TAILOR-MADE SOLUTIONS FOR THE CEMENT INDUSTRY

Pro Global Media's comprehensive Global Cement Directory found 406 cement plants operating in the Americas. Of those, 57% of them source Aerzen blowers, rotary lobe compressors, and screw compressors.

Figure 1. Delta blower, screw, and hybrid compressors. Source: Aerzen

Aerzen is a worldwide, leading application specialist in the fields of pneumatic conveying and gas compression, with an established presence in the cement industry. Their tailored solutions address the current and future needs of the cement industry by guaranteeing increased safety and reliability of primary and secondary processes, addressing the needs of new plants and plant expansions alike.

Cement applications

Aerzen is an applications specialist providing the cement industry with proprietary solutions that address the unique needs of each use case. From pneumatic transport of raw material to silo storage and packaging of cement bags, barges, trains, and trucks, they provide technical analysis of existing and proposed infrastructure and devise solutions that increase equipment reliability and enhance operational safety.

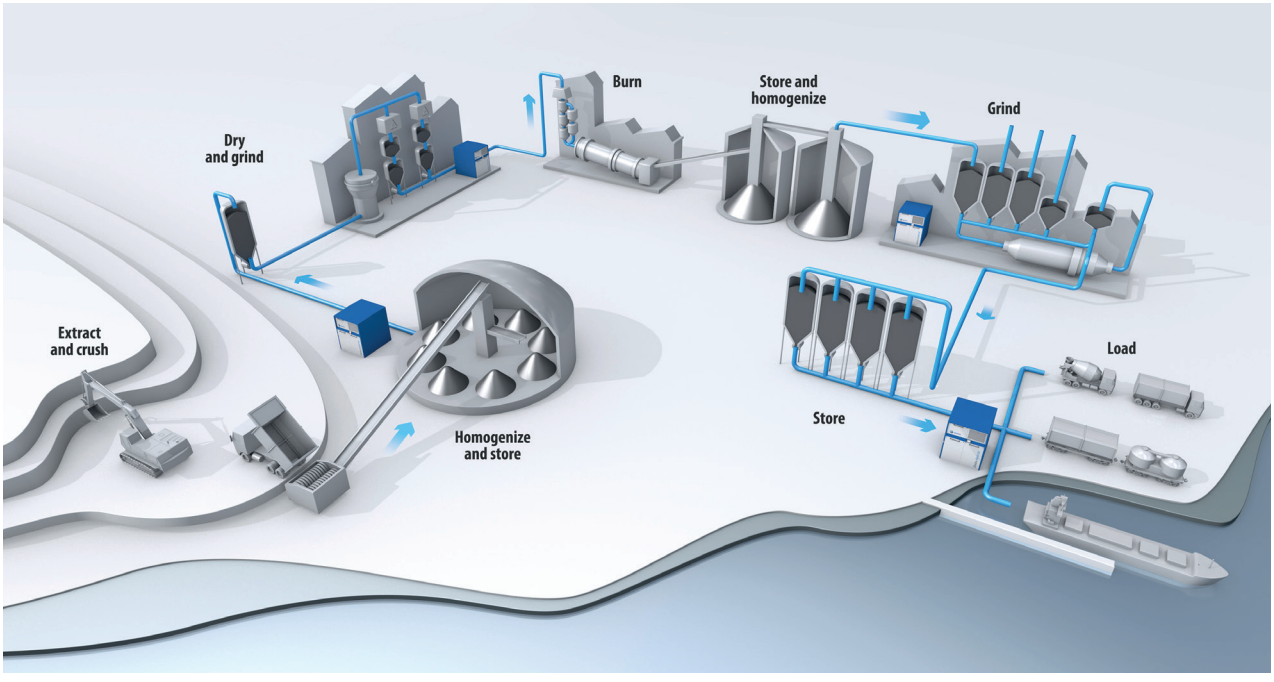

Figure 2. Illustration depicting critical and non-critical applications for Aerzen cement solutions in dry-process cement production. Source: Aerzen

Primary applications
Cement production plants run 24/7, and any disruption to critical infrastructure can equate to production losses as great as $1 million per day, depending on the cement plant production capacity. Aerzen's tailored solutions address reliability and safety concerns to keep plants operating at peak efficiency levels.

Pneumatic conveyance of raw material to preheater
A preheater serves several functions in a cement plant, as it separates and suspends raw material, removes moisture, decomposes raw material and drives an endothermic reaction to form an intermediate. It is critical that a constant feed of raw material is fed to the preheater so that the kiln has material to burn. Aerzen Delta hybrid units incorporate IE3 premium efficiency motors and advanced air filter technologies to address drive load requirements and increase operational efficiency while operating in a highly contaminated environment.

Pneumatic conveyance of solid fuel to the kiln
Kilns require a constant supply of solid fuel, such as coal or waste fuels like petroleum coke. Aerzen Delta Blower and Delta Hybrid ATEX-compliant solutions are suitable for handling these solid fuels. They safely convey the needed capacity to keep kiln-burners operational, which reach temperatures up to 1450° C. They also address safety concerns with the anticipated increased use of biofuels, which are known to be highly volatile, as Aerzen's ATEX-compliant solutions are built to address process safety and reliability requirements.

Oxygen supply to the burner
Oxygen supply to the burner is also critical as the fuel will extinguish without it. Aerzen offers Delta Blowers and Delta Hybrids with variable frequency drives for optimal flow control and reliable flame size.

Pneumatic conveyance of finished cement powder
Cement plants run continuously and to maintain operations, finished cement powder must be transported to a storage silo, as over-accumulation or backlogs can lead to a plant shutdown. Aerzen Delta blower, hybrid or screw compressors can be configured to handle elongated pipe distances and a wide range of pipe diameters to guarantee constant flow and mitigate pipe clogging.

Figure 3. Pneumatic conveyance of finished cement powder to storage silos. Source: Aerzen

Secondary applications
Processes where improved designs increase operational efficiency and improve product quality include:
- Pneumatic conveyance of raw material from crushing grinding mill to silos.
- Homogenizing silos of raw material and blending of corrective materials.
- Fluidizing finished cement silos.

Advanced features and safety measures
Aerzen's compressors and blowers address key performance indicators in the cement industry by extending mean time between repairs (MTBR), improving overall equipment efficiency (OEE) and enhancing operational safety through a collection of built-in advanced features and safety measures.

Air filter solutions
Aerzen's air filter solution system addresses reliability and safety concerns when operating in highly contaminated environments. Designed to meet airflow and cooling requirements, their air filter solutions prevent dust build-up, support continuous operation, improve OEE, and extend MTBR.

Discharge pressure and temperature sensors
A collection of condition monitoring sensors prolong the life and prevent critical failure of Aerzen's blowers, rotary lobe compressors, and screw compressors. A discharge pressure sensor ensures differential pressure is maintained within operational ranges and disrupts power to the electric motor when abnormalities are detected. Likewise, temperature sensors monitor discharge temperature to prevent thermal overload conditions that can lead to critical failure.

Aertronic monitoring system
Aertronic, Aerzen's advanced unit control system, provides real-time operation information and data transfer capabilities. As an extension of the industrial internet of things, it supports a number of different protocols including Profibus DP, Modbus TRU, Modbus Gateway, and Profinet, providing remote monitoring, reporting and control capabilities to help ensure operating parameters are maintained within limit values for safe and continuous operation.

Use-case: Coal-feeding pneumatic conveying system
In the cement industry, each use-case presents unique challenges and product requirements. In the case of Holcim's plant in Noba, Colombia, the coal-feeding pneumatic conveying system in place suffered from high energy usage, unstable airflow patterns and exceeded local noise requirements. Aerzen application specialists identified a technology upgrade. They created a solution inclusive of model D62S Delta Hybrid Blowers, replacing existing 75 kW motors with IE3 premium efficiency 55 kW motors. They remediated operational deficiencies, and through a total cost of ownership, project evaluation found the following results.

- 40% operational cost reduction
- 40,000 hours MTBR – double the previous interval
- 72 dB noise reduction

Conclusion
Aerzen has a rich history of devising solutions that address key performance indicators. Their solutions have proven to extend MTBR, improve OEE, enhance operational safety, and increase product quality through support of both primary and secondary cement production processes. Their comprehensive product portfolio is built to support next-generation infrastructure requirements. To learn more about possible performance upgrades or to get in touch with a specialist who can facilitate a technical analysis of a proposed or existing cement plant, contact Aerzen's application sales team.

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