Control of Filter Clay Dust: Dust in a filter plants results principally from the operation of the clay handling machinery. The condition is aggravated by the present practice at some refineries by using an air hose to blow accumulated dust and spilled clay from equipment, walls and floors. Handling a fine light dust producing material, such as filter clay, in a system which includes open belt conveyors is inherently a dusty operation. (12,687,360 particles, ten microns or less in size, per cubic foot). It is difficult to prevent some dust from being generated at unloading points where the clay falls into chutes or bins, but it can and should be controlled by means of hoods, enclosures, and adequate exhaust systems with effective dust collectors.

There will always be an irreducible minimum of spillage and dust settlement wherever dusty material is handled in systems such as exist in most refinery filter houses. This is an economic waste and increases the difficulty of the dust control problem. Unless the present practice of cleaning dust spillage by blowing with compressed air is changed, the necessary periodic cleaning will continue to be a very dusty and unhealthful operation even though all precautions have been taken to prevent the escape of dust from clay handling equipment. A modern industrial vacuum cleaning system would do the job efficiently, without creating any dust.

The principal source of dust in filter buildings is the belt conveyor which is usually located at the top of the building. Gusts of wind from the monitor blow the clay and dust from the belt. A certain amount of dust is also generated by clay falling into the tripper chute (6,060,480 particles per cubic foot) and discharging from the tripper chute into the chute leading to the various filters (7,306,560 particles per cubic foot). This could be considerably reduced by inserting canvas or sheet iron connections between the ends of the tripper chutes and the chutes to the filters, and by using a properly designed belt tripper on the conveyer belt.

Bins for the storage of filter clay should be closed with steel decks having the smallest possible openings in the form of chutes to receive clay from the conveyers. If care were taken not to overflow the bins, the dust and spillage could be greatly reduced.

For complete control of dust, an exhaust system equipped with dust collector, fan, ducts and hoods should be installed to remove dust from the points of origin, such as, all unloading points (except movable trippers) of each belt conveyer in the building, new clay bins and burned clay bins. One estimate which has been prepared for such an installation calls for an exhaust system with a capacity of approximately 15,000 cubic feet of dust laden air per minute, and is based on maintaining an inward flow of air at openings into hoods and bins at a recommended velocity of 200 feet or more per minute. In considering dust collectors, it should be borne in mind that the cyclone type will not remove the fine dust particles (ten microns or less in size) which are most injurious to health, and that the cloth bag type filter has been proven to be more successful in removing these fine particles.

Under existing conditions at most plants it is almost impossible to keep the plants clean, regardless of how carefully the equipment is operated. However, the installation of a vacuum system and adequate dust collectors should encourage operators to exercise more care in the operation of equipment and thus cut down the amount of dust and spillage.

B - CONTACT CLAY:

Most contact clays, particularly in the United States, are acid treated "Bentonite". Bentonite is a non-refractory clay, a double silicate of iron and aluminum, derived from the shale of the Fort Benton formation in the upper Missouri valley.