

VIBRA SCREW CASE HISTORY



C-236

Vibra Screw Bin Activator and Feeder In Continuous Service For 13 Years — So Far

Customer

General Refractories Company, Fort Hill, Pa. Producers of refractory brick for use in high temperature applications over 3000° F., in linings for melting and processing furnaces.

Problem

At its Fort Hill operation, the company mines raw fire clay for the manufacture of refractory brick. In the process of mining the clay, a tremendous volume of acid mine drainage is generated, for which water treatment is required. This is accomplished with superfine hydrated lime, whose bulk density is 27 lbs. per cu. ft. During periods of high humidity, the lime is especially difficult to move from storage; it is subject to bridging and erratic flow. In order to meet EPA requirements, the company needed a water treatment system which was thoroughly dependable and capable of sustained operation without shutdowns.

Solution

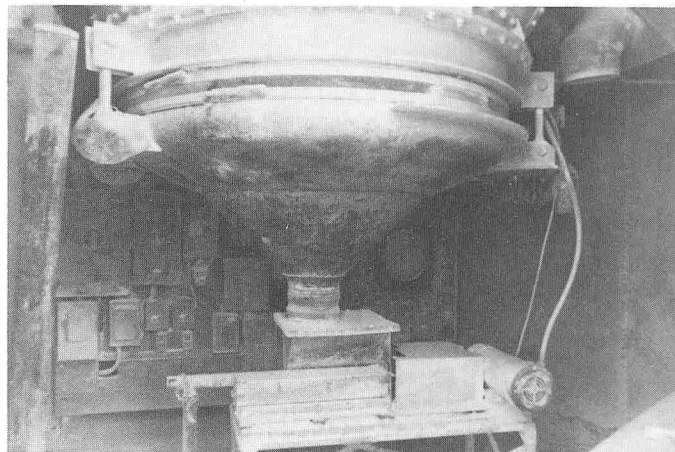
Vibra Screw Bin Activator, 5 ft. diameter, carbon steel construction; Vibra Screw Heavy Duty Feeder HD-2, 1½-in. screw diameter.

In 1968, the company installed a water treatment system composed of a storage silo, a Bin Activator and a Heavy Duty Feeder. The Bin Activator is flexibly mounted to the bottom of a 10 ft. diameter skirted steel silo. The silo is 30 ft. high, and has a capacity of 30 tons. It is filled pneumatically from bulk tank trucks. The Bin Activator employs controlled vibration supplied by a patented gyrator. Powerful horizontal thrusts produced by the gyrator vibrate the Bin Activator, an integral baffle and the contained material but not the bin. Bridging is overcome by the curved baffle which relieves headload and also transmits vibrations far up into the material in the bin. The Heavy Duty Feeder, located below the Bin Activator and receiving lime from it, operates by means of a vibrating trough and rotating and vibrating feed screw. This action of the feeder conditions the material to uniform density, completely fills and empties each flight of the screw, and assures ± 1 to 2 percent feed accuracy minute to minute. Even though flow varies more than tenfold at different times of the year, the system provides consistent flow of lime in the amounts needed for

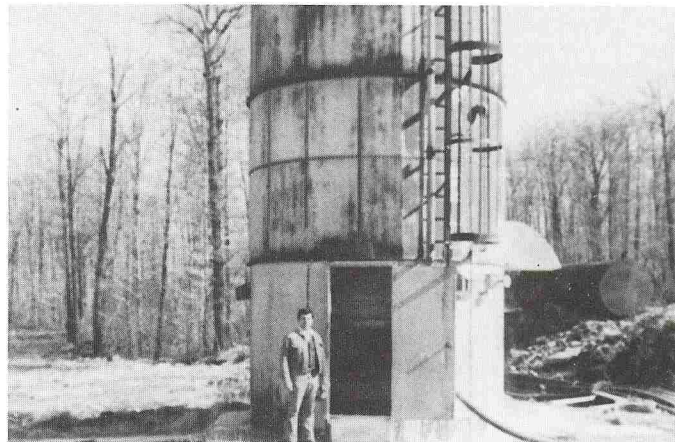
correct pH. Drainage water flows directly under the floor of the silo, and the lime is discharged from the feeder into a flume which travels about 200 feet into four settling ponds for removal of solids before the water leaves the mine.

Results

The original Vibra Screw Bin Activator and Heavy Duty Screw Feeder at General Refractories have delivered 13 years of service, so far. The system continues to be highly successful in meeting its objectives, never failing to meet government requirements and never failing to deliver lime as needed, no matter how humid the weather or how varied the quantity of waste water.



The Vibra Screw Bin Activator and Heavy Duty Feeder provide a consistent flow of lime, as needed, for pH control.



General Refractories' water treatment system is composed of a storage silo, Bin activator, and a Heavy Duty Feeder. It has never failed to meet government requirements in 13 years.