



COROMANDEL CEMENTS LIMITED

Reduction of Velocity in Coal Mill Outlet Duct

SUMMARY OF THE OPTION

Coromandel Cements Ltd., is a small OPC cement (Ordinary Portland Cement) manufacturing plant in South India, presently producing around 460 Tons per day of OPC.

In this option implemented by the plant, the coal is milled to a fine powder (200 mesh) and is conveyed to the storage hopper pneumatically by air from the circulating air fan. Towards this the fan consumes power which is dependant on quantity of coal to be conveyed and the pressure drops it has to overcome in the process of conveying from mill outlet to the hopper. It is known that higher velocities (acceptable up to 18 m/s to 20 m/s) and smaller duct cross sectional areas result in high-pressure developed by the fan and thereby higher power consumption.

The existing fan speed was reduced from 875 to 750 resulting in drop in conveying air velocity in the outlet duct from 24 to 20 m/s. This manifested as reduction in power consumption in the CA fan to the tune of 8 kW (28 kW to 20 kW). Speed reduction was affected by replacing the existing AC drive with a DC drive available in the stores.

KEY WORDS

India, Cement, Fans and blowers, Coal mill, Fan speed reduction

OBSERVATIONS

Prior to modification the CA fan was supplying 'conveying air' at an air velocity in the mill outlet duct of 24 m/s. The drive motor was an AC induction squirrel cage motor operating at a speed of 1440 rpm and delivered at a speed of 875 rpm at the fan shaft through a pulley arrangement. The power being consumed by the motor was 28 kW.

Before Modification

Velocity of conveying air in discharge duct of mill (875 rpm) = 24 m/s
Corresponding power consumption by the fan drive = 28 kW

After Modification

Velocity of conveying air in discharge duct of mill (750 rpm) = 20 m/s
Corresponding power consumption by the fan drive = 20 kW

RESULTS

Financial benefits

- Investment: none
- Annual cost savings: US\$ 2,761 or Rs.118,720 (= 32000 kWh X Rs.3.71/kWh) (@ Rs.43/US\$)
- Payback period: immediate



Environmental benefits

- Reduction in power consumption: 8 kW
- Annual energy savings (@4000 mill rmg.hrs/yr): 32000 kWh (= 8 kW X 4000 hrs/yr)
- Annual GHG reduction: 29 tons of CO₂ (= 32000 kWh X 0.000893 tons of CO₂/kWh)

FOR MORE INFORMATION

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