DOLOMITE APPLICATIONS

01 1100℃ light-burnt dolime,mainly for steel or hydrated dolime

02 1400℃ Medium-burnt dolime, For making metal magnesium/alloy

03 2000℃ dead-burnt dolime, For refractory material



Dolomite and its calcined products (light-burned dolomite, sintered dolomite, dolomite sand) possess various valuable properties (such as providing magnesium oxide and calcium oxide, acting as a flux, good refractoriness, neutralizing acidity, etc.), leading to widespread applications across numerous industries:

Production of Light-Burned Dolomite:

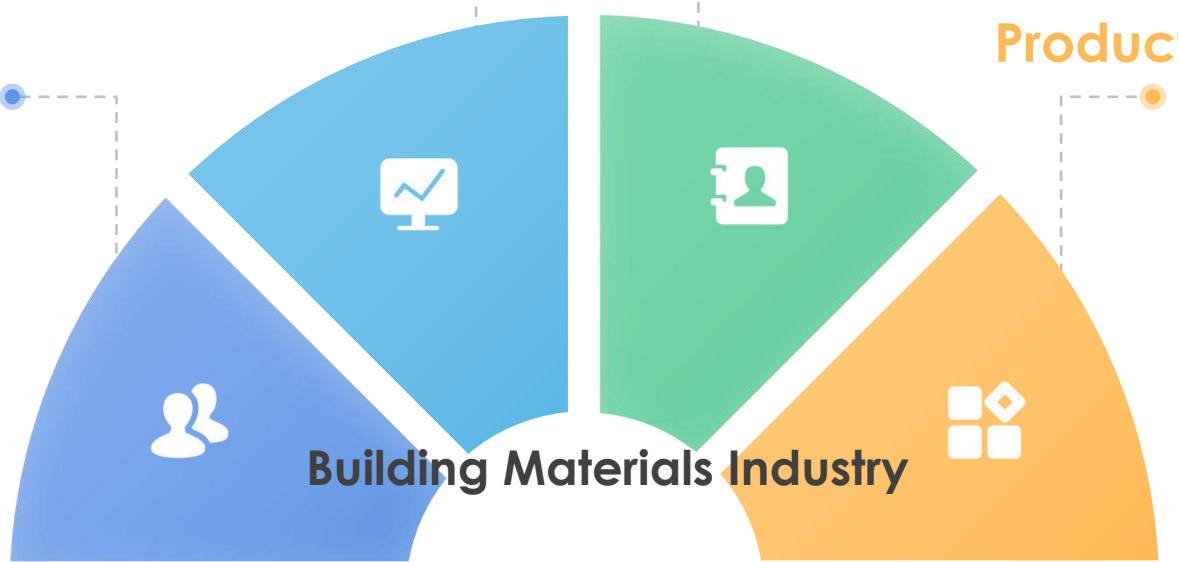
Used in manufacturing magnesia-containing cementitious materials.

Crushed Stone and Aggregate:

Crushed for use as concrete aggregate, railroad ballast, and road base material.

Building Stone:

Dolomite rock with hard texture and attractive color can be used directly as building stone, exterior cladding, steps, flooring, etc.



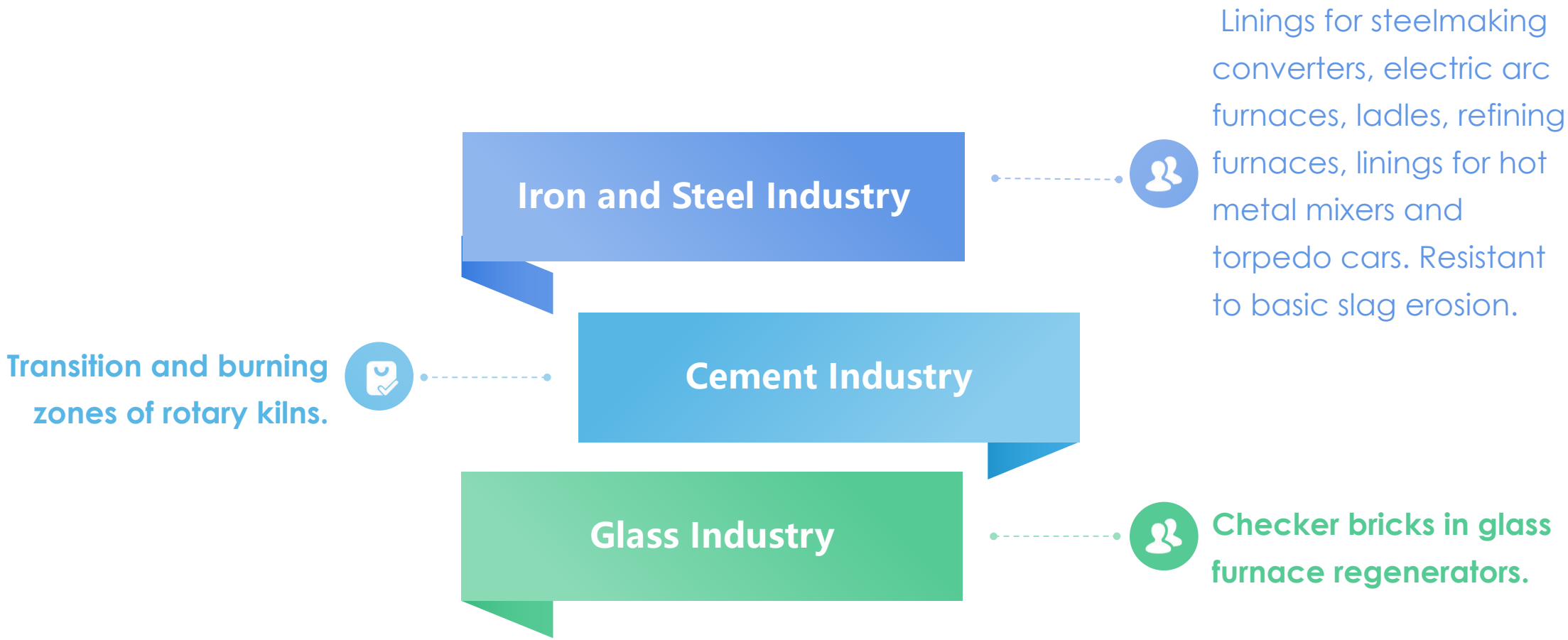
Production of Dolomite Sand:

Crushed Stone and Aggregate: Crushed for use as concrete aggregate, railroad ballast, and road base material.

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Refractories Industry

This is a very important application area. Rich in magnesium oxide (MgO), dolomite is a primary raw material for manufacturing basic refractories (e.g., magnesia-dolomite bricks, dolomite bricks). These refractories are widely used in:

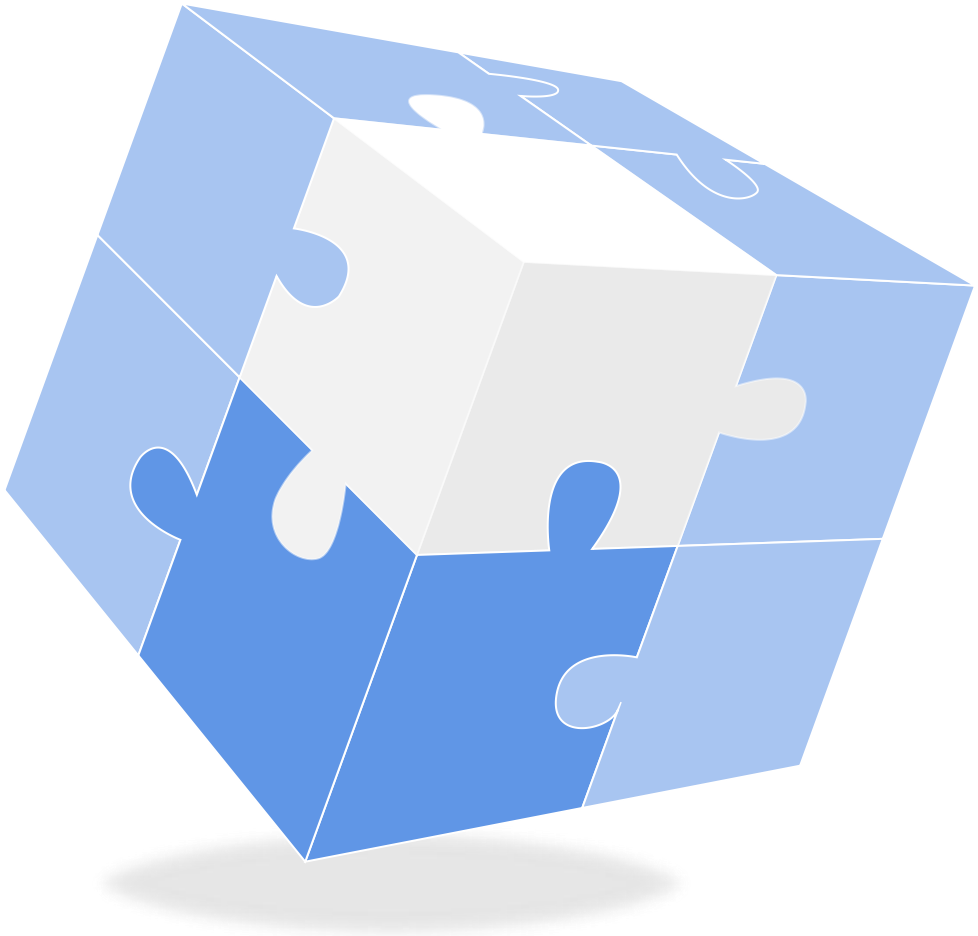


Metallurgical Industry

Flux

Used as a flux in ironmaking blast furnaces and steelmaking converters to lower slag melting point, improve slag fluidity, aid in desulfurization, and protect the furnace lining. Particularly in steelmaking, it helps form slag with a certain MgO content, reducing erosion of the refractory lining.

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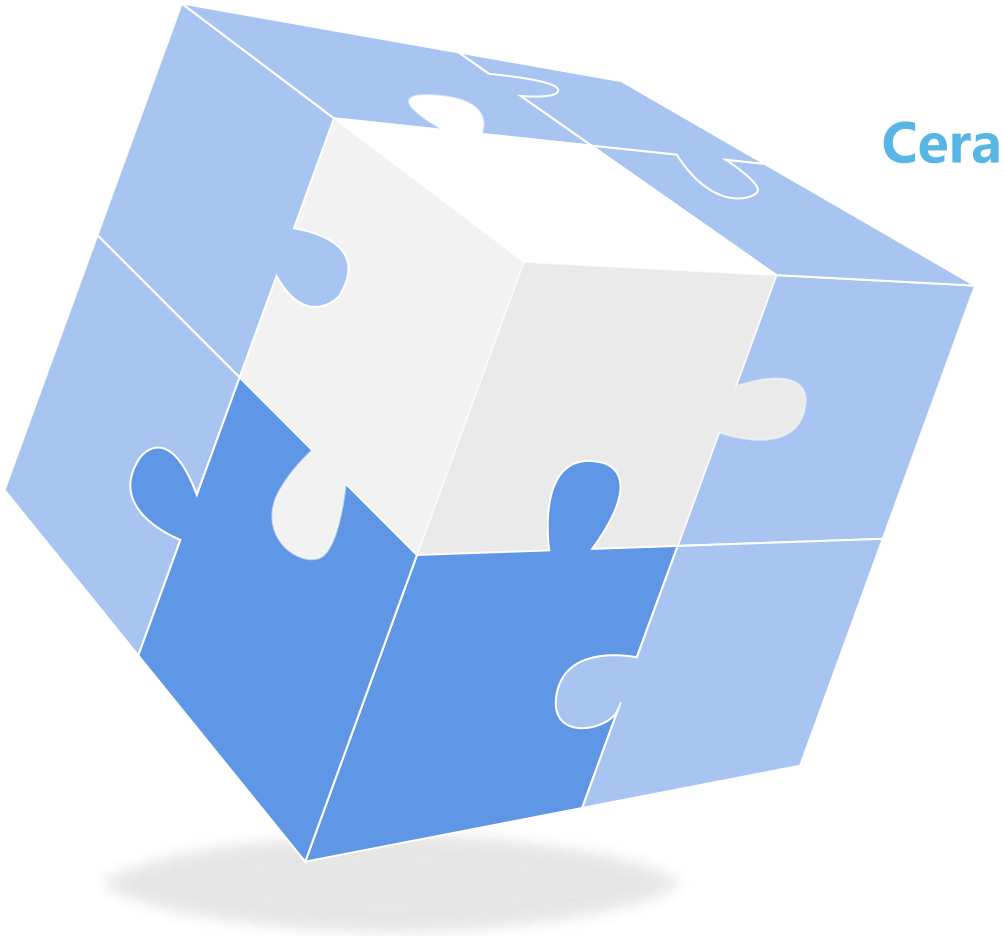
Magnesium Metal Production

Dolomite is a crucial raw material in the Pidgeon process (silicothermic reduction) for producing magnesium metal (reacted with ferrosilicon under vacuum and high temperature).

Glass and Ceramics Industry

Glass Manufacturin

Dolomite is a significant component of glass batch, introducing magnesium oxide (MgO) and calcium oxide (CaO). MgO improves glass forming properties, chemical stability, mechanical strength, and thermal shock resistance. Commonly used in flat glass, container glass, and tableware glass.



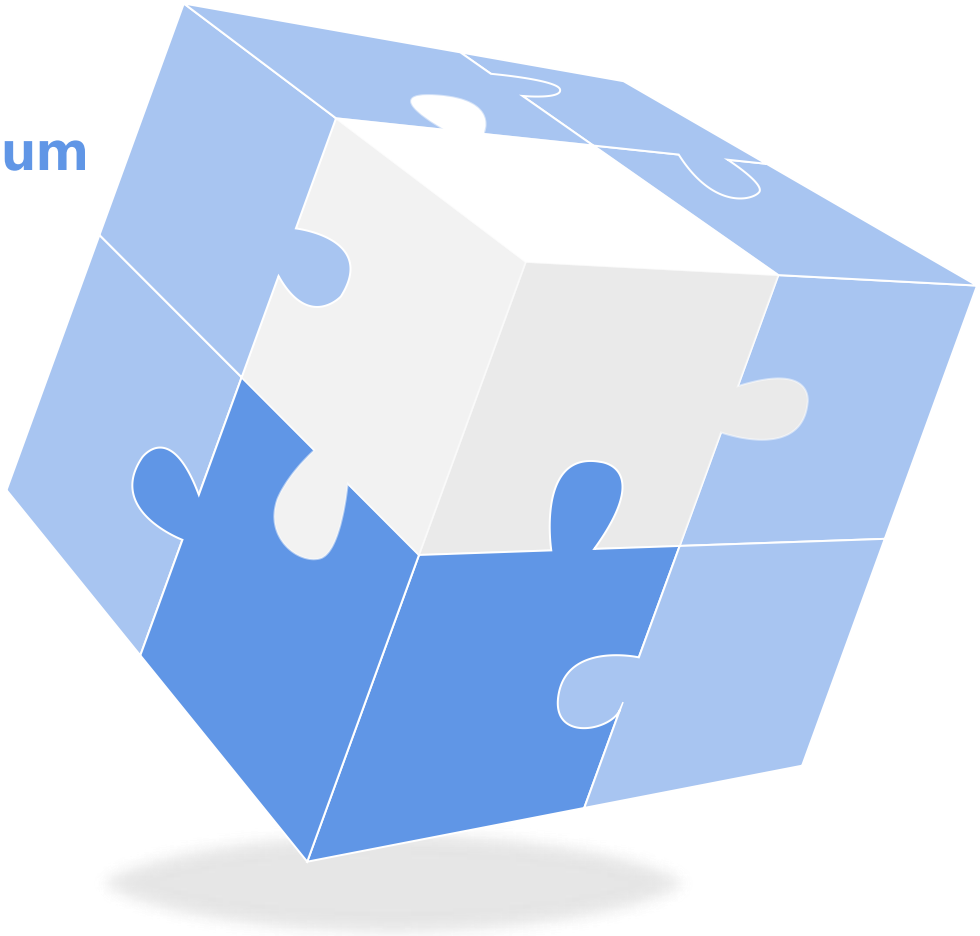
Ceramic Manufacturing

Used as a raw material in glazes and bodies, providing MgO and CaO, influencing glaze melting point, fluidity, gloss, as well as the sintering behavior and strength of the ceramic body.

Chemical Industry

Production of Magnesium Compounds

A key raw material for producing magnesium salts and chemicals like magnesium sulfate, magnesium hydroxide, magnesium oxide (light-burned magnesia, dead-burned magnesia, fused magnesia). These products have wide uses, e.g., as flame retardants, water treatment agents, rubber fillers, in pharmaceuticals, and food additives.



Neutralizing Agent

Calcined dolomite (a mixture of quicklime and magnesia) can be used to neutralize acidic wastewater, exhaust gases (e.g., flue gas desulfurization), and for soil improvement (see Agriculture).

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Agriculture Industry

Soil Conditioner

Crushed dolomite powder (agricultural dolomite) can be applied directly to acidic soils to provide calcium and magnesium, neutralize soil acidity, improve soil structure, and enhance fertilizer efficiency.

Magnesium Fertilizer

Provides essential magnesium to crops, preventing magnesium deficiency.

Feed Additive

Added to animal feed as a calcium and magnesium supplement.

Paint and Coating Filler:

Used as an extender pigment and filler.

Sugar Industry:

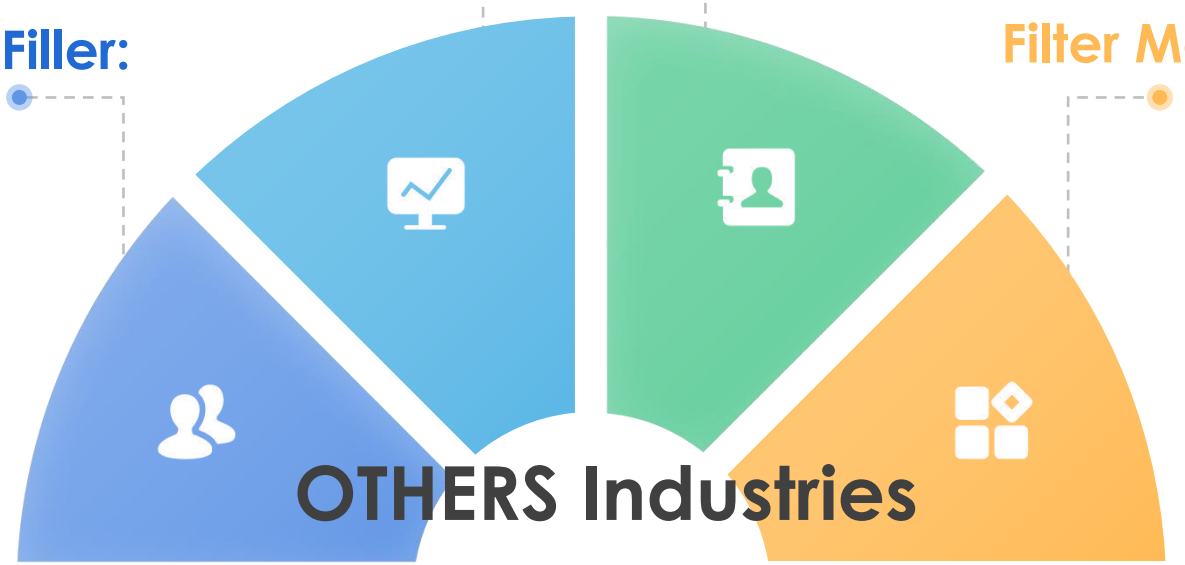
Used in juice purification.

Rubber and Plastic Filler:

Ultrafine dolomite powder can be used as a filler to reduce costs and improve properties.

Filter Media:

Used in water treatment.



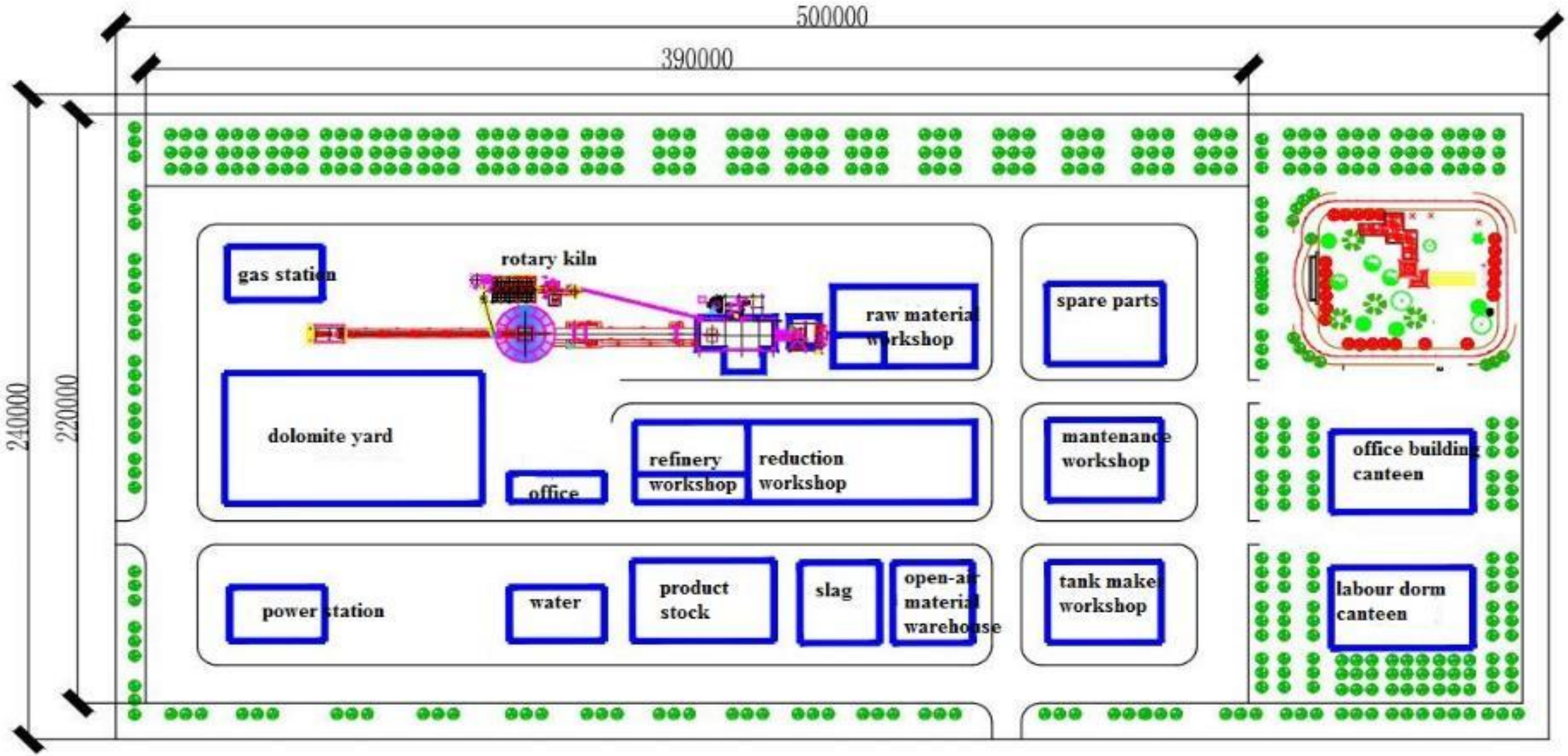
OTHERS Industries

Dolomite is a versatile fundamental mineral resource whose applications permeate almost every aspect of modern industrial production and agriculture. From serving as a basic building material to providing critical refractories and fluxes for high-temperature industries like steel and glass, and further offering solutions for environmental protection, agriculture, and chemicals, dolomite plays an indispensable role due to its unique chemical composition (rich in MgO and CaO) and physical properties. Its calcined products further extend its application value.



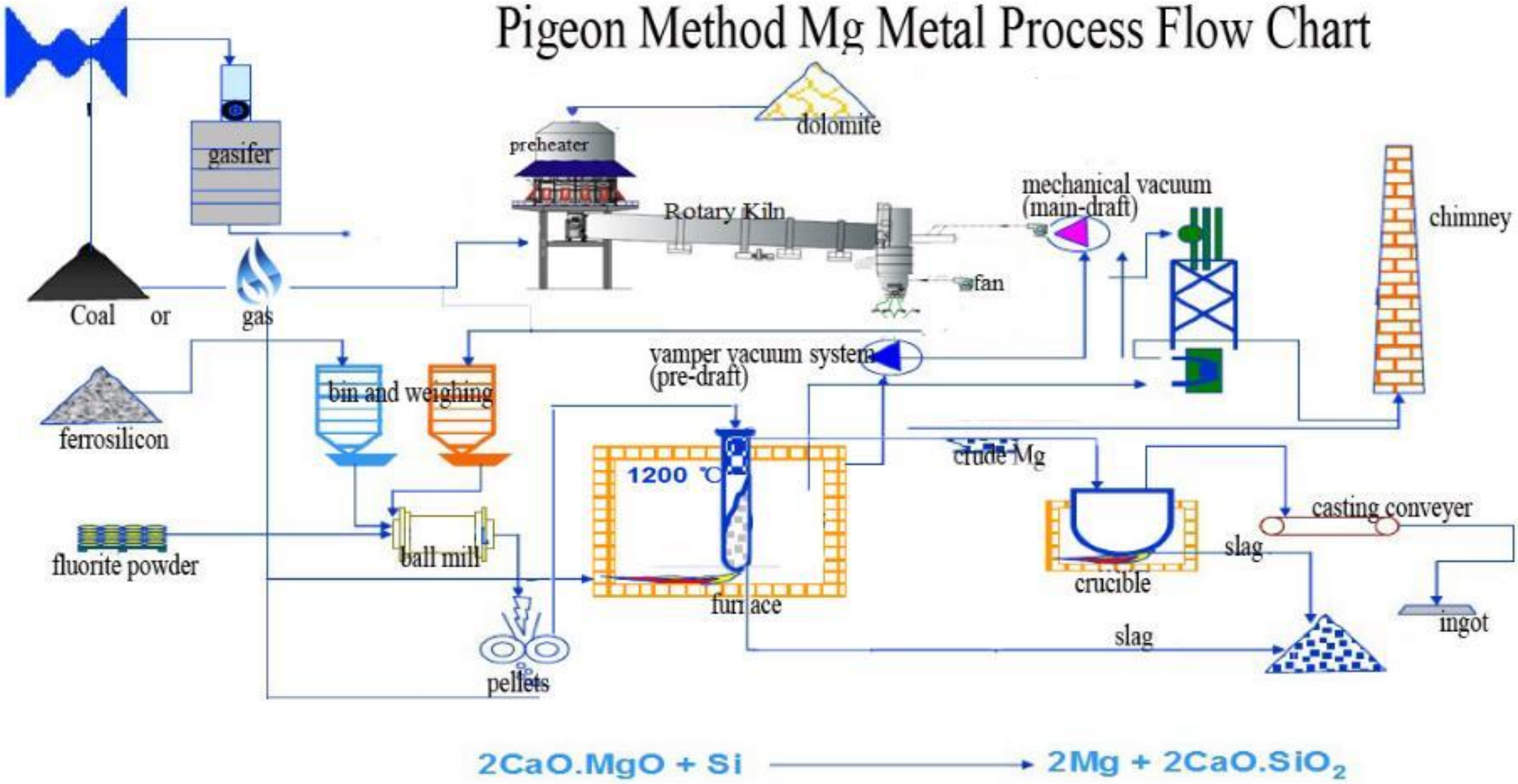
Shanxi Bada Magnesium Co., Ltd, 35kpa Mg Ingot, 20kpa Mg Alloy

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10~12kpa general plan drawing

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Process flow—Chart 2

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Mg Melting Process

There are two main methods for smelting raw magnesium:

silicon thermal reduction

electrolysis

At present, most of the domestic original magnesium manufacturers use the Pidgeon method rather than the silicon thermal reduction method. The following is a brief introduction of the more mature Pidgeon method.

The Pidgeog method produces magnesium ingots by calcining dolomite or magnesite ore, ferrosilicon as reducing agent and fluorite as catalyst. After grinding, it is pressed into a ball, called a pellet. The pellets were charged into a reduction tank, heated to 1200° C, and evacuated to 13.3 Pa or higher to generate magnesium vapor. Magnesium vapor forms crystalline magnesium in the condenser at the front end of the reduction tank, also known as crude magnesium. After refining with a flux, a commercial magnesium ingot, that is, refined magnesium, is produced.

Mg Melting Process

Pidgeon method magnesium production process:

(1) Dolomite calcination: The dolomite is heated to 1100-1200°C in rotary kiln, and calcined dolime (MgOCaO).

(2) Material batching and briquetting: The calcined dolime, ferrosilicon powder and fluorite powder are metered, milling, and then pressed into pellet.

(3) Reduction: The pellet is heated to (1200 + 10) ° C in a reduction tank, and maintained under a vacuum of 13.3 Pa or higher for 8 to 10 hours, and the magnesium oxide is reduced to magnesium vapor, and after condensation, it becomes crude magnesium.

(4) Refining ingot: The crude magnesium is heated and melted, and refined at a high temperature of about 710°C, and then refined into a magnesium ingot, also called fine magnesium.

(5) Pickling: The magnesium ingot is washed with sulfuric acid or nitric acid to remove surface inclusions to make the surface beautiful.

China Mg History and development

1957—Fushun Alu co., Ltd started to producing Mg

1960—Tianjin, Hangu electrolytic magnesium (loss), Zhengzhou and Qingxi Mg-Ti 20kpa (stopped)

1970—14 small E-Mg and 13 small P-Mg co., failed of technology, high cost

1985~1995—120co.s dozens~hundreds tpa, Fushun imported E-Mg tech from Russia (market is poor, closed), 180kpa, 4000USD/ton

Now China Mg 1.3million tpa, (1million raw Mg, 0.3million Mg Alloy) Shanxi~50%, Shaan'xi~35%, Ningxia~15%, others 10%10kpa companies—37, producing 750kpa; 30kpa companies—9, producing 300kpa

Our client—Baowu Special Metal Group (ex. Yunhai co.) is going to set up 0.3million Mg plant in next two years;

ZHONGKE DINGXIN supplied 3x1250tpd PRK and batching equipmentsBig companies:

Shaan'xi—Coal Chemical companies (Taida, Jingfu, Wantong)

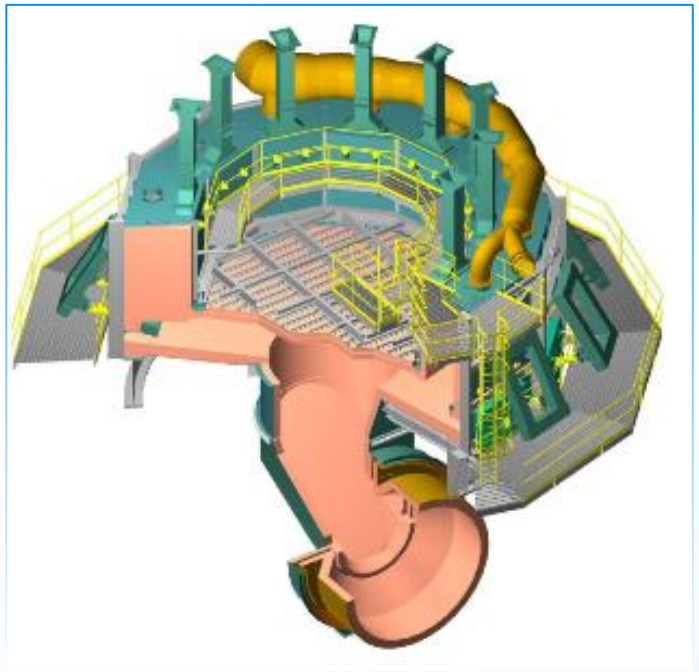
Shanxi– Yunhai, Yingguang, Bada

Key Technology

Patented technology

- ✓ Energy saving preheater and cooler
- ✓ Reduction furnace burning equipment.
- ✓ Reduction furnace top cover plate brick
- ✓ Automation integration operation device for reduction furnace
- ✓ Burning equipment of refining furnace
- ✓ Automaticpalletizing machine of refining furnace
- ✓ Heatexchanger ofslag cooler

Rotary Kilns for lime/dololime/metal MG



SINOMEMA ZHONGKE DINGXIN ENGINEERING

own the first-class R & D team. China Top Three R&D ability and Projects number.

professional design, in order to adapt to the plateau, very low temperature, high humidity areas, accurate calculation and computer simulation, developed a series of equipment and processes for a variety of situations.

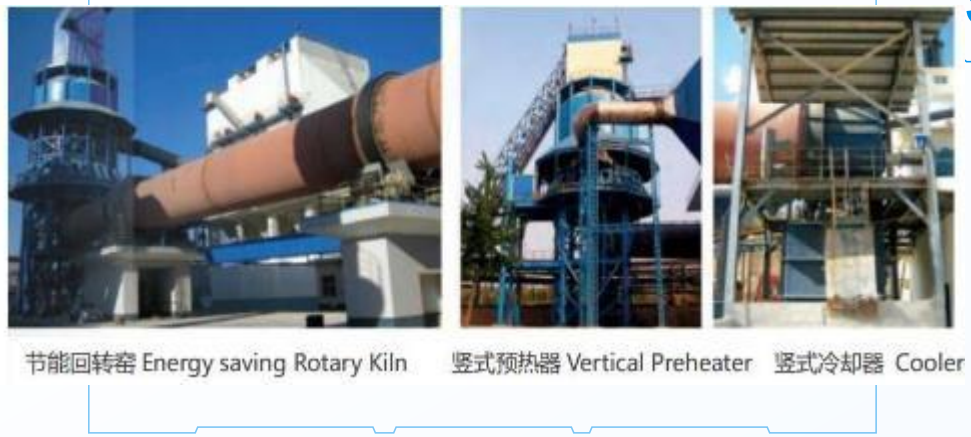
Increasing the silo volume in the preheater top, increasing the rate of material seal, reducing the external air into, and effectively reducing the feeding frequency.

the preheater adopts the 3rd generation chamber separated control technology, so that the preheating temperature of each preheating chamber is more easily adjusted and controlled, more stable preheating temperature

the preheater pushing device is increased of guiding device, making the pusher operation more stable, reducing the pusher failure rate.

the preheater increases the heat exchange area, not only makes the heat utilization more completely, but also ensures the material pre-decomposition rate 30% +, so as to fully guarantee the quality and output of finished products.

Rotary Kilns for lime/dololime/metal MG



SINOMEMA ZHONGKE DINGXIN ENGINEERING

the preheater pusher sealing device adopts special seal form, reducing the air leakage rate

transfer chute adopts the proprietary technology of heat-resisting steel and carbide silicon brick, improving the heat resistance and impact resistance.

the kin head and tail seal adopts the scale type seal, the short section uses the heat-resist8ing steel, not easy to deform, in the kiln head is equipped with the cooling fan which can prevent the seal failure effectively.

rotary kiln adopts special composite brick technology, compared with ordinary brick, good performance of heat preservation, strong heat insulation ability, low temperature of kiln shell, kiln surface temperature can be reduced 80 to 100℃, and not easy to fall off, long service life.

the burning system uses proprietary technology of combustion burner, compared with ordinary burner, good effect of the flame formation, which has a decisive role to the active lime roasting for rotary kiln, and it can slow the ring jam cycle, and improve the operation rate and working time.

Rotary Kilns for lime/dololime/metal MG



回转窑石灰燃烧器 Burner



燃烧状态 Firing Status

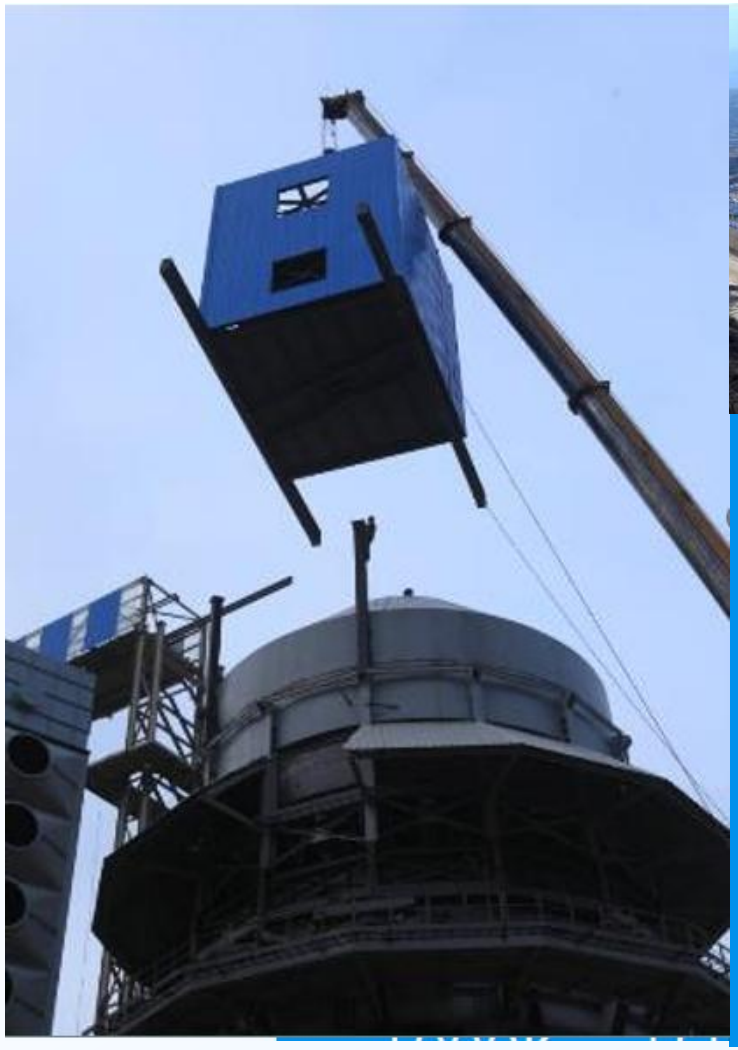
SINOMEMA ZHONGKE DINGXIN ENGINEERING

Burner

Our burner is designed on the basis of different kiln type, coal powder character and technical conditions. Its special structure and reasonable technical parameter could ensure full mixing among fuel, primary air and secondary air. It has advantages of high burning efficiency, strong heating intensity and good flame shape.

- Flame shape is regular, complete, and stable. Sweeping of furnace lining will not appear. Ringing will be avoided, so it can prolong the service life of furnace lining.
- Good mixing of fuel, primary air and secondary air could lead to full burning. It could raise the heating intensity of furnace, and reach the purpose of increasing production and reducing energy consumption.
- Reasonable flame shape can bring uniform burning temperature distribution. So it could protect furnace mouth and cylinder.
- Reducing the content of CO and NOx, ensuring the safety operation of dust removal behind the kiln and environment protection.
- Controlling valve is equipped in each ventilation circuit, and it's flexible in adjusting the air volume and proportion of it in respective circuit, thus to adjust the shape of flame and combustion intensity

Fabrication and installation

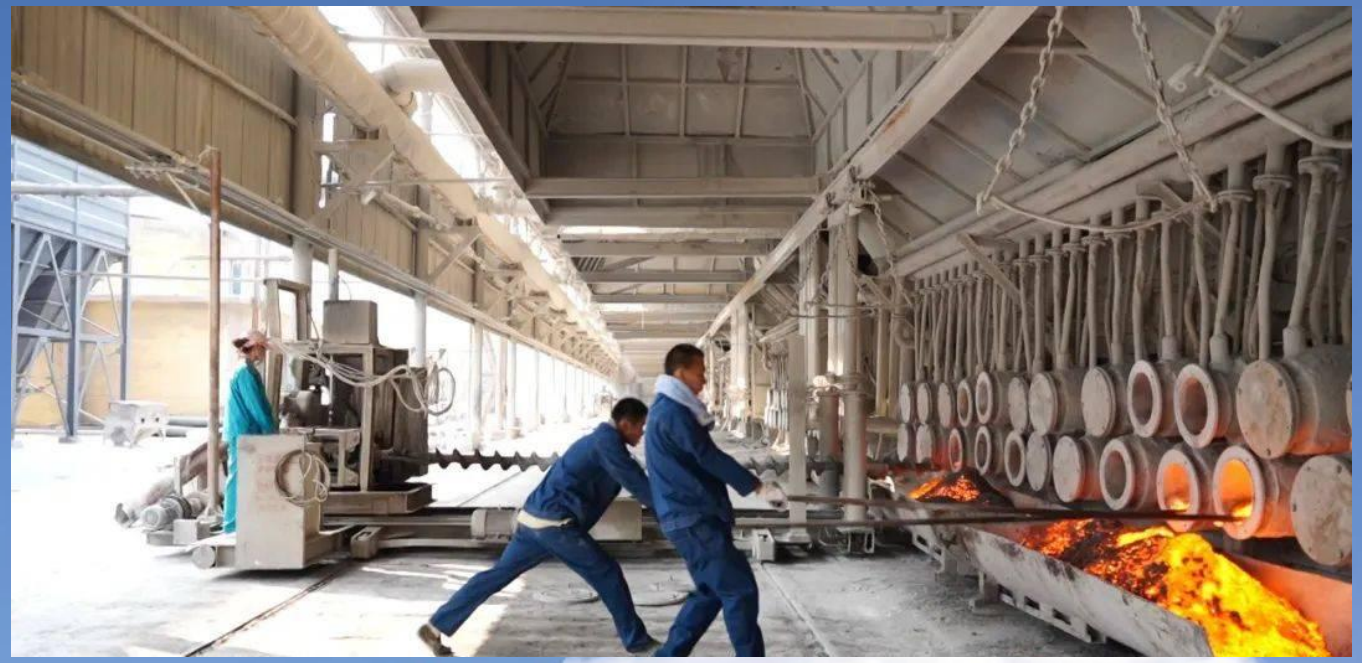








Usage: Al2O3, LOI＜1%, actual productivity≥900T/D , heat consumption 900～1000Kcal/ kg lime, Electric consumption～40kW.h/t lime (containing PCI system)












莫湖云海

