Phasecon Mining

A DIVISION OF PHM GLOBAL

ROTARY KILN CONVERSIONS AND REFURBISHMENTS

GLOBAL EXPERTISE LOCAL PASSION

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PHASECON MINING IN THE FIELD OF KILN CONVERSIONS

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Knowledge & Experience:
Phasecon Mining has led the way in **Kiln heating system designs, conversions, and refurbishments** for over 42 years. We bring our clients a wealth of experience in installing, supplying, controlling, and monitoring elements across various heating applications.

Our **extensive global experience** includes successful implementations, refurbishments, and conversions of control and heating solutions in the mining industry across several countries, including Brazil, Mexico, Ghana, Guinea, the DRC, and South Africa, among others.

Equipment:
Our **Phase Angle Power Controller** maintains and monitors optimal voltage and current for each element heating bank. Its ability to limit voltage and current creates a safe operational environment for the elements. The controller can be **remotely integrated to ensure seamless functionality** between the power controller and the Kiln's PLC.

Technical Support & Spares Availability:
Phasecon Mining's design solutions are practical, reliable and technically supported by **our dedicated field service & installation teams,** to ensure our clients that we will get the job done on time, to the highest quality and standards the first time.

We take pride in offering a **complimentary yearly heating solution service agreement with all our conversions.** During this time, we monitor and service the heating solution quarterly.

Due to the **extended lead times for elements from overseas,** which can range from 14 to 18 weeks depending on production and shipping logistics, we have agreements with several end-users to **stock a percentage of elements locally** for up to 12 months. This is based on the client's requirements and their installation base.

Advanced Intelligent Control & Monitoring of Elements:
Phasecon Mining's intelligent element control and monitoring system measures temperatures directly on predetermined elements to **protect against over-temperature conditions** and **track resistance changes.** It calculates the remaining element life and can **alert clients** to schedule replacements in advance.

VARIOUS TYPES OF HEATING ELEMENTS

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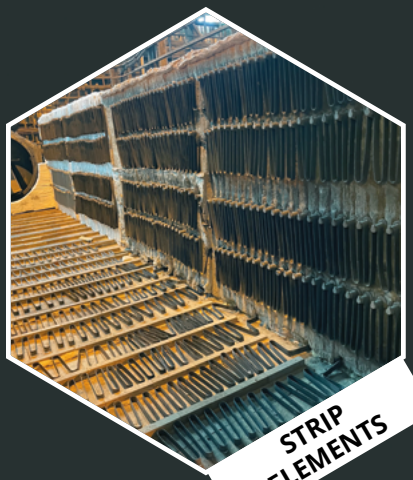
METAL - BASED ELEMENTS



STRIP ELEMENTS

CANDLE ELEMENTS

COIL ELEMENTS

NON - METAL ELEMENTS

SILICON CARBIDE ELEMENTS

WHY SILICON CARBIDE ELEMENTS?

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Operating Cost:

- Silicon carbide elements outlast normal strip and coil elements and are designed to produce the required power for a **5-year resistive life cycle.**
- Silicon carbide elements have a higher heat transfer efficiency, contributing to **power savings of 20-30%.**

Operating Down Time:

The Kiln is more available for production requirements because:

- Elements can be replaced during normal kiln operation (affected zone locked out) without disassembling the Kiln.
- Elements can be replaced during operating conditions (affected zone locked out) using specialised thermal protective PPE.
- Element connections are made on cold-formed sections of the elements. Connections are done through open braided cable, which allows for **superior heat dissipation** compared to conventional insulated cable connections.

VARIOUS TYPES OF HEATING ELEMENTS

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Ease of Maintenance:

- Elements are accessed through the side of the kiln, eliminating the need to remove the roof, even during retort tube maintenance schedules.
- No access within the heating cabinet is required to reach any heating element.

Safety & Risk Reduction::

- The risk associated with rigging and lifting heavy Kiln components is greatly reduced, as there is no need to open the kiln cabinet to access elements.
- The risk of exposure to hazardous refractory material is reduced.
- The risk of electrical shock is minimized, as cable insulation and integrity are maintained without exposure to extreme temperatures associated with element connections.

Optimal Heat Transfer:

- Silicon carbide elements are chemically manufactured to **create a selectable hot zone** section on the element. This ensures that heat is efficiently transferred to where it is needed in the process, contributing to **electrical power savings.**

TYPICAL KILN CONVERSION STEPS

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STEP 1

Strip kiln assembly to gain access to the refractory material.

1

STEP 2

Cut the side walls of the Kiln cabinet & current electrical boxes if applicable.

2

TYPICAL KILN CONVERSION STEPS

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STEP 3

Install element support bricks. Weld mild steel adaptive element fabricated side plates into position.

3

STEP 4

Install element lead-out connections.

4

TYPICAL KILN CONVERSION STEPS

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STEP 5

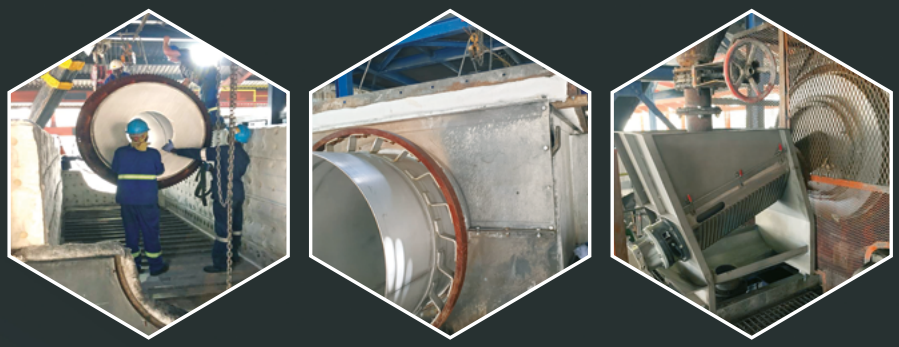
Install the element accessories and make any necessary modifications or patchwork to the refractory lining.

5

STEP 6

Re-assemble the kiln parts.

6



STEP 7

Install the elements & do the element terminations.

7

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