

# DAPHABITAT SYSTEM ENVIRONMENTAL PRODUCT DECLARATION

WWW.DAPHABITAT.PT

[ACCORDING TO ISO 14025, EN 15804:2012+A2:2019 AND EN 15942]



Declaration number: DAP 008:2024

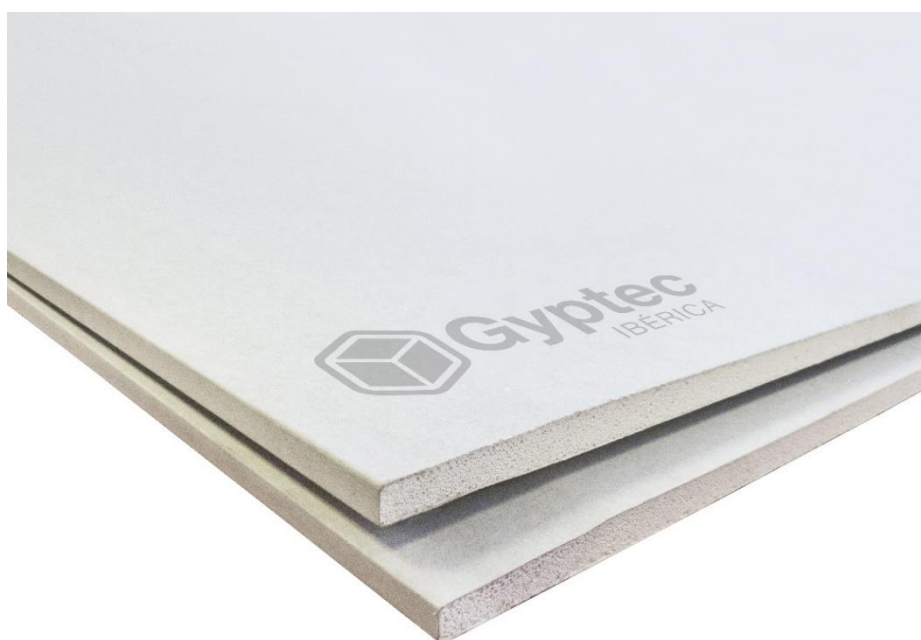



## PLASTERBOARD GYPTEC 13A (STANDARD)

Issue date: 19/09/2024

Valid until: 18/09/2029

GYPTEC IBÉRICA – GESSOS TÉCNICOS, S.A.



 Cluster Habitat  
Sustentável  
Version 1.4. Ed. Março 2024



## INDEX

<b>1.</b>	<b>GENERAL INFORMATION .....</b>	<b>1</b>
1.1.	THE DAPHABITAT SYSTEM .....	1
1.2.	EPD OWNER.....	1
1.3.	INFORMATION CONCERNING THE EPD .....	3
1.4.	DEMONSTRATION OF THE VERIFICATION .....	3
1.5.	EPD REGISTRATION .....	3
1.6.	PCR (PRODUCT CATEGORY RULES) BASIC MODEL .....	4
1.7.	RELEVANT C-PCR (COMPLEMENTARY PRODUCT CATEGORY RULES).....	4
1.8.	INFORMATION CONCERNING THE PRODUCT/PRODUCT CLASS .....	5
1.9.	CALCULATION RULES OF THE LCA.....	6
1.10.	USE OF AVERAGE ENVIRONMENTAL PERFORMANCE .....	7
1.11.	TECHNICAL INFORMATION FOR REFERENCE SERVICE LIFE (RSL).....	7
1.12.	FLOW DIAGRAM OF INPUT AND OUTPUT OF THE PROCESSES .....	8
<b>2.</b>	<b>CORE ENVIRONMENTAL IMPACT INDICATORS .....</b>	<b>9</b>
2.1.	DESCRIPTION OF THE SYSTEM BOUNDARIES .....	9
2.1.1.	JUSTIFICATION FOR THE EXEMPTION TO DECLARE MODULES C1, C2, C3, C4 AND D.....	9
2.2.	CORE ENVIRONMENTAL IMPACT INDICATORS .....	10
2.3.	ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS .....	11
2.4.	INDICATORS DESCRIBING RESOURCE USE .....	12
2.5.	OTHER ENVIRONMENTAL INFORMATION DESCRIBING DIFFERENT WASTE CATEGORIES .....	13
2.6.	ENVIRONMENTAL INFORMATION DESCRIBING OUTPUT FLOWS .....	13
2.7.	INFORMATION DESCRIBING THE BIOGENIC CARBON CONTENT AT THE FACTORY GATE .....	14
<b>3.</b>	<b>SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION.....</b>	<b>14</b>
3.1.	C1 DE-CONSTRUCTION, DEMOLITION – END OF LIFE OF THE PRODUCT .....	14
3.2.	C2 TRANSPORT – END OF LIFE OF THE PRODUCT.....	14
3.3.	C3 WASTE PROCESSING FOR REUSE, RECOVERY AND/OR RECYCLING – END OF LIFE OF THE PRODUCT .....	14
3.4.	C4 DISPOSAL – END OF LIFE OF THE PRODUCT.....	14
3.5.	SCENARIO AND TECHNICAL INFORMATION FOR MODULE D.....	15
3.6.	ADDITIONAL INFORMATION ON RELEASE OF DANGEROUS SUBSTANCES TO INDOOR AIR, SOIL, AND WATER DURING THE USE STAGE	15
3.7.	OTHER ADDITIONAL INFORMATION .....	15
<b>4.</b>	<b>REFERENCES .....</b>	<b>17</b>

## 1. GENERAL INFORMATION

### 1.1. The DAPHabitat System

<b>Program operator:</b>	Sustainable Construction Platform <a href="http://www.clusterhabitat.pt">www.clusterhabitat.pt</a> <a href="mailto:geral@clusterhabitat.pt">geral@clusterhabitat.pt</a>	
<b>Address:</b>	Departamento Engenharia Civil Universidade de Aveiro 3810-193 Aveiro	
<b>Email address:</b>	<a href="mailto:deptechnico@clusterhabitat.pt">deptechnico@clusterhabitat.pt</a>	
<b>Telephone number:</b>	(+351) 234 401576	
<b>Website:</b>	<a href="http://www.daphabitat.pt">www.daphabitat.pt</a>	
<b>Logo</b>		

### 1.2. EPD owner



<b>Name of the owner:</b>	Gyptec Ibérica – Gessos Técnicos, S.A.	
<b>Production site:</b>	Rua das Olaias, nº 3 Parque Industrial e Empresarial da Figueira da Foz 3090-380 Figueira da Foz, Portugal	
<b>Telephone:</b>	(+351) 233 403 050	
<b>E-mail:</b>	<a href="mailto:geral@gyptec.eu">geral@gyptec.eu</a>	
<b>Website:</b>	<a href="http://www.gyptec.eu">www.gyptec.eu</a>	
<b>Logo:</b>		
<b>Information concerning the applicable management Systems:</b>	Quality Management System which fulfills the requirements of the following standard ISO 9001:2015, Registration Number: ES-1595/2009 Environmental Management System which fulfills the requirements of the following standard ISO 14001:2015, Registration Number: ES-2017/0224 <a href="https://gyptec.eu/en/technical-documentation/">https://gyptec.eu/en/technical-documentation/</a>	
<b>Specific aspects regarding the production:</b>	CEA 23620 – production of plaster products for construction	
<b>Organization's environmental policy:</b>	Conciliate progress and economic growth with an appropriate preservation and protection of the environment is one of the main business purposes of Gyptec Ibérica – Gessos Técnicos, S.A. It is therefore concerned to ensure the highest level of satisfaction of all interested parties, based on a “green economy”, rational and efficient in the use of natural resources. <a href="https://gyptec.eu/en/quality-and-environment/">https://gyptec.eu/en/quality-and-environment/</a>  To ensure compliance with this purpose, the organization has developed the following guidelines:	

1. Comply with customer requirements in order to promote their satisfaction and exceed their expectations, always respecting and promoting the protection of the Environment and social responsibility;
  2. Comply with applicable laws and regulations on Quality and Environment, as well as other subscribed compliance obligations, relating to its products and services, environmental aspects and impacts;
  3. Promote continuous improvement of the Integrated Management System by reviewing the established goals and the adequacy of the organization's context, of the interested parties and of the risks and opportunities inherent to its activity, improving the production process and periodically evaluating its aspects and significant environmental impacts, on a life-cycle perspective and taking into account future activities to develop;
  4. Train, inform and sensitize employees to care about the Environment and Quality in the tasks they perform, always acting in a conscious, ethical and responsible manner;
  5. Prevent pollution by implementing good environmental management practices, with emphasis on a careful management of waste, favoring reduction, reuse and recycling, and the preservation of natural resources;
  6. Maintain and strengthen its market position through the high quality and innovation of its products, technical support and compliance with deadlines, thereby addressing the market competition with confidence, openness and determination to differentiate itself from the competitors in a positive way;
  7. Promote and communicate this Policy with the interested parties as appropriate, with all employees, as well as with subcontractors, in order to comply with the Quality and Environment requirements of Gyptec Ibérica – Gessos Técnicos, S.A.
- The Administration of Gyptec Ibérica – Gessos Técnicos, S.A. undertakes to periodically review this Integrated System Policy, which is documented, implemented, maintained and communicated as appropriate, in order to guarantee its effectiveness.

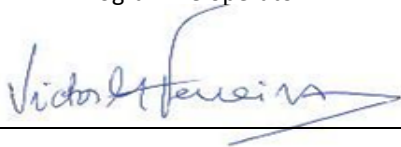
### 1.3. Information concerning the EPD

<b>Authors:</b>	1) Gyptec Ibérica – Gessos Técnicos, S.A. - 2) Itecons – Instituto de Investigação e Desenvolvimento Tecnológico para a Construção, Energia, Ambiente e Sustentabilidade
<b>Contact of the authors:</b>	1) Gyptec Ibérica – Gessos Técnicos, S.A.   Rua das Olaias, nº 3, Parque Industrial e Empresarial da Figueira da Foz, 3090-380 Figueira da Foz, Portugal T (+351) 233 403 050   Dulce Carvalho: <a href="mailto:geral@gyptec.eu">geral@gyptec.eu</a> 2) Itecons – Instituto de Investigação e Desenvolvimento Tecnológico para a Construção, Energia, Ambiente e Sustentabilidade   Rua Pedro Hispano, s/n, 3030-289 Coimbra, Portugal T (+351) 239 798 949   Maria Inês Santos: <a href="mailto:itecons@itecons.uc.pt">itecons@itecons.uc.pt</a>
<b>Issue date:</b>	19/09/2024
<b>Registration date:</b>	09/10/2024
<b>Registration number:</b>	DAP 008:2024
<b>Valid until:</b>	18/09/2029
<b>Representativity of the EPD (location, manufacturer, group of manufacturers):</b>	EPD of one (1) product class, produced in one (1) plant, belonging to a single (1) producer (Gyptec Ibérica – Gessos Técnicos, SA).
<b>Where to consult explanatory material:</b>	<a href="http://www.gyptec.eu">www.gyptec.eu</a>
<b>Type of EPD:</b>	EPD: cradle-to-gate with modules C1-C4 and module D.

### 1.4. Demonstration of the verification

External independent verification, accordingly with the standard ISO 14025:2010 and EN 15804:2012+A2:2019	
Certification Body	Verifier (s)
	
(CERTIF – Associação para a Certificação)	(Ana Cláudia Dias)

### 1.5. EPD Registration

Programme operator

(Plataforma para a Construção Sustentável)

## 1.6. PCR (product category rules) basic model

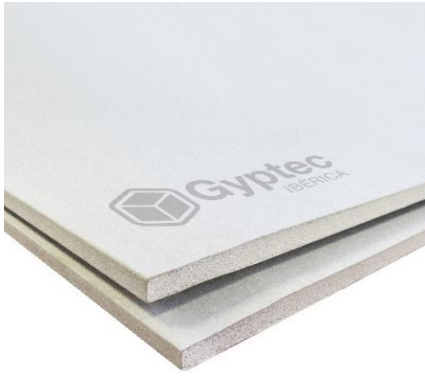
<b>Name:</b>	PCR: Basic module for construction products and services
<b>Issue date:</b>	Edition August 2023
<b>Number of registration on the data base:</b>	RCP-mb001
<b>Version:</b>	Version 2.3
<b>Identification and contact of the coordinator (s):</b>	Marisa Almeida   marisa@ctcv.pt Luís Arroja   arroja@ua.pt José Dinis Silvestre   jose.silvestre@ist.utl.pt
<b>Identification and contact of the authors:</b>	Marisa Almeida   marisa@ctcv.pt Luís Arroja   arroja@ua.pt José Silvestre   jds@civil.ist.utl.pt Fausto Freire Cristina Rocha Ana Paula Duarte Ana Cláudia Dias Helena Gervásio Victor Ferreira Ricardo Mateus António Baio Dias
<b>Composition of the Sectorial Panel:</b>	-
<b>Consultation period:</b>	18/11/2015 - 18/01/2016
<b>Valid until:</b>	01/06/2027

CEN standard EN 15804 serves as the core Product Category Rules (PCR).

## 1.7. Relevant c-PCR (Complementary product category rules)

<b>Name:</b>	1. RCP: Wall coverings 2. prEN 17328 :2022 - Complementary product category rules for gypsum-based construction products
<b>Issue date:</b>	1. June 2022 2. November 2022
<b>Number of registration on the data base:</b>	1. RCP002:2014 2. -
<b>Version:</b>	1. Version 1.2 2. -
<b>Identification and contact of the coordinator (s):</b>	1. Luís Arroja   <a href="mailto:arroja@ua.pt">arroja@ua.pt</a> Marisa Almeida   <a href="mailto:marisa@ctcv.pt">marisa@ctcv.pt</a> 2. -
<b>Identification and contact of the authors:</b>	1. Marisa Almeida   marisa@ctcv.pt Luís Arroja   arroja@ua.pt Ana Cláudia Dias   acdias@ua.pt 2. -
<b>Composition of the Sectorial Panel:</b>	1. RMC - Revestimentos de Mármore Compactos, S.A.; APICER – Associação Portuguesa da Indústria de Cerâmica; Sonae Indústria, SGPS, S.A.; Gyptec Ibérica - Gessos Técnicos, S.A. 2. -
<b>Consultation period:</b>	1. 12/08/2013 a 30/11/2013 2. -
<b>Valid until:</b>	1. 01/06/2027 2. -

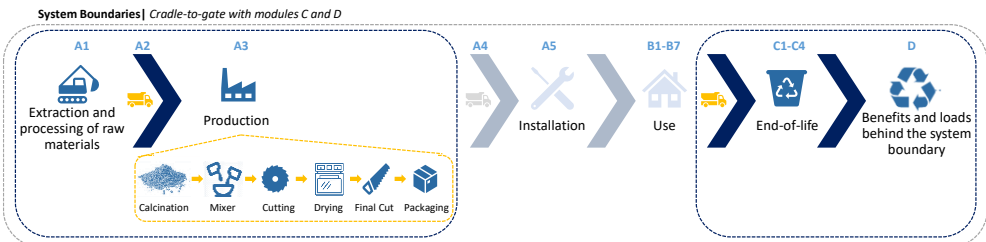
## 1.8. Information concerning the product/product class

<b>Identification of the product:</b>	<p>Plasterboard Gyptec 13A (Standard). The results presented in this EPD correspond to the most representative product: Plasterboard Gyptec 13A (Standard). To estimate the environmental impacts for other thicknesses (Standard Plasterboard 6A, 10A, 15A and 18A) the results of Plasterboard 13A can be multiplied by the corresponding conversion factors (see point 3.7. Other additional information).</p>															
<b>Illustration of the product:</b>																
<b>Brief description of the product:</b>	<p>Laminated plasterboard made up of two sheets of paper with high-quality plaster inside. It is a non-combustible material, resistant to fire and impact, free of harmful substances and which ensures a healthy indoor environment. It's a high energy saving and acoustic performance enhancer, contributing to the comfort and efficiency of the building.</p>															
<b>Main technical characteristics of the product:</b>	<p>Table 1: Technical characteristics (<a href="https://gyptec.eu/en/technical-documentation/">https://gyptec.eu/en/technical-documentation/</a>)</p> <table border="1"> <thead> <tr> <th>Essential characteristics</th> <th>Performance</th> <th>Harmonized technical specification</th> </tr> </thead> <tbody> <tr> <td>Reaction to Fire</td> <td>A2-s1,d0</td> <td>EN520</td> </tr> <tr> <td>Water Vapor Resistance <math>\mu</math></td> <td>10</td> <td>EN 12524</td> </tr> <tr> <td>Flexural Strength Transverse (T) e Longitudinal (L): Thickness 6.5mm Thickness 9.5mm Thickness 12.5mm Thickness 15mm Thickness 18mm</td> <td>T: 100.8N; L: 258N T: 160N; L: 400N T: 210N; L: 550N T: 250N; L: 650N T: 302.4N; L: 774N</td> <td>EN520</td> </tr> <tr> <td>Thermal Conductivity <math>W/m \cdot ^\circ C (23^\circ C / seco) /</math> <math>W/m \cdot ^\circ C (23^\circ C / 50\%)</math> Thickness 6.5mm Thickness 9.5mm Thickness 12.5mm Thickness 15mm Thickness 18mm</td> <td>0.25 (tabled) 0.115/0.200 0.100/0.175 0.105/0.185 0.115/0.200</td> <td>EN 12664</td> </tr> </tbody> </table>	Essential characteristics	Performance	Harmonized technical specification	Reaction to Fire	A2-s1,d0	EN520	Water Vapor Resistance $\mu$	10	EN 12524	Flexural Strength Transverse (T) e Longitudinal (L): Thickness 6.5mm Thickness 9.5mm Thickness 12.5mm Thickness 15mm Thickness 18mm	T: 100.8N; L: 258N T: 160N; L: 400N T: 210N; L: 550N T: 250N; L: 650N T: 302.4N; L: 774N	EN520	Thermal Conductivity $W/m \cdot ^\circ C (23^\circ C / seco) /$ $W/m \cdot ^\circ C (23^\circ C / 50\%)$ Thickness 6.5mm Thickness 9.5mm Thickness 12.5mm Thickness 15mm Thickness 18mm	0.25 (tabled) 0.115/0.200 0.100/0.175 0.105/0.185 0.115/0.200	EN 12664
Essential characteristics	Performance	Harmonized technical specification														
Reaction to Fire	A2-s1,d0	EN520														
Water Vapor Resistance $\mu$	10	EN 12524														
Flexural Strength Transverse (T) e Longitudinal (L): Thickness 6.5mm Thickness 9.5mm Thickness 12.5mm Thickness 15mm Thickness 18mm	T: 100.8N; L: 258N T: 160N; L: 400N T: 210N; L: 550N T: 250N; L: 650N T: 302.4N; L: 774N	EN520														
Thermal Conductivity $W/m \cdot ^\circ C (23^\circ C / seco) /$ $W/m \cdot ^\circ C (23^\circ C / 50\%)$ Thickness 6.5mm Thickness 9.5mm Thickness 12.5mm Thickness 15mm Thickness 18mm	0.25 (tabled) 0.115/0.200 0.100/0.175 0.105/0.185 0.115/0.200	EN 12664														
<b>Description of the product's application/use:</b>	<p>Typical plasterboard uses are as wall linings, internal partitions or ceilings.</p>															
<b>Placing on the market / Rules of application in the market / Technical rules of the product:</b>	<ul style="list-style-type: none"> <li>- EN 520:2004+A1:2009 Gypsum plaster boards. Definitions, requirements and test methods</li> <li>- UNE 102043:2013 – “Assembly of constructive systems with laminated plasterboard (PYL). Partitions, linings and ceilings. Definitions, applications and recommendations.”</li> <li>- Sistemas Constructivos con Placa de Yeso Laminado, Asociación Técnica y Empresarial del Yeso – A.T.E.D.Y., 4.ª, Edição, January 2011.</li> <li>- Regulation (EU) no. 305/2011 of the European Parliament and of the Council, of 9</li> </ul>															



	March 2011, which establishes harmonized conditions for the marketing of construction products.
<b>Quality control:</b>	Quality assurance in accordance with the technical standards of the product
<b>Special delivery conditions:</b>	Not applicable
<b>Components and substances to declare:</b>	The gypsum plasterboards are formed by high quality plaster mixed with additives and encased in two sheets of paper. The products do not contain any substance included in the Candidate List of Substances of Very High Concern (SVHCs) for authorization with concentrations higher than 0.1% weight by weight (w/w).
<b>Where explanatory material may be obtained:</b>	--
<b>History of the LCA studies:</b>	--

## 1.9. Calculation rules of the LCA

<b>Functional unit:</b>	--																															
<b>Declared unit:</b>	1 m <sup>2</sup> of Plasterboard Gyptec 13A (Standard), packaging included.																															
	<table border="1"> <thead> <tr> <th>Parameter</th> <th>Value</th> <th>Unit</th> </tr> </thead> <tbody> <tr> <td>Unit of measurement</td> <td>1</td> <td>m<sup>2</sup></td> </tr> <tr> <td rowspan="2">Plasterboard Gyptec 6A (Standard)</td> <td>Product weight</td> <td>5.50E00 kg/m<sup>2</sup></td> </tr> <tr> <td>Conversion factor to 1 kg</td> <td>1.82E-01 m<sup>2</sup>/kg</td> </tr> <tr> <td rowspan="2">Plasterboard Gyptec 10A (Standard)</td> <td>Product weight</td> <td>6.55E00 kg/m<sup>2</sup></td> </tr> <tr> <td>Conversion factor to 1 kg</td> <td>1.53E-01 m<sup>2</sup>/kg</td> </tr> <tr> <td rowspan="2">Plasterboard Gyptec 13A (Standard)</td> <td>Product weight</td> <td>7.20E00 kg/m<sup>2</sup></td> </tr> <tr> <td>Conversion factor to 1 kg</td> <td>1.39E-01 m<sup>2</sup>/kg</td> </tr> <tr> <td rowspan="2">Plasterboard Gyptec 15A (Standard)</td> <td>Product weight</td> <td>9.01E00 kg/m<sup>2</sup></td> </tr> <tr> <td>Conversion factor to 1 kg</td> <td>1.11E-01 m<sup>2</sup>/kg</td> </tr> <tr> <td rowspan="2">Plasterboard Gyptec 18A (Standard)</td> <td>Product weight</td> <td>12.43E00 kg/m<sup>2</sup></td> </tr> <tr> <td>Conversion factor to 1 kg</td> <td>8.05E-02 m<sup>2</sup>/kg</td> </tr> </tbody> </table> <p>The results presented in this EPD correspond to the most representative product: Plasterboard Gyptec 13A (Standard). To estimate the environmental impacts for other thicknesses (Standard Plasterboard 6A, 10A, 15A and 18A) the results of Plasterboard 13A can be multiplied by the corresponding conversion factors (see point 3.7. Other additional information).</p>	Parameter	Value	Unit	Unit of measurement	1	m <sup>2</sup>	Plasterboard Gyptec 6A (Standard)	Product weight	5.50E00 kg/m <sup>2</sup>	Conversion factor to 1 kg	1.82E-01 m <sup>2</sup> /kg	Plasterboard Gyptec 10A (Standard)	Product weight	6.55E00 kg/m <sup>2</sup>	Conversion factor to 1 kg	1.53E-01 m <sup>2</sup> /kg	Plasterboard Gyptec 13A (Standard)	Product weight	7.20E00 kg/m <sup>2</sup>	Conversion factor to 1 kg	1.39E-01 m <sup>2</sup> /kg	Plasterboard Gyptec 15A (Standard)	Product weight	9.01E00 kg/m <sup>2</sup>	Conversion factor to 1 kg	1.11E-01 m <sup>2</sup> /kg	Plasterboard Gyptec 18A (Standard)	Product weight	12.43E00 kg/m <sup>2</sup>	Conversion factor to 1 kg	8.05E-02 m <sup>2</sup> /kg
Parameter	Value	Unit																														
Unit of measurement	1	m <sup>2</sup>																														
Plasterboard Gyptec 6A (Standard)	Product weight	5.50E00 kg/m <sup>2</sup>																														
	Conversion factor to 1 kg	1.82E-01 m <sup>2</sup> /kg																														
Plasterboard Gyptec 10A (Standard)	Product weight	6.55E00 kg/m <sup>2</sup>																														
	Conversion factor to 1 kg	1.53E-01 m <sup>2</sup> /kg																														
Plasterboard Gyptec 13A (Standard)	Product weight	7.20E00 kg/m <sup>2</sup>																														
	Conversion factor to 1 kg	1.39E-01 m <sup>2</sup> /kg																														
Plasterboard Gyptec 15A (Standard)	Product weight	9.01E00 kg/m <sup>2</sup>																														
	Conversion factor to 1 kg	1.11E-01 m <sup>2</sup> /kg																														
Plasterboard Gyptec 18A (Standard)	Product weight	12.43E00 kg/m <sup>2</sup>																														
	Conversion factor to 1 kg	8.05E-02 m <sup>2</sup> /kg																														
<b>System boundaries:</b>	<p>EPD: cradle-to-gate with modules C1-C4 and module D</p>  <p>Figure 1: Life cycle model (cradle-to-gate with modules C1-C4 and module D) of Plasterboard Gyptec (Standard).</p>																															
<b>Criteria for the exclusion:</b>	According to EN 15804:2012+A2:2019, the cut-off criterion for unit processes is 1% of the total energy consumed and 1% of the total mass of the inputs, with a maximum of 5% of energy usage and mass per module of the life cycle. The developed LCA includes all available data associated to the product stage [A1-A3] and end of life stage																															

	<p>[C1-C4]. The following processes were not considered:</p> <ul style="list-style-type: none"> <li>- Construction of industrial infrastructure and equipment manufacturing;</li> <li>- Maintenance operations of industrial infrastructure and equipment (in accordance with prEN 17328:2022);</li> <li>- Burdens of infrastructures associated to transportation of pre-products and raw materials;</li> <li>- Transport of fuels used at the manufacturing site;</li> <li>- Consumption and emissions related to human activities such as employee transport, administration departments and central support services (where this information is not amalgamated into site totals).</li> </ul>
<b>Assumption and limitations</b>	The year 2020 was considered as the reference year for data collection. This year was selected because it is a typical year in which total heat produced in the cogeneration from natural gas was used. In the following years, there were large fluctuations in the prices of natural gas, so over time the amount of heat produced by cogeneration was reduced.
<b>Quality and other characteristics about the information used in the LCA:</b>	<p>Specific data was used based on the average production of Gyptec Standard Plasterboards in 2020. For processes that the producer has no influence over or specific information on, such as the production of raw and auxiliary materials and the production of electricity, generic data from the Ecoinvent v3.10, EF database 2.0 and Agri-footprint 5 databases was used, taking geographical coverage into account.</p> <p>The quality of the primary and generic data was assessed based on the levels and criteria of the UN Environment Global Guidance on LCA database development, taking into account at least 80% of the environmental impacts in each of the main impact categories. This assessment showed that the quality of the primary data varies between good and very good and that the quality of the generic data varies between poor ('occasional situation') and very good.</p>
<b>Allocation rules:</b>	The industrial unit where Gyptec Standard Plasterboards are manufactured also produces other products (not at the same time). Considering this, a mass allocation methodology was used to determine which inputs and outputs are due to manufacturing these products. It should be noted that during the Gypsum Plasterboard manufacturing no co-products are produced.
<b>Software used for the assessment:</b>	SimaPro v9.6
<b>Background database used for the LCA:</b>	<p>Ecoinvent v3.10</p> <p>EF Database v2.0</p> <p>Agri-footprint 5</p>
<b>Comparability of EPD for construction products</b>	The EPD of construction products and services cannot be comparable in case they are not produced according to EN 15804 and EN 15948 and according to the comparability conditions determined by ISO 14025.

### 1.10. Use of average environmental performance

Not applicable.

### 1.11. Technical information for Reference Service Life (RSL)

Not applicable. This EPD does not include the use stage (module B).

### 1.12. Flow diagram of input and output of the processes

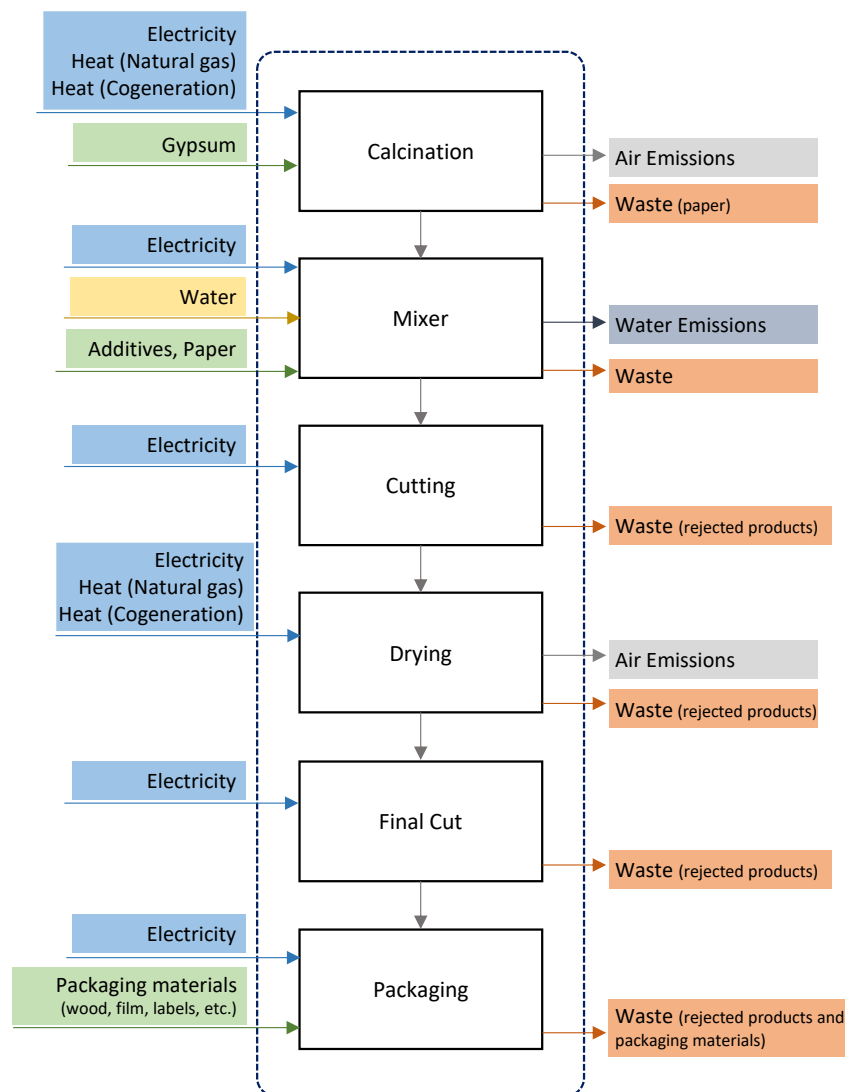


Figure 1: Production process of Standard Gypsum Plasterboard.

The Standard Gypsum Plasterboard production comprises 6 stages: calcination, mixer, cutting, drying, final cut and packaging. The company Gyptec Ibérica – Gessos Técnicos, S.A. dedicates itself to the production of gypsum boards. For this purpose, it uses gypsum of two different types, mineral gypsum, which comes from gypsum mining, and synthetic gypsum, which comes from the desulphurization operations of thermoelectric power stations. This gypsum is prepared for production, by grinding, drying and calcining, using thermal energy from the burning of natural gas and mechanical energy from the action of electrically driven mills. At the end of this process, a hemihydrate powder is obtained, subsequently stored in silos.

In the mixing zone, this hemihydrate powder is mixed with water and additives to form a mass, subsequently injected between two sheets of paper, to form the plate that is transported to a cutting area, where it is selected and cut to size for insertion into the dryer.

In the dryer, excess water is removed, using thermal energy from the burning of natural gas, and then the board is taken to the final cutting and packaging area, where it is subjected to final finishing and packaging.

## 2. CORE ENVIRONMENTAL IMPACT INDICATORS

### 2.1. DESCRIPTION OF THE SYSTEM BOUNDARIES

(✓= included; ND = module not declared)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
Raw material supply	Transport	Manufacturing	Transport	Construction installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-constructions, demolition	Transport	Waste processing	Disposal	Re-use, recovery, recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
✓	✓	✓	ND	ND	ND	ND	ND	ND	ND	ND	ND	✓	✓	✓	✓	✓

#### 2.1.1. Justification for the exemption to declare modules C1, C2, C3, C4 and D

Not applicable.

## 2.2. Core environmental impact indicators

The results presented in this EPD correspond to the most representative product: Plasterboard Gyptec 13A (Standard).

	Global warming potential total; GWP-total	Global warming potential fossil; GWP-fossil	Global warming potential biogenic; GWP-biogenic	Global warming potential land use and land use change; GWP-luluc	Depletion potential of the stratospheric ozone layer; ODP	Acidification potential; AP
Unit	kg CO <sub>2</sub> eq.	kg CO <sub>2</sub> eq.	kg CO <sub>2</sub> eq.	kg CO <sub>2</sub> eq.	kg CFC 11 eq.	mol H <sup>+</sup> eq.
<b>Modules A1-A3</b>	<b>2.45E+00</b>	<b>2.53E+00</b>	<b>-8.61E-02</b>	<b>7.68E-03</b>	<b>1.11E-07</b>	<b>5.31E-03</b>
<b>Module C1</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>
<b>Module C2</b>	<b>1.65E-01</b>	<b>1.65E-01</b>	<b>5.35E-05</b>	<b>4.01E-06</b>	<b>3.33E-09</b>	<b>1.84E-04</b>
<b>Module C3</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>
<b>Module C4</b>	<b>8.28E-01</b>	<b>2.26E-01</b>	<b>6.02E-01</b>	<b>9.96E-05</b>	<b>4.62E-09</b>	<b>2.23E-01</b>
<b>Module D</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>

LEGEND:

- Product stage
- End - of - life stage
- Benefits and loads beyond the system boundary

Units expressed by declared unit.

	Eutrophication potential aquatic freshwater; EP-freshwater	Eutrophication potential aquatic marine; EP-marine	Eutrophication potential terrestrial; EP-terrestrial	Formation potential of tropospheric ozone; POCP	Abiotic depletion potential for non-fossil resources ADP-minerals&metals	Abiotic depletion potential for fossil resources potential ADP-fossil	Water (user) deprivation potential; WDP
Unit	kg P eq.	kg N eq.	mol N eq.	Kg COVNM eq.	kg Sb eq.	MJ, P.C.I.	m <sup>3</sup> World eq. deprived
<b>Modules A1-A3</b>	<b>2.39E-04</b>	<b>1.99E-03</b>	<b>1.43E-02</b>	<b>6.80E-03</b>	<b>1.21E-05</b>	<b>3.83E+01</b>	<b>1.42E+00</b>
<b>Module C1</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>
<b>Module C2</b>	<b>1.18E-06</b>	<b>3.85E-05</b>	<b>4.25E-04</b>	<b>4.01E-04</b>	<b>5.40E-09</b>	<b>2.16E+00</b>	<b>9.17E-04</b>
<b>Module C3</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>
<b>Module C4</b>	<b>2.87E-05</b>	<b>1.27E-03</b>	<b>4.90E-03</b>	<b>1.52E-02</b>	<b>5.10E-08</b>	<b>3.61E+00</b>	<b>-7.82E-01</b>
<b>Module D</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>

LEGENDA:

- Product stage
- End - of - life stage
- Benefits and loads beyond the system boundary




Units expressed by declared unit.

"The results obtained for the indicators "Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)", "Abiotic depletion potential for fossil resources potential (ADP-fossil)" and "Water (user) deprivation potential (WDP)" should be used with caution since the uncertainties associated with them are high or there is little experience with the indicator."

## 2.3. Additional environmental impact indicators

	Potential incidence of disease due to PM emissions PM	Potential Human exposure efficiency relative to U235 IRP	Potential Comparative Toxic Unit for ecosystems ETP-fw	Potential Comparative Toxic Unit for humans, cancer effects HTP-c	Potential Comparative Toxic Unit for humans, not cancer effects HTP-nc	Potential soil quality index SQP
Unit	Disease incidence	kBq U 235 eq.	CTUe	CTUh	CTUh	-
Modules A1-A3	ND	ND	ND	ND	ND	ND
Module C1	ND	ND	ND	ND	ND	ND
Module C2	ND	ND	ND	ND	ND	ND
Module C3	ND	ND	ND	ND	ND	ND
Module C4	ND	ND	ND	ND	ND	ND
Module D	ND	ND	ND	ND	ND	ND

**LEGEND:**

	Product stage
	End-of-life stage
	Benefits and loads beyond the system boundary

**NOTES:**

Values expressed by declared unit. "ND" means Not Declared.

The impact indicator "POTENTIAL HUMAN EXPOSURE EFFICIENCY RELATIVE TO U235" focuses mainly on the possible impact of a low dose of ionising radiation on human health resulting from the nuclear fuel cycle. It does not consider effects arising from possible nuclear accidents, occupational exposure or the disposal of radioactive waste in underground facilities. Potential ionising radiation from soil, radon and some building materials is also not measured by this indicator.

The results of the indicators "POTENTIAL COMPARATIVE TOXIC UNIT FOR ECOSYSTEMS (ETP-FW)", "POTENTIAL COMPARATIVE TOXIC UNIT FOR HUMANS, CANCER EFFECTS", "POTENTIAL COMPARATIVE TOXIC UNIT FOR HUMANS, NOT CANCER EFFECTS" and "POTENTIAL SOIL QUALITY INDEX" should be used with caution as the uncertainties associated with them are high or there is little experience with the indicator.

## 2.4. Indicators describing resource use

The results presented in this EPD correspond to the most representative product: Plasterboard Gyptec 13A (Standard).

Unit	Primary energy					
	EPR	RR	TRR	EPNR	RNR	TRNR
	MJ, P.C.I.	MJ, P.C.I.	MJ, P.C.I.	MJ, P.C.I.	MJ, P.C.I.	MJ, P.C.I.
Modules A1-A3	2.00E+00	8.90E-01	2.89E+00	3.81E+01	1.58E-01	3.83E+01
Module C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module C2	7.49E-03	0.00E+00	7.49E-03	2.16E+00	0.00E+00	2.16E+00
Module C3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module C4	1.22E-01	0.00E+00	1.22E-01	3.61E+00	0.00E+00	3.61E+00
Module D	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

**LEGEND:**

- Product stage
- End-of-life stage
- Benefits and loads beyond the system boundary

Units expressed by declared unit.

EPR = use of renewable primary energy excluding renewable primary energy resources used as raw materials; RR = use of renewable primary energy resources used as raw materials; TRR = total use of renewable primary energy resources (EPR + RR); EPNR = use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; RNR = use of non-renewable primary energy resources used as raw materials; TRNR = total use of non-renewable primary energy resources (EPNR + RNR);

Unit	Secondary materials and fuels, and use of water			
	MS	CSR	CSNR	Net use of fresh water
	kg	MJ, P.C.I.	MJ, P.C.I.	m <sup>3</sup>
Modules A1-A3	3.48E-01	0.00E+00	0.00E+00	1.29E-01
Module C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module C2	0.00E+00	0.00E+00	0.00E+00	5.52E-05
Module C3	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Module C4	0.00E+00	0.00E+00	0.00E+00	-1.77E-02
Module D	0.00E+00	0.00E+00	0.00E+00	0.00E+00

**LEGEND:**

- Product stage
- End-of-life stage
- Benefits and loads beyond the system boundary

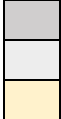
Units expressed by declared unit.

MS = use of secondary material; CSR = use of renewable secondary fuels; CSNR = use of non-renewable secondary fuels.

## 2.5. Other environmental information describing different waste categories

The results presented in this EPD correspond to the most representative product: Plasterboard Gyptec 13A (Standard).

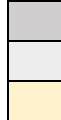
	Hazardous waste disposed	Non-hazardous waste disposed	Radioactive waste disposed
Unit	kg	kg	kg
<b>Modules A1-A3</b>	<b>1.80E-04</b>	<b>3.55E-02</b>	<b>2.31E-05</b>
<b>Module C1</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>
<b>Module C2</b>	<b>1.43E-05</b>	<b>6.58E-05</b>	<b>2.03E-07</b>
<b>Module C3</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>
<b>Module C4</b>	<b>2.99E-05</b>	<b>7.31E+00</b>	<b>3.40E-06</b>
<b>Module D</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>

**LEGENDA:**  

 Product stage  
 End-of-life stage  
 Benefits and loads beyond the system boundary  
 Units expressed by declared unit.

## 2.6. Environmental information describing output flows

The results presented in this EPD correspond to the most representative product: Plasterboard Gyptec 13A (Standard).

	Components for re-use	Materials for recycling	Materials for energy recovery	Exported energy
Unit	kg	kg	kg	MJ
<b>Modules A1-A3</b>	<b>0.00E+00</b>	<b>1.95E-02</b>	<b>0.00E+00</b>	<b>0.00E+00</b>
<b>Module C1</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>
<b>Module C2</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>
<b>Module C3</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>
<b>Module C4</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>
<b>Module D</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>

**LEGEND:**  

 Product stage  
 End-of-life stage  
 Benefits and loads beyond the system boundary  
 Units expressed by declared unit.



## 2.7. Information describing the biogenic carbon content at the factory gate

The results presented in this EPD correspond to the most representative product: Plasterboard Gyptec 13A (Standard).

Biogenic carbon content*	Units**	Modules A1-A3 (results)
Biogenic carbon content in product	kg C	<b>1.76E-01</b>
Biogenic carbon content in accompanying packaging	kg C	<b>2.93E-02</b>
<p>* 1 kg biogenic carbon is equivalent to 44/12 kg of CO<sub>2</sub>.</p> <p>** This information can be omitted whenever the content of biogenic carbon in the product, or in the respective packaging, is less than 5% of the mass of the product, or the respective packaging.</p>		

## 3. SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION<sup>1</sup>

### 3.1. C1 De-construction, demolition – End of life of the product

According to prEN 17328:2022, “The deconstruction and/or dismantling (C1) of gypsum-based products often occurs as part of the demolition of the entire building. Due to regulatory requirements, gypsum wastes need to be separated from other mineral deconstruction waste. That is why selective dismantling needs to be applied, either entirely manually or with some electrical devices. Therefore, the environmental impact of deconstructing gypsum-based products is assumed to be very small compared to the deconstruction of other (mineral) building products and therefore, the corresponding environmental impacts can be neglected on the grounds of materiality”. The deconstruction of Gyptec Standard Plasterboard is typically carried out manually, without associated consumption, so the impacts are zero.

### 3.2. C2 Transport – End of life of the product

In the transport of the gypsum plasterboard waste, it was considered that the waste operators are within a radius of 50 km, according to primary information from the manufacturer. It was also assumed that the waste was transported by lorry with a gross weight of 3.5-7.5 tonnes.

### 3.3. C3 Waste processing for reuse, recovery and/or recycling – End of life of the product

It was considered that, in the present moment, no waste is sent to reuse, recycling or energy recovery. The impact is considered zero.

### 3.4. C4 Disposal – End of life of the product

A scenario of landfill disposal (100%) was considered. The landfill scenario was defined based on a conservative approach and primary information from the manufacturer (current situation).

<sup>1</sup> IF THERE IS NO ADDITIONAL TECHNICAL INFORMATION AND NO SCENARIOS HAVE BEEN CARRIED OUT, ENTRIES SHOULD BE FILLED IN WITH "NOT APPLICABLE".

### 3.5. Scenario and technical information for module D

At present there are no processes for re-use or recovery. Therefore, the potential benefits beyond the system boundaries (D) are zero.

### 3.6. Additional information on release of dangerous substances to indoor air, soil, and water during the use stage

Gyptec gypsum boards are rated A+ for indoor air quality. This qualification comes from the French regulations for emissions of volatile pollutants, with Category A+ being the best indoor air quality classification, meaning very low or no emissions of substances in indoor air, such as VOCs (volatile organic compound). <https://gyptec.eu/en/gyptec-the-most-advantageous-gypsum-board/>

### 3.7. Other additional information

#### ADDITIONAL CERTIFICATES:

- AENOR Product Certificate [N] according to RP035.09 Private Regulation of the AENOR brand for Gyptec plasterboards;
- Certificate Sustainable Value for Gyptec plasterboards according to ISO 14024.

#### FACTORS TO ESTIMATE ENVIRONMENTAL IMPACTS FOR OTHER THICKNESSES:

Standard plasterboards are produced in different format. To estimate environmental impacts for other thicknesses, results might be multiplied by the corresponding factor in the following table.

	Conversion factors				
	Plasterboard 6A	Plasterboard 10A	Plasterboard 13A	Plasterboard 15A	Plasterboard 18A
<b>GWP-Total</b> (kg CO <sub>2</sub> eq.)	1.00	0.93	1.00	1.19	1.52
<b>GWP-Fossil</b> (kg CO <sub>2</sub> eq.)	0.97	0.91	1.00	1.22	1.62
<b>GWP-Biogenic</b> (kg CO <sub>2</sub> eq.)	1.16	1.01	1.00	1.01	0.92
<b>GWP-Luluc</b> (kg CO <sub>2</sub> eq.)	1.03	0.93	1.00	1.08	1.14
<b>ODP</b> (kg CFC-11 eq.)	279.94	0.91	1.00	1.23	1.67
<b>AP</b> (mol H+ eq.)	0.76	0.91	1.00	1.26	1.75
<b>EP-Freshwater</b> (kg P eq.)	1.38	0.91	1.00	1.08	1.17
<b>EP-Marine</b> (kg N eq.)	1.09	0.93	1.00	1.15	1.38
<b>EP-Terrestrial</b> (mol N eq.)	1.19	0.92	1.00	1.18	1.46
<b>POCP</b> (kg NMVOC eq.)	0.85	0.90	1.00	1.24	1.68
<b>ADP-Minerals&amp;metals</b> (kg Sb eq.)	1.19	1.03	1.00	1.09	1.12
<b>ADP-Fossil</b> (MJ)	0.93	0.91	1.00	1.22	1.62
<b>WDP</b> (m3 world eq. deprived)	1.05	0.92	1.00	1.14	1.36

END OF LIFE:

A scenario of landfill disposal (100%) was considered. The landfill scenario was defined based on a conservative approach and primary information from the manufacturer (current situation). However, Gyptec plasterboard can be recycled in a closed loop into new product without any loss in quality or performance. Gyptec plasterboard waste from deconstruction should be consigned to a recycling center.

#### 4. REFERENCES

- ✓ EN 15804:2012+A2:2019 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products;
- ✓ International Organization for Standardization (ISO). EN ISO 14040:2006. Environmental management – life cycle assessment – principles and framework, 2006.
- ✓ International Organization for Standardization (ISO). EN ISO 14044:2006. Environmental management – Life cycle assessment – Requirements and guidelines, 2006.
- ✓ International Organization for Standardization (ISO). ISO 14025:2006. Environmental labels and declarations – Type III environmental declarations – Principles and procedures, 2006.
- ✓ European Standard. EN 15804:2012+A2:2019. Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products, 2019.
- ✓ European Standard. CEN/TR 15941:2010. Sustainability of construction works - Environmental product declarations - Methodology for selection and use of generic data, 2010.
- ✓ EN 15942:2021 Sustainability of construction works – Environmental product declarations – Communication format business-to-business.
- ✓ European Standard. prEN 17328:2022. Complementary product category rules for gypsum-based construction products, 2022.
- ✓ General Instructions for the Daphabitat System, Version 2.1. Aveiro, August 2023.
- ✓ PCR Basic module for construction products and services, version 2.3. Aveiro, August 2023.
- ✓ PCR Wall covering, version 1.2, Aveiro, June 2022.
- ✓ SimaPro software, PRé Consultants bv 1990-2024, Release 9.6.0.1.
- ✓ FitzGerald D., Bourgault G., Vadenbo C., Sonderegger T., Symeonidis A., Fazio S., Mutel C., Müller J., Dellenbach D., Stoikou N., Baumann D., Clementi M., Ioannou I., Cirone F., Superti V., Beckert P., Treichel A., Kaarlela O., Kunde S., Valsasina L., Moreno Ruiz E. Documentation of changes implemented in the ecoinvent database v3.10. Ecoinvent Association, Zürich, Switzerland, 2023.
- ✓ European Commission. Environmental Footprint (EF) database 2.0, Version 1.1, 2020.
- ✓ Blonk Agri-footprint BV. (2019). Agri-Footprint – Part 2 – Description of data. Gouda, the Netherlands.
- ✓ PRé, SimaPro Database Manual Methods Library, 2024.