



## DALMIA CEMENT (B) LIMITED – DALMIAPURAM



### PRODUCTION DEPARTMENT

Issue No. 02	Rev. No: 01	Effective Date: 22.05.2015	SOP/PROD/07
Issued By: S & P		Approved By: Head – Production	
SOP FOR prepare raw meal and store in silos			

**SCOPE** : prepare raw meal and store in silos

**RESPONSIBILITY** : CCR executive.

**Accountability** : Section Head – Pyro.

**PPE:**

1. Safety goggles,
2. Safety helmet,
3. Safety shoe,
4. Mask,
5. Cotton Gloves.
6. Safety harness(Full body)

**TOOLS:**

1. Poking bar,
2. Hammer.
3. shovel

**Hazard:**

**Risks associated:**

Fall from height,

Fall of tools;

Hit of Hammer in hand;

**Mitigating Measures**

Use of safety harness

Carry the tools in tool bags

Trained to be engaged

**Procedure:**

- Get clearance from Maintenance Crew for starting the mill if stopped for maintenance work.
- Ensure that KHD Kiln is running at min 90 TPH raw meal feeding



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- Get clearance from Apron Feeder M/A & VRM-II M/A to start the Plant. Ensure clearance is obtained as per Work Instruction.
- Depending upon silo level & Quality requirement select Silo-I or Silo-II or both.
- Start Mill auxiliary group (Group 301).
- After getting clearance from Electrical Shift In-charge(orally) for starting HT drives, start Mill fan group (Group 352).
- Open recirculation damper to 30 – 60%.
- When Mill fan is in LRS mode, make sure the LRS end position is reached before opening the fan inlet damper LD5.
- When Mill fan is in LRR mode, immediately after starting the fan make the LRR mode enable and adjust the speed and damper LD5 to maintain a draught of min – 30mm of WG at mill inlet. When mill fan is in SPRS mode, after ensuring the SPRS taken over signal is arrived, adjust the speed keeping the damper LD5 fully open to get a draught of min – 30mm of WG at mill inlet.
- Open LD1 and LD4 parallelly maintaining the Mill inlet draught around – 50mm WG, Mill fan outlet draught at –5 to –10 mm WG and PH fan outlet draught at –5 to –10 mm WG
- Adjust the speed of ESP fan, if required, to maintain the ESP inlet draught at –40 to –90mm WG and PH fan outlet draught at –5 to –10 mm WG.
- Close damper LD2 maintaining the mill inlet draught and PH fan outlet draught at the above said levels. Close recirculation damper to maintain the above said draught levels.
- Start mill group (Group 302), when the mill outlet temperature is more than 75 °C ensure LRS end position is reached.



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- Set classifier speed around 1200 rpm depending on residue of last sample and classifier speed.
- Start mill feed group (Group 303), when mill outlet temperature is more than 85°C and adjust air damper depending upon the mill outlet temperature.
- Adjust Mill fan speed / damper LD5, ESP fan speed and recirculation damper such that mill total air flow at fan inlet is around 310 km<sup>3</sup>/hr & PH fan outlet draught at -5 to -10 mm WG.
- Regulate and set the total feed rate around 150 – 250 TPH, such that the differential pressure across the mill and outlet damper are between 800-1000 mm WG and 85-110° C respectively.
- Adjust LD2 and ESP fan speed to maintain PH fan outlet draught at –5 to –10 mm WG.
- Optimise the production by monitoring and controlling the operating parameters in the following suggested range.
- Mill feed rate = 170 – 250 TPH
- Mill differential pressure = 750 – 1000 mm WG
- Mill outlet temperature = 80 – 110° C
- Total air volume = 260 – 360 Km<sup>3</sup> /hr.
- Classier drive speed = 1000 - 1400 RPM
- Mill hydraulic pressure =55 to 75 bar
- Mill inlet draught =-30 to -70mm WG



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- When the operating parameter goes beyond the suggested range, take necessary corrective action to bring it back to the suggested range.
- When mill is running in stable condition, put mill operation in fuzzy mode after entering the present operating parameters and the desired range in the fuzzy PC. Alternatively, the DP loop can be made energized when fuzzy is not in operation.
- When higher inlet temperature is required, as seen from the mill outlet tamper, start HAG for HAG operation.
- By cutting additives, run VRM with Limestone alone to find the stacker value of Limestone whenever required.
- Inform Laboratory about mill running.
- Silo feed is either given to Silo-I or Silo-II to maintain quality control plan considering the following points.
  - X-Ray – Lab report on raw meal to Silo feed.
  - X-Ray – Lab report on raw meal to Kiln feed.
  - From which silo extraction is taking place.
  - Type of clinker production.
- a) Mill feed rate ratio between Limestone sweetener, moorum and additives (fire clay / black clay / ferrogenious material) is determined depending on the Laboratory report of silo feed raw meal in order to maintain quality control plan.
- b) Under normal running conditions of mill changeover the mill feeding control system to OBCS (Optima blending control system) as per procedure below:
  - While starting OBCS after long time or for the first time:



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- Enter the Raw meal Targets in specifications -> Quality Targets -> Simultaneous control menu. Enter any 4 values. The other values will be calculated. Press OK.
- Goto specifications -> Feeder specifications. Enter the latest analysis values for LS, SW, CL, AD. Choose the feeders. Enter latest Values by clicking Modify button. Press Save and Close buttons after entering all feeders. For Limestone stacker value can be entered. This feeder value will be Back Projected when the Raw Meal analysis comes and this major feeder composition is getting changed during the course of control.
- If a fresh batch is to be started or while starting for the first time go to setting -> batch -> Reset. Press OK. Then all the rows in setting -> batch -> View batch table will be cleared.
- Goto simulation -> simultaneous control and see the set points suggested by OBCS. If needed change these set points and press update button. Then the Projections for next hour and for batch will be displayed. If these values are accepted press send button. If the control is in Ramco mode in Foxboro PC then these set points will be sent to field. Otherwise press Restore button to switch back to Ramco suggested set points. If control is in Ramco mode then the feeder set point ratio changed in Foxboro machine will not be sent to field.
- When the raw meal analysis screen automatically comes from lab, Press set point. If sample taken time (On side bar) is present then sample boy time will be filled by system -> then we need not edit it. Otherwise give 10 to 15 minutes for sample boy time. Then press Set point button.
- Now Back Projection screen will come. This will show the changed feeder analysis based on latest raw meal analysis. If these values differ much from the previously given values, enter permissible values for the feeder and press accept -> update -> and close. From now onwards these values will be taken for the feeder.
- Now the set points screen will be displayed. Here Accumulation in the silo, targets and setpoints will be present. If the OBCS suggested setpoints are acceptable then press Send button. Otherwise change the setpoints and press Update button to view the projections. To



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switch back to OBCS suggested setpoints presses restore. Pressings send button will send the setpoints.

- Now onwards for each hour repeat steps 5,6,7 to send new setpoints.
  - **Note:**
- At any time simulation -> simultaneous control will be used to change the feeder ratios and upon seeing the projections, poress send button to send setpoints. But do not choose X-Ray option -> Setpoints, as this adds to batch table and the analysis duration and sample boy time becomes invalid. This X-ray option can only be used while the data is not transferred from Lab.
- When several X-ray Automatic invoke screens are transmitted from lab press Cancel button to close the wrong Analysis other than the needed one. Other wise this will cause Error in lab machine. The lab operator must give 'VRM-I' or 'VRM-2' for the sample name. If any other name is given, then the result will not be transmitted.
- If the analysis is not transferred from the lab then choose X-Ray menu to manually enter the values. Here choose Raw meal button, and enter values. Then follow steps 5,6,7 as usual.
- We can change the targets at any time by choosing specifications -> Quality Targets -> Simultaneous control menu.
- Choose file -> save params between 3 or 4 hours to save the current settings. This stores the latest back projected feeder oxides and other changed settings during the operation. While closing OBCS (if any manjor error occurs) it will ask for saving parameters. Click yes to save it.
- Change the feeder controls from Manual **M** to Ramco **R** in VRM-II page in the advisor.
- When OBCS is not working changeover from Ramco mode to Manual mode.
  - If there is variation beyond the limit and when it is reflected in kiln feed raw meal, care should be taken to maintain kiln operation parameters and to accept / reject clinker as per quality control plan.



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- Record the results of raw meal analysis in Laboratory report and take corrective action as said above.
- Record % residue (on 90 micron) of silo feed raw meal and alters the speed of classifier if required so that residue is maintained as per quality control plan.
- Ensure that hourly operating parameters are recorded automatically in the report and take remedial action to maintain the Quality and optimum production level. In case of any problem in auto recording inform the concerned engineer and record the parameters manually.
- Monitor the mill alarm pages in the respective advisor and record the fault in fault register in the respective section.
- Monitor the roller “too low” position during normal operation of the mill. Plan for roller adjustment in the next available mill stoppage hrs. or preventive maintenance day.
- Stop the plant as per para 5.39 for planned stoppages.
- Release the mill for Preventive Maintenance as per schedule and or as agreed mutually with other dept. Get the clearance from concerned dept. before restarting the mill.
- Restart the plant as per procedure after a tripping or power failure.
- Record any fault in the mill circuits and plant, in the fault register.
- Check and monitor the total mill feed. The Production, Consumption and Stock level to be monitored if deviation is consistent and more than +/- 15% then weigh feeder to be checked for its accuracy. Record the same in fault register for corrective action.
- Record start, stop hrs. of the mill with the probable reason in stoppage report.



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#### ○ SHUTTING DOWN THE PLANT (VRM-II)

- Divert the hot gas through GCT, by opening GCT inlet and outlet dampers.
- Stop mill feed group, if mill to be stopped for 1-2 hrs. Otherwise stop prefeeders for weighfeeders and additive feeders and stop mill feed group after ensuring the conveyors are emptied.
- Close mill fan inlet and outlet dampers gradually and open fresh air damper
- Wait till the rollers are lifted up and stop the mill or mill group.
- Stop the mill fan
- Adjust the ESP fan speed to maintain PH fan outlet draught between –5 to –10 mm WG.
- Start GCT water pump and maintain GCT outlet temperature between 160 - 250°C
- Inform electrical shift incharge.
- Get the isolator key if mill is to be released for maintenance etc.
- Send the clearance slip to maintenance for taking maintenance work during P.M. or Planned stoppage.

#### ○ RESTARTING THE MILL AFTER TRIPPING OR AFTER SHORT INTERVAL FOR MAINTENANCE PURPOSE.

- Get the clearance from the maintenance.





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- Get the material in belt conveyors or ensure materials is available BC-12 & BC-13.
- Get the clearance from M/A of Apron feeders and VRM-II.
- Ensure mill outlet temperature is more than 85 oC.
- Start the plant as per procedure – DP07.

<b>Job Safety Analysis</b>	Job: Belt Discharge chute cleaning	Date: 01 – 07 - 2013	Analysis by: Section Incharge	Reviewed by: Section Head
<b>Title of employee doing job:</b>	Supervisor: Sec. Incharge	Department: Raw mill section	Section: All belt conveyers	Approved by: Department Head

Req'd/recommended PPE:

<b>Sequence of Basic Job Steps</b>	<b>Potential Hazards</b>	<b>Recommended Safe Job Procedure</b>	<b>What Could Go Wrong</b>	<b>Corrective Action</b>
Cleaning of the Coating at belt discharge chute	pipe hit to the person	Hold the Pipe properly, if there any possible tie it one end.	Pipe may hit the person while cleaning the chute.	Hazards to be explain to the people who are working in that area by safety PP talk, tool box talk.
Inspecting the chute	Fall of the person	While inspecting the chute use safety belt and make proper approach to view the chute.	Person may fall on to the chute due to slip.	Use Proper safety belt to inspect the chute.
Cleaning of raw meal dust spillage	Hot material cause burn injury	Use hand gloves and showel for cleaning hot powder	Hot powder may entrapped into shoes	Use proper safety aspestos PPE's



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#### Emergency Shut- off:

1. In case of belt is moving, Emergency pull chord switch should be activated by the person.
2. If body injury is there, First aid will be given and inform to the Safety department or Call Emergency number 233/555/9865125176/9865177444.

HOD PRODUCTION

HOD TECHNICAL