

● Case Study 1

Castle Cement

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Fact file

Date: January 9th 2003
Location: Castle Cement, Ketton Site (UK)
Product: PAS 350 Audiosonic™ Acoustic Cleaner
Principal: Primasonics® International Ltd (UK)
Problem: solution required for the cleaning of the ID fan used with their cement kiln 7.

Client Background

The FLS Type HAF 290 fan that was in use was heavily loaded with dust which was not separated in the cyclones. Due to the deposition, the vibration level of the fan used to increase rapidly, automatic shutdowns due to excess vibration detected by a sensor mounted on the ID fan shaft occurred around every 3-4 weeks. Each unplanned shutdown cost the department £30,000 per day in variable costs alone. The total procedure of cleaning the fan used to take about 1 to 2 days - completely stopping the production.

THE APPROACH

Donald Cameron visited the plant to inspect the fan during a shutdown period to study the problem in detail and note the process parameters. The separator fan has backward rotor with 2 inlets and 1 outlet. The process parameters are as follows:

Temperature of material: 400° C
Temperature of air: 400° C
Moisture content of material: 5%
Moisture content of air: 5%
Fan RPM: 929
Fan Diameter 2.900 m

Inlet Conditions:
Temperature 400° C
Density: .540(kgm9³)
Pressure: 96078Pa

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System Conditions:

System flow volume 76.30 (M3s⁻¹)

System Pressure Drop 5253 Pa

Engineering drawings of the fan and details of the material on the impeller were sent to PRIMASONICS® for their recommendation, based on which PRIMASONICS® selected the most appropriate model from their extensive range of Primasonics® Cleaners. A trial request form was then filled in by Castle Cement staff and returned to Primasonics®.



THE SOLUTION

PRIMASONICS® supplied the AudioSonic™ Acoustic System directly to Castle Cement, Ketton plant, along with the accessories required i.e. mounting tube and flange, solenoid valve, flexible air line pipes. The mounting tube arrangement was welded onto the fan casing and the Primasonics® system was installed according to the instructions supplied.

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The following compressed air conditions were maintained for sounding the Acoustic System:

- 1) Flow rate: 40-80 scfm**
- 2) Pressure: 4.8 - 6.2 bar**

The fan was not cleaned before sounding the Acoustic System. The trial was started with sounding pattern as a variable and after continuously monitoring the vibration level, the most effective sounding pattern was established.

The trial commenced on 23 November 2001 at 13:30. The trial was extended by a rental period and conducted for three months to observe the trend in vibration levels.

THE RESULT

Following the installation of the Primasonics® System there have been no shutdowns due to vibration. The fan gets manually cleaned once every 6 months as part of a planned shutdown. The trial was declared successful and the Castle Cement, Ketton site now significantly benefits from increased efficiency after reducing unplanned shutdowns in the clinker section.