

BIRLA CORPORATION LTD.(Cement Division)
SATNA CEMENT WORKS
Satna (M.P)

COMPANY PROFILE :

Commissioned in 1959, Satna Cement Works (SCW) has the distinction of being the first Cement plant in Birla Group manufacturing Cement with the then prevailing "Wet process" technology. In keeping with technological developments, the plant was upgraded and switched over to "Dry process" of Cement manufacturing in 1989. Against the rated capacity of 7.50 millions tones Clinker, the percentage utilisation has always exceeded in all the years and the highest ever production, 9.96 million tones, was achieved in the year 2003-04. The plant has been conferred with ISO-9002 and ISO-14001 certification in recognition of its performance in quality management and environmental management systems. Besides the conventional general purpose Cement OPC 33G, 43G and 53G, Satna Cement manufactures PPC utilizing Flyash received from NTPC Thermal Power Plant at Unchahar(U.P) and also special purpose Cements viz. Sulphate Resistant Portland Cement, Low Alkali Cement and 1RS.-T-40 grade Cement for Railway sleepers. This plant has the distinction of being the only plant in INDIA with an Alkali bypass system installed. In consonance with its commitment to quality, necessary instrumentation facilities including X-Ray analyzer and X-Ray diffractometer are provided for monitoring and controlling quality of Raw materials and Clinker/Cement. While domestic market requirements the met with our products under the brand name "BIRLA CEMENT KHAJURAHO" and "BIRLA SAMRAT", our Cement is being regularly exported to Nepal and Bangladesh under the brand name "CAMEL" & "ROYAL TIGER".

An split location Cement Grinding unit was commissioned in Dec.1998 for Flyash base PPC grinding capacity of 30000 TPM, Clinker is being sent from Satna and Flyash is collected from NTPC Thermal Power house at Unchahar (U.P).



An Overview of "Satna Cement Works" Plant

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ENERGY CONSUMPTION :

The company has always accorded top priority for minimization of energy consumption by putting consistent efforts towards optimization of operating/process parameters, efforts have been made for reducing energy consumption, wherever possible, by adopting appropriate technology and suitably modifying the process stream with installation of necessary equipment /machinery etc..

The electrical energy consumption for the year 2003-2004 is 803.24 lakh Kwh in cement process excluding electricity supplied to hospital and other non productive units. This includes 494.85 Lakhs Kwh of purchased electricity from grid and 308.40 Lakh Kwh (net) from electricity generated from its own captive Thermal plant & Diesel generating sets. The primary energy consumed during 2003-2004 is 1.45 lakh tones of coal in the cement process.

The Specific energy consumption is 97.54 Kwh/tonne of Cement. The specific thermal energy consumption of the plant during the year 2003-2004 was evaluated at 776 Kcal/kg of Clinker (NCV Basis).

ENERGY CONSERVATION COMMITMENT, POLICY AND SET UP :

With a view to sustaining energy conservation efforts, an "Energy Conservation Cell" has been instituted headed by President himself and comprising engineers from Production, Mechanical and Electrical departments. The cell has been entrusted with the responsibility of monitoring both Electrical & Thermal energy consumption on a continuous basis, advising concerned departments for taking corrective actions, wherever necessary and implementing energy saving schemes.

The above group of ECC prepares reports on energy performance of the plant on daily and monthly as well as yearly basis. The reports thus prepared are reviewed at different levels of management as given below:

- Daily review in production meeting where weak areas are identified and attended with a view to improving energy performance and implementing remedial measures quickly.
- Monthly review by President at plant apex level meeting.
- Yearly review for setting up energy targets for next consecutive year.

Based on the recommendation made by Energy Conservation Cell and review by various level committees the decisions are taken for implementation of energy conservation programmes in short, medium and long term basis. Modifications and retrofitting of energy efficiency equipment in different areas are implemented by respective heads of departments with advise of top executives.

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Our energy management policy is as follows :

BIRLA CORPORATION LIMITED

Energy management Policy

We, at Birla Corporation Limited are committed to continuously improve the energy performance in all our activities and services to maximize reduction in energy consumption and to conserve energy resources for future generations without impairing productivity. To accomplish this, we will –

- Set targets and continuously monitor the energy consumption pattern and take corrective actions.
- Upgrade the process, technology and equipment to reduce the cost of energy and increase the profitability of the organization.
- Make energy conservation a mass movement by creating awareness and encouraging the employees participation at all levels.
- Enhance the use of non-conventional and renewable forms of energy wherever possible.
- Explore the possibility of waste heat recovery in the plant
- Ensure energy efficient Captive generation.

K C Mittal
Managing Director

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ENERGY CONSERVATION ACHIEVEMENTS :

As discussed above Satna Cement Works has accorded top priority on energy conservation programmes. This has resulted in a declining of specific electrical energy consumption for the last three years as shown below in the table.

Year	Specific Energy Consumption	
	Electrical Energy (Kwh/tonne cement)	Thermal Energy (Kcal/kg Clinker)(On NCV Basis)
2001-2002	98.02	793
2002-2003	90.11	789
2003-2004	87.54	776

The various factors attributed to the above energy savings are installation of energy efficient equipment/system, optimization of process operating parameters, plugging of leakages and regular in-plant energy monitoring etc.

BRIEF DESCRIPTION OF MEASURES TAKEN

FOR ENERGY CONSERVATION DURING THE YEAR 2003-04

OBJECT -To increase Clinker production from 2900 TPD to 3400 TPD, reduce electrical and thermal energy consumption, with major modifications in Pyro-process (PH & Cooler) .

Following modifications were carried out during the year 2003-04 :

(A) RETROFIT OF CLINKER COOLER

- 23 rows of conventional grates (18 rows of the 1st grate and 5 rows of the 2nd Grate) after IKN KIDS system were converted to CFG.
 - 4 nos. new CFG Fans and Seal air fan provided for modified CFG section.
- Existing 3 Nos. Fans for conventional Grate section II were replaced with new Fans for new process parameters.
- Drive enhancement of Grate-I (37 KW) and Grate-II (55KW).
- Take off section of T.A.duct & Kiln hood were enlarged to reduce gas velocity to 5-6 m/sec.
- Water spray system provided at Cooler vent for temperature control.
- New Bag Filter installed at Cooler discharge **for Pollution control.**
- Drag Chain drive modified to eliminate bull gear for reliability.

(B) PREHEATER MODIFICATION

- 4.4m dia. Stage-I twin cyclone replaced with single low pressure design cyclones of 7.2m dia. To reduce pressure drop and dust loss.
- Riser duct between stage-II to stage-I enlarged from 4.15m to 4.85m dia.to improve heat exchange & reduce pressure drop.

- Downcomer duct enlarged from 2.8 to 3.5m to reduce the velocity from 25 to 16 m/s & pressure drop.
- Precalciner vessel's bottom part was modified by elimination of swirl inlet manifold of T.A. duct entry to reduce pressure drop, with effective extension by another 6.36 meters to maintain adequate residence time of gases & material feed in the calciner vessel for complete combustion of Coal & achieving adequate degree of calcinations in kiln feed.
- Precalciner sideways outlet modified with top outlet from roof and enlargement of connecting duct to 5th cyclone from 3.6m to 4.5m diameter.
- **Effective diameter of T.A. duct was increased from 1.67m to 1.84m by reduction in refractory thickness from 265mm to 180mm.**
- **Kiln drive rating was enhanced from 375KW to 450KW & Kiln speed increased from 3.3 rpm to 3.9 rpm.**

(C) SAVINGS ACHIEVED :

- Increase in Clinker production : 500 TPD
- Reduction in Thermal energy consumption : 7 Kcal/kg.Clkr.
- Reduction in Specific power consumption : 2.65 U/ton of Clkr.
(In PH Fan, Cooler fans, Vent Fan & others)

Total investment (project cost) : Rs. 73.5 millions

NOTE :

Above modification project was implemented in Nov. 2003 only, hence impact of full advantage of electrical & Thermal energy savings has not been reflected in avg. figures of the year 2003-04. Actual additional savings anticipated as full advantage is as mentioned below :

- Savings in electrical energy : 2.0 U/ton of Clinker
- Savings in Thermal energy : 36 Kcal/Kg of Clinker

ENERGY CONSERVATION PLANS AND TARGETS :

We are planning to upgrade the plant and enhance the plant capacity from 3400 TPD to 4200 TPD. Requirement, investment and saving is being calculated.