

Dedusting rotary kiln: ProJet mega® bag filter offline cleaning

The scope of the turn-key project for de-dusting the rotary kiln line 8 of the Slite plant included a bag filter of the type ProJet mega®, the process fan, the ducting, the dust discharge and also the transportation, assembly and commissioning.

With residual dust contents of originally 50 mg/m³ and despite extensive upgrading work still at 30 mg/m³, the electrostatic precipitator, which dated back to 1979, was unable to keep to the required emission limits under all conditions. As such, the operators decided to use modern bag filter technology from

Intensiv-Filter that keeps within the legally prescribed residual dust content limits without any problems.

Thanks to its reduced dust emissions, the new bag filter of the generation ProJet mega® used at Cementa AG directly contributes to the protection of the environment. Due to its high energy efficiency, the filter also contributes indirectly to the reduction in CO₂ emissions. In comparison to conventional filtering installations, the ProJet mega® in offline mode saves up to 30% more energy.



Reference plant



DUST REMOVAL TECHNOLOGY + FILTRATION

Process data	Dedusting of rotary kiln/ raw mill at Slite plant, HeidelbergCement
Commissioning	11/2009
Gas volume	< 1,223,500 m ³ /h
Reverse gas quantity	26,000 m ³ /h a.c.
Temperature	max. 220 °C
Intensiv-Filter type	IFJCN 136/36-8000 D Eco
Filter area	20,289 m ²
Filter medium	Glass bags with PTFE dia- phragm
Raw gas dust content	Max. 900 g/m ³ under normal conditions
Residual dust content	< 10 mg/m ³ n.c.
Pressure loss	15 mbar
Cleaning pressure	0.3 – 0.6 MPa
Compressed air consumption	< 310 m ³ /h n.c.
Cleaning mode	offline

Basic data

Project	ProJet mega® with offline cleaning
Contractor	Cementa AB
Location	Slite, Schweden
Construction time	6 months
Task	Reduction of dust emissions for rotary kiln in line 8

Structural design

The filtering installation was made even more compact by arranging the 36 chambers into two parallel rows of a double row filter. The filter rows are connected via a combi-duct (raw and clean gas duct).

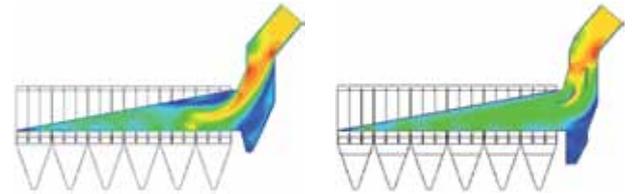
The modern profibus control system used for cleaning the filter allows both online and offline operation. By switching off sections of filter units, the control system allows maintenance of the installation during operation.

The system allows cleaning dependent on differential pressure, i.e. the compressed air pulses used to clean the bags are regulated according to need, thus saving compressed air.

The intelligent energy-saving control concept is also evident in the chain conveyors, which are controlled by a frequency inverter. The delivery rate is adapted to suit actual requirements.

Filtering dusts is the task Intensiv-Filter has been addressing itself to since its foundation in 1922. As a specialist in filtering installations we have a leading position in the international markets. This applies both to new installations and to conversions in various business areas.

Optimisation of the flow into the raw gas chamber and the pre-separator using CFD simulation



Based on the simulation results, suitable deflector profiles and arrangements for the area around the filter inlet were identified and evaluated using CFD in order to calculate the flow distribution in the filter. The variants which were eventually used clearly demonstrated the effect that flow op-

timisation can have. The deflectors were positioned optimally, thus eliminating the recirculation zone and achieving a homogeneous flow throughout the filter chambers. Measurements taken from practical application examples confirm the low differential pressure of the CFD model.



900 t of material were shipped across the Baltic Sea to Gotland. The retrofit and assembly work took place from May to October 2009. With dimensions of 33 m length, 15 m width and 22 m height, extensive construction work was re-



quired in advance. A total of approx. 200 t of steelwork was assembled for the supporting structure, maintenance platform and railings, and approx. 180 t of ducting with diameters of 3.00 m and 4.50 m was installed.

Customer benefits

- ✓ Compatible with alternative fuels
- ✓ Reduces dust and CO₂ emissions
- ✓ Increased extraction power
- ✓ Improved dust separator performance, as secondary air is fed through during the cleaning phase
- ✓ Low operating costs due to low pressure loss in the filter when cleaning in offline mode



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