

Intervening Technique	Installation of VFD on Throat Cooling Blower Motor in figure glass industry																												
Before CP	<p>Most electric motors are designed to run at 50% to 100% of rated load. Maximum efficiency is usually near 75% of rated load. Thus, a 10-horsepower (hp) motor has an acceptable load range of 5 to 10 hp; peak efficiency is at 7.5 hp. A motor's efficiency tends to decrease dramatically below about 50% load. However, the range of good efficiency varies with individual motors and tends to extend over a broader range for larger motors.</p> <p>A motor is considered under loaded when it is in the range where efficiency drops significantly with decreasing load. Figure shows that power factor tends to drop off sooner, but less steeply than efficiency, as load decreases.</p> <p>Electrical load survey was conducted on major motors in the plant, the parameters measured are shown in following table:</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr style="background-color: #92D050;"> <th>Motor Name</th> <th>Voltage (V)</th> <th>Current (A)</th> <th>Power Factor</th> <th>Power (kW)</th> <th>Rated Power (kW)</th> <th>Loading (%)</th> </tr> </thead> <tbody> <tr> <td colspan="7" style="text-align: center; padding: 5px;">Unit No. 2 (75 TPD Furnace Area)</td> </tr> <tr> <td style="text-align: left; padding: 5px;">Throat Cooling Blower</td> <td style="padding: 5px;">412</td> <td style="padding: 5px;">8.57</td> <td style="padding: 5px;">0.64</td> <td style="padding: 5px;">3.94</td> <td style="padding: 5px;">9.32</td> <td style="padding: 5px;">42</td> </tr> <tr> <td colspan="7" style="text-align: center; padding: 5px;">Unit No. 1 (84 TPD Furnace)</td> </tr> </tbody> </table>	Motor Name	Voltage (V)	Current (A)	Power Factor	Power (kW)	Rated Power (kW)	Loading (%)	Unit No. 2 (75 TPD Furnace Area)							Throat Cooling Blower	412	8.57	0.64	3.94	9.32	42	Unit No. 1 (84 TPD Furnace)						
Motor Name	Voltage (V)	Current (A)	Power Factor	Power (kW)	Rated Power (kW)	Loading (%)																							
Unit No. 2 (75 TPD Furnace Area)																													
Throat Cooling Blower	412	8.57	0.64	3.94	9.32	42																							
Unit No. 1 (84 TPD Furnace)																													

	Throat						
	Cooling Blower	416	6.32	0.78	3.55	9.32	38
<p>Loading on both the motors is less than 50 %, thus they are running at lower efficiency of around 75 %,</p> <p>Recommendation:</p> <p>It is recommended to replace these motors with appropriate size on next failure, the motor need to be selected so that the loading on motor is more than 80 % to have more than 90 % efficiency.</p> <p>Replacement of these motors with energy efficient motors will save approximately 9450 kWh per annum.</p>							
Benefits							
Environmental	<ul style="list-style-type: none"> • Per Day reduction in the Electricity consumption: 26.25 KWh • Per Year reduction in Electricity consumption: 9450 KWh • Per Day reduction in Greenhouse Gas (CO₂) emission: 0.02 MT of CO₂ • Per Year Reduction in Greenhouse Gas (CO₂) emission: 8.13 MT of CO₂ 						
Economical	<p>Investment: Rs. 50,000/- (for 2 nos. of Furnace)</p> <p>Annual Savings: Rs. 71,253/- per annum</p> <p>Payback Period: 9 months</p>						