



OPTIONS FOR SAVING ELECTRICITY

Intervening Technique	Installation of Variable Frequency Drive (VFD) In Furnace Blower Motor in Container Glass Manufacturing Industry
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Before CP

Plant is operating 6 nos. Of furnace with common connection to 30 HP to 60 Hp motor. The motor load test conducted while operating all 4 nos. blower simultaneously is shown in table below:

Table: Electrical Parameters Measured at Ball Mill Motor (4 nos. Motor)

Parameter	75 TPD Furnace		55 TPD Furnace	100 TPD Furnace
	BT-11 Throat Cooling Blower (30 HP)	BD-12 Distributi on Blower (30 Hp)	BB-3 Block Cooling Blower (50 HP)	BB-663 Block Cooling Blower (60 HP)
Voltage (V)	412	418	420	420
Ampere (A)	16	5.66	26.7	34.1
Power (kW)	3.46	1.15	7.98	11.0
Power Factor (Cos Ø)	0.30	0.28	0.51	0.44

	<p>The load survey conducted on the blower shows that the maximum loading on blower motor are between 15 to 50 %.</p> <p>The load variation recorded during normal operation of blower motor is</p> <ul style="list-style-type: none"> • kW for BT-11 Throat Cooling Blower, while the rated capacity of motor is 22.2 kW • 1.15 kW for BD-12 Distribution Blower, while the rated capacity of motor is 22.2 kW • 7.98 kW for BB-3 Block Cooling Blower, while the rated capacity of motor is 37 kW • 11.0 kW for BB-663 Block Cooling Blower, while the rated capacity of motor is 44.4 kW. <p>The load survey during all blower operation is shown in table above:</p> <ul style="list-style-type: none"> • It could be observed that all the motors are running below 50% of the rated load; however, this does not consume less electricity than required at full load, on the contrary, the motor efficiency decreases dramatically. • Cooling blowers are critical equipments for glass industries and they keep on running for 24 hours all the day, hence there is a huge scope of saving the electricity.
After CP	<ul style="list-style-type: none"> • The speed of the motor can be reduced by installing variable frequency drive on Blower motor and operating

	<p>speed can be programmed accordingly.</p> <ul style="list-style-type: none"> • This will result in reduction in electricity consumption to the tune of 15% saving in electricity consumption in blowers. This concept is applicable to all the motors in the plant above 5 HP. • Approximate total one time investment will be Rs.2, 45,000 for all four VFD.
Benefit	
Economical	<p>Investment: Rs. 2,45,000/- for 4 nos. of VFD</p> <p>Annual Savings: Rs. 2,80,000/- per annum</p> <p>Payback Period: 10 months</p>