KÜMAŞ
MANYEZİT SANAYİ A.Ş.

BRIQUETTE

ENVIRONMENTAL PRODUCT DECLARATION

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

EPD Owner:
KÜMAŞ Manyezit Sanayi A.Ş

Programme:
International EPD System
www.environdec.com

Programme Operator:
EPD International AB

Licensee:
EPD Türkiye

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EPD INTERNATIONAL EPD SYSTEM

TÜRKİYE EPD INTERNATIONAL EPD SYSTEM

ECO PLATFORM EPD VERIFIED

KÜMAŞ
MANYEZİT SANAYİ A.Ş.

General Information

Programme Information

Programme:	The International EPD System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	support@environdec.com
Licensee:	EPD Türkiye
Address:	NEF O9 B Blok No:7/15, 34415, Kağıthane/İstanbul, Türkiye
Contact:	www.epdturkey.org, info@epdturkey.org

Product Category Rules (PCR)

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)	
Product Category Rules (PCR):	PCR 2019:14 Construction products (EN 15804+A2) (2.0.1)
PCR review was conducted by:	The Technical Committee of the International EPD System. See www.environdec.com for a list of members. Review chair: Rob Rouwette (chair), Noa Meron (co-chair). The review panel may be contacted via the Secretariat www.environdec.com/support.

Third-party Verification

Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:

☑ Individual EPD verification without a pre-verified LCA/EPD tool

Third-party verifier	Agnieszka Pikus, Greenwise
Approved by	International EPD System

Procedure for follow-up of data during EPD validity involves third party verifier:

Yes ☐ No ☑

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

EPDs within the same product category but published 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 first-digit version number) 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 identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterisation factors); and be valid at the time of comparison.

For further information about comparability, see EN 15804 and ISO 14025.

About KÜMAŞ

KÜMAŞ Magnesite Inc.

EPD Owner: KÜMAŞ Magnesite Inc.
Contact e-mail: srd.isg@kumasref.com
Production Plant: Eskişehir Karayolu 9 km. Merkez, Kütahya/ Türkiye

KÜMAŞ Magnesite Inc., founded in 1972, specializes in producing sintered magnesite, basic refractory bricks, and mortar using natural magnesite ore from the Kütahya-Eskişehir-Bilecik region. The company began producing sintered magnesite in 1976 and became an integrated organization with the addition of a brick factory in 1990. In 2008, they expanded to producing fused magnesite.

Today, KÜMAŞ provides sintered magnesite, fused magnesite, fused oxychrome, and calcined magnesite derivatives as industrial raw materials. Additionally, it manufactures magnesite, dolomite, and alumina-based refractory bricks and mortars at its integrated brick and mortar plants. Located on the Kütahya Province, Eskişehir Road 9th Km, KÜMAŞ operates over a total area of 695,270 m², with 68,561 m² dedicated to closed facilities. Their product range includes "Sintered Magnesite, Calcined Magnesite, Fused Magnesite, Kures Powder, and Refractory Bricks and Mortar."

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Product Information

Product name	Briquette
Product description	Briquetted Calcined Magnesium Oxide, processed from magnesite and/or dolomite ore.
Technical purpose of product	Due to its high MgO content, it is mainly used in refractory applications, the steel industry (such as slag conditioner), and various high-temperature processes.
Manufacturing description	Briquette, is produced almost entirely from fine filter dusts captured from KÜMAŞ's refractory production lines (e.g., fused magnesia, sintered magnesia/ magnesite, dolomite). Filter dust is recovered via dust-collection systems, then screened and homogenized to achieve the target chemistry (with MgO as the main constituent), followed by briquetting. The briquettes are conditioned/dried as required and then sized (nominally 10–40 mm with limited fines/oversize) for end-use. This closed-loop, circular approach diverts waste from landfill and improves resource efficiency while meeting the required chemical and physical specifications.
Material properties	MgO: ≥62% (ASTM C 574-71) SiO_2: ≤15% CaO: 3–5% Fe_2O_3: ≤5% LOI: ≤17% Grain size: 10–40 mm (ISO 2591-1)
Manufacturing site	Manyezit A.Ş., Eskişehir Road 9th Km, Kütahya, Türkiye
UN CPC code	379 – Other non-metallic mineral products n.e.c.
Geographical scope(s)	A1: Global, A2: Global, A3: Republic of Türkiye
Hazardous and toxic substances	The product does not contain any substances from the SVHC candidate list in concentrations exceeding 0.1% of its weight.

KÜMAŞ MANYEZİT SANAYİ A.Ş.

Product Information

Content Declaration

The contect declaration is provided as intervals due to confidentiality reasons.

*Content Name	Weight, %	Post-consumer recycled material, weight-% of product	Biogenic material, weight-% of product	Biogenic material[1], kg C/ declared unit
Caustic Calcined Magnesite	60 - 70	0	0	0
Kures	10 - 20	0	0	0
Fused Magnesite	10 - 20	0	0	0
Dolomite	1 - 5	0	0	0
Dead Burnt Magnesite	1 - 5	0	0	0
Enriched Magnesite Ore	0.5 - 5	0	0	0
Total	**100**	**0**	**0**	**0**

Note 1 1 kg biogenic carbon is equivalent to 44/12 kg of CO_2

*All materials listed in the content declaration table originate from internal recovery processes. These materials are entirely derived from recovered filter dust and bypass dust generated within the production process. Therefore, they are considered secondary materials (recycled content) and no primary raw material input was used.

Packaging Materials

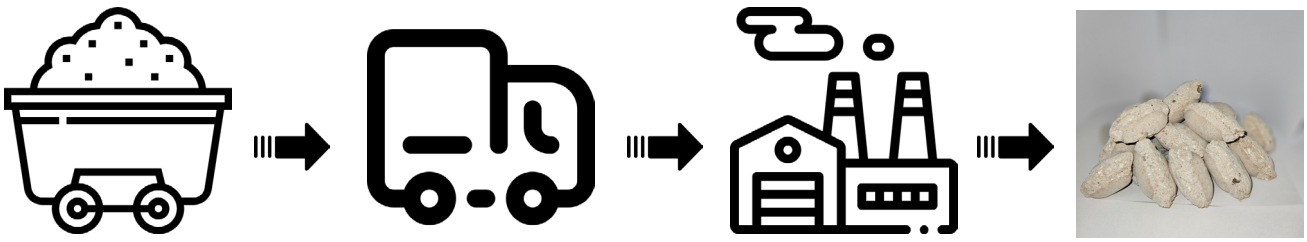
Material Name	Weight, kg	Weight-% (versus the product)	Biogenic material[1], kg C/declared unit
Big Bag	2.75	0.275	0
Pallet	2.5	0.25	1.23
Total	**5.25**	**0.525**	**1.23**

Note 1 1 kg biogenic carbon is equivalent to 44/12 kg of CO_2

LCA Information

EPD based on declared or functional unit	Declared unit
Declared unit and reference flow	1 tonne of Briquette
Data sources used for this EPD	ecoinvent 3.11 database
LCA Software	SimaPro Craft 10.2
Version of the EN 15804 reference package	EF Reference Package 3.1
Scrap (recycled material) inputs contribution level	The product contains 100% recovered filter dust from primary production.
Infrastructure and capital goods	Excluded
Excluded Stages	The end-of-life stages have been excluded from the system boundaries, as permitted by the exclusion criteria defined in the applicable Product Category Rules (PCR).
Allocation	Recovered filter dusts from primary production is treated as a secondary material due to its economic value. Accordingly, economic allocation is applied based on the relative market value of the primary product and the secondary material's quality factor, ensuring a transparent distribution of environmental burdens while supporting circular resource use.

System Boundary



A1
Raw Material Supply

A2
Raw Material Transport

A3
Manufacturing (collection, screening, homogenization, briquetting and packaging)

Data quality assessment

Description of data quality assessment and reference years: The Life Cycle Assessment (LCA) for this Environmental Product Declaration (EPD) is based on both primary and secondary data. Primary data were collected directly from the manufacturer's production processes and site-specific operations for the reference year 2024. The quality and representativeness of all data used for the EPD have been evaluated in terms of time, geography, and technology according to the principles outlined in EN 15804:2012+A2:2019, Annex E, and the data quality requirements specified in EN 15941:2010 for life cycle data. All relevant datasets were reviewed for completeness, consistency, and reliability, and the assessment confirmed that no data were classified as "poor" or "very poor" in quality.

Process name	Source type	Source	Reference year	Data category	Share of primary data, of GWP-GHG results for A1- A3
Fused Magnesite	Collected Data	EPD	2024	Primary Data	10.2
Enriched Magnesite Ore	Collected Data	EPD	2024	Primary Data	0.06
Caustic Calcined Magnesite	Collected Data	EPD	2024	Primary Data	50.1
Kures	Collected Data	EPD	2024	Primary Data	0.22
Dead Burnt Magnesite	Collected Data	EPD	2024	Primary Data	0.79
Manufacturing	Collected Data	EPD Owner	2024	Primary Data	38.0
Total share of primary data, of GWP-GHG results for A1-A3					**99.5%**
Note	The share of primary data is calculated based on GWP GHG results. It is a simplified indicator for data quality that supports the use of more primary data to increase the representativeness of and comparability between EPDs. Note that the indicator does not capture all relevant aspects of data quality and is not comparable across product categories.				

ELECTRICITY USED IN THE MANUFACTURING PROCESS IN A3

Type of electricity mix	Residual electricity mix on the market	
Energy sources	Imported coal	40.5%
	Natural gas	35%
	Lignite	22.1%
	Hard coal	1.84%
	Asphaltite	0.55%
Climate impact (GWP-GHG):	**0.89 kg CO_2 eq./kWh**	
Method used to calculate residual electricity mix	The market consumption data for Türkiye is modified to include all the renewable sources as there is no 'secondary data' on the residual market mix for Türkiye.	

Description of the System boundary	d) Cradle to gate (A1-A3)
Excluded modules	Use and end-of-life modules are excluded due to not being relevant for the product.

	Product stage			Construction process stage		Use stage							End of life stage				Beyond product life cycle
	Raw material supply	Transport	Manufacturing	Transport to s	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse- Recovery- Recycling-potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	ND													
Geography	Global		Türkiye	-													
Share of specific data	99.5%			-													
Variation - products	0%			-													
Variation - sites	0%			-													

System Boundary

A1- Raw Material Supply

The materials used in the manufacturing of the product are entirely secondary inputs. These consist of dust and fines recovered from Kümaş Magnesite Inc.'s own production processes, including rotary kilns, multiple hearth furnaces, electrofilters, and other process units. The exclusive use of in-house secondary products enhances resource efficiency by minimizing waste generation and eliminating the need for virgin raw materials. All recovered materials are carefully weighed, blended, and prepared according to standardized formulations to ensure consistent product quality.

A2- Transport

Materials consist exclusively of secondary inputs recovered internally within Kümaş's production facilities. Transport activities associated with these externally sourced materials are already included within the referenced EPD datasets and have therefore been directly adopted for this study. In general, transport is performed primarily by road using heavy-duty trucks, while imported additives involve overseas shipments via container vessels followed by road delivery to the facility. Transport distances and modes are represented using weighted averages from purchase records to ensure realistic modelling in the LCA

A3- Manufacturing

The manufacturing of Briquette is carried out within Kümaş's integrated production facilities. The process encompasses material blending, homogenization and briquetting. Electricity is the main energy input. Packaging materials, such as pallets and bigbags, are included within the system boundaries. In line with the balancing-out methodology prescribed by the applicable PCR, the end-of-life of packaging materials is also considered in this stage. Furthermore, the internal recovery of dust and fines from other production lines significantly reduces material losses and enhances the overall environmental performance of the product.

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LCA Results

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

Mandatory environmental performance indicators according to EN 15804

Module	Indicator	Unit	A1-A3
Climate change - total	GWP-total	kg CO_2 eq.	5.17E+01
Climate change - fossil	GWP-fossil	kg CO_2 eq.	5.15E+01
Climate change - biogenic	GWP-biogenic	kg CO_2 eq.	7.16E-02
Climate change - land use and land-use change	GWP-luluc	kg CO_2 eq.	1.86E-01
Ozone depletion	ODP	kg CFC-11 eq.	3.44E-07
Acidification	AP	mol H+ eq.	1.81E-01
Eutrophication aquatic freshwater	EP-freshwater	kg P eq.	7.94E-03
Eutrophication aquatic marine	EP-marine	kg N eq.	3.14E-02
Eutrophication terrestrial	EP-terrestrial	mol N eq.	3.36E-01
Photochemical ozone formation	POCP	kg NMVOC eq.	1.09E-01
Depletion of abiotic resources - minerals and metals	ADP- minerals & metals[1]	kg Sb eq.	3.56E-05
Depletion of abiotic resources - fossil fuels	ADP-fossil[1]	MJ, net calorific value	4.56E+02
Water use	WDP[1]	m^3 world eq. deprived	1.24E+01
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption		
Disclaimer 1	The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator		

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LCA Results

Additional mandatory environmental performance indicators

Module	Indicator	Unit	A1-A3
Climate change - GWP-GHG	GWP-GHG[1]	kg CO_2 eq.	5.21E+01
Acronyms	GWP-GHG = Global warming potential greenhouse gas.		
Disclaimer 1	The GWP-GHG indicator is termed GWP-IOBC/GHG in the ILCD+EPD+ data format. The indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO_2 is set to zero.		

Resource use indicators according to EN 15804

Module	Unit	A1-A3
PERE	MJ, net calorific value	9.19E+01
PERM	MJ, net calorific value	3.20E+00
PERT	MJ, net calorific value	9.68E+01
PENRE	MJ, net calorific value	4.56E+02
PENRM	MJ, net calorific value	1.34E+00
PENRT	MJ, net calorific value	4.58E+02
SM	kg	1.00E+03
RSF	MJ, net calorific value	2.47E-05
NRSF	MJ, net calorific value	0.00E+00
FW	m^3	1.66E+00
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water.		

LCA Results

Waste indicators according to EN 15804

Module	Unit	A1-A3
HWD	kg	1.40E+00
NHWD	kg	9.80E+01
RWD	kg	2.33E-05
Acronyms	HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed.	

Output flow indicators according to EN 15804

Module	Unit	A1-A3
CRU	kg	0.00E+00
MFR	kg	0.00E+00
MER	kg	0.00E+00
EEE	MJ, net calorific value	0.00E+00
EET	MJ, net calorific value	0.00E+00
Acronyms	CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy.	

Abbreviations

Abbreviation	Definition
EN	European Norm (Standard)
EPD	Environmental Product Declaration
EF	Environmental Footprint
GPI	General Programme Instructions
ISO	International Organization for Standardization
CEN	European Committee for Standardization
CPC	Central product classification

Version History

Original version of the EPD, 2025-11-20.

References

EN 15804:2012+A2:2019 + AC:2021 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products

PCR 2019:14 (ver. 2.0.1) Construction products (EN 15804:A2)

ISO 14040:2021 "Environmental management - Life cycle assessment - Principles and framework".

ISO 14044:2018 "Environmental management - Life cycle assessment - Requirements and guidelines".

ISO 14025:2006 "Environmental labels and declarations - Type III environmental declarations - Principles and procedures".

General Program Instructions of International EPD System, (Ver. 5.0.1) 2025-02-27 "General Programme Instructions for the International EPD® System".

Ecoinvent database (v3.11) - www.ecoinvent.org

KÜMAŞ www.kumasref.com

Metsims www.metsims.com

Programme & Programme Operator	EPD INTERNATIONAL EPD SYSTEM	EPD International AB Box 210 60 SE-100 31 Stockholm, Sweden www.environdec.com info@environdec.com
Licensee	TÜRKİYE EPD INTERNATIONAL EPD SYSTEM	EPD registered through fully aligned regional licensee: EPD Türkiye www.epdturkey.org info@epdturkey.org NEF O9 B Blok No:7/15, 34415 Kağıthane/İstanbul, Türkiye
Owner of the declaration	KÜMAŞ MANYEZİT SANAYİ A.Ş.	Eskişehir Karayolu 9 Km. Kütahya, Türkiye srd.isg@kumasref.com www.kumasref.com
LCA & EPD Consultant	metsims Sustainability Consulting	<u>The United Kingdom</u> Clear Water Place Oxford OX2 7NL, UK 0 800 722 0185 www.metsims.com info@metsims.com <u>Türkiye</u> Nef 09 B Blok No:7/46-47 34415 Kağıthane/Istanbul, Türkiye +90 212 281 13 33