Application note
AC drives ensure efficient and precise cooling of clinker and reduce energy consumption

Application description
For clinker quality, cooling plays a very important role. Hot clinker supplied by the kiln enters the clinker cooler. The clinker travels on the clinker cooler bed where it is cooled by several clinker cooling fans. The cooling air is blown through the cooler bed. Exhaust air is extracted by an exhaust air fan.

The most common way to control the cooling fans’ and the exhaust fan’s speed, and hence ensure efficient and precise cooling, is to use AC drives.

AC drives for accurate control of cooling air
The cooler requires a continuously changing air flow in order to provide proper cooling of the clinker. By using AC drives, the amount of cooling air can be exactly controlled. This means that electrical energy is not wasted, as opposed to damper control of the cooler fans.

When the air pressure at the kiln outlet is to be kept within tight tolerances, without compromising efficient cooling, the exhaust air fan and the clinker cooler fans need to be operated in close cooperation. The use of AC drives to control the speed of both clinker cooler and exhaust air fans guarantees a fast and precise regulation of cooling air and an easy connection to the cement plant’s automation system.
AC drives also enable soft start of the fans, which minimizes mechanical stress of the fans, pipes and other mechanical equipment. Through soft start, the supply network can be dimensioned with a low starting current, thus reducing the low voltage switchgear, transformer and cabling costs.

The dynamic direct torque control (DTC) of ABB AC drives eliminates mechanical resonances of the fan installations. Critical frequencies can also be skipped to further avoid resonance.

**Benefits**

AC drives provide many benefits such as:

- Substantial energy savings through optimal control of cooling air
- Enables removal of mechanical control devices, e.g. damper control (plates) of fans - which require regular maintenance due to harsh environment
- Soft start of fan motors
- Flying start of fan motors without high starting torques or high starting current peaks thanks to DTC
- Power loss ride-through, i.e. in case of power failure in the supply network, the AC drive can utilize the energy from the fan’s rotating inertia in order to keep the control electronics operational during the power failure
- Jump-over of critical frequencies
- High power factor
- Easy connection to the cement plant’s automation system via various fieldbus adapters

For more information please contact:

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