



OLIDUN

**A HUMBLE ROCK TO THE OUTSIDER
A PRECIOUS GREEN MINERAL TO THE EXPERT**





OLIDUN INTRO



- **OLIDUN** is the brand name of a series of Dunite (Natural Magnesium Silicate) based products.
- **OLIDUN** is a magnesium silicate raw material with a high content of olivine $(\text{Mg,Fe})_2\text{SiO}_4$. It is mined from our dunite deposit in Yerakini, co-produced with the magnesite ore.
- Yerakini deposit is of stock-werk type with magnesite veins and dunite as the host rock. Dunite of the upper benches is weathered and can be used only as aggregate, while the one of the lower benches becomes “healthy” and can be commercialized in several industrial applications.
- A total volume of approx. half a million tones of dunite is co-extracted every year.



OLIDUN INTRO

The Dunite Project received a major “boost” through the implementation of the MagWasteVal Program (2018-2021, co-funded by the EU), coordinated by Grecian Magnesite in co-operation with the Aristotle University of Thessaloniki and potential end-users.

Evaluation and development of Dunite based products in several industrial applications by our engineering teams and R&D center.

Commercial launch of **OLIDUN** in 2022



Extensive quantitative and qualitative mapping of the Yerakini dunite “deposit” was carried out (chemical, mineralogical, thermogravimetric analyses etc).

Industrial scale trials in refractory/foundry, construction, and environmental applications by potential users and in-house.



OLIDUN MAIN CHARACTERISTICS



- MgO-rich Dunite deposit with the following typical mineralogical composition:

Olivine: 50-70%

Serpentine: 5-20%

Enstatite: 0-20%

Free Faylite: 0%

- Typical Chemical composition:

MgO: 41-44%

Very low Al_2O_3 and alkalis content

- Three versions:

Raw Dunite with L.O.I. : 6.0-9.0%

Dried Dunite with L.O.I. : 5.0-8.0% (drying at 200°C)

Calcined Dunite with L.O.I. : <1.0% (fired at 850°C)



OLIDUN MAIN BENEFITS

A promising mineral for the future!



- A Green - CO₂ Neutral Mineral.
- Significant reduction of mining by-products.
- Low production cost (co-extracted with Magnesite).
- Extension of the lifetime of Yerakini mines.
- Diversification of product portfolio.



OLIDUN MAIN APPLICATIONS



- Slag conditioning in Blast Furnaces
- EBT filler
- Refractory bricks and mortars
- Mineral wool
- Foundry sand
- Sandblasting
- Fertilizers
- CO₂ sequestration
- Cement industry



OLIDUN
REFRACTORY BRICKS



- Development of “Green” Ceramic bonded Forsterite (DuniteMagnesia) Bricks in cooperation with the Aristotle University of Thessaloniki and selected Refractory Brick producers.
- The ceramic bonded Forsterite bricks can be used in temperatures up to 1.600°C, in cement, glass and lime kilns, in EAFs, Ladles & blast furnaces, in rotary kilns for the production of MgO (from the inlet up to the burning zone).
- Characteristics:
 - ❑ Refractoriness under load 1.600°C.
 - ❑ Very high resistance in alkalis attack.
 - ❑ Low linear expansion.
 - ❑ High resistance in aggressive slags and aluminum.
 - ❑ Optimum thermal conductivity / Low thermal losses.
 - ❑ Sufficient cold crushing strength and attrition resistance.



OLIDUN
REFRACTORY BRICKS



- Industrial scale production of DuniteMagnesia Bricks (Outsourced to selected brick producer, approx. 60MT).
- Formulation: Own raw materials containing:
 - ✓ Approx. 80% Dunite &
 - ✓ Approx. 20% recycled DBM (PSM pellets, from recycled processing streams – Pelletized Sintered Magnesia).
- The DuniteMagnesia bricks are currently being tested for long term performance in our rotary kilns No 2 & 3, with positive results so far!



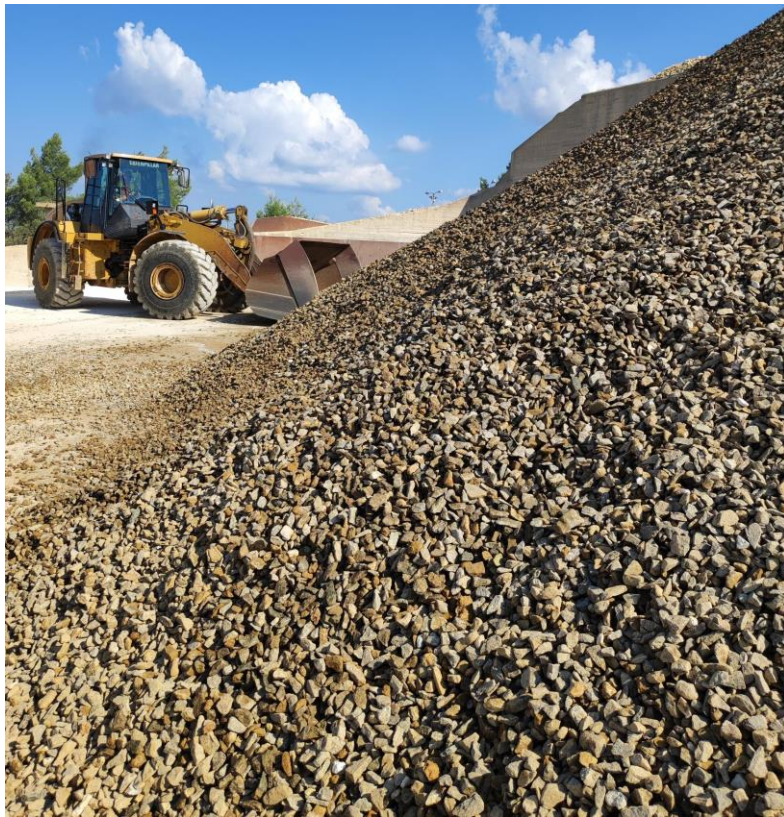
OLIVUN - REFRA **REFRACTORY MORTARS**



- Replacement of outsourced Olivine with significant techno-economical advantages.
- Further replacement (10-40% w/w) of in-house DBM in Tundish working lining mixes:
 - ❑ Cost advantages.
 - ❑ Lighter product with higher porosity (Lower losses, less specific consumption).
 - ❑ Reduction of the environmental footprint in the final product.
 - ❑ Increase in calcination capacity & Magnesite reserves.



OLIDUN - SLAG **SLAG CONDITIONING**



- **OLIDUN** is an ideal fluxing agent in blast furnaces in place of Dolomite by improving the sintering capacity and the product quality.
- Main Advantages:
 - ❑ Reduced energy consumption (does not require energy for decomposition as dolomite).
 - ❑ Almost zero CO₂ emissions (< 2% compared to dolomite's 40%).
 - ❑ Rich in MgO:
 - ✓ Very fast saturation of the slag in MgO and protection of the refractory lining.
 - ✓ Less consumption comparing to dolomite.
 - ❑ Better control of the Sulphur and Phosphorous in Pig iron.



OLIDUN - SLAG

SLAG CONDITIONING



- ☐ Better thermal equilibrium.
- ☐ Better control of slag viscosity.
- ☐ Better alkali removal and protection of refractory lining.



OLIDUN - EBT

EBT (Eccentric Bottom Tap)



- **OLIDUN** EBT is a high refractory Dunite-based granular material, used as filler in the Eccentric Bottom Tap hole (EBT).
- **OLIDUN** EBT filler's refractory properties (refractoriness around 1.450°C) along with its well-defined & consistent grain size distribution & shape, ensure an easy tap hole opening (over 98% success rate) for fast free flowing of molten metal.
- Relatively low-cost product with a low environmental footprint.
- No sintering under liquid steel temperatures and no steel leakage from the tap hole.



OLIDUN MINERAL WOOL



- **OLIDUN** is especially suitable as a raw material for mineral wool:
- ✓ It can be used as a source of both SiO_2 and MgO in the formulation.
 - ✓ Depending on the formulation, it can form low melting point phases with other components in the wool.
 - ✓ It is a relative low cost MgO source with a low environmental footprint compared to dolomite, limestone or lime.



- Grecian Magnesite exports to 65 countries in all continents.
- Industrial processing installations are just 15km away from Nea Moudania port and 75km from Thessaloniki port.
- Deliveries in containers to various sea destinations via Thessaloniki port.
- Deliveries in Bulk carriers (Bulk and big-bags) through shipments at Nea Moudania port (vessels up to 6-7.000 MT) and Thessaloniki port.
- Direct JIT deliveries to various destinations, by trucks.

