Mind the gap

by InterCem, Germany & Switzerland

Cimenterie de Lukala (CILU), majority owned by HeidelbergCement, recently installed a new kiln inlet sealing system in its cement plant in the DR of Congo. The new system resulted in an improved kiln operation and helped ensure a safer working environment for its employees.

Cimenterie de Lukala (CILU) is a major cement producer in the Democratic Republic of Congo. The integrated cement factory, situated in the town of Lukala, experienced several issues as its kiln inlet sealing system did not meet the demands of an efficient and safe kiln operation. The plant saw its lamellar seal quickly destroyed and the regulation of the horizontal thermal expansion of the kiln compromised.

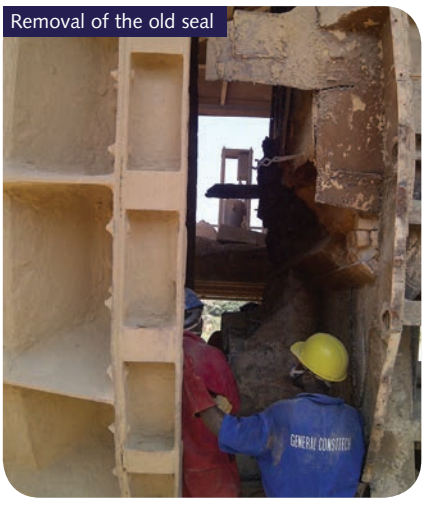
Moreover, false air entered into kiln, which resulted in a temperature drop in the kiln. This led to high energy losses and increased fuel consumption to maintain the clinkering temperature. Variations in temperature prevented the kiln running under optimal conditions.

In addition, the spillage of hot raw meal led to uneven quantities of raw meal, which affected the quality and volume of clinker as well as uncontrollable emissions. The spillage also presented a considerable safety risk for the company's employees.

InterCem cement describes the modification and delivery of a new kiln inlet sealing system for CILU's kiln line at its plant in Democratic Republic of Congo

Working towards a solution

To solve this issue, HeidelbergCement sought to lower and move the inlet troughs to increase the overlap between kiln and inlet and thus reduce the gap. However, it was concerned about the deformation of the kiln lining and exacerbating an already-considerable issue.



Removal of the old seal

Recognising the need for additional expert advice, HeidelbergCement contacted InterCem which had previously carried out the rehabilitation and modernisation of a kiln line for Tanzania Portland Cement, also owned by the HeidelbergCement group.

InterCem not only proposed a completely-new design, a kiln inlet sealing system with a retention ring but also made further recommendations:

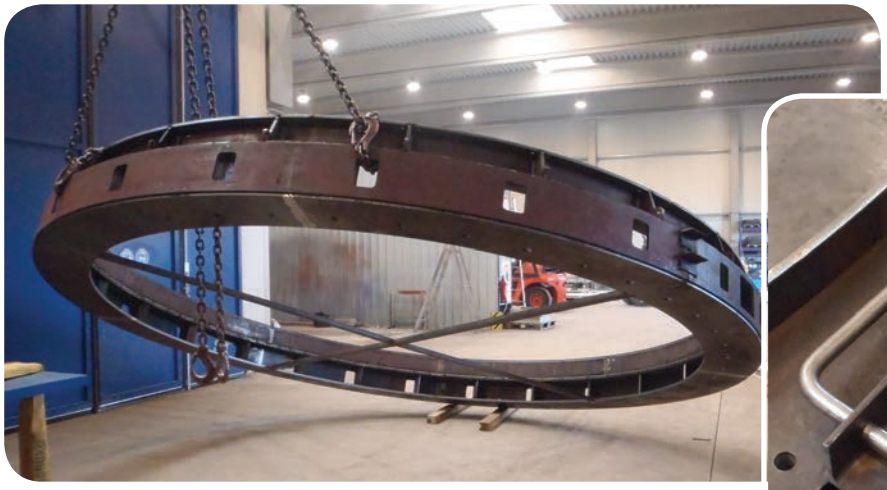
- installation of heat-resistant kiln inlet troughs to protect refractory lining
- installation of shock blowers to improve the raw meal flow and to prevent accumulation and incrustation in the inlet area
- contact pressure by tension springs, which would be low in maintenance, reliable and independent from the air supply.

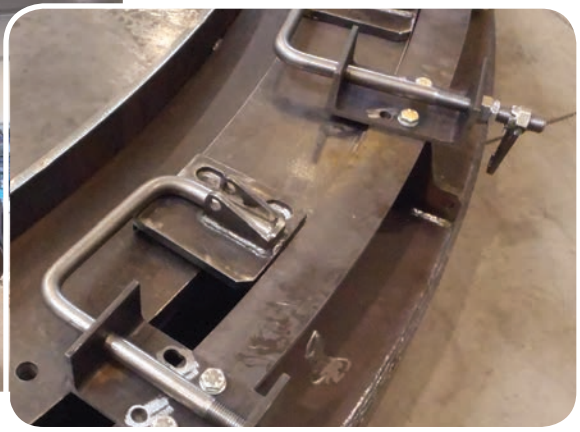
Project execution

To determine the current state of the kiln inlet seal, the kiln was shut down and dimensional measurements were carried out on-site. A 3D scanner performed the following measurements:

- hot-state kiln movement – thermal expansion in axial direction, measurement of grooves, scratches and scrapes in the supporting rollers in axial direction
- cold-state kiln movement – wobbling, axial eccentricity, axial run-out as well as rotation of the end of the kiln with non-constant axis
- wobbling of the kiln end was measured on the slowly-rotating kiln through the measurement of several points in axial and radial direction. Measurement showed that the axial run-out was within the tolerance range. Hence, the kiln shell did not need adjustment.

After InterCem's engineering department carried out its analysis and





The new kiln inlet seal was manufactured at InterCem's German manufacturing facilities

completed arrangement and layout drawings, the company presented and explained its design to CILU and following a discussion, InterCem was given the go-ahead to execute the project.

The new kiln inlet seal was manufactured in Germany to ensure high accuracy. To further guarantee a high precision in roundness of the total unit, the seal was split into segments after manufacturing. The two halves were then containerised and sent to the CILU plant.

Meanwhile, the dismantling of the old kiln inlet sealing system had begun. The old seal was removed and the area was thoroughly cleaned with accumulations and incrustations in the inlet carefully removed.

Thanks to the new kiln inlet sealing system, the CILU works now benefits from an improved and more stable kiln operation with a lower energy consumption.

Installation of inlet troughs

The installation of the new kiln inlet seal was carried out by CILU personnel under InterCem supervision

Subsequently, the customer installed the new system, under supervision of two InterCem engineers. Heat-resistant nozzles for the aeration system were installed and the kiln inlet area received a new refractory lining. Then followed the installation of heat-resistant cast-iron kiln inlet troughs as well as the new kiln inlet sealing and corresponding refractory lining. The new system also saw the placing of new shock blowers. Finally, the project reached its final commissioning stage where fine-tuning of the sealing was performed, again under InterCem supervision.

Conclusion

Thanks to the new kiln inlet sealing system, the CILU works now benefits from an improved and more stable kiln operation with a lower energy consumption. Furthermore, as raw meal is no longer spilt from the kiln, both clinker quality and volume have seen improvement and staff are no longer facing a considerable safety risk in their working environment.