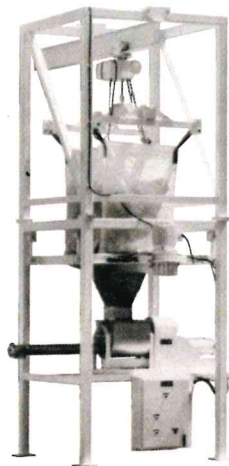


Controlled Vibration Equipment

Bin Activators



Bulk Bag Unloaders

The Bulk Bag Unloader from Vibra Screw provides a safe, dust-free and convenient way to handle and discharge bulk bags.

It's available in several configurations to accommodate all styles of bags and all discharge requirements. These range from a receiving hopper and frame for customer-supported bags, to a complete bag handling station with integral bag hoist and trolley.

All models are available with or without vibration, depending on material handling difficulty.



Bin Activators mount under any new or existing storage bin or silo to overcome the problems of bridging, rat-holing and intermittent flow. A vibrating internal baffle relieves the final outlet of the headload of material in the bin.

The patented Vibra Screw gyrator is guaranteed for 20,000 hours continuous, 24-hour per day operation, without relubrication. Available in sizes from 2 to 18 ft.

**We
keep
bulk
materials
moving.**

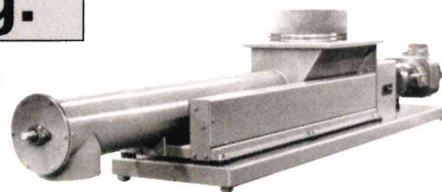


Live Bottom Bins

A combination of a static bin and a Bin Activator in a single, integrated, self-contained package.

Live Bottom Bins are particularly suited to applications where particle segregation is a problem. They handle everything from micron-size powders to fibrous and flaky materials.

A Live Bottom Bin subjects the bin bottom and contents to controlled vibration, conditioning the materials to a constant bulk density.



HD-2 Heavy-Duty Screw Feeders

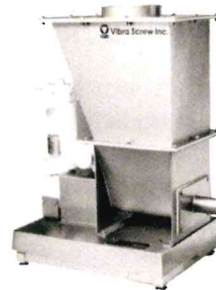
These ruggedly constructed Volumetric Screw Feeders employ controlled vibration for dependable feeding of a wide variety of materials. They include few moving parts, and offer accuracies within $\pm 1\%$ in most applications. Capacities range from .28 to 9,800 cubic feet per hour. Screw speeds are variable over a range of 20 to 1. Available in 1 in. to 16 in. screw sizes.

Pan and Tube Feeders/Conveyors

Vibra Screw's line of Vibrating Feeders and Conveyors offers a simple and efficient means to meter and convey your dry bulk material. These open or closed units will handle nearly any material, regardless of size and bulk density, in a reliable and economical manner.



Loss-In-Weight Feeders



Vibra Screw Loss-In-Weight Continuous and Batch Weigh Feeders provide unparalleled versatility in handling a broad range of feeding requirements with high accuracy.

Feed rates of from 1 lb to 24,000 lb per hour can be accommodated with accuracies of $\pm 0.5\%$ minute-to-minute at 2 sigma.

CASE HISTORY

Non-stop batching succeeds at Owens Corning India

Reliably metering the ingredients is crucial at "world-class" glass fiber plant.

Owens Corning India Ltd. (OCIL), opened its plant in Taloja, India, in August 1998. The plant, located about 25 miles from Bombay (also called Mumbai), makes glass fibers in two forms: chopped-strand mats and rovings.

Chopped-strand mats are sheets of randomly oriented strands bound together. Rovings are loosely gathered fiberglass strands. Both products are used to reinforce plastics. The reinforced plastics—called composites—are then used to make products for the



These storage bins are the heart of the batch house at OCIL's glass fiber plant in Taloja. The plant opened in August 1998.



Specialists in the precision processing of dry materials

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transportation, telecommunications, and construction industries. Examples include automobile parts, cable sheathing, and shower enclosures.

According to Greg Morgan, plant leader at Taloja, composites have a bright future in India. "If you look at consumption of composites per capita here, it's less than what it is in other parts of the world," he said. "It was a great opportunity for us to develop a market in India." The Taloja plant also supplies glass fibers to customers in the Middle East, Europe, Australia, and the Asian Pacific.

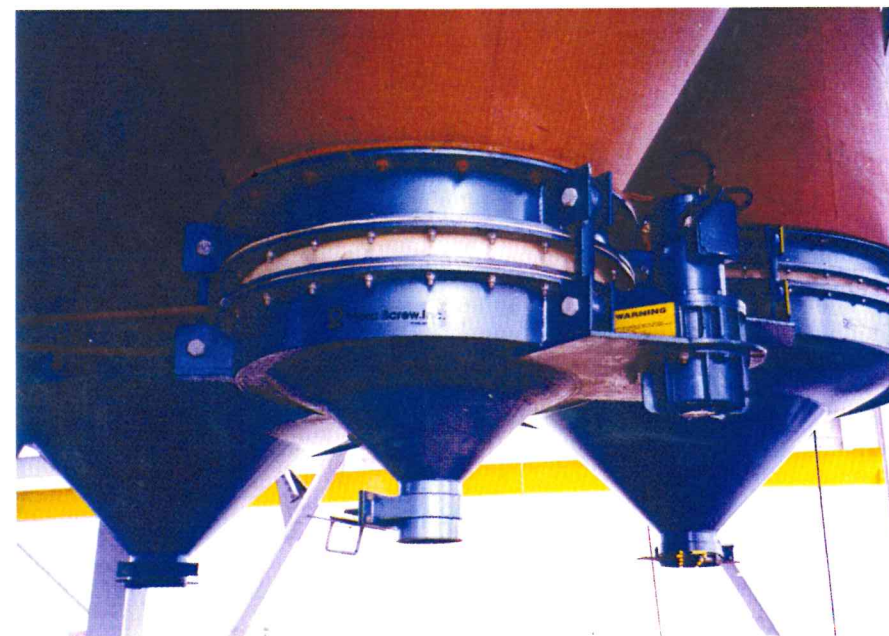
No supervisors required

From the beginning, Owens Corning planned the Taloja plant to be "world class," Morgan said. It began with the workers. "We probably have the most highly educated workforce in any of our plants in the world," Morgan said. "On average, our operators have 2 years of college education, and many have had 3 years of college." All the operators also have previous electrical and mechanical experience.

Well-educated operators are a big advantage, Morgan said, because their knowledge enables them to handle in-process maintenance and minor equipment change-outs, in addition to operating the equipment. Those abilities, in turn, enabled OCIL to eliminate plant supervisors and distribute authority broadly. At Taloja, there are only three levels of authority. This is a new concept in India, Morgan said. "It is probably as new and as exciting to India as anything we've done. And it allowed us to bring in very modern, very sophisticated equipment to do our job."

Born in the USA

The Taloja plant began in the United States, where engineers at OCIL's parent company, Owens Corning, designed the Taloja plant and specified its equipment. The plant has three main areas. First is the batch area, where ingredients are brought together. Second is the furnace and forming area, where glass is made and fiberized. Third is the fabrication area, where the chopped-strand mats and rovings are produced.



Bin activators ensure that the ingredients flow consistently. (The photo was taken before the loss-in-weight feeders were installed.)

Modern equipment and well-educated workers keep the plant running smoothly.

After getting the equipment ready, OCIL worked with an Indian joint venture partner and other Indian companies to help find workers and to import, install, and operate the equipment. Here is a look at how the plant batches dry ingredients to the furnace.

Stocking the ingredients

The glass fibers are made from four major ingredients and several minor ingredients. The major ingredients include silica, clay, and limestone.

All the ingredients arrive at the plant in bulk bags, also called flexible intermediate bulk containers (FIBCs). Bulk bags were a new approach for many of OCIL's vendors. "They were used to dealing with 50-kilogram bags," Morgan said, "but this is a large facility, so we didn't want to do it that way."

Workers transfer the bulk bags from the trucks to bulk bag unloaders. Workers then untie the bottom of the bag, allowing the contents to drop through a chute into a pneumatic conveyor that transports the ingredients to the correct bin. Workers in the batch house wear protective masks, but dust isn't a problem. "I was really concerned about that," Morgan said. "When you're handling that many bags, the dust could be a problem. Our batch houses perform well. We have very little dusting."

To ensure that the incoming ingredients meet OCIL's specifications, each shipment is tested in the plant's laboratory. OCIL had some early quality problems with the shipments, Morgan said, but "once we got [the quality] worked out with our suppliers, we've had no problems at all."

Batching non-stop

The major ingredients are kept in storage bins that hold 70 to 260 cubic feet of material, and each bin has a bin ac-



Heavy-duty screw feeders mounted on load cells batch the ingredients to a mixer.

tivator at its outlet. The bin activators include a top section that is bolted to the bin and a bottom section that is connected to the top section by forged steel hangers. A seamless rubber sleeve spans the gap between the two sections and isolates the bin from vibration. A direct-drive motor mounted on the lower section powers a gyrator that creates vibration. The vibration, the shape of the bin activator, and internal baffles ensure that the material flows consistently from the storage bins in a first-in, first-out manner.

Directly under each bin is a weighing and feeding system, which may include a live-bottom bin. The live-bottom bins act as buffer storage vessels and have vibratory bin activators similar to those on the other bins.

The weighing and feeding system transfers the ingredients to a blender in the batch house basement. Next, a pneumatic conveyor sends the mixture to the furnace area for further processing. This process is repeated 24 hours a day, 7 days a week.

Reliable feeding

According to Morgan, who has worked at Owens Corning 26 years, the Taloja plant is the first to use this batching technology to proportion glass fiber ingredients. Previous plants used single-ingredient scales. The new approach has performed well at Taloja. "It's been great," Morgan said. "From day one, [the batching system] has operated very well, with tolerances that are as good as anything we have anywhere in the world. We do

also have a backup system since this was our first system like this."

In addition to its accuracy, the batching system is reliable. In fact, the system is so reliable that "one shift per day, we let it run on its own," Morgan said. "The entire batch system is tied into our furnace control system, so we can monitor the batch house."

The batching system is "as good as anything we have anywhere in the world," says the plant leader.

And the contractors at the plant help, too. "We let them deal with the specialty equipment," Morgan said. "For things like the furnace control system and the batching and mixing system, there are experts who are better at that than we are." Of the 300 workers at the plant, only a few are needed in the batch house. "We tried to build something different here as far as an Owens Corning facility," Morgan said, "And so far we've been pretty successful."

PBE International

Bulk bag unloaders, bin activators, live-bottom bins, and feeders: **Vibra Screw, Totowa, NJ USA.**

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The photo shows the live-bottom bins and heavy-duty screw feeders before shipment to the Taloja plant.

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