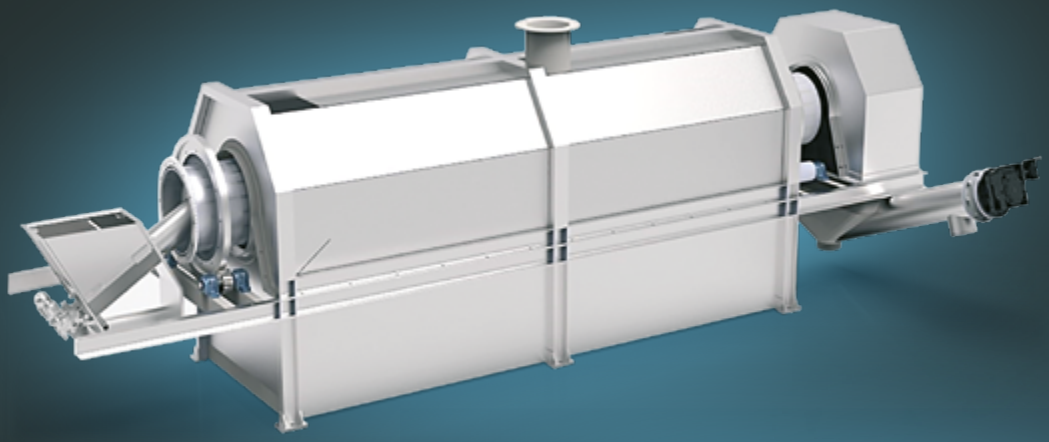
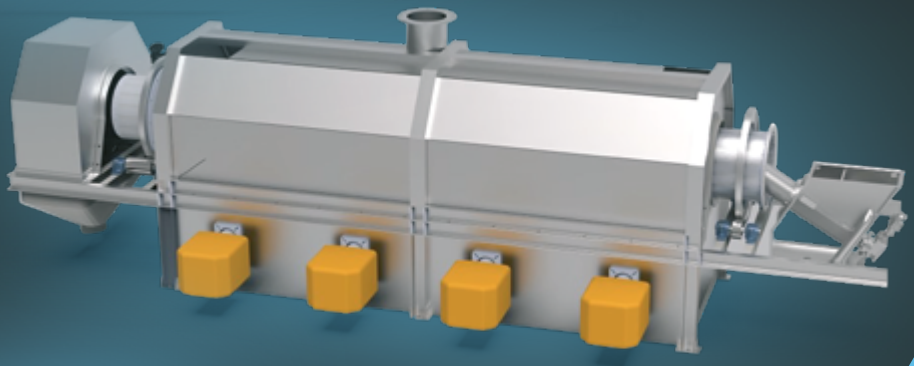
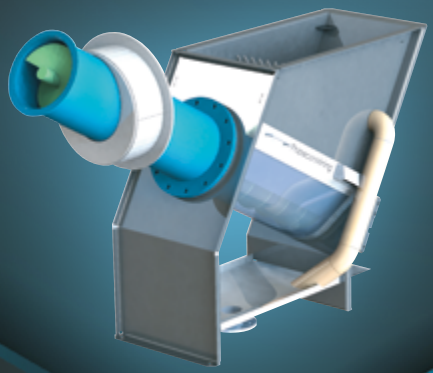
Phasecon Mining

A DIVISION OF PHM GLOBAL

ROTARY CARBON REGENERATION KILN







GLOBAL EXPERTISE LOCAL PASSION

BBBEE LEVEL 2

+27 12 030 0320

sales@phaseconsa.co.za

Unit 2, Icon Industrial Park,
473 Barolong St, Sunderland Ridge,
Centurion, 0157, South Africa

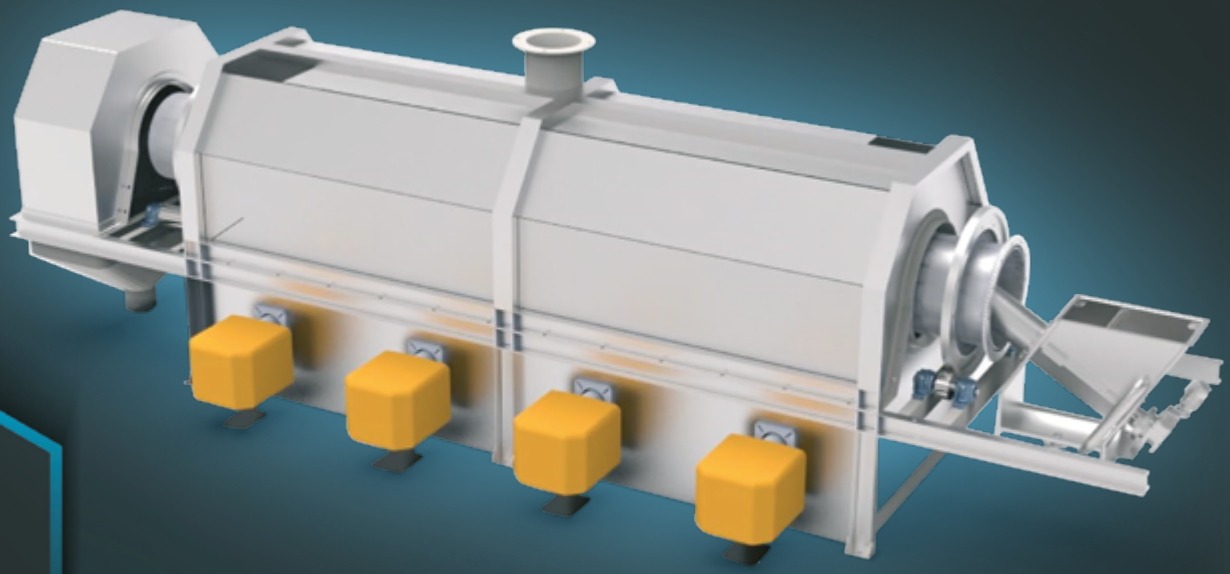
www.phaseconmining.co.za

PHASECON MINING IN THE FIELD OF KILN CONVERSIONS

Phasecon Mining
A DIVISION OF PHM GLOBAL

At Phasecon Mining, we take pride in leveraging 42 years of experience to create custom sound design solutions that incorporate innovative technology.

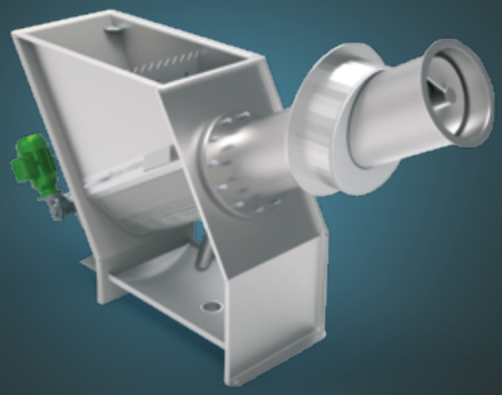
Our rotary carbon regeneration kilns are renowned in the industry, thanks to our unique heating control philosophies, robust and reliable power controllers, deep knowledge of the carbon regeneration process and our design solutions that effectively address factors contributing to poor regeneration.



PHASECON MINING ROTARY CARBON REGENERATION KILN SOLUTION OFFERS:

A Phasecon Mining Rotary Kiln design solution consists of the following:

- Refractory lined heating cabinet
- Modular drive assembly frame
- Indirect heating solution
- Retort Tube
- Refractory insulated modular discharge assembly frame
- Control panel solution



Refractory lined heating cabinet

Phasecon Mining Rotary Kilns cabinet is constructed from mild steel and is refractory lined to ensure heating efficiencies are maintained. The heating cabinet is corrosion protected through heat resistant paint.

Modular drive assembly frame

The Phasecon Mining Rotary Kiln's drive assembly houses the unique dewatering screw feeder hopper, which incorporates a distinct overflow and access water screening design, the AC and backup drive assemblies, as well as the anti-slip support roller assemblies with an alignment-adjustable interface design.

The modular frame is constructed from mild steel and protected against corrosion with heat-resistant paint.

Indirect heating solution

The Phasecon Mining Rotary Kilns are heated indirectly using a variety of heating sources. These include electric options such as SIC, Candle, and Striper, as well as gas or fuel burners.

PHASECON MINING ROTARY CARBON REGENERATION KILN SOLUTION OFFERS:

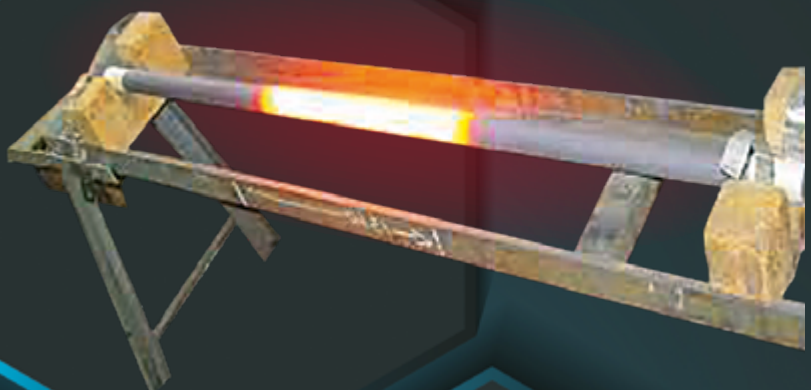
Phasecon Mining has developed an **intelligent element control and monitoring system** that measures the element temperatures directly on certain predetermined elements which enables the system to protect the elements against over temperature conditions as well as to consistently measure the elements change in resistance during operation. The **amount of element life remaining** on the elements is then calculated and the client could choose to receive early notifications or **alerts from the system to schedule future replacements in advance** before the system heating performance comes into question.

SIC Elements as a heat source

- Silicon carbide (SIC) elements are designed to outlast normal strip and coil elements, providing the required power for a 5-year life cycle.

They offer several advantages:

- Higher heat transfer efficiency leads to **power savings of 20-30%.**
- Chemically manufactured to produce a selectable hot zone section on the element, allowing for ideal positioning to ensure **effective and efficient heat transfer** where it is needed in the process.
- Cold-formed element termination connections points ensure **superior heat dissipation** compared to conventional element lead-out cable connections found on strip, coil, and candle elements.
- Accessible through the side of the Kiln, making **maintenance and replacement easier.**



PHASECON MINING ROTARY CARBON REGENERATION KILN SOLUTION OFFERS:

Retort Tube

The retort tube in Phasecon Mining's Rotary Kilns is made of either 321 or 310 Stainless Steel. The drive sprockets and support riding rings are bolted onto the tube assembly.

Retort Tube Manufactured from 310 vs 321 Stainless Steel

Based on our clients' operational experience, retort tubes made from 310 stainless steel have been reported to be a superior material choice compared to the industry norm of 321 stainless steel.

The superior 310 Stainless Steel material offers the following benefits:

- Less deformation compared to 310 s/s material.
- Takes longer to develop creep stress.
- Five times more capacity to withstand rupture due to creep stress.
- 20% higher continuous operating temperature exposure acceptance.
- High Chromium & Nickel content ensures improved resistance to oxidation and corrosion, suitable for applications in reducing Sulphur atmospheres containing H2S.

PHASECON MINING ROTARY CARBON REGENERATION KILN SOLUTION OFFERS:

Refractory Insulated Modular Discharge Assembly Frame

The discharge assembly in Phasecon Mining's Rotary Kilns is modular and includes a stainless steel discharge chute with a replaceable wear plate. It also features a refractory insulated outer casing made from mild steel plate, protected against corrosion with heat-resistant paint, and anti-slip support roller assemblies with an alignment-adjustable interface design.

PHASECON MINING ROTARY CARBON REGENERATION KILN SOLUTION OFFERS:

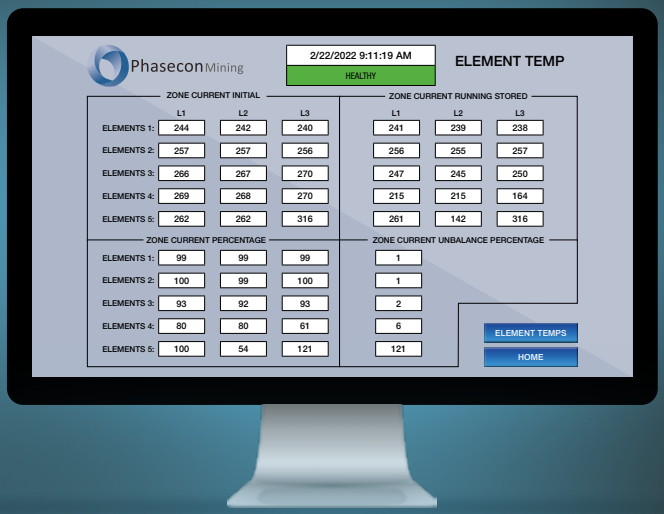
Control Panel Solution

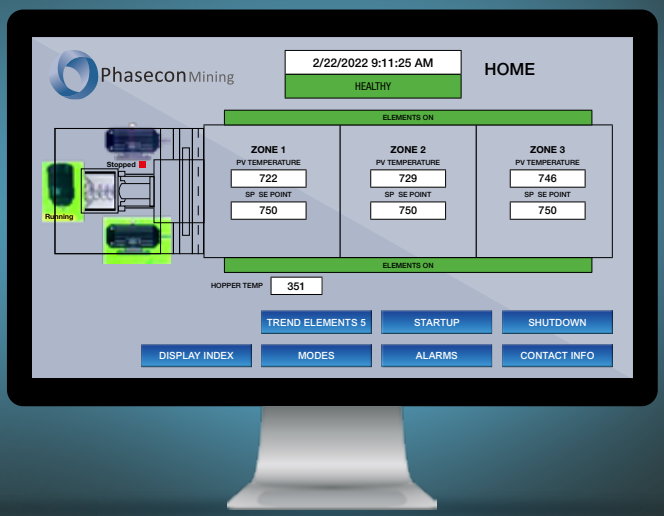
The control panel solution for Phasecon Mining's Rotary Kilns includes:

- PLC & HMI Control system with remote monitoring & control capabilities.
- Battery backup options: Sealed Lead Acid / Lithium Iron Phosphate (LiFePO4) batteries.
- Power controller drives by Phasecon Mining for controlling silicon carbide elements.
- Variable speed drives with motor protection for the screw feeder and main drive.
- Emergency DC drive with hardwire interlocks.
- Latest element protection control technology by Phasecon Mining, featuring continuous individual element zone feedback, monitoring, and PID control for element protection and control limits to prolong element life.
- Control panels come with a 12-month service agreement free of charge, along with a standalone remote monitoring network that connects to licensed mobile phone devices for live remote system monitoring & control.
- Temperature & alarm recording on PLC.

PHASECON MINING ROTARY CARBON REGENERATION KILN SOLUTION OFFERS:

TYPICAL HMI SCREEN LAYOUTS AND ELEMENT MONITORING PAGES





CONTACT US

Phasecon Mining
A DIVISION OF PHM GLOBAL

Unit 2, Icon Industrial Park, 473 Barolong Street,
Sunderland Ridge, Centurion, 0157, South Africa

+27 12 030 0320 sales@phaseconsa.co.za www.phaseconmining.co.za