

Case story | VLT® AutomationDrive FC 302

# Back-channel cooling, a **simple** and **efficient** solution for the Sagrex Lemay quarry, Belgium (HeidelbergCement Group)

**90%**

of heat load is removed, preventing thermal overload of equipment



# Limestone crusher **no longer vulnerable** to **unplanned shutdowns**

Limestone crushing represents a large proportion of the electrical energy consumed by the Sagrex Lemay quarry in Antoing, Belgium. It is therefore particularly interesting to look for possible savings. Traditional starter solutions (DOL, star-delta, soft starters) generate high current peaks and thermal overloads (motor and transformer) that limit the number of start-ups per hour and the adaptability to production needs, not to mention quarter-hour peak problems. These traditional solutions do not limit the damage caused by untimely blockages. Production shutdowns are long and costly. When the machine suddenly stops, the engine experien-

ces a surge of current and generates a torque peak, which aggravates the damage.

## The grinder retrofit challenge

After 35 years of service the grinder needed to be replaced. Mr. Henneuse from Sagrex wished to improve the machine performance by removing the belt drive and eliminating the two major drawbacks: starting current peaks and untimely shutdowns caused by the accidental introduction of uncrushable parts.

## Danfoss solution delivers **98% efficiency with no thermal overload**

Mr. Henneuse chose the solution offered by Mr. De Smet from Danfoss because it fully satisfied his requirements:

**98%**

efficiency in the retrofit solution

Unloading quarried limestone into the crusher.





a high efficiency of 98% and good protection of the crusher. In addition, there is no risk of thermal overload of the technical room, and no need for a condensing unit.

The VLT® AutomationDrive FC 302 is a vector frequency converter that limits the starting current to a minimum while continuously monitoring the motor torque. The high-speed control card combined with the speed measurement of an encoder placed on the motor makes it possible to immediately stop the machine as soon as the reference torque threshold is exceeded.



*90% of the heat generated by the AC drive bypasses the technical room.*

*Direct coupling eccentric crusher driven by a 400-kW motor.*







Quarried limestone is transported to the crusher.

When the torque is controlled, the risk of damage to the machine is under control too.

The cos phi at the input of the drive is always close to 1. There are no more quarter-hour current spikes.

The motor and the power transformer are no longer subject to thermal overload. The machine can start up as often as desired without disturbing other connections to the same transformer.

To maintain an acceptable temperature in the technical room without the use of a chiller, the AC drive manages the cooling air intake directly from the outdoor environment and rejects the hot air in the same way. This is the back-channel cooling solution, enabling 90% of the heat produced to bypass the technical room. The room is protected from dust without the need for a condensing unit.



**Sagrex Lemay – Belgique**  
(HeidelbergCement Group)

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