TERNA MAG: The revival of a world famous Greek magnesite activity

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General Mgr.
TERNA MAG revives, in a modern way, the magnesite operations of FIMISCO, which was world-known for its high-class magnesia products and refractories.

TERNA MAG is committed to becoming a reliable, leading, global supplier of magnesia and magnesium products, being a sophisticated business partner with its customers and following sustainable development principles and practices.
TERNA MAG is a member of GEK TERNA Group of companies (www.gekterna.com)

• GEK TERNA is one of the largest Greek business groups and has operations in Central and SE Europe, USA, N. Africa and the Middle East

• GEK TERNA Business sectors:
  • Construction (railway and highway networks, hydro-electric plants, dams, harbors, industrial facilities, biomass & waste management facilities, hotels, large buildings, etc.)
  • Renewable Energy Resources (wind power, photovoltaics)
  • Thermal Power (natural gas)
  • Mining (lignite, special aggregates, magnesite)
  • Real Estate and Facilities Management

• Key-figures/GEK TERNA
  • € 924 mil turnover
  • 5,000 employees
  • Presence in 16 countries
  • 45 years business activity
The place

Terna Mag facilities are located at the NE part of Euboea island, Greece
Mapping of current activities on Euboea island

- All mines are within a 14 km radius around the industrial site
- Industrial production site is just 1.5 km away from the loading port

MagMin, Athens May 2015
World-class cryptocrystalline magnesite deposits

• 2 underground mines (Gerorema area)
• 2 open pit mines (Kakavos area)
• 2 new underground mines on the way to permitting and operation

• Total current reserves: 15 mil MT magnesite
• Exploration continues for identification and confirmation of new reserves

• Total concession areas:
  • 404 km² in Euboea
  • 56 km² in various places in Greece
Beneficiation takes place in-situ at two sites: Gerorema and Kakavos

- Beneficiation includes crushing, washing, screening/classification and use of magnetic and optical sorters.
- Hand-picking is also used for the selection of high purity, special material
Current activities / Industrial processing (1)

- Calcination of magnesite in Mantoudi premises through state-of-the-art equipment
- Multiple Hearth Furnace (Herreshoff) provides high flexibility for custom-made and uniform CCM
- LPG as fuel — clean and efficient calcination
- Packaging in 1 MT and 25 kg bags
- Strict QC and testing in own modern lab
- Fully automated processes
- High standards for Environment, Health, Safety

Annual capacity: 60,000 MT CCM
Current activities / Industrial processing (2)

All materials, raw and calcined, can be:

- Milled (e.g. at -75 or 45 μm)
- Bagged in 1 MT big-bags or 25 kg small bags
Current activities / Logistics (1)

• **Warehousing:**
  Large covered area for storage of 10-12,000 MT (big-bags)

• **Access to ports:**
  • Industrial processing installations are just 1.5 km away from Kymasi port and 150 km from Piraeus port. Euboea island is connected with mainland through a bridge
  • Kymasi port: Public pier can accommodate vessels up to 6-7,000 MT
  • Kymasi private jetty will be repaired. Can accommodate vessels up to 25,000 MT
Loading options:

- Raw magnesite in-bulk and magnesia in big-bags through shipments at Kymasi port (vessels up to 6-7,000 MT)
- Deliveries in containers (graded and milled) to various sea destinations via Piraeus port
- Direct JIT deliveries to various European destinations, by trucks
Current activities / Products

• At present, TERNA MAG produces Caustic Calcined Magnesia products.

• 4 basic products can cover all applications:

<table>
<thead>
<tr>
<th></th>
<th>Betamag</th>
<th>Alfamag</th>
<th>Deltamag</th>
<th>Kappamag</th>
</tr>
</thead>
<tbody>
<tr>
<td>MgO (% on ignited basis)</td>
<td>83-85 %</td>
<td>90-91 %</td>
<td>93-95 %</td>
<td>96-97 %</td>
</tr>
</tbody>
</table>

Special grades available upon request!
## Products / typical chem composition

<table>
<thead>
<tr>
<th>Alfamag</th>
<th>% (on ignited basis)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MgO</td>
<td>90.6</td>
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<tr>
<td>SiO2</td>
<td>4.8</td>
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<tr>
<td>CaO</td>
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<tr>
<td>Fe2O3</td>
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<tr>
<td>Al2O3</td>
<td>0.09</td>
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<tr>
<td>SO3</td>
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<tr>
<td>MnO</td>
<td>0.016</td>
</tr>
<tr>
<td>Na2O</td>
<td>0.02</td>
</tr>
<tr>
<td>P2O5</td>
<td>0.04</td>
</tr>
<tr>
<td>LOI</td>
<td>2.5</td>
</tr>
</tbody>
</table>
Our value proposal

• High quality CCM: Low iron content, no chlorine, no boron, extremely low heavy metals
• Stable and uniform quality of products
• Custom-made CCM grades
• Various options for deliveries and logistics, including JIT deliveries in small volumes
• Uninterrupted and smooth supply. Reasonable delivery time and response.
• Safety stocks can be kept in the plant
• Technical co-operation with customers to maximize products’ value
• Fair pricing in Euros. No surprises, no “seasonality”.
• Stable commercial strategy and policy. Transparency. Respect on relationship and partnership.
• Security of supply. Terna Mag is a E.U. producer, following Sustainable Development principles.
Plans for the future expansion

- **Phase 1** of investment plan was completed.
  60,000 MT CCM capacity

- **Phase 2** (under implementation):
  - Second MHF, briquetting unit, shaft kiln for DBM production. Total demolition of old installations.
  - 120,000 MT total capacity for CCM or 90,000 MT CCM+30,000 MT DBM (double calcination)

- **Phase 3** (depending on market development and needs):
  - Overall re-construction of private jetty aiming to load large vessels
  - Flotation unit for upgraded beneficiation and production of high quality raw materials
  - Production of Mg(OH)2 and other magnesium products
Thank you for your attention

TERNA MAG S.A.
www.ternamag.com