



Bin "Activated" System at Whirlpool Permits Bulk Lime Economy

Customer

Whirlpool Corporation, Clyde, Ohio Division. Prominent manufacturer of washing machines.

Problem

Waste water treatment to meet stringent EPA standards requires the use of lime to control pH at the Whirlpool Clyde plant. Formerly, bagged lime in 50 lb. bags was manually added to a mixing tank, and from there it was gravity fed into process. Bulk density of the lime is 55 lbs. per cu.ft. To maintain accurate solution concentrations, constant personal supervision of the processes was required. Under normal conditions, 15-20 bags of lime have to be added to the mixing tank in a day's time for pH adjustments. Bulk handling would permit greatly improved economy and efficiency if its problems — flow blockages caused by bridging and packing of lime in storage — could be overcome.

Solution

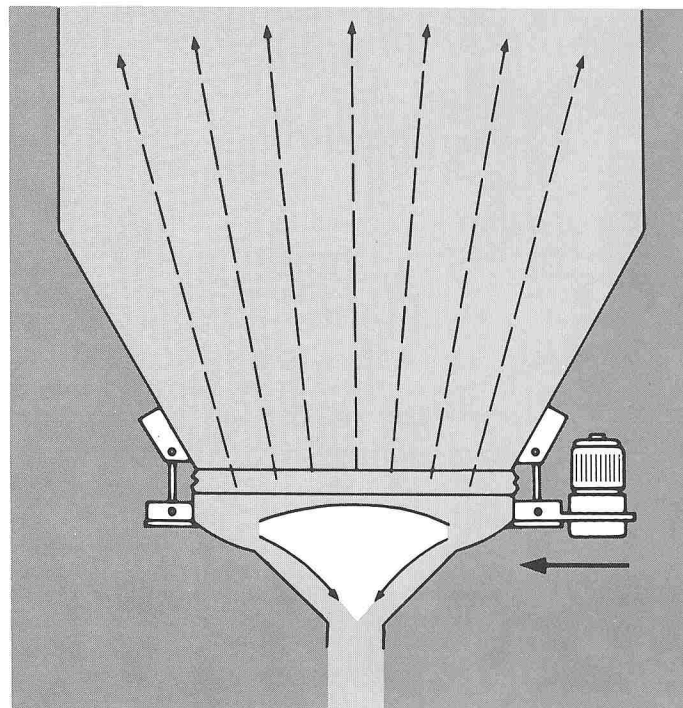
Vibra Screw Bin Activator, 6 ft. diameter, carbon steel construction, preassembled mounting ring.

A new system was designed to take advantage of the economy of bulk handling of lime, using a Vibra Screw Bin Activator to overcome flow difficulties. In this system, the Bin Activator is mounted by means of a preassembled mounting ring to the bottom of a 12 ft. diameter bolted steel silo (capacity: 2450 cu.ft.). The Bin Activator is a discharger which uses controlled vibration to provide a steady, uninterrupted flow of lime. A patented gyrator, mounted to the Bin Activator, provides horizontal thrusts which vibrate the Bin Activator and material in the bin, but not the bin itself. An integral baffle, mounted directly above the discharge outlet, relieves the headload and transmits the horizontal thrust into vertical forces which penetrate far up into the material in the bin. Lime flows freely at different rates as desired from the bin into a 40 cu.ft. slurry bin. A 24-in. dual feed

screw maintains a 60% solution which is pumped by a diaphragm metering system to various processes. When major pH adjustments are required, bulk additions can be made straight from the Bin Activator, for example, when batch treating specific processes. This eliminates the necessity for manual handling of even just a few bags of lime for special adjustments.

Results

The new system provides more efficient control of pH and lime slurry concentration. It achieves substantial economy through bulk lime handling, and because it is an enclosed system, it results in better environmental conditions through cleaner air. Other important benefits are the system's low maintenance and the fact that it virtually "runs itself."



Bin Activator cross-section shows how particles are disengaged by horizontal force, preventing bridging and packing.