

Before CP

Plant is operating 5 nos. ball mills, with common connection to single 30 HP motor. The motor load test conducted while operating all 5 nos. ball mill simultaneously is shown in table below:

Table: Electrical Parameters Measured at Ball Mill Motor (5 Ball Mills to single motor)

Parameter	O/P from the panel (to ball mill)			I/P to the panel	
	Reading 1	Reading 2	Reading 3	Reading 1	Reading 2
Voltage (V)	408	409	410	409	408
Ampere (A)	22.5	20.0	21.1	15.6	16.6
Power (kW)	9.71	6.90	8.35	6.10	7.27
Power Factor (Cos Ø)	0.61	0.49	0.56	0.55	0.62

The load survey conducted on the ball mill shows that the maximum loading on ball mill motor is 43%. The load variation recorded during normal operation of ball mill motor is 6.10 kW to 9.71 kW, while the rated capacity of motor is 22.4 kW.

The load survey during single ball mill operation is shown in table below:

Table: Electrical Parameters Measured at Ball Mill Motor (Individual Motor)

Parameter	Reading 1	Reading 2	Reading 3	Reading 4
Voltage (V)	417	416	417	417
Ampere (A)	7.03	6.95	7.00	7.20
Power (kW)	2.83	2.71	2.78	3.02
Power Factor (Cos Ø)	0.56	0.54	0.55	0.58

Thus even if less than 5 nos. ball mill(s) operate, the loading on motor will be less than 40 % and thus resulting in higher efficiency losses at motor.

Ball mill/Blunger is a batch grinding process. As per the process requirement the motor should run at full speed during the start of batch, however after a particular time the ball mill or Blunger can be rotated at less speed (RPM).

After CP	<p>The speed of the motor can be reduced by installing variable frequency drive on Ball Mill/Blunger motor and operating speed can be programmed based on time.</p> <p>This will result in reduction in electricity consumption to the tune of 15% saving in electricity consumption in ball mills and blunger.</p>
Benefit	
Environmental	Reduction in the electricity consumption by 5500 units per year, ultimately reducing the carbon footprints to the environment.
Economical	<p>Investment: Rs. 40,000/- (for 40 HP VFD) Approx.</p> <p>Annual Savings: Rs. 41,300/- per annum</p> <p>Payback Period: 12 months</p>