





## **GENERAL INFORMATION**

### **MANUFACTURER**

Manufacturer	United Mining Industries
Address	Al Razi St., Light Industrial City, RC, Yanbu, Saudi Arabia
Contact details	yanbusales@ugc.com.sa
Website	https://www.ugc.com.sa

### **EPD STANDARDS, SCOPE AND VERIFICATION**

EPD Hub, hub@epdhub.com
EN 15804+A2:2019 and ISO 14025
EPD Hub Core PCR Version 1.1, 5 Dec 2023
Construction product
Third party verified EPD
Cradle to gate with modules C1-C4, D
Jimymol, Grey Matters
Independent verification of this EPD and data, according to ISO 14025:  ☐ Internal verification ☑ External verification
Haiha Nguyen, as an authorized verifier acting for EPD Hub Limited

The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

### **PRODUCT**

Product name	Gypsum Powder
Place of production	Yanbu, Saudi Arabia
Period for data	01.01.2023 - 01.01.2024
Averaging in EPD	No averaging
Variation in GWP-fossil for A1-A3	Not relevant

### **ENVIRONMENTAL DATA SUMMARY**

Declared unit	1 Ton of Gypsum Powder
Declared unit mass	1000 kg
GWP-fossil, A1-A3 (kgCO₂e)	122
GWP-total, A1-A3 (kgCO₂e)	122
Secondary material, inputs (%)	0
Secondary material, outputs (%)	0
Total energy use, A1-A3 (kWh)	515
Net freshwater use, A1-A3 (m³)	0.16





## PRODUCT AND MANUFACTURER

#### **ABOUT THE MANUFACTURER**

Established in 2006, United Mining Industries Limited (UMI) is a Saudi Arabian joint-venture of three of the Saudi leading companies in construction and building industry. We have been able to carve a niche in the domain of producing a flawless range of Gypsum Products and Fiber Cement Products for use in local and regional markets, providing quality solutions for residential and commercial development. We are privileged to have a team of trained personnel, whose meticulous efforts assist us in achieving the goal of having utmost client satisfaction. With the dedication of our team, we are competent to offer our clients with a faultless range of Gypsum Products and reliable services that are executed within the promised time-frame.

The gypsum manufacturing complex was established in Yanbu, Saudi Arabia, on an area of more than 114,000 square meters. to manufacture gypsum boards, in addition to a warehouse and a service area. the production capacity of the complex ranges from 20 million to 22 million square meters annually.

### PRODUCT DESCRIPTION

UMI Gypsum powder is an inorganic mineral consists of calcium sulfate hemihydrate. It is made from natural gypsum (Gypsum rock) using suitable calcination processes. GUMI Gypsum powder is neutral and doesn't have any health hazards. UMI Gypsum powder can be used at interior and exterior decoration works as single coat for walls and ceilings, also used in molds for making decorative forms, can be used also in other fabrication works like electrical or plumbing as an accelerator for setting time.

Compressive strength@ 7 days: 12.5 MPa

Whiteness: 90%

Further information can be found at https://www.ugc.com.sa

### PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Minerals	100	KSA

#### **BIOGENIC CARBON CONTENT**

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	-
Biogenic carbon content in packaging, kg C	-

#### **FUNCTIONAL UNIT AND SERVICE LIFE**

Declared unit	1 Ton of Gypsum Powder
Mass per declared unit	1000 kg

### **SUBSTANCES, REACH - VERY HIGH CONCERN**

The product does not contain any REACH SVHC substances in amounts greater than  $0.1\,\%$  (1000 ppm).





## PRODUCT LIFE-CYCLE

### SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

Pro	duct st	tage	Assembly stage				U	se sta	ge			E	nd of l	ife stag	Beyond the system boundaries				
A1	A2	А3	A4	A5	B1	B2	В3	В4	В5	В6	В7	C1	C2	С3	C4		D		
×	×	×	MND	MND	MND	MND	MND	MND	MND	MND	MND	×	×	×	×		×		
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction/ demolition	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling	

Modules not declared = MND. Modules not relevant = MNR

## **MANUFACTURING AND PACKAGING (A1-A3)**

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

The gypsum rock is crushed into smaller pieces, typically less than 50 mm, using crushers. This initial size reduction facilitates more efficient grinding. The crushed gypsum is then heated in a mill at temperatures between 150-180°C to remove moisture and convert it into calcium sulfate hemihydrate (CaSO<sub>4</sub>·½H<sub>2</sub>O), commonly known as plaster of Paris. After calcination, the gypsum is cooled and fed into the silos or transferred to Gypsum board plant. Dust control mechanisms capture fine particles, minimizing emissions and maintaining a clean working environment. The final gypsum powder is packaged and can be used in various applications, including drywall/Gypsum production, plaster, cement, and agricultural soil amendments.

### **TRANSPORT AND INSTALLATION (A4-A5)**

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

This EPD does not cover the transport (A4) and installation (A5) phase.

### **PRODUCT USE AND MAINTENANCE (B1-B7)**

This EPD does not cover the use phase.

Air, soil, and water impacts during the use phase have not been studied.





### PRODUCT END OF LIFE (C1-C4, D)

At the end-of-life, in the demolition phase 100% of the waste is assumed to be collected as separate construction waste. The demolition process consumes energy in the form of diesel fuel used by building machines. Energy consumption of a demolition process is on average 10 kWh/m2 (Bozdağ, Ö & Seçer, M. 2007). Based on a Level(s) project, an average mass of a reinforced concrete building is about 1000 kg/m2. Therefore, energy consumption demolition is assumed to be 10 kWh/1000 kg = 0,01 kWh/kg. The source of energy is diesel fuel used by work machines (C1). Transportation distance to treatment is assumed as 50 km and the transportation method is assumed to be lorry (C2). Gypsum is considered to be 100% landfilled. Wooden pallets waste treatments are considered in EoL module, 100% assumed to be landfill.

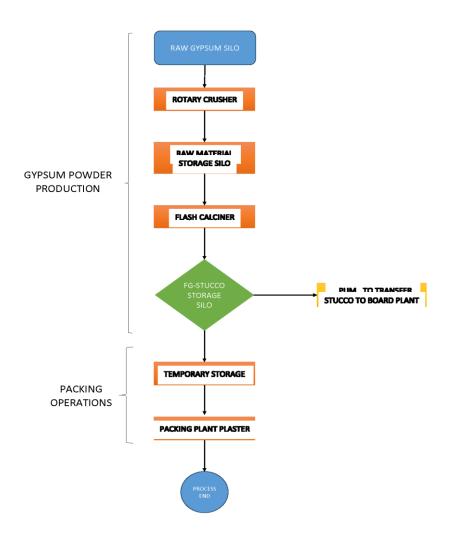




# **MANUFACTURING PROCESS**

Gypsum Powder

Manufacturing Process Chart







## LIFE-CYCLE ASSESSMENT

### **CUT-OFF CRITERIA**

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

### **ALLOCATION, ESTIMATES AND ASSUMPTIONS**

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

Data type	Allocation
Raw materials	Allocated by mass or volume
Packaging material	Allocated by mass or volume
Ancillary materials	Allocated by mass or volume
Manufacturing energy and waste	Allocated by mass or volume

#### **AVERAGES AND VARIABILITY**

Type of average	No averaging
Averaging method	Not applicable
Variation in GWP-fossil for A1-A3	Not relevant

This EPD is product and factory specific and does not contain average calculations.

#### LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses Ecoinvent v3.8, Plastics Europe, Federal LCA Commons and One Click LCA databases as sources of environmental data.







## **ENVIRONMENTAL IMPACT DATA**

## CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	В3	B4	B5	В6	B7	C1	C2	С3	C4	D
GWP – total <sup>1)</sup>	kg CO₂e	3,68E+00	7,95E+00	1,10E+02	1,22E+02	MND	3,31E+00	4,70E+00	0,00E+00	1,47E+01	0,00E+00								
GWP – fossil	kg CO₂e	3,67E+00	7,95E+00	1,10E+02	1,22E+02	MND	3,31E+00	4,70E+00	0,00E+00	1,45E+01	0,00E+00								
GWP – biogenic	kg CO₂e	0,00E+00	0,00E+00	-1,04E-01	-1,04E-01	MND	0,00E+00	0,00E+00	0,00E+00	1,04E-01	0,00E+00								
GWP – LULUC	kg CO₂e	4,33E-03	2,93E-03	8,81E-03	1,61E-02	MND	3,30E-04	1,73E-03	0,00E+00	1,51E-02	0,00E+00								
Ozone depletion pot.	kg CFC-11e	5,02E-07	1,83E-06	1,26E-05	1,50E-05	MND	7,07E-07	1,08E-06	0,00E+00	3,33E-06	0,00E+00								
Acidification potential	mol H⁺e	6,83E-02	3,37E-02	3,17E-01	4,19E-01	MND	3,44E-02	1,99E-02	0,00E+00	3,22E+01	0,00E+00								
EP-freshwater <sup>2)</sup>	kg Pe	9,18E-05	6,51E-05	6,50E-04	8,07E-04	MND	1,10E-05	3,85E-05	0,00E+00	3,08E-04	0,00E+00								
EP-marine	kg Ne	2,30E-02	1,00E-02	6,26E-02	9,56E-02	MND	1,52E-02	5,92E-03	0,00E+00	3,46E-02	0,00E+00								
EP-terrestrial	mol Ne	3,22E-01	1,10E-01	6,66E-01	1,10E+00	MND	1,67E-01	6,53E-02	0,00E+00	3,82E-01	0,00E+00								
POCP ("smog") <sup>3</sup> )	kg NMVOCe	6,84E-02	3,53E-02	2,19E-01	3,23E-01	MND	4,59E-02	2,09E-02	0,00E+00	2,10E+00	0,00E+00								
ADP-minerals & metals <sup>4</sup> )	kg Sbe	4,32E-02	1,86E-05	5,78E-05	4,33E-02	MND	1,68E-06	1,10E-05	0,00E+00	4,25E-05	0,00E+00								
ADP-fossil resources	MJ	4,80E+01	1,19E+02	1,74E+03	1,91E+03	MND	4,45E+01	7,06E+01	0,00E+00	2,83E+02	0,00E+00								
Water use <sup>5)</sup>	m³e depr.	6,92E-01	5,34E-01	5,96E+00	7,18E+00	MND	1,20E-01	3,16E-01	0,00E+00	2,16E+00	0,00E+00								

<sup>1)</sup> GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. 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 experience with the indicator.





## ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	А3	A1-A3	A4	A5	B1	B2	В3	B4	B5	В6	В7	C1	C2	С3	C4	D
Particulate matter	Incidence	1,53E-06	9,16E-07	2,16E-06	4,61E-06	MND	9,22E-07	5,42E-07	0,00E+00	2,63E-05	0,00E+00								
Ionizing radiation <sup>6)</sup>	kBq 11235e	3,88E-01	5,69E-01	1,49E+00	2,45E+00	MND	2,05E-01	3,36E-01	0,00E+00	1,38E+00	0,00E+00								
Ecotoxicity (freshwater)	CTUe	2,68E+03	1,07E+02	7,72E+02	3,56E+03	MND	2,68E+01	6,35E+01	0,00E+00	6,65E+03	0,00E+00								
Human toxicity, cancer	CTUh	1,78E-09	2,64E-09	1,81E-08	2,25E-08	MND	1,03E-09	1,56E-09	0,00E+00	3,35E-08	0,00E+00								
Human tox. non-cancer	CTUh	4,36E-08	1,06E-07	2,98E-07	4,48E-07	MND	1,94E-08	6,29E-08	0,00E+00	1,58E-06	0,00E+00								
SQP <sup>7)</sup>	-	-2,72E+01	1,38E+02	6,46E+01	1,75E+02	MND	5,79E+00	8,14E+01	0,00E+00	6,08E+02	0,00E+00								

6) EN 15804+A2 disclaimer for lonizing radiation, human health. This impact category deals mainly with the eventual impact of low-dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator; 7) SQP = Land use related impacts/soil quality.

### **USE OF NATURAL RESOURCES**

Impact category	Unit	A1	A2	А3	A1-A3	A4	A5	B1	B2	В3	B4	B5	В6	В7	C1	C2	С3	C4	D
Renew. PER as energy <sup>8)</sup>	MJ	2,88E+00	1,35E+00	9,77E+00	1,40E+01	MND	2,54E-01	7,96E-01	0,00E+00	8,30E+00	0,00E+00								
Renew. PER as material	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00								
Total use of renew. PER	MJ	2,88E+00	1,35E+00	9,77E+00	1,40E+01	MND	2,54E-01	7,96E-01	0,00E+00	8,30E+00	0,00E+00								
Non-re. PER as energy	MJ	4,80E+01	1,19E+02	1,67E+03	1,84E+03	MND	4,45E+01	7,06E+01	0,00E+00	2,83E+02	0,00E+00								
Non-re. PER as material	MJ	0,00E+00	0,00E+00	6,56E+01	6,56E+01	MND	0,00E+00	0,00E+00	0,00E+00	-6,56E+01	0,00E+00								
Total use of non-re. PER	MJ	4,80E+01	1,19E+02	1,74E+03	1,90E+03	MND	4,45E+01	7,06E+01	0,00E+00	2,18E+02	0,00E+00								
Secondary materials	kg	2,26E-02	3,32E-02	7,85E-02	1,34E-01	MND	1,74E-02	1,96E-02	0,00E+00	9,39E-02	0,00E+00								
Renew. secondary fuels	MJ	6,22E-04	3,34E-04	5,47E-02	5,57E-02	MND	5,70E-05	1,98E-04	0,00E+00	4,06E-03	0,00E+00								
Non-ren. secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00								
Use of net fresh water	m³	1,78E-02	1,55E-02	1,30E-01	1,64E-01	MND	2,70E-03	9,15E-03	0,00E+00	2,82E-01	0,00E+00								

<sup>8)</sup> PER = Primary energy resources.





### **END OF LIFE – WASTE**

Impact category	Unit	A1	A2	А3	A1-A3	A4	A5	B1	B2	В3	B4	B5	В6	В7	C1	C2	С3	C4	D
Hazardous waste	kg	1,82E-01	1,58E-01	6,78E-01	1,02E+00	MND	5,96E-02	9,36E-02	0,00E+00	0,00E+00	0,00E+00								
Non-hazardous waste	kg	3,89E+00	2,60E+00	1,20E+01	1,85E+01	MND	4,19E-01	1,54E+00	0,00E+00	1,00E+03	0,00E+00								
Radioactive waste	kg	2,65E-04	7,99E-04	1,86E-03	2,92E-03	MND	3,13E-04	4,72E-04	0,00E+00	0,00E+00	0,00E+00								

## **END OF LIFE – OUTPUT FLOWS**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	В3	B4	B5	В6	В7	C1	C2	С3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00								
Materials for recycling	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00								
Materials for energy rec	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00								
Exported energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00								

## ENVIRONMENTAL IMPACTS - EN 15804+A1, CML / ISO 21930

Impact category	Unit	A1	A2	А3	A1-A3	A4	A5	B1	B2	В3	B4	B5	В6	В7	C1	C2	С3	C4	D
Global Warming Pot.	kg CO₂e	3,60E+00	7,87E+00	1,08E+02	1,19E+02	MND	3,27E+00	4,65E+00	0,00E+00	1,42E+01	0,00E+00								
Ozone depletion Pot.	kg CFC-11e	4,01E-07	1,45E-06	1,01E-05	1,19E-05	MND	5,60E-07	8,57E-07	0,00E+00	2,65E-06	0,00E+00								
Acidification	kg SO₂e	4,56E-02	2,62E-02	2,59E-01	3,31E-01	MND	2,45E-02	1,55E-02	0,00E+00	2,95E+01	0,00E+00								
Eutrophication	kg PO <sub>4</sub> ³e	1,26E-02	5,96E-03	3,22E-02	5,08E-02	MND	5,69E-03	3,52E-03	0,00E+00	3,23E-02	0,00E+00								
POCP ("smog")	kg C₂H₄e	8,22E-04	1,02E-03	1,41E-02	1,59E-02	MND	5,36E-04	6,04E-04	0,00E+00	1,18E+00	0,00E+00								
ADP-elements	kg Sbe	1,36E-05	1,80E-05	5,76E-05	8,92E-05	MND	1,65E-06	1,07E-05	0,00E+00	4,08E-05	0,00E+00								
ADP-fossil	MJ	4,80E+01	1,19E+02	1,74E+03	1,91E+03	MND	4,45E+01	7,06E+01	0,00E+00	2,83E+02	0,00E+00								





### **ENVIRONMENTAL IMPACTS – GWP-GHG - THE INTERNATIONAL EPD SYSTEM**

Impact category	Unit	A1	A2	А3	A1-A3	A4	A5	B1	B2	В3	B4	B5	В6	В7	C1	C2	С3	C4	D
GWP-GHG <sup>9)</sup>	kg CO₂e	3,68E+00	7,95E+00	1,10E+02	1,22E+02	MND	3,31E+00	4,70E+00	0,00E+00	1,45E+01	0,00E+00								

<sup>9)</sup> 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 5 (IPCC 2013). In addition, the characterisation factors for the flows - CH4 fossil, CH4 biogenic and Dinitrogen monoxide - were updated in line with the guidance of IES PCR 1.2.5 Annex 1. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterization factor for biogenic CO2 is set to zero.





## **VERIFICATION STATEMENT**

### **VERIFICATION PROCESS FOR THIS EPD**

This EPD has been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliancy with reference standard, ISO 14025 and ISO 14040/14044, following the process and checklists of the program operator for:

- This Environmental Product Declaration
- The Life-Cycle Assessment used in this EPD
- The digital background data for this EPD

Why does verification transparency matter? Read more online This EPD has been generated by One Click LCA EPD generator, which has been verified and approved by the EPD Hub.

### THIRD-PARTY VERIFICATION STATEMENT

I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of the data collected and used in the LCA calculations, the way the LCA-based calculations have been carried out, the presentation of environmental data in the EPD, and other additional environmental information, as present with respect to the procedural and methodological requirements in ISO 14025:2010 and reference standard.

I confirm that the company-specific data has been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity and legal compliance.

I confirm that I have sufficient knowledge and experience of construction products, this specific product category, the construction industry, relevant standards, and the geographical area of the EPD to carry out this verification.

I confirm my independence in my role as verifier; I have not been involved in the execution of the LCA or in the development of the declaration and have no conflicts of interest regarding this verification.

HaiHa Nguyen, as an authorized verifier acting for EPD Hub Limited 16.05.2025



