Magnesium Oxide's calcination process

Magnesium metal refining mature method is Pidgeon magnesium, Pidgeon magnesium metal smelting is the most representative, the most widely used silicon thermal reduction process.

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1. The rotary kiln calcines: molecular formula of dolomite is MgCo3CaCO3. Pidgeon magnesium dolomite generally contain MgO19%-21%, CaO30%-33%, (SiO2 + Al2O3 + Fe2O3) <0.5%. Dolomite, magnesite by crushing to 3-5cm, through the feeding device into the rotary kiln preheater, after preheating enter into the rotary kiln. In 1100-1200 °C calcined dolomite, in 1423-1473K temperature calcination 2-3h after decomposing into MgO.CaO. After calcination MgO37%-39%, about 1% loss on ignition, the activity of more than 30%.

2. Batching pressure ball: a calcined dolomite, ferrosilicon powder metering and fluorite powder batching and milling, and then pressing into a ball. Ferrosilicon as a reducing agent, the silicon content as high as possible, typically 75% -78%, fluorite is the reduced utilization rate
increased by 5%, the content is not less than 95%, the roller pressure ball machine under pressure greater than 150MPa into pellets, ellet proportion 1.95-2.05g/cm³.

3. Vacuum reduction: the pellet is heated to 1200 °C ± 10 °C in reducing pot at 13.5Pa or higher vacuum, holding 8-10 hours, Magnesium Oxide reduce to magnesium vapor, condense into a thick magnesium. The crude magnesium is heated and melted at a high temperature of about 700 °C with a solvent refined cast ingot, also known as fine magnesium.

Pidgeon's magnesium reduction scale can be big or small, the cost compared with electrolytic method is low, technology is not difficult to grasp, and the grade quality of magnesium is a little more than electrolytic magnesium.

Produce one ton of magnesium ingots, we need to consume 12-14 tons of dolomite, bituminous coal or anthracite 8-10 tons, reducing slag byproduct 5-6 tons.