“Limestone is our Milestone”
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Dear Stakeholders / Customers,

Having had the honor and privilege of serving our stakeholders at Astra Industrial Group (AIG) and their Subsidiaries for three decades in the sectors of Pharmaceuticals, Specialty Chemicals, Power & Steel and Mining, I am pleased to welcome you this time as the CEO of Astra Mining Co. Ltd.

Astra Mining was founded in 2011 as a limited liability company by AIG and Tharawat Mining Company; owning (60%) and (40%) respectively and was established as the Mining arm of AIG for the exploration of ores and minerals in Saudi Arabia and establishing factories to process them to serve the market requirements both in the local market and the MENA region; which in turn enables the development of downstream industries in the country.
Our commitments to you are built upon a smart, safe, efficient and effective approach through which; great human capital assets teams are assigned and trained, an efficient infrastructure with the latest Swiss technology is adopted, the latest SAP ERP & CRM end-to-end solutions have been implemented and the ISO9000 certification (ISO 9001/2015) will be awarded soon. All mentioned and more are initiatives we are consistently working rigorously on to achieve in order to ensure our customers’ satisfaction are met and exceeded to the highest level.

We strongly believe that our customers and partners’ support coupled with progressive thinking, creative approach, adoptable strategy and a clear vision, mission and core values are what make us stand out to achieve sustainable success, growth and winning customers’ appreciation which is the biggest of awards to Astra Mining.

And despite these challenging and exciting times Astra Mining is going through, I am proud of the work we do and give you my personal commitment that we will deliver what we promise in a comprehensive and sustainable model and hope that our new Plant in Al Kharj Industrial Zone with an expected production capacity of (300) thousand tons of Quick Lime and Hydrated Lime of the first production line will create the opportunity for our valued customers to meet their goals via using our products of limestone, quicklime and hydrated lime with highest calcium carbon contents and all sizes.

And, God willing, after the successful operation of our project first, we will provide you more services, including but not limited to; the expansion of our production capacity and the addition of producing of treated and non-treated powdered calcium carbonate in various smoothness grades, in addition to the production of Precipitated Calcium Carbonate (PCC), which have very advanced applications and the production of Talc Powder and more.

Our clear philosophy “Clients at the heart of our practices” and our motto “Limestone is our Milestone” will guide us to your heart!

Thank you for taking the time to read our documents and I willingly welcome any of your constructive feedback or comments.

Ali Al Jabrah
CEO

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Mobile; +966 50 586 42 71
About Astra Mining

Founded in 2011, Astra Mining (A subsidiary of Astra Industrial) is a limited liability Saudi company. The company is active in the exploration of ores and minerals in Saudi Arabia and establishing factories to process them, which in turn enables the development of downstream industries in the country.

Our Vision

“Our vision is to be the premier mining company in the MENA region, delivering long term stakeholder value through profitable growth”.

Our Mission

“Develop the strongest portfolio of mining-related projects in the Kingdom of Saudi Arabia and the MENA region through timely strategic investments and growth by providing optimal managerial and financial resources”.
Our Core Values

- **Result Oriented**: We will allocate resources in the most efficient manner so as to achieve optimal returns.
- **High Ethical Standards**: We will continue to deal with customers, partners, employees and authorities with the highest levels of integrity and respect.
- **Continuous Improvement**: Through accountable leadership and a clear focus on our objectives we are dedicated to continually improving our performance.
- **Commitment to Quality**: We will deliver the best quality products and services by differentiating ourselves from our competitors through a relentless focus on exceeding customer expectations.
- **Empowerment & Accountability**: We will attract highly talented employees and empower them to perform their duties and responsibilities to their fullest potential, at the same time making them fully accountable for their results.
Astra Mining’s Sustainability Mission

Our Commitment

Astra Mining is committed to achieving industry leadership in sustainability, in accordance with our mission to be the premier mining company in the MENA region by responsibly meeting society’s needs for quality lime products.

Thanks to the high quality of our production facilities and people, Astra Mining is well positioned to meet the increasing demand for lime that will result from a regional heightened emphasis on environmental protection.

Astra Mining is aware that more stringent environmental regulations and increased societal expectations with respect to industry performance and behavior could well present challenges for our operations and long-term expansion plans of the company.

Astra Mining regards such challenges as opportunities to further improve our health and safety performance, minimize our impact on the environment, and foster meaningful relationships with communities and other key stakeholders. To that end, Astra Mining has adopted a comprehensive Health, Safety and Environment (HSE) Action Plan, designed to drive continuous improvement in these crucial areas through the fundamental expectation within Astra Mining that all employees share in the responsibility for developing and maintaining a sustainable organization.
Environmental Care

Astra Mining, while proud of the fact that our products are a big part of the solution in terms of addressing many of today’s environmental challenges, recognizes the inevitable impact on the environment resulting from its production activities.

Our strategy with respect to environmental care focuses primarily on three key areas; air emissions, energy efficiency and waste reduction; which form the environmental pillars of Astra Mining’s HSE Management System.

Responsible use of resources enables Astra Mining to extend the life of those resources further and reduce the Company’s impact on the environment.
Astra Mining derives its competitive edge in large part from our remarkable and diverse workforce; bringing their skills and energy to work every day at the offices and plant sites. In return for their hard work and commitment, Astra Mining aspires to provide competitive wages and benefits, a safe, healthy work environment where employees can function day in and day out without injury, as well as opportunities to grow and develop their skills in order to realize their full potential.

Striving to be a world-class company necessitates achieving an outstanding level of performance in the crucial area of health and safety. To that end, Astra Mining is continuing to develop and implement company-wide safety standards, which emphasize employee involvement through safety committees, internal safety audits, training and certification, as well as strict adherence to safe work habits, with our ultimate goal of achieving zero injuries and zero incidents company-wide.
Astra Mining believes that the foundation of being a good neighbor is open and honest communication in a meaningful way with key stakeholders such as governments, non-governmental organizations (NGOs) and communities.

Accordingly, we endeavor to be proactive in communicating our plans and seeking community input so that concerns and potential issues can be identified and addressed early on and factored into our decision-making.

Astra Mining aims to contribute in a significant way to the well-being and quality of life through investments in community programs, projects and activities and by encouraging and supporting employee involvement in the broader community.

One of Astra Mining’s main endeavors is to professionally, efficiently and effectively implement its Transparency Policy towards its customers, clients and community.

Under Astra Mining’s Code of Business Conduct and Ethics (the Code), Astra Mining employees, officers and directors are required, among other things, to carry out their work according to the highest ethical and legal standards, to engage in ethical and legal conduct when dealing with customers, partners, suppliers and competitors and to report any known or suspected ethical or legal misconduct. Failure to abide by the Code may result in disciplinary action, up to and including termination.
Astra Mining’s first project is aimed to produce quick lime and hydrated lime (Calcium Carbonate).

Established in Al Kharj Industrial Zone, the project occupies over (92) thousand square meters of land with an expected production capacity of (99) thousand tons of Quick Lime and (66) thousand tons of Hydrated Lime.
Astra Mining Core Products

Limestone Definition:
Limestone is a sedimentary rock, formed organically, from which lime is extracted and contains a percentage of (10%) of Dolomites called Limestone Dolomite. It is generally white in color but may exist in various different colors such as; yellow and grey; due to the presence of some impurities such as sand, silt and iron oxide, etc. Overall, its texture is smooth or rough granules and sometimes it is in the form of veins.

Its demand is proportional to its content of Calcium Oxide (CaO) and its degree of hardness usually determines its optimal utilization; as it is an important component of most industries and it is sufficient to mention that it is a key substance in the Food Industry.

Limestone exists in large margins in the Earth’s crust and the Kingdom of Saudi Arabia is rich with this mineral. And given that the best types of Limestone, containing the highest percentage of Calcium (not less than 95% and up to 99%), are found in the Eastern Region of Al-Kharj, it was the vision of Astra Mining to establish the first core of its mining industry there. Limestone constitutes approximately (20%) of the sedimentary rocks of the Earth’s crust.

It is one of the most important raw minerals that is utilized as a primary or secondary material in most production industries, such as; steel, paints, plastics, agriculture, glass, marble, sterilization, medicine, ceramics, putty and food, etc., as it often contains limestone non-carbonic metals, such as; volcanic morsels, silica or clay and the remains of fossils and metals, etc.
### An overview of some uses of Astra Limestone Quick & Hydrated

<table>
<thead>
<tr>
<th>Industry</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Portland Cement Industry;</strong></td>
<td>Limestone is considered the core and the main structure of this industry with no less than (76%); where it is mixed with non-metallic minerals which are chemically treated.</td>
</tr>
<tr>
<td><strong>Anhydrous Sodium Carbonate Industry</strong></td>
<td>Which is an important material extracted from limestone for the glass industry, cleaning and sterilization through the reaction of carbon dioxide with sodium chloride and ammonia.</td>
</tr>
<tr>
<td><strong>Agent in Iron and Steel Smelters;</strong></td>
<td>Iron often contains impurities as silica and aluminum and about (410 kg) of limestone is needed to produce one ton of iron.</td>
</tr>
<tr>
<td><strong>Rock Wool Industry;</strong></td>
<td>Impure limestone mud is fused in ovens to extract slag through a narrow opening and then steam-blown with great force to produce threads of calcium silicate which are collected as Rock Wool to be utilized for heat insulation.</td>
</tr>
</tbody>
</table>
An overview of some uses of Astra Limestone Quick & Hydrated

**Metal Fillings Industry;**
Limestone is one of the most important mineral used for metal fillings due to the ease of its milling, its low absorption of oils and ease to blend. It is also used in the manufacturing of bitumen rolls to cover walls, boats, cars and plumbing.

**Food Industries;**
Pure non-toxic Limestone free from lead and copper is used in the manufacturing poultry feed and food processing to extract sugar from beets.

**Ornamental Stones Industry;**
Limestone is used for floor covering, as well as the internal and external facades of buildings.

**Building Blocks Industry;**
Limestone is used in the crushed gravel and concrete industries, as well as sewer filters. It is also used for road paving after mixing it with bitumen where it remains holding a high percentage of silicon dioxide.

**Paper, Plastic and Paints Industry;**
Treated or untreated Limestone with a high degree of smoothness and whiteness is used in the paper, plastics and paints industries, as well as many downstream and transformative industries.
<table>
<thead>
<tr>
<th>Specifications of Limestone</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CaCO$_3$</td>
<td>95-97%</td>
</tr>
<tr>
<td>CaO</td>
<td>54.5% Max</td>
</tr>
<tr>
<td>Size</td>
<td>30-70 mm</td>
</tr>
<tr>
<td>SiO$_2$ and insol</td>
<td>2% Max</td>
</tr>
<tr>
<td>MgCO$_3$</td>
<td>1% Max</td>
</tr>
<tr>
<td>Impurities</td>
<td>0.5% Max</td>
</tr>
<tr>
<td>MgO</td>
<td>0.5% Max</td>
</tr>
<tr>
<td>Fe$_2$O$_3$</td>
<td>0.17% max</td>
</tr>
</tbody>
</table>
The following presents the Manufacturing Process of Lime Stone.

1. **Milling CaCO₃**
   - Milling to Different Grades

2. **Burning CaCO₃**
   - To produce Quick or Burnt Lime (Calcium Oxide) CaO

3. **Water is added to Quick Lime CaO**

4. **Adding more water then evaporating CO₂**
   - Re-adding Carbon Dioxide CO₂

5. **Producing Precipitated Calcium Carbonates**
   - Ca(OH)₂(s) + CO₂(aq) → CaCO₃(s) + H₂O

**Calcium Carbonates**

**Calcium Oxide**

**Calcium Hydroxide**

**Precipitated Calcium Carbonates**
ASTRA LIME is one of the main raw materials containing a high concentration of calcium used by Astra Mining Company at its plant in Al-Kharj Industrial Zone, an area rich in limestone, located at about one hundred kilometers southeast of Riyadh.

Astra Mining processes limestone under its brand name (ASTRA LIME) in different ways to directly serve the local market and the Middle East and North Africa regions (MENA Region) as a first stage with classifications according to measurement, components, milling and filtering to serve its customers through providing the highest quality and standards of fineness starting almost from zero and to the highest required percentage as per the request and needs of the customer. Some quantities of raw ASTRA LIME with the highest measurements are burn-processed through kiln furnaces and utilizing high standard Swiss Technology at Astra Mining Limestone Plant to produce under the brand name ASTRA LIME - Quick.

ASTRA LIME is burned at an average temperature of (900 - 1,100° C) until it loses carbon dioxide by (44%) of its weight, leaving behind Calcium Oxide (Quicklime); which can be used immediately or milled to different degrees of fineness according to the market requirements.

ASTRA LIME - Quick can be delivered to the Astra’s customers in silo tanks, large bags weighing up to a ton and half or in small bags weighing up to twenty five kilograms. At a later stage, part of the high-finesse produced ASTRA LIME - Quick is hydrated through the Water Hydration Production Line; utilizing high-standard European Technology to produce under the brand name ASTRA LIME – Hydrated. The final product provides the highest degree of finesse according to the market requirements.

ASTRA LIME - Hydrated can be delivered to the Astra’s customers in silo tanks, large bags weighing up to a ton or in small bags weighing up to twenty kilograms.
Quicklime

Calcium Oxide, commonly known as quicklime is produced by burning the limestone containing Calcium Carbonate - the chemical process is called “calcination”.

Quicklime substance is caustic, alkaline and white powder that strongly reacts with water to form calcium hydroxide also known as “Quicklime”. It is pulverizing with water into special sizes, separating it from the dust, and putting it in ovens. After that, acidification, calcination, and cooling processes are repeated at an average temperature (900 - 1,100° C), consequently transforming calcium carbonate Calcium Oxide (Quicklime); filled in big bags with capacity start from 25 kg to 50 kg, and ton and a half.

Chemical Equation:

\[
\text{CaCO}_3(s) \rightarrow \text{CaO}(s) + \text{CO}_2(g)
\]

Uses:
It is used in many modern industries. such as: Iron, steel, glass, paper, sugar production, leather tanning, treatment of sewage, processing industrial waste and the preparation of some dyes and bleaches. In addition, it is cast-off in extract minerals, acidic soils and as an adjunct to the fertilizer into the soil.
Astra Mining processes limestone under its brand name (ASTRA LIME) in different ways to directly serve the local market and the Middle East and North Africa regions (MENA Region) as a first stage with classifications according to measurement, components, milling and filtering to serve its customers through providing the highest quality and standards of fineness starting almost from zero and to the highest required percentage as per the request and needs of the customer. Some quantities of raw ASTRA LIME with the highest measurements are burn-processed through kiln furnaces and utilizing high standard Swiss Technology at Astra Mining Limestone Plant to produce under the brand name ASTRA LIME - Quick.

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Astra Mining produces the highest quality of ASTRA LIME – Quick with product purity up to 95% and various measurement ranges, such as; (0-1 mm), (1-3 mm), (3-12 mm), (12-30 mm), (30-60 mm) and (5-50 mm) to cover the needs and specifications of all industries. ASTRA LIME - Quick can be delivered to the Astra’s customers in silo tanks, large bags weighing up to a ton and half or in small bags weighing up to twenty five kilograms.
Types of Quick Lime:

Quick Lime and Hard Burnt Lime

Specification of Quicklime:

<table>
<thead>
<tr>
<th>CHEMICAL PROPERTIES</th>
<th>PERCENTAGE</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium Oxide (CaO)</td>
<td>92-95%</td>
<td>MINIMUM</td>
</tr>
<tr>
<td>Carbon Dioxide (CO2)</td>
<td>3.00%</td>
<td>MAXIMUM</td>
</tr>
<tr>
<td>Silicon Dioxide &amp; Insol</td>
<td>2.00%</td>
<td>MAXIMUM</td>
</tr>
<tr>
<td>Magnesium Oxide (MgO)</td>
<td>1.00%</td>
<td>MAXIMUM</td>
</tr>
<tr>
<td>Sulphur Trioxide (SO₃)</td>
<td>0.50%</td>
<td>MAXIMUM</td>
</tr>
<tr>
<td>Iron Oxide (Fe₂O₃)</td>
<td>0.50%</td>
<td>MAXIMUM</td>
</tr>
</tbody>
</table>

Note: This product should not come in touch with skin or eyes and must be stored away from water and moisture as it is highly reactive to water.

Uses of Quick Lime: It is used in various industries, such as; paints, cables, paper, cement, ceramics, additives, compounds, rubber, pharmaceuticals, iron and other metals smelting, sugar and sterilization.

Chemical Equation: Calcium Carbonate $\rightarrow$ Calcium Oxide + Carbon Dioxide

$$\text{CaCO}_3(s) \rightarrow \text{CaO}(s) + \text{CO}_2(g)$$
Specification of Hard Burnt Lime:

Astra Hard Burnt Lime is characterized, when compared with Quick Lime, as having a slower reaction with water and is used in light brick industry for insulation.

<table>
<thead>
<tr>
<th>HARD BURNT LIME SPECIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEMICAL SPECIFICATION</td>
</tr>
<tr>
<td>Calcium Oxide (CaO)</td>
</tr>
<tr>
<td>Carbon Dioxide (CO₂)</td>
</tr>
<tr>
<td>Silicon Dioxide (SiO₂) &amp; Acid insol</td>
</tr>
<tr>
<td>Magnesium Oxide (MgO)</td>
</tr>
<tr>
<td>Al₂O₃</td>
</tr>
<tr>
<td>Fe₂O₃</td>
</tr>
<tr>
<td>Sulphur (S)</td>
</tr>
<tr>
<td>Phosphorus (P)</td>
</tr>
<tr>
<td>PHYSICAL SPECIFICATION</td>
</tr>
<tr>
<td>1- PARTICLE SIZE</td>
</tr>
<tr>
<td>FINE POWDER 90% &lt; 75 Micron</td>
</tr>
<tr>
<td>2-REACTIVITY (T60)</td>
</tr>
<tr>
<td>8-15 minutes</td>
</tr>
</tbody>
</table>
Definition: Hydrated Lime, also known as Calcium Hydroxide, is an inorganic compound which is formed when Calcium Oxide is combined with water and is used in tanning and agriculture. And in an additional process called “Burning”, where water is added to cold quicklime that causes a chemical reaction producing heat and water vapor; the steam fades and leaves a soft white powder called “hydrated lime”. If more water is added to hydrated lime, a dense liquid forms; consisting of partially dissolved lime known as “Milk of Lime”. When hydrated lime is totally melted in water, a clear liquid is formed and is called “Water Lime”; which is used to test if carbon dioxide exists in any substance, as carbon dioxide disturbs the Water Lime. Calcium Hydroxide is known as hydrated lime or hydrogenated lime.

Uses: Hydrated Lime is used as an adjuvant agent for smelting and producing iron. It is also used in aluminum, copper and zinc purification, as well as Water Softening by removing certain minerals; making it an important element in the treatment of sewers. Additionally, farmers inseminate the lime into the soil of their fields to neutralize its acidity. Homeowners use it in their gardens to prevent algae growth. Hydrated Lime helps maintain the cohesion of the soil in the foundations of roads and runways. In the leather industry, it is used in the tanneries to remove hair from animals’ skins. In construction, grout consisting of a mixture of lime, sand and water, is placed between bricks or stones in buildings’ walls. It is also the most important component of gypsum, and the main module of the cement type called “Portland Cement”. It is also used in cooling and facilitating the cutting of rocks such as marble, water desalination, pharmaceuticals and construction works in mortar construction and plastering especially for buildings designed with sandstone brick limestone, coating stalks trees to protect them from pests and sun heat, carbonated water industry through the purification of water from impurities, germs and harmful materials.

Chemical Equation: Reacts with water producing heat and forming Calcium Hydroxide

\[ \text{CaO} + \text{H}_2\text{O} \rightarrow \text{Ca(OH)}_2. \]
Furthermore, Astra Mining high-finesse produced ASTRA LIME - Quick is hydrated through the Water Hydration Production Line; utilizing high-standard European Technology to produce under the brand name ASTRA LIME – Hydrated.

The final product, ASTRA LIME – Hydrated, provides the highest degree of finesse according to the market requirements.

ASTRA LIME - Hydrated can be delivered to the Astra’s customers in silo tanks, large bags weighing up to a ton or in small bags weighing up to twenty five kilograms.

**Specification of Astra Lime-Hydrated (Calcium Hydroxide Ca(OH)2):**

<table>
<thead>
<tr>
<th>CONTENTS</th>
<th>PERCENTAGE</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium Hydroxide Ca(OH)2</td>
<td>92-95%</td>
<td>Above 92%</td>
</tr>
<tr>
<td>Iron Oxide (Fe2O3)</td>
<td>0.10%</td>
<td>MAXIMUM</td>
</tr>
<tr>
<td>Silicon Dioxide &amp; Insol</td>
<td>1.00%</td>
<td>MAXIMUM</td>
</tr>
<tr>
<td>Magnesium Oxide (MgO)</td>
<td>1.00%</td>
<td>MAXIMUM</td>
</tr>
<tr>
<td>Aluminum Oxide Al2O3</td>
<td>0.20%</td>
<td>MAXIMUM</td>
</tr>
<tr>
<td>Moisture</td>
<td>0.20%</td>
<td>MAXIMUM</td>
</tr>
<tr>
<td>Size</td>
<td>0-1 mm</td>
<td></td>
</tr>
<tr>
<td>Color</td>
<td>White</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Caution is advised when handling this product, as it may cause certain allergies to some individuals.
Astra Mining Quality Assurance

- **Quality Control:** Our production adheres to all the latest and updated Quality Control measures to ensure that our products meet the required standards as requested by our customers and clients.
- **Modern Lab Equipment:** Our factories are always equipped with the most modern lab equipment to ensure continuous adherence to quality control measures.
- **Environment Friendly:** Our factories implement green practices in all their processes, from grinding to packing to finally disposing of waste through energy and resource conservation and engineering that reduces operational and lifecycle costs.
- **Dedicated Sales Team:** Our Sales Team aims to provide our customers and clients with full support through continuous communication, field visits and providing the latest products’ information.
- **Continuous Follow-up:** We perform continuous and periodical follow-up on our customers and clients through a dedicated CRM System.
- **Products’ Guarantee:** We provide our customers with a 100% guarantee to all our products.
- **Technical Support:** We provide our customers and clients with 100% technical support to resolve any technical issues with our products.
- **Packaging and Transport:** Silo tanks, large (jumbo) and small bags.

Silo tanks 20 kg bags Small Bags Jumbo Bags
Some Uses of Lime Stone