How digital solutions help to find optimum operating conditions for cement plants

Mills are at the starting point of every cement production chain and are subject to immense wear and tear. They break down limestone into finely milled clinker meal – which is the basis for cement production. That is why identifying the optimal operating parameters is so important: It prolongs the lifespan of mills in cement production and reduces unforeseeable downtimes immensely.

quadropol® vertical roller mill setup for increased availability & reduced downtimes

A smart sensor monitors the collective loads that occur during the grinding process and emits appropriate alarms up to the point of shutting down the grinding plant. This so-called MPS (Machine Protection System) prevents damage to the machine. In addition, this MPS is standard equipment for quadropol® vertical roller mills. This system is based on continuous measurements of actual loads during operation and knowledge of the design limits of the mill. Furthermore, additional condition monitoring systems monitor the condition and functioning of other components of the mill, such as the main gear unit, the hydraulic unit, the hydraulic cylinders, the nitrogen accumulators and the oil supply system.

In addition, process parameters and vibrations of the mill are monitored and recorded. This data can be used to program the controllers that keep the mill at an optimum operating point.

Smart data-based systems

Artificial intelligence is to be tested for the first time on a quadropol® vertical roller mill for the production of raw meal at a plant in Allmendingen, Baden-Wuerttemberg, Germany. In this project, the aim is to optimise the operation of the vertical roller mills with the aid of a smart data-based control system. The manipulated variables are adjusted by a controller in such a way that the mill operation approaches an optimum state defined by a target function of guide values for throughput, quality, availability, energy efficiency and smooth running. In this state, the mill can be operated in a stable manner. The controller's AI model dynamically adapts to changing operating conditions through continuous learning to always achieve an optimal operating point.

Improvement is a continuous process

Thanks to our polysius® digital solutions, we are able to collect data on individual plant components and use data analysis to fine-tune the operating conditions to the individual optimum performance conditions of the components.

In this way, digital solutions improve the performance and availability of mills in the cement industry. Plant operators are able to increase the availability of their plant and extend the life cycle of their mills - avoiding production stoppage and saving material, energy and logistics for the premature replacement of a mill.
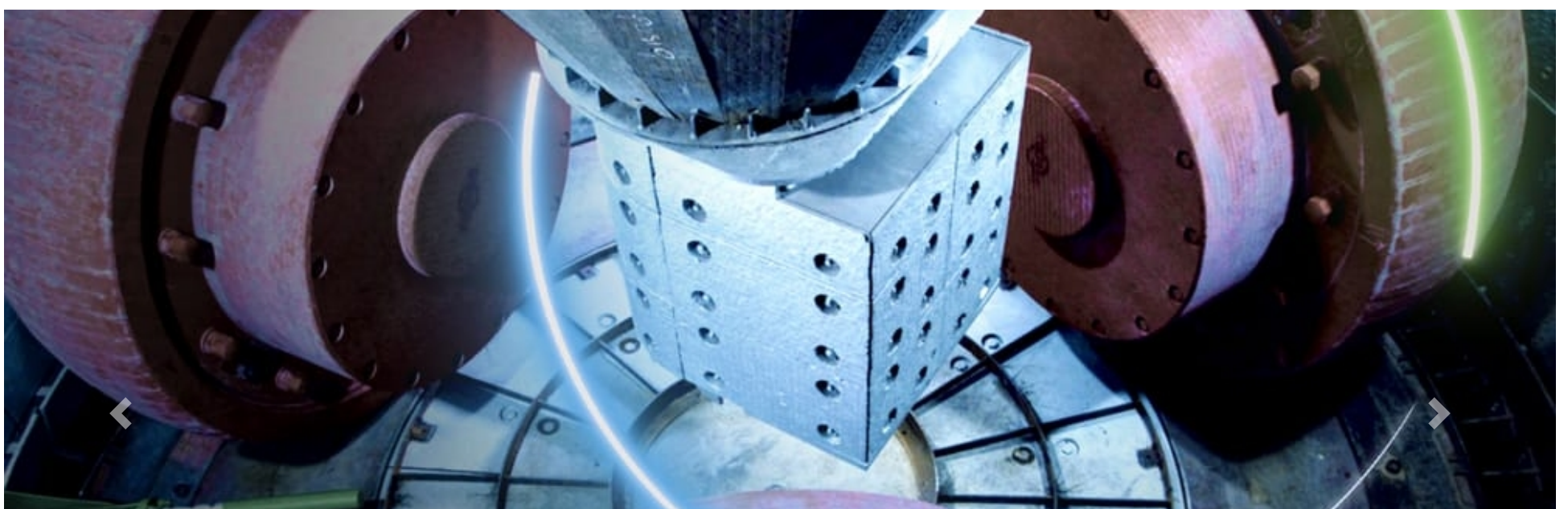
The bottom line: polysius® digital solutions level up performance and sustainability of mills in the cement industry. Plant operators are able to up their plant's availability and prolong their mills lifecycle – avoiding production shutdowns and saving the material, energy and logistics of prematurely replacing a mill. Let's find your plant's optimum performance conditions together. Let's make your plant smarter, safer and more efficient.