



## **SIAM WHITE CEMENT COMPANY LIMITED**

### **Reduction of Pressure Drop across the Cyclone System**

#### **SUMMARY OF THE OPTION**

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Siam White Cement Co., Ltd (SWCC) is located the Saraburi, Thailand, and is the largest white cement producer in Thailand with a production capacity of 160,000 tons of white cement.

A cyclone system uses fans to convey materials, exchange heat, and separate particles from the air. The Team found that the pressure drop across the company's 4-stage cyclone system was almost double the figure recommended for a five-stage cyclone system (which is generally used as the benchmark for the cement industry).

The following general rules apply to fans:

- pressure drop (i.e. pressure loss) across the system varies directly with square of speed, i.e. (rpm)<sup>2</sup>
- input power varies (i.e. either increase or decrease) directly with cube of speed, i.e. (rpm)<sup>3</sup>
- kW (power) = constant X flow X pressure

Excess pressure drop in the cyclone system therefore causes more power consumption by fans/blowers. Cyclones currently used at SWCC are conventional types that have inlet air ducts attached vertically to the cyclones. Such a design can cause back pressure due to the collision of the air flow with the opposite wall.

UNEP's expert recommended replacing the existing cyclones with a tilt air duct cyclone. This would reduce the angle between the air flow and the wall, and thus reducing back pressure. At the same time, the angle (tilt) of the duct should be optimized to keep the gas/air velocity between 18-20 m/s, otherwise material can be lost from the cyclone system.

A tilt air duct cyclone would reduce the pressure drop across the cyclone system and therefore:

- Increase the feed rate that would reduce the specific electrical and thermal energy consumption
- Reduce power consumption of the pre-heater fan

The company already had plans to modify the existing cyclone system (e.g. replacing vertical ducts with tilt air ducts) or replacing the existing four-stage with a five-stage cyclone system. The company has now included the installation of a tilted air duct cyclone into the plan. At time of writing of this case study, the design study and feasibility analysis of the installation of a five-stage cyclone system was still in progress, and therefore financial and environmental costs and benefits could not be determined.

#### **KEY WORDS**

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Cement, Thailand, Fans and Blowers



## FOR MORE INFORMATION

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