

Technical Article Series

Vibratory sifter speeds flow of flour.

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Regional commissary prepares dough for 60,000 pizzas/day

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When you make a good pizza and get it from customer order to home delivery quickly, word travels fast. Reliable service builds product demand. To meet this high volume, hundreds of Domino's Pizza stores have been opened during the past year. Today, the company has more than 4,200 stores throughout the world, and continues to expand.

Flour dough and other ingredients for pizzas are distributed through 35 regional commissaries. Typical of this operation is the DNC Michigan Commissary at Ann Arbor, which services pizza stores in Michigan, northern Ohio, and northern Indiana. Dough for 60,000 pizzas a day is prepared at this plant

When the Ann Arbor commissary first opened, bags of flour were handled manually. Heavy 100-lb bags were carried from storage and dumped into a mixer. This system was acceptable for small quantities of flour, but inefficient for the increasingly large volumes of dough now needed.

In January 1987, an automatic flour handling system was installed to increase production, relieve workers of heavy lifting tasks, and ensure that no lumps of flour or foreign material got into the pizza dough. Also, the new operation is cleaner since there are no dusty bags to handle.

With the new procedure, tank trucks now deliver bulk quantities of hard grain wheat flour regularly to a unique rectangular inside storage bin. The 12-ft wide by 28ft long by 17-ft high storage bin holds up to 128,000 lb of flour for dough making operations. Flour travels through 4" diameter conveying lines at 12 psi pressure into the bin. Unloading takes about 1/2 hours per truck.

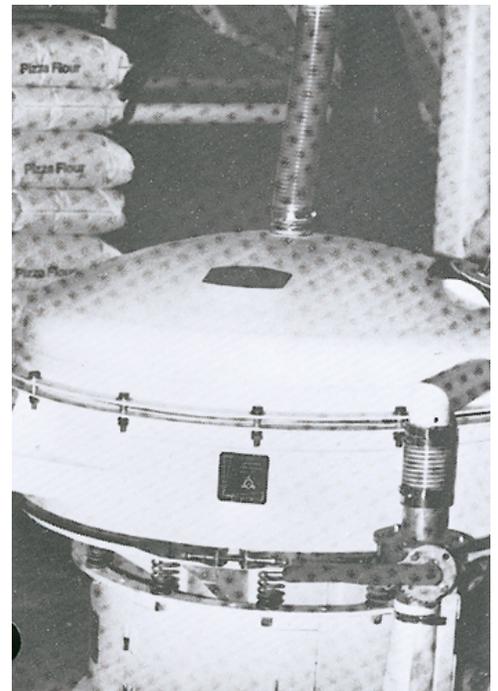
Two 13-ft long airslide assemblies in the base of the bin feed product through a rotary airlock into a pneumatic conveying system. A pressure blower keeps flour flowing through the lines and prevents formation of cavities or air pockets in the bin.

On demand, the positive pressure pneumatic conveyor moves the flour from bin to production room. Flour flows through a circular vibratory pressure sifter to the scale hopper. The high volume system operates at 8 psi pressure. Flour travels 150 ft through 3" diameter conveying lines, around 90° elbows, and up a 30-ft lift to the scale hopper.

The vibratory pressure sifter operates from midnight to 10 a.m., seven days a week. The 48" diameter machine sifts flour through 22 mesh tensile stainless steel screens at 200 lb/min, ensuring delivery of a high quality filtered product.

Since flour tends to blind the fine screens, a "ball tray" was installed under the screen to increase sifting efficiency: The tray holds 100 food-safe "bouncing balls" which keep the flour agitated and the screen clog-free.

The vibratory pressure sifter has proved ideal for this service. Adjustable top and bottom eccentric weights enable the machine to handle various types of flour. Weights are independently variable for mass and angular relationship. If mass of the top weight is increased, the horizontal throw of the screen also



Flour flows through vibratory sifter at 200 lb/min

increases. Increasing the bottom weight amplifies vertical movement. This allows a maximum quantity of undersize material to flow through the screen without blinding.

The angular relationship between top and bottom weights also controls the flow pattern that any oversize material will follow on the shaker screen. Once optimum settings have been achieved, it is easy to maintain uniform performance. A vibration amplitude gauge gives the operator a visual check on horizontal and vertical motion. This results in maximum screening efficiency.

Flow rate from sifter to scale hopper is 200 lb/min. The hopper holds 1,100 lb of sifted flour. Product flow automatically turns off when the desired size batch has been received. A 3" diameter conveying line carries any excess flour back to the storage bin for reprocessing.

Weighed quantities of flour, generally 300-lb batches, are transferred from the scale hopper to a mixing kettle for final blending. This takes about four minutes.

The finished dough is rolled into individual balls and packaged 10 to a tray for delivery to pizza stores. Required quantities of other ingredients such as tomato sauce, cheese, sausage, onions, peppers, and mushrooms are also packaged for store deliveries. Store orders are shipped out every night in temperature controlled (35° F) refrigerated delivery trucks. .

Additional information on the Blo-Thru® circular vibratory pressure sifter and auxiliary flow control equipment may be obtained from the Kason Corp.