



MANAGEMENT OF AIR POLLUTION CONTROL IN CEMENT INDUSTRY WITH REFERENCE TO INDIA

¹SHAIKH AHMAD SHAIKH ISMAIL

Abstract

The cement industry is one of the oldest and most important industries in India's economy as well as one of its greatest environmental polluters. Any activities that involve the breaking, crushing, drilling and grinding of materials may produce fine silica dust. However, the dusts can also be found in soil, mortar, plaster, shingles and abrasives. Dust particles are usually in the size range from about 1 to 100 μm in diameter. Pollutants are greatest risks for the environment and human health problems. The pollutants are often lumped together under the term smog. Dust generated in the cement industry can be studied in order to achieve the dust emission control equipment. Although many operations generate dust are inevitable, but the loss of trapping dust and prevent dust dispersion produced by techniques such as those outlined in the paper will be obtainable.

Keywords— *management, cement, dust, pollution, air, control.*

I. INTRODUCTION

Cementations materials are ability to bind particles together and creating a body of Fabrics are formed particles. The definition of the cement with such thoroughness that can include a variety of adhesives, including adhesives, cement liquid in sand or stones and metal pieces could also be used to each other. Examples of these adhesives, cement industry, cement kiln is used in laying brick and its main feature is that brick (which is a ceramic material) into the body of the furnace (iron) attached, as well as other types of cement. That are used in dentistry, including adhesives is. What is the word cement in the text; it is the type of cement is limestone origin. In other words, they cement the main constituent of limestone and limestone is the main raw material for them. Based on a combination of cement, calcium oxide (lime) with other oxides such as aluminum oxide , silicon oxide , iron oxide ,magnesium oxide and oxides of alkaline affinity with the water and in air and under water can be difficult , and resistance gradually ore. According to the above characteristics can have a different combination of cement and water is the principle of the mortars. Blue mortars were known from the past, including the Egyptians and Greeks with lime mortar mixed with volcanic ash soil, brick and lime juice in a sense the water that careers were taking strain hardening properties. By applying the mortar the Romans were able to build large buildings that are still remnants after several thousand years of stable and visible.

II. CEMENT PRODUCTION PROCESS

Cement manufacturing process requires much time and patience to explain, for this reason we confine ourselves only to name them. The raw materials for Portland cement: Portland cement raw materials mainly limestone and clay materials are included. That is used in the production of

Portland cement raw materials containing calcium carbonate compounds are aluminum silicates. Extraction of raw materials: Mines, cement raw materials, especially limestone, clay, Marley, gypsum and the like, as mine is open. The extraction of materials such as limestone, iron ore and gypsum are also Poke holes and exploded by dynamite. The primary mode of crushing: by crusher movable or fixed, initial mixing and storage: before the crushed material in the crusher, raw mill for combination way they are dumped into the hall, thus they are mixed together, and that initially, the hall has a storage warehouse. Drying of raw materials: In some cement plants, due to the special geographical position and rich rain in some raw materials (mainly clay), moisture that direct use of them impossible. Powder mixture of raw materials in dry method cement production, it is necessary that the raw materials are powdered before entering the furnace. By raw material pellet mills or roller mills for raw materials is carried out.

Raw material planning, Raw material silos:

The major action in uniform working furnace for high quality cement clinker and ultimately effective, uniform furnace feed composition; it is well mixed and homogeneous.

Pre heater, Rotary kiln:

The main part of the grill cooking is done. Cement kiln, a metal cylinder with a length and a diameter, which is proportional to the plant capacity.

Cooling (air conditioning):

Clinker output of the furnace temperature of about 1000 to 1200 degrees. Recover this amount of heat and the difficulty of moving the hot Clinker; it necessitates the need for cooling. Another fundamental characteristic of cooling clinker, clinker and high quality crystals to form complete it.

Silo (storage) Clinker:

Clinker output cooling, before entering the mill, cement silo or barn, or house is saved. Cement mill, Cement silos, Download home. The cement industry is one of our strategic industries and emissions, although it has always been the case. The main pollutants of dust that can be as productive in recent years, industrialized countries spend a large potential to reduce and eliminate those who have. Undoubtedly the major cement dust generated resolver counts with a wide variety of different parts of the production line. According to the characteristics of the production and accumulation of large amounts of dust in the surrounding factories, in the long run numerous environmental problems and human health risks. Europe, though standards for dust exhaust flue gases 50 mgr / Nm² is, however, already been able to use advanced technology to release dust particles less than 10 mgr / Nm² can also So two important environmental problems is the cement industry, as well as the accumulation of dust particles suspended in the atmosphere and received by the dust in the surrounding factories that due to changes in natural conditions, soil and dust emissions into the environment, leads to environmental pollution. Dust defined General to the specific circumstances in which solid particles can stay suspended in a gaseous environment, say dust. Usually dust is generated when a gas stream in the presence of solid particles to get moving. In this mode of operation the solid particles are dispersed. For example, it is one of the other places where the material falls below. The amount of dust emitted by the cement industry cement manufacturing process is expressed as follows 9 to 25 percent more holistic approach to the production process of cement production - Semi- dry process cement production holistic zero to 3 percent - Dry process cement production process, from 7 to 15 percent of production holistic.

III. SOURCES OF DUST IN CEMENT PRODUCTION LINE

In a cement production plant, the effects of abrasion, crushing, unloading, handling, cooking food on the grill and move within it and ... Dust is generated. These items are described as follows.

Handling:

Conveyor belts for material handling equipment used is one of three areas that cause dust is beginning to embrace cord conveyor belt, where the material is hit. To adjust the conveyor belt

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can be applied to the following: Change the speed, angle of 20 degrees to 30 degrees, for example rollers, conveyor width increases from 24 to 36 inches, for example, the method of loading the material on the belt strap can be transported back. The end point of conveyor belt is an important factor in production of the dust.



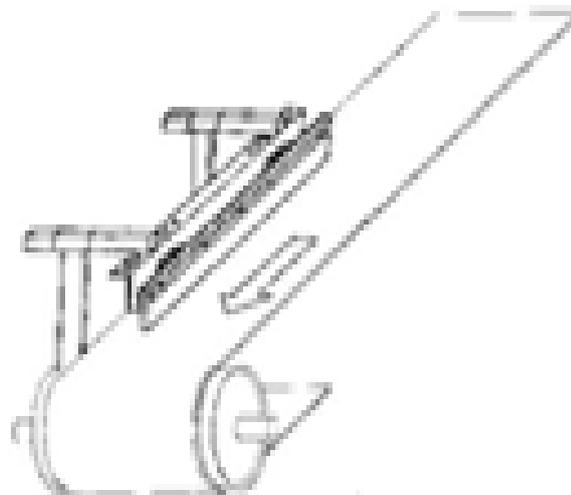
The materials should be in direction of belt travel and at belt speed. Material impact on Chutes Annie belt on the belt caused the traumatic material and creates a cloud of dust. To prevent such a minor fender rollers can be installed. Two types of equipment with V-shaped belt cleaner reduce dust, scratches and belt conveyors produced by factors. Scratch belt to dislodge dust particles that stick to the belts used. And reduces the material on the belt is returned. A dust collection chamber must also be installed along the belt scratches to collect dust from the belt. Dust accumulation on the surface of the material and non-carrier overflow, causing the belt to move sideways and pull it to the side and arm bands is ineffective. V-belts are mounted on the side of the belt cleaner prevents dust accumulation. The belt keeps overall balance. Side strap for holding the straps after loading the materials used are usually equipped with a flat rubber bands realize the armpit seam mist nets and provide a moving belt .

Use rubber strips are not recommended for two reasons:

Rubber dams with vertical side quickly disappear, setting tires on a constant basis, usually is not done properly can cause dust emissions.

Use the arm strap is enhanced with the following advantages:

The capacity to accept large volumes of material and compressive stresses are large. Instead of using a bolt -on clamps quick why to adjust side tires used. To prevent the release of dust by gasket seal on the side of self-adhesive neoprene gasket is worn.

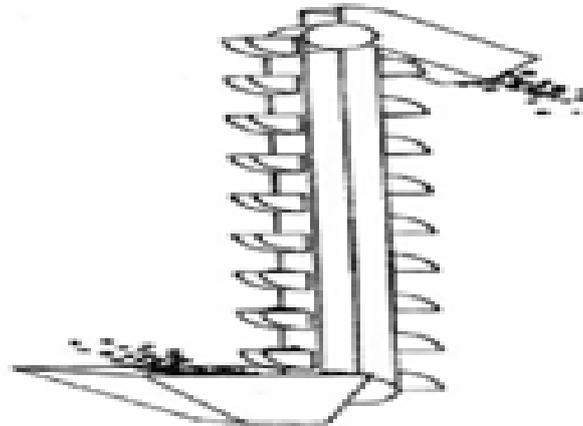


Ventilation of belt conveyor:

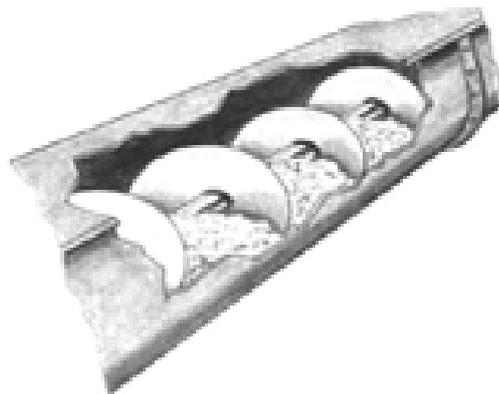
ventilated areas should be designed in such a way that besides being ventilated and adequate site to create dust, dirt deflector directs the system to the lowest dust. Hoods of poor design, in some cases causing severe dust catcher dust too early design input to the system is dust.

Bucket elevators:

consists of a series of bins, which the chain or belt is moving up and down by the wheels, are connected. This total is placed inside a metal casing. Which in the absence of the chamber and holes in the well casing is to contain dust? There are only two points to lift dust emission: where the materials are fed or where the material is discharged. By appropriate design of the transfer and holding down a fine dust emissions at low lift height of the fall of materials can be reduced. The equipment received by the correct drain wall material and unloading will cause dust control.



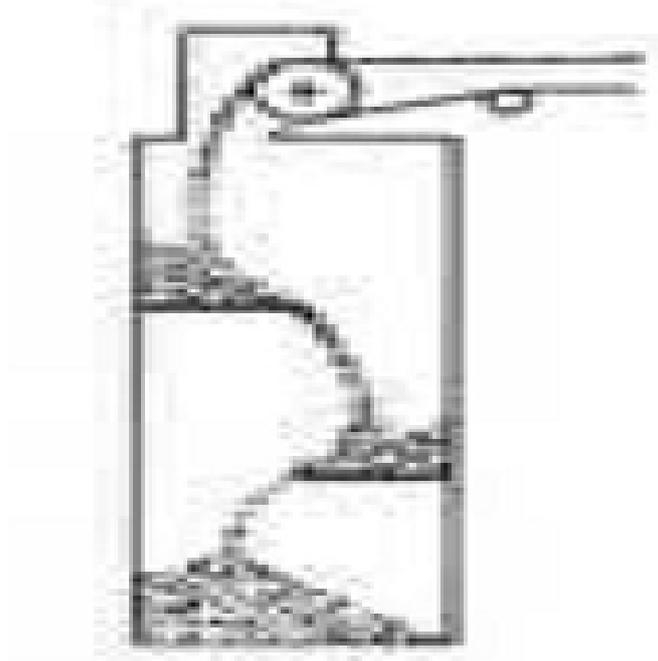
Screw conveyor of the oldest and simplest equipment used in material handling is considered. These locations are mainly caused by dust emission: the entrance, where the material is received. Compartment cover screw holes, worn container, screw conveyors are usually fully enclosed except at the end of the dust emission can be controlled by the appropriate design of a shot transition. Chamber is closed by a screw and nut shells. But it is better to use the self-adhesive rubber neoprene material.



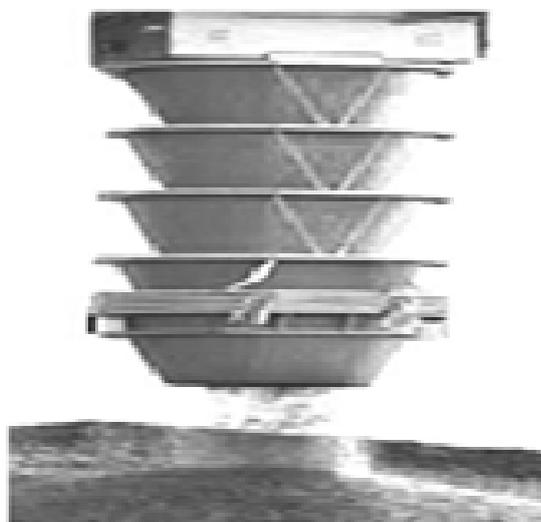
Pneumatic conveyor structure conveyor pipe or conduit body is composed of material by air pressure or vacuum (suction) it is moved. Because it is completely enclosed will not cause dust emissions except in areas to be worn? Most wear occurs in pipes and knees. To avoid this situation, the bend radius can be large and heavy material making. Covering with Abrasion resistant materials or ceramics also reduce wear them. Also, to reduce dust emissions from connectors can be used to seal self adhesive neoprene gasket for dust to be created. Transfer chute to prevent dust emissions following points should be considered when designing a better shot: shots to be large enough to prevent the flow of materials to be stopped. Shoot for the use of materials that are heterogeneous aggregation shot at least three times the depth is the maximum size of the material.

If possible, it is best materials on a rocky not on a metal surface, the use of stone is recommended for the following reasons:

To reduce dust generation, noise reduction (noise) Input material to absorb impact, reduce wear and corrosion Shoot the surface, reducing the height of material fall. Handling for other types of shots is used. Each with their part to reduce the large amount of dust generated. Including stone stairs shot to prevent collapsed ore used. This shot is made of a steel tower and a number of small rocky plates. Pages arrangement is such that the height of material fall would not be more than 5 to 6 feet.



Telescopic chute with material falling down on the pile height can reduce dust generation. As the pile height increases or decreases based on the shot goes up or down. Low shot pourer funnel for feeding material into the hopper are used. Channels are composed of material from the hopper discharge machining down the steer. Material around the cone inside the bunker shot widen. The shot greatly reduces dust when feeding funnels.



Roller blinds coverings for dust scattered gather around a dust emission sources are used. The following is the cover design for proposed dust source coverage must be significant enough room to let the dust carrying air to circulate. Easy to repair and maintenance, covers separable parts of the equipment must be installed. Sliding doors can be installed to visit a day. Storage hopper for temporary storage is used.

Mainly emit dust from the following locations:

Entries for feeding, visiting doors, releasing dust into the feed hopper can be minimized by the following measures: Install a low shot pourer funnel. Completely enclose the hopper. If the hopper is fully enclosed must visit a door or a level gauge can be installed to control input. Feeder: The feeder can be considered relatively short conveyor to deliver a controlled substance to the process equipment will be used. Dust emissions from a feeder type, size and material depend on the degree of turbulence. Release of a feeder include: in the end, where the materials are received. First, where the materials are unloaded dust emissions can be confined as much as possible and pick up the feeder large or a little turbulence in the materials to create can be reduced. Storage pile two main factors producing the accumulation of dust in a pile of fall height and wind speed are material. Down falling material can be made using the following methods: Use the drop height telescopic keep it minimal. Acting the conveyor Accumulation is similar to telescopic chute. Such conveyors have an adjustable arm that goes up or down based on pile height.

To reduce dust generation by wind can do the following actions:

Insert pile behind natural or artificial windbreak cover the pile with Bitumen or other cheap materials. Passage of heavy machinery traffic routes are always the main sources of dust in the process are considered.

IV. CONTROL AND REDUCE OF AIR POLLUTION IN CEMENT PLANTS

Dust emissions in different ways, depending on the surface condition and has the capacity and speed of transportation. Dust emission pathways can be minimized by the following measures: frequent spraying of water, oil, or other materials on soil stabilization. Paving the way for paving the way it should be cleaned periodically to remove dust collected from the surface. Reducing road traffic transportation by replacing smaller with larger vehicles reduces the speed of vehicles. Air pollution caused by particulate matter PM One of the major problems of environment is mainly developed and developing countries are considered to be mixtures of silica factors known human carcinogen in humans and a major cause lung disease job in the world is mainly through the cement plants humans and the environment face with toxic dust containing free silica should be given to the determination of element concentrations in the air of control and legal aspects of health is important. Pollutants produced from burning materials, kiln dust, dust and material loss due process and exhaust gases from the mill is electro. Proposed strategies to control and reduce pollution, create a fully equipped indoor dust filter holder for single packing, dust filters improve performance, according to the retrieval and reuse and reuse of materials (especially waste), shaving mill cement and raw materials, reduce energy consumption, eliminate storage of clinker dust is to reduce energy consumption.

V. CONCLUSIONS

Cement industry is one of the industries major contributions in the amount of atmospheric pollutants. Dust the crushing and grinding of materials, there is such a high risk of polluting the environment and human health that comes with. Dust generated in the cement industry, during the preparation, transport and storage of materials can study the dust emission control equipment. Reducing the height of the fall of materials during fruiting equipment, enclosures and fences for the containment of dust production, design and optimization of devices to supplement equipment and reconstruction of old equipment, including measures that reduce the production of dust in the processing and handling equipment, have been discussed.

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