐ internally ☒ externally



Ms Jane Anderson  
(Independent verifier)

## 2. Product

### 2.1 Information about the enterprise

Knauf, whose history and family business began in Germany in 1932, is now a leader on five continents as a manufacturer and supplier of products of guaranteed quality in the field of construction. Thanks to 35,000

employees in 86 countries around the world, the Knauf trademark offers an extremely wide range of products that are present throughout the modern construction process – from complete energy-efficient systems to finishing works in the interior of buildings.

## 2.2 Product description/Product definition

The plasterboard consists of gypsum core wrapped around and tightly glued to a durable and resistant paper layer. The paper surfaces are different depending on the specific type and use of the plasterboard and the core might include additives for improved properties. The declaration refers to the declared unit of 1 m<sup>2</sup> of an average plasterboard product with a thickness 12.5 mm and average surface mass of < 10 kg/m<sup>2</sup>. This product in this EPD is a weighted average of the following products:

- KNAUF gypsum plasterboard type A;
- KNAUF gypsum plasterboard type H;
- KNAUF gypsum plasterboard type DF
- KNAUF gypsum plasterboard type DFH2;
- KNAUF gypsum plasterboard type DFH2IR.

The life cycle assessment results can be applied approximately to other board thicknesses, too.

For the placing on the market of the product in the EU/EFTA (with the exception of Switzerland) Regulation (EU) No. 305/2011 (CPR) applies. The product needs a declaration of performance taking into consideration /EN 520:2004+A1:2009/ Gypsum plasterboards – definitions, requirements and test methods and the CE-marking. For the application and use the respective national provisions apply.

## 2.3 Application

Gypsum plasterboards are directly placed in drywall systems. The specific recommended applications of the products are as follows:

- **KNAUF plasterboard type A** – interior drywall systems without special requirements: wall and ceiling panelling on metal framing construction, wall liner systems, partition walls and suspended ceilings;
- **KNAUF plasterboard type H** – interior drywall systems in rooms with moderate humidity (kitchens, bathrooms): wall and ceiling panelling on metal framing construction and as a base layer for tiles;
- **KNAUF plasterboard type DF** – interior drywall systems with requirements for fire resistance: wall and ceiling panelling on metal framing construction, wall liner systems, partition walls and suspended ceilings;
- **KNAUF plasterboard type DFH2** – interior drywall systems with requirements for fire resistance in humid rooms: wall and ceiling panelling on metal framing construction particularly (e.g. bathrooms in residential buildings);
- **KNAUF plasterboard type DFH2IR** – partition shaft walls, wall panelling, suspended ceilings with increased requirements for sound insulation and fire resistance both in dry and humid rooms (kitchens, bathrooms, toilets). This plasterboard is appropriate in case of requirements for high mechanical resistance, higher walls and buildings with large people flow.

## 2.4 Technical Data

/Regulation (EU) No.305/2011/ applies for placing of the declared products on the market within European union/European Free Trade Association EU/EFTA.

KNAUF plasterboards are required to have declarations of performance and CE marking.

## Constructional data

The following technical information based on DoPs of the delivered products is relevant for the declared products:

Name	Value	Unit
Gross density	640 - 1027	kg/m <sup>3</sup>
Thermal conductivity	0.21 - 0.27	W/(mK)
Water vapor diffusion resistance factor – $\mu$	10/4	

Performance data of the product with respect to its characteristics in accordance with the relevant technical provision (no CE-marking).

In Bulgaria the following standards apply:

- /BDS EN 520:2004+A1:2009/ Gypsum plasterboards – definitions, requirements and test methods;
- /BDS EN 520: 2004+A1:2009/NA:2014/ Gypsum plasterboards – definitions, requirements and test methods – National Annex to /BDS EN 520:2004+A1:2009/;

KNAUF plasterboards are processed in accordance with these standards and Knauf Standard for Production and Quality Control of Gypsum plasterboards /V5/08.03.2018/.

Flexural strength tests fulfill the requirements for minimum destructive load.

Sound insulation, sound absorption and impact resistance are not declared for the product per se as they depend on the application/system. Data on these characteristics can be found on [www.KNAUF.bg](http://www.KNAUF.bg)

## 2.5 Delivery status

The plasterboards considered in this EPD are produced and delivered in the following formats:

Product	Width [mm]	Length [mm]	Thickness [mm]	Surface mass [kg/m <sup>2</sup> ]
Type A	600/1200/1250	2000-3000	6.5/9.5/12.5/15	5.0-10.7
Type H	600/1200	2000-3000	12.5/15/18	8.0-11.2
Type DF	1200	2000-3000	12.5/15/18	10.0-10.7
Type DFH2 and DFH2IR	1200	2000/2600	12.5/15	10.1-15.4

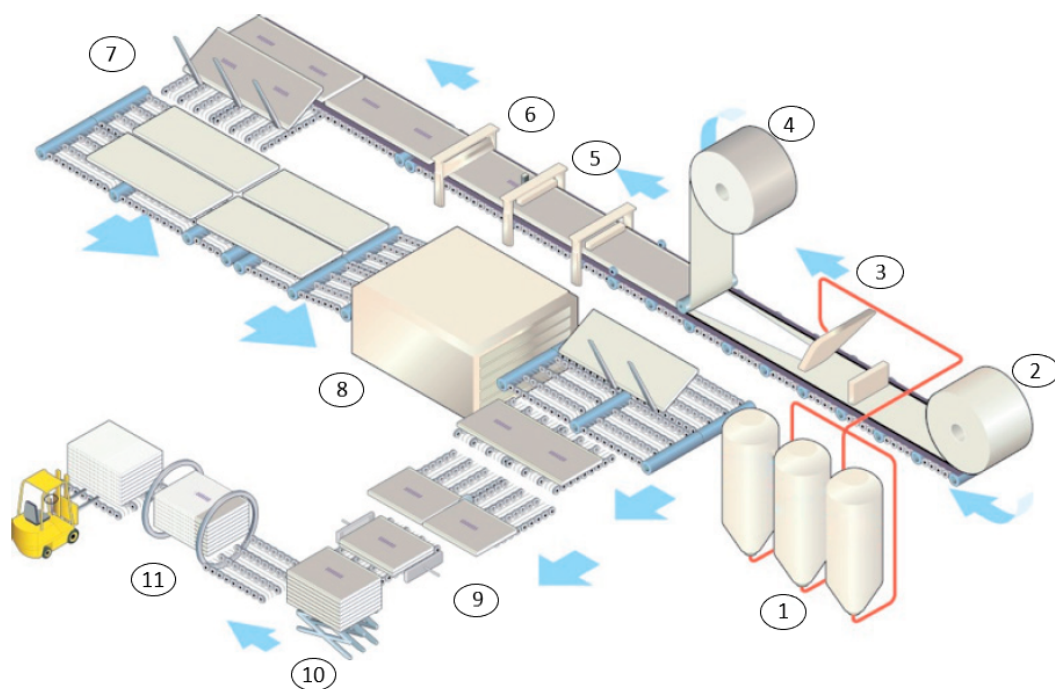
## 2.6 Base materials/Ancillary materials

KNAUF gypsum plasterboards consist of 82% gypsum on weighted average (ranging between 80% and 90% among types) in between two layers of cardboard liner. Plasterboards contain small amounts (less than 3%) of modifying additives for the gypsum core. Plasterboards do not contain substances included in the "Candidate List of substances of very high concern" (ECHA 2019)/ in more than 0.1% by weight.

## 2.7 Manufacture

The manufacturing process is illustrated in the following figure.





A gypsum slurry is made up from dehydrated flue gas desulfurization (FGD) gypsum, raw FGD gypsum, water and other additives, in a continuous mixer (1). Rolled cardboard is supplied to a conveyor line (2). This slurry is spread (3), in a uniform stream, from multiple outlet hoses onto a moving rolled paper. The back layer (4) of paper is then laid from above and applied to the slurry. The front face paper is folded at the edges and the gypsum slurry is fully enclosed in paper.

After that, the board is moved along the length of the production line on a series of setting belts, and sections of rollers (5). The plasterboard is then delivered at the shear (6) and is cut into panels with specific length. The panels are then turned over (7) and processed to a multi-level dryer (8). After the drying process is finished, the boards are trimmed (9) and arranged onto pallets (10). The pallets are covered with plastic foil and are placed for storage in the warehouse or they are sent for direct distribution (11).

## 2.8 Environment and health during manufacturing

The manufacturing plant is certified under /BDS EN ISO 9001:2008/, /BDS EN ISO 14001:2015/ and /BS OHSAS 18001:2007/ and has implemented an occupational system for health and safety management. Gypsum plasterboards are manufactured in KNAUF Maritsa plant permitted by the relevant Bulgarian authorities with regards to greenhouse gases emissions, waste management and discharge waters in accordance with the specifications of the /Bulgarian Law on Environmental Protection/, /Waste Management Act/ and /Waters Act/.

## 2.9 Product processing/Installation

### Storage

KNAUF plasterboards should be stored in a horizontal position in dry conditions.

### Installation

The installation of the products should follow the recommendations and instructions available on [www.KNAUF.bg](http://www.KNAUF.bg).

## 2.10 Packaging

KNAUF gypsum plasterboards are stored, transported and delivered to the market on pallets and covered with plastic film. Plasterboard inserts and stretch film provide protection against damage of the plasterboard pallets. The wooden pallets are reusable and the packaging film are externally recycled or disposed of.

## 2.11 Condition of use

The plasterboards are intended for interior use only and are not designed for exterior exposure.

## 2.12 Environment and health during use

Gypsum plasterboards are tested by the /Institut für Baubiologie Rosenheim GmbH (2016)/ and results state that there are no harmful effects and no hazardous substances are emitted above permissible amounts during use.

## 2.13 Reference service life

No reference service life is determined in accordance with /EN ISO 15686-1:2011/. A service life of >50 years can be considered for the gypsum plasterboards in accordance with the Bundesinstitut für Bau-, Stadt- und Raumforschung /(BBSR)/ table "Service lives of components for life cycle assessment according to BNB".

If installed and used in accordance with established construction practices and manufacturer's instructions, no effect on ageing is to be observed.

## 2.14 Extraordinary effects

### Fire

Gypsum plasterboards in general offer excellent fire protection due to both mineral composition and low density - the core of gypsum di-hydrate contains

approximately 20% chemically bound crystalline water which evaporates when exposed to fire, thereby consuming energy by means of conversion. The resulting gypsum semi-hydrate offers increased thermal insulation. KNAUF plasterboard types DF, DFH2 and DFH2IR have enhanced performances when exposed to fire due to the addition of glass fibres reinforcement to the gypsum core.

The reaction to fire for all plasterboard types is classified according to /BDS EN 13501-1:2007+A1:2009/ and is declared as A2-s1, d0 in compliance with /BDS EN 520:2004+A1:2009/.

#### Fire protection

Name	Value
Building material class A2	Non-flammable
Burning droplets s1	No smoke
Smoke gas development d0	No flaming droplets/particles

#### Water

Unless expressly designated by the manufacturer, all gypsum products must be protected from permanent humidity.

KNAUF plasterboards type A and type DF should be protected from continuous moistening. KNAUF plasterboards type H, type DFH2 and DFH2IR have improved moisture resistance and are suitable for application in domestic wet rooms. However, a permanent exposure to wet conditions or relative humidity above 70 % may lead to a decrease in strength. Measures to assess and repair water damage to gypsum plasterboards is available at [www.gypsum.org/GA-238-2016](http://www.gypsum.org/GA-238-2016), GA-801-2017/.

#### Mechanical destruction

Minor defects and damages on plasterboards can be repaired with suitable gypsum filling materials. In case of severe damages, the plasterboards can be easily replaced by new boards. Unforeseeable mechanical destructions of plasterboards are not supposed to cause any environmental impacts.

#### 2.15 Re-use phase

##### Re-use

Once KNAUF plasterboards are installed, they are not suited to be re-used in an unchanged way. It is

recommended that, after the initial use, plasterboards are collected separately from other used construction materials and waste and pruned of foreign matter.

#### Further use

Residual materials from the installation of new KNAUF plasterboards (e.g. cuttings at the building site), can be further used after some processing (e.g. crushing and/or removal of board liner) for various purposes such as mining sites reclamation, soil conditioner or fertilizer, cement or other binder production, subject to agreement with the purchaser and consideration of national regulations. At the present moment, the Bulgarian legislation demands these materials to be collected separately and sent for recovery operation R13 as per Waste Management Act or for disposal to landfills for nonhazardous waste in cells where no biodegradable waste is accepted.

#### Recycling

Gypsum is considered to be 'indefinitely' recyclable (closed-loop recycling) because its chemical composition does not change while the processes of dehydration (calcination) and hydration are reversible. However, plasterboard recycling requires crushing, removal of the cardboard liner and treatment in order to be used for the production of new gypsum products. The removed cardboard can be used as a secondary fuel or added to recycled paper.

#### 2.16 Disposal

Disposal of gypsum plasterboards should be made in compliance with the following waste code of the /European Waste Catalogue/, transposed in Bulgaria by /Bulgarian Ordinance No.2 on waste classification/: 17 08 02 – gypsum-based construction materials other than those mentioned in 17 08 01. Gypsum plasterboard waste falls under the conditions for disposal to landfills for non-hazardous waste in cells where no biodegradable waste is accepted, according to /Bulgarian Ordinance No.6/ for construction and use of landfills and other facilities for waste recovery and disposal. This EPD has not modelled the sequestration of carbon.

#### 2.17 Further information

Further information about KNAUF plasterboards is available on [www.KNAUF.bg](http://www.KNAUF.bg).

### 3. LCA: Calculation rules

#### 3.1 Declared Unit

The declared unit is 1m<sup>2</sup> of KNAUF plasterboard with thickness 12.5 mm as an average of KNAUF plasterboard type A, KNAUF plasterboard type H, KNAUF plasterboard type DF, KNAUF plasterboard type DFH2 and KNAUF plasterboard type DFH2IR. Average surface mass of the plasterboard is 8.31 kg/m<sup>2</sup> and is calculated as a weighted average value from the annually produced quantities of each plasterboard type.

##### Declared unit

Name	Value	Unit
Declared unit	1	m <sup>2</sup>
Conversion factor to 1 kg ( in kg/m <sup>2</sup> )	8.31	-
Grammage	8.31	kg/m <sup>2</sup>
Layer thickness	0.012	m

#### 3.2 System boundary

This EPD covers the production stage in accordance with /EN 15804/, i.e. the scope is cradle-to-gate (Modules A1-A3). This includes the production of raw materials and their transport to the manufacturing site, the production processes, the packaging and the preparation for delivery, as well as the use of electricity, fuels and water.

#### 3.3 Estimates and assumptions

Assumptions are made regarding the following:

#### 3.4 Cut-off criteria

All components, electricity, fuels and water demand for manufacturing of the gypsum plasterboards are

considered. Most of materials and energy flows with share of less than 1% are also considered. Components not included as chemical composition are still considered in the transport calculations. The total sum of omitted components has less than 1% contribution to the total mass.

### **3.5 Background data**

Background data from the /ecoinvent v.3.4/ database is used for the LCA modelling and calculations. The life cycle assessment is modelled for Bulgaria as a reference area and datasets for Bulgaria are used where possible. The electricity mix for Bulgaria for 2014 is used /International Energy Agency/.

### **3.6 Data quality**

Data is collected from the manufacturer for the production processes and amounts for 2017. Where actual data is missing, background datasets are used from the /ecoinvent v.3.4/ database (2017). Therefore, the quality of data is considered to be very good.

### **3.7 Period under review**

The modelling is based on the annual production of KNAUF plasterboards for 2017.

### **3.8 Allocation**

Co-product allocation (by mass) is applied for data on used energy, fuels and water consumption, auxiliary, operating materials and generated waste for individual products in the factory and is based on physical relationships.

### **3.9 Comparability**

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account.

## **4. LCA: Scenarios and additional technical information**

This is a cradle-to-gate declaration, so no scenarios have been considered.

## 5. LCA: Results

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE NOT DECLARED; MNR = MODULE NOT RELEVANT)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	MND	MND	MND	MND	MNR	MNR	MNR	MND	MND	MND	MND	MND	MND	MND

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A1: 1 m2 Average KNAUF Bulgaria plasterboard, 12.5 mm

Parameter	Unit	A1-A3
Global warming potential	[kg CO <sub>2</sub> -Eq.]	1.51E+0
Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	1.32E-7
Acidification potential of land and water	[kg SO <sub>2</sub> -Eq.]	8.20E-3
Eutrophication potential	[kg (PO <sub>4</sub> ) <sup>3</sup> -Eq.]	1.38E-3
Formation potential of tropospheric ozone photochemical oxidants	[kg ethene-Eq.]	3.58E-4
Abiotic depletion potential for non-fossil resources	[kg Sb-Eq.]	7.29E-6
Abiotic depletion potential for fossil resources	[MJ]	2.50E+1

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A1: 1 m2 Average KNAUF Bulgaria plasterboard, 12.5 mm

Parameter	Unit	A1-A3
Renewable primary energy as energy carrier	[MJ]	1.54
Renewable primary energy resources as material utilization	[MJ]	8.56
Total use of renewable primary energy resources	[MJ]	10.10
Non-renewable primary energy as energy carrier	[MJ]	32.04
Non-renewable primary energy as material utilization	[MJ]	1.59
Total use of non-renewable primary energy resources	[MJ]	33.63
Use of secondary material	[kg]	7.16
Use of renewable secondary fuels	[MJ]	0.00
Use of non-renewable secondary fuels	[MJ]	0.00
Use of net fresh water	[m <sup>3</sup> ]	0.02

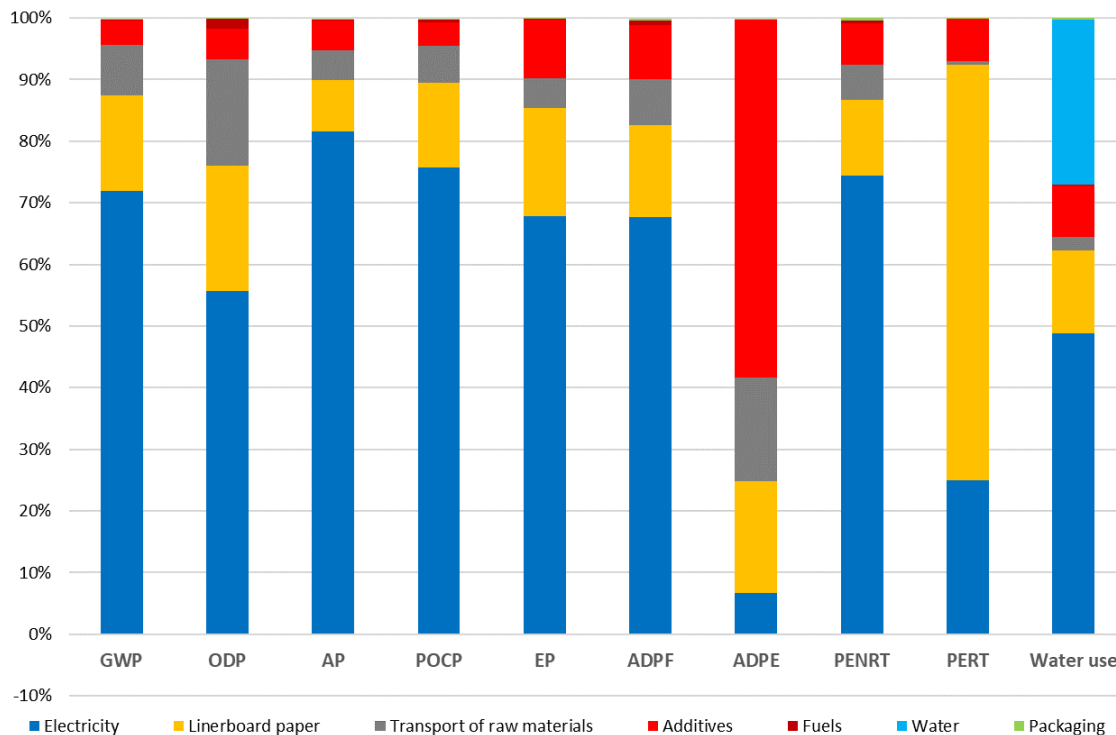
RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A1: 1 m2 Average KNAUF Bulgaria plasterboard, 12.5 mm

Parameter	Unit	A1-A3
Hazardous waste disposed	[kg]	8.61E-3
Non-hazardous waste disposed	[kg]	1.08E-3
Radioactive waste disposed	[kg]	1.41E-4
Components for re-use	[kg]	0.00
Materials for recycling	[kg]	1.77E-2
Materials for energy recovery	[kg]	0.00
Exported electrical energy	[MJ]	0.00
Exported thermal energy	[MJ]	0.00

## 6. LCA: Interpretation

The predominant components in the plasterboard produced by KNAUF Bulgaria EOOD (gypsum and water) are side products from the operating of the nearby thermal power plant. The overall assessment indicated that the major share of the environmental impacts arises from the manufacturing process – it is strongly dependent on electricity, as the gypsum drying and calcination units, mixing station, the conveyor line, the multi-level dryer, the cutting station and the packaging installation are operated with electrical energy. The linerboard paper appears to be of second

importance for most indicators. The transport causes notable contribution to Ozone Depletion Potential (ODP) and Abiotic Depletion Potential (ADPE) but is much less significant for the other indicators. Additives in plasterboard are used in small quantities but their production processes can be intensive in terms of elements depletion (ADPE). Fuels for factory transport and some facilities have negligible environmental effect which is visible only in ODP. Packaging materials for palletizing are also negligible.



The environmental impacts of the weighted average plasterboard are influenced mainly by the results for type A and type H plasterboards as they form a great share in the total plasterboard production. The results for type DF and DFH2/DFH2IR are higher than the weighted average due to their higher density. On average, the increase of all impacts, excluding ADPE, is 20% for type DF and 40% for DFFH2/DFH2IR.

ADPE is influenced by the use of additives: it is twice as much the average value for type DF and four times higher than the average for DFH2/DFH2IR. ADPE of type A and type H is smaller than the weighted average by 50% and 30% respectively.

The impact estimate results are relative expressions and do not predict impacts on category endpoints or the transgression of thresholds, safety margins or risks.

## 7. Requisite evidence

### 7.1 Leaching (sulphate + heavy metals)

No analysis of KNAUF plasterboard waste (not hazardous waste on its own) according to procedures of the /Bulgarian Ordinance No.6/ on landfills has been performed, because it is commonly accepted that the product displays the sulphate concentration in the saturation range which is typical for gypsum (approx. 1500 mg/l), resulting in risks of odorous and toxic hydrogen sulphide gas production in landfills.

Therefore, the proper management of this waste requires separate collection from other waste and handing over to authorized bodies (as per cl. 35 of the Bulgarian /Waste Management Act/) for further treatment through recovery or disposal operations. The disposal is allowed only to landfills for non-hazardous waste in cells where no biodegradable waste is accepted (cl. 2.2.3. of Appendix 1 of /Bulgarian Ordinance No.6/).

Heavy metal content is significantly below the corresponding criteria for landfill for non-hazardous waste as per /Bulgarian Ordinance No. 6/.

### 7.2 Radioactivity

The tested product with an ACI value of 0.03 (as per Gutachten Nr. 3016 – 855) complies with the official guideline value of  $ACI \leq 1$  (European Commission RP 112) and is therefore harmless from the point of view of exposure to radiation.

### 7.3 Volatile Organic Compound (VOC) emissions

KNAUF Plasterboards were tested by Materialprüfanstalt (MPA) Eberswalde (Germany) as per /DIN ISO 16000-9:2006/ and /German Committee for Health-related Evaluation of Building Products/ test scheme and it was found that the requirements of the AgBB protocol /AgBB 2015/ are fully met.

**Total volatile organic compound (TVOC)**  $3 \leq 10$  mg/m<sup>3</sup>

**Carcinogenic, mutagenic, reprotoxic (CMR)-substances 3**  $\leq 0.01$  mg/m<sup>3</sup>

**TVOC 28**  $< 1.0$  mg/m<sup>3</sup>

**Sum semi-volatile organic compounds (SVOC)**  $28 \leq 0.1$  mg/m<sup>3</sup>

**CMR-substances**  $28 \leq 0.001$  mg/m<sup>3</sup> as a single substance consideration.

**Total VOC 28 excl. LCI**  $\leq 0.1$  mg/m<sup>3</sup>

**R-value**  $< 1$



## 8. References

### Standards

#### EN 15804

EN 15804:2012-04+A1 2013, Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products.

#### EN 15804

EN 15804:2019+A2 (in press), Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products.

#### ISO 14025

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

### Further References

#### Title of the software/database

Title of the software/database. Addition to the title, version. Place: Publisher, Date of publication [Access on access date].

#### IBU 2016

Institut Bauen und Umwelt e.V.: General Programme Instructions for the Preparation of EPDs at the Institut Bauen und Umwelt e.V. Version 1., Berlin: Institut Bauen und Umwelt e.V., 2016.  
[www.ibu-epd.com](http://www.ibu-epd.com)

/IBU Product Category Rules (PCR)/ for Building-Related Products and Services Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report–v. 1.7 (IBU PCR Part A-v.1.7)

/IBU PCR/ Guidance-Texts for Building-Related Products and Services Part B: Requirements on the EPD for Plasterboard (IBU PCR Part B: Plasterboard v.1.7, Jan, 2019)

/BDS EN ISO 14040:2006/  
Environmental management -- Life cycle assessment - Principles and framework

/BDS EN ISO 14044:2006/  
Environmental management – Life cycle assessment – Requirements and guidelines

/BDS EN 15942:2011/  
Sustainability of construction- Environmental product declarations. Communication format business-to-business

/BDS EN 520:2004+A1:2009/  
Gypsum plasterboards – definitions, requirements and test methods

/BDS EN 520: 2004+A1:2009/NA:2014/  
Gypsum plasterboards – definitions, requirements and test methods – National Annex to BDS EN 520:2004+A1:2009

/V5/08.03.2018/

Knauf Standard for Production and Quality Control of Gypsum plasterboards

/EN ISO 15686-1:2011/

Buildings and constructed assets -- Service life planning -- Part 1: General principles and framework

/BDS EN 13501-1:2007+A1:2009/

Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests

/BDS EN ISO 10456:2008/

Building materials and products - Hygrothermal properties - Tabulated design values and procedures for determining declared and design thermal values (ISO 10456:2007)

/DIN ISO 16000-9:2006/

Indoor air - Part 9: Determination of the emission of volatile organic compounds from building products and furnishing - Emission test chamber method (ISO 16000-9:2006)

/German Committee for Health-related Evaluation of Building Products/

<https://www.umweltbundesamt.de/en/topics/health/com-missions-working-groups/committee-for-health-related-evaluation-of-building>

/AgBB 2015/

AgBB - Evaluation procedure for VOC emissions from building products, Committee for Health-related Evaluation of Building Products, February 2015

/DIN EN ISO 17294-2:2003/

Water quality - Application of inductively coupled plasma mass spectrometry (ICP-MS) - Part 2: Determination of 62 elements (ISO 17294-2:2003)

/Regulation (EU) No 305/2011/

of the European parliament and of the council of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC

/Declaration of Performance No. 0102/24.01.2019 for gypsum plasterboard type A/

/Declaration of Performance No. 0102/24.01.2019 for gypsum plasterboard type H2/

/Declaration of Performance No. 0102/24.01.2019 for gypsum plasterboard type DF/

/Declaration of Performance No. 0102/14.04.2015 for gypsum plasterboard type DFH2/

/Declaration of Performance No. 0102/16.08.2017 for gypsum plasterboard type DFH2IR/

/Data safety sheet for gypsum plasterboard type A v.2 – 14.04.2015/

/Data safety sheet for gypsum plasterboard type H2 v.2 – 14.04.2015/

/Data safety sheet for gypsum plasterboard type DF v.2 – 14.04.2015/

/Data safety sheet for gypsum plasterboard type DFH2 v.2 – 14.04.2015/

/International Energy Agency/  
[www.iea.org](http://www.iea.org) (last visited March 21, 2019)

/Institut für Baubiologie Rosenheim GmbH (2016)/  
Gutachten Nr. 3016-855 von Institut für Baubiologie  
Rosenheim GmbH, 19.09.2016

/European Commission Radiation protection 112/  
Radiological Protection Principles concerning the  
Natural Radioactivity of Building Materials, 1999

/“Candidate List of substances of very high concern”  
(ECHA 2019)/  
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**Publisher**

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