Bhilai Jaypee Cement Limited

Babupur (Satna) MP-485112

GUIDELINES FOR PREVENTION AND CONTROL OF FUGITIVE EMISSIONS IN CEMENT PLANTS

For achieving effective prevention and control of potential fugitive emission sources in cement manufacturing plants, specific requirements along with guidelines have been evolved.

1. Unloading Section (Limestone, Coal & other relevant material)

The Bhilai Jaypee Cement is a clinkerisation unit and adopted most modern available technology to manufacture the clinker and controlling the dust emission for maintain the clean and green Environment .

Sr. No.	Control Measures to be Provided	ACTION TAKEN
1.	Enclosure should be provided for all unloading operations, except wet materials like gypsum	√
2.	Water shall be sprayed on the material during unloading	√

1. Material Handling Section (Including Transfer Points)

Sr. No.	Control Measures to be Provided	ACTION TAKEN
1.	All transfer point locations should be fully enclosed.	√
2.	Airborne dust at all transfer operations/ points should be controlled either by spraying water or by extracting to bag filter.	Limestone, Laterite and coal belt transfer points and storage silos equipped with adequate capacity of Pollution control equipments such as bag filters to control the dust emission and the equipments are working efficiently. The stacker boom height is operated at optimum level to reduce the dust nuisance.
3.	Belt conveyors should preferably be closed.	Raw materials conveying belts are covered with G.I sheet to avoid fine dust emission during wind blowing and fine/finish material conveyed through fully closed air slides /screw conveyors.

2. Coal Storage Section

Sr. No.	Control Measures to be Provided	ACTION TAKEN
1.	Coal yard / storage area should be clearly earmarked.	Covered coal shed has been provided with earmarked.
2.	The pathways in coal yard for vehicle movement should be paved.	√
3.	Accumulated dust shall be removed/ swept regularly and watering the area after sweeping.	All roads around the factory premises has been cleaned regularly by a mechanized vacuum sweeping machine and good housekeeping practices followed to avoid dust accumulation on roads. Water is being sprayed on roads regularly by tanker to avoid dust emission.
4.	Coal other than coal stock pile should preferably be stored under covered shed.	Covered coal shed has been provided.
5	The coal stock pile should preferably be under covered shed for new plants.	Not Applicable.

6.	Instead of dust extraction cum bag filter system. If dust suppression measure is used, following additional control measures should be provided.	
a	Wetting before unloading.	During the unloading of raw coal, water is sprayed on coal to avoid dust emission. 3 nos. Fog type water sprinklers is provided
b	Spray water at crusher discharge and transfer points.	Water spray system is installed at Crusher hopper & conveying belt for suppresses the dust emission.

4. Clinker Cooler Section

Sr. No.	Control Measures to be Provided	Guidelines /ACTION TAKEN
1.	Air borne fines extracted from clinker cooler shall be separated and sent to last possible destination directly, if possible.	The Clinker cooling system is provided with adequate capacity of Electrostatic Precipitator and ESP dust stored in clinker silo by pane conveyor/ belts conveyor. Clinker silo is equipped with adequate capacity of Bag filter to control the dust emission.

5. Clinker Stock Piles Section

Sr. No.	Control Measures to be Provided	Guidelines / ACTION TAKEN
1.	In new cement plant, clinker should be stored preferably in silo.	Clinker is stored in closed silo for controlling the dust emission. A Bag filters of adequate capacity is installed and working satisfactory for controlling the dust emission.
2.	Clinker should be stored in closed enclosure covered from all sides and should have a venting arrangement along with a bag filter.	For clinker storage, we have constructed a clinker silo of capacity 24000 T with adequate capacity of Bag Dust collector connected directly to clinker silo to avoid fugitive dust emission.
3.	The dust extracted and captured in bag filter should be avoided to feed back / recycled to the clinker stockpile, if possible.	There is no clinker stock pile in the process of this plant.
	Generally open storage of clinker should be avoided. Only in case of emergency clinker should be stored in open with following control measures.	
1.	Area for open storage of clinker should be clearly earmarked.	Clinker is not stored at open places.
2.	Provide cover on openly stored clinker.	√
3.	Provide windbreak walls or greenbelt on three sides of open stock piles.	No open stock pile
4.	Provide partial enclosure for retrieving area.	No open stock pile
5.	The travel path of pay loaders should be paved and frequently swept.	Travel path of pay loader is paved. It has been swiped by mechanized sweeping machine regularly to avoid dust accumulation on roads.
6.	Provide loading of clinker by pay loaders into trucks trailers be carried out in an enclosure vented to a bag filter.	Not applicable. Clinker loading in wagon/ trucks is done by silo through telescopic chute.

6. Storage of Limestone, Gypsum, Flyash and other additives:

Sr. No.	Control Measures to be Provided	Guidelines / ACTION TAKEN
1.	The storage should be done under	Being followed

	covered shed.	
2.	Dry fly ash shall be transported by closed tankers. In case of wet fly ash trucks may be used for transportation.	Not applicable.
3.	Dry Fly ash shall be stored in silos only.	Not applicable.
4.	Fly ash in the dry form should be encouraged an in wet form should be discouraged. In case we fly ash is to be used, it may be stored in open temporarily for the purpose of drying with necessary wind break arrangement to avoid wind carryover of fly ash. The fly ash should be removed immediately after drying.	Not applicable.

7. Cement Packing Section:

Sr. No.	Control Measures to be Provided	Guidelines / ACTION TAKEN
1.	Provide dust extraction arrangement for packing machines.	Not applicable.
2.	Provide adequate ventilation for the packing hall.	Not applicable.
3.	Spillage of cement on floor shall be minimized and cleared daily to prevent fugitive emissions.	Not Applicable.
4.	Prevent emissions from the recycling screen by installing appropriate dust extraction system	Not applicable.

8. Silo Section:

Sr. No.	Control Measures to be Provided	Guidelines / ACTION TAKEN
1.	The silo vent to be provided with a bag filter type system to vent out the air borne fines.	All silos/ hoppers has provided with adequate capacity of bag filters for controlling the dust emission.

9. Roads:

Sr. No.	Control Measures to be Provided	Guidelines / ACTION TAKEN
1.	All roads on which vehicle movement of raw materials or products take place should be paved.	The all approach roads within the factory premises are concreted and maintained properly to avoid dust deposition.
2.	Limit the speed of vehicles to 10 Km/h for heavy vehicles with in the plant premises to prevent the road dust emissions.	Being Followed.

3.	Employ preventive measures to minimize dust build up on roads.	The following preventive measure shall be adopted to avoid dust build up on roads. 1. The Telcos and other vehicles should not be over loaded. 2. Telco /dumpers should be leakage free and doors are tightened properly. 3. Housekeeping practices being followed strictly to avoid dust accumulation.
4.	Carry out regular sweeping of roads to minimize emissions.	Housekeeping practices are being strictly followed. Mechanized sweeping machine are used regularly for sweeping on road Water is being sprayed regularly on roads by Tanker to prevent dust emission.

1.2 Requirement of Maintaining Documentation and Records:

The industry shall maintain records to document the specific dust control actions taken and maintain such records for a period of not less than two years and make such records available to the regulatory authorities upon request. In addition documents of technical specifications of the control system and O&M guidelines should also be maintained. (Refer Appendix AI for details of documents and records to be maintained). **All maintenance records are available with maintenance dept.**

1.3 Requirement of trained Manpower :

- The industry shall employ or contract a "dust control officer" who shall be available on site during working hours and should have authority to expeditiously employ sufficient dust mitigation measures to ensure control of fugitive emissions especially in abnormal circumstances. A suitably qualified person could be designated to operate as dust control officer. But, he should be provided necessary training and should be aware of operational, maintenance aspects. He should be responsible for proper control of fugitive emissions. Environmental Officer may act as a Dust Control Officer**. Being followed.**

- Regular training should be given to the personnel operating and maintaining fugitive emissions control systems on the operational and maintenance aspects and record keeping responsibility.

  M/s Bhilai Jaypee Cement Limited has setup fully equipped Environmental Laboratory for monitoring of Air emission/ Water & Waste water analysis with suitable qualified technical personnel. The Environmental Cell is functioning under control of Joint President(Technical) who is having keen interest to look after the all pollution control related works required for pollution control in cement Industry.

1.4 <u>Operation and Maintenance Requirement for all Dust Extraction cum Bag filter Systems:</u>

- A "U" tube manometer (of minimum 400 mm length) shall be fixed at all bag filters. It shall be connected with inlet and outlet side of the bag filter through flexible rubber tubes. Colored water should be filled to zero level mark for proper visibility of the pressure drop across bag filter. **Being followed.**

- The minimum dust extraction volume should be based on the guidelines for ventilating various sources as per industrial ventilation hand book guidelines. **Being followed.**

- Un-interrupted supply of dry compressed air at desired pressure should be always ensured for pulsejet cleaning type bag filter. **Being followed.**

- The flow rate and static pressure at the bag filter inlet should be monitored at least quarterly and recorded to ensure appropriate functioning of the bag filter installed. Followed.

- A sampling platform, portable and access ladder shall be provided at the all major stack to carry out stack monitoring. Final emission should not exceed the prescribed standard. **We are complying all prescribed norms laid down by MPPCB.**

- In systems where water is also spread, it should be ensured that water does not get carried over/sucked to the bag filter. The details such as bag house specifications, layout drawing, operation and maintenance guidelines are to be maintained. **Being Followed.**

- The details such as bag house specifications, layout drawing, operation and maintenance guidelines are to be maintained. **Being followed.**

1.3 Operation and maintenance Requirements for all Dust Suppression Systems:

- Basic details/specifications of the dust suppression systems installed at various locations should be maintained. The information should contain the quantity of water sprayed in LPH, number of nozzles, type of nozzles, desired water pressure, details of suppliers of spares, pipeline diagram, system layout etc.

Details of dust suppression system installed in our plant.

LOCATION	Capacity of pump	No. of nozzle
1. Lime stone crusher hopper	500 LPH	4 Nozzles
2. Coal Unloading/Handling	2000 LPH	Manual Spray / Fog type water sprinkler

- A fine mesh micro filter should be installed for filtering suspended solids from water prior to pumping to the nozzles to prevent choking of nozzles thereby ensuring proper sprays. **Followed.**

- A pressure gauge and water flow meter shall be installed at major source for online measurements and a record be maintained for quantity of water sprayed. **Followed**.

1.4 SPM Concentration Standard for Assessing Effectiveness of Control Measures Adopted **:**

- The effectiveness of prevention cum control measures provided for controlling fugitive emissions from any source shall be said to be satisfactory, provided the SPM concentration, measured at 10 metre distance (from the enclosure wall housing the emission source or from the edge of the stockpiles/pavement area) in downwind direction shall not exceed 2000 microgram per cubic metre and 5000 microgram per cubic metre for coal yard /coal stock pile and rest other area respectively. These standards are for one year period and will be reviewed after one year. In cases where SPM concentrations exceed the prescribed limit, necessary corrective measures in terms of improving the controls shall be taken and action taken records of improvements carried out be maintained. **Being Followed.**

- The measurement shall be carried out by High Volume / Respirable type samples as per standard method prescribed by CPCB/BIS, covering at least 4 hours duration (240 minutes) during normal working hours with normal production rate of the operation / source being monitored on quarterly basis. : Being Followed.

1.5 General Guidelines (For areas not otherwise specified):

Apart from the specific guidelines provided above for some specific sections/areas, for all other fugitive dust emitting areas, following general guidelines would apply.

- The industry should prevent fugitive emission from all active operation and storage piles such that the emissions are not visible in the atmosphere beyond the boundary line of the emission source. To be followed.

- The Industry shall conduct active operations by utilizing the applicable best available control measures to minimize the fugitive dust emission from each fugitive dust source type within active operation. : Advance available technology is being adopted.

- Except for Gypsum and Clinker, all storage piles should be kept in moist condition by spraying water at regular intervals for controlling fugitive emission, wherever possible. To be followed.

- The operation of the pay loaders shall be slow down whenever the average wind speed is high exceeding 50 km/h. which may cause fugitive emission. Being followed.

- All storage silos shall be vented to bag filters, which should have proper bag cleaning arrangement so as to avoid choking of filter bags, thereby to avoid pressurization of silos. Being followed.

- Regular inspection at a pre-determined frequency be carried out of all fugitive dust control system and records be maintained of such inspection and corrective action taken if any**.** Being followed.

Appendix A.I

A 1: List of Documents & records to be maintained for fugitive dust control

Title of Record to be maintained	**Frequency of Recording**	**Information to be recorded**
Documents :		
List of Fugitive Emission Management Systems (FEMS) installed	To be up-dated once in a year.	Location of FEMS, marked on process flow diagram, Identity Number. Type of FEMS, Year of installation. Operating Status. **To be followed**.
Technical Specifications of FEMS installed		
Specification of Dust suppression system	Available with Maintenance dept.	Locations of controlling emissions, Identity Number, Supplier Name, Date of Commissioning, Pump HP, flow rate in LPM, Pressure in kg/cm^2, Nozzles type, numbers, LPM, O&M instruction from supplier.
Specification of Dust Extraction cum APCD	Available in Env. Cell	Location of system installed, Identity Number, Name of system supplier, date of commissioning, flow rate in m3/hr, Time, flow m^3/hr. static pressure mm Wc, velocity m/sec, Current Drawn by ID fan motor, operation & maintenance instruction from supplier. *All pollution control equipments systems are supplied in our plant by reputed suppliers.* *The supplier guidelines/ technical specification to be followed strictly by us during the operation of A.P.C.D. for getting the optimum efficiency of equipments.*
Capacities of Closed Storages	Annually/Monthly Coal - 10000 Ts Clinker - 24000 Ts	For coal, limestone, clinker, gypsum, cement, additives, fly ash, Dimensions, bulk density.

Capacities of Open Storages	Annually/Monthly (TS) Limestone -15000 (Pile) Laterite - 2000 Ts.	For coal, limestone, clinker, gypsum, additives, fly ash, Dimensions, bulk density,
Records		
Replacement of Damaged filter bags	As per requirement	Number of bags replaced, Date, bag filter Identification number.
Measurement of flow rate static pressure at bag filter inlet	As per requirement	Bag filter Number, Date of monitoring, Time, flow m^3/hr. static pressure mmwg, velocity m/sec. Current Drawn by ID fan motor Name of the person Followed**.**
Stack Monitoring of bag filters stack, where ever monitoring is feasible	Monthly	Bag filter Number, Date of monitoring, Time, Measured Data in m^3/hr and mmwg. Dust concentration in mg/Nm^3. *If dust emission visible from chimney damage filters to be replaced as per requirement.*
Operational Details of Dust Suppression System	Once in a month	Quantity of material handled. Quantity of water sprayed, number of operational nozzles water pressure at filter inlet and outlet. Details of damaged nozzles and replacements. *Spares being replaced as per requirements*.
Road Sweeping record	Daily (Manually)	Road location swept, date, running hours of sweeping machines To be followed**.**
Quantity of coal in open storage, if any	Quarterly	Inventory of Existing storage, add on retrieved on quarterly basis, Date
Quantity of clinker in open storage, if any	As per requirement	Inventory of Existing storage, add on retrieved on quarterly basis, Date (To be *Covered with Tarpaulin*.)
Corrective actions taken for improving controls	As per requirement	Details of modifications carried out, level of reduction in SPM achieved. Presently not required.