

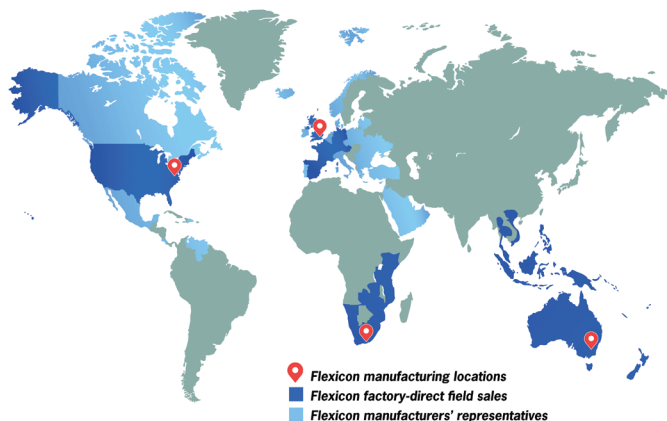
FLEXICON CASE STUDY



Raw material is manually fed into floor-mounted hopper from which flexible screw conveyor transfers material through the wall to the pulverizer in adjacent process room. A second hopper and flexible screw conveyor run parallel to the first bulk solids handling line.

Bulk Food Processor Boosts Capacity 3-Fold With Flexible Screw Conveyor

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Bulk Food Processor Boosts Capacity 3-Fold With Flexible Screw Conveyor

Food and Spice Product Manufacturing Ltd. increased production of vegetable puree products from 5 tons/week to 15-20 tons/week after installing a new bulk solids handling system consisting of flexible screw conveyors, hoppers and controls. F&S also received a more consistent mix with better taste, more accurate pH readings, and improved worker safety. The company met growing demand for its products by adding only one additional operator.



From pulverizer (left), puree is transferred through a second flexible screw conveyor to two gate valves from which line-end operators fill buckets.

3-Fold Capacity Increase Required

F&S needed to improve efficiency to meet rapid growth of its business. The company also needed to comply with new British health regulations limiting manual load handling to 33 lb (15 kg).

Within F&S's original 8,000 sq. ft. (740 m²) facility, a forklift truck placed trays of raw foods, such as ginger, lemon grass and garlic, on a 10 ft high gantry from which two operators deposited the foods and preservative into a pulverizer. A pump system transferred the vegetable puree from the pulverizer into a loading hopper, then into 11 lb (5 kg) and 55 lb (25 kg) buckets after sanitation checks to prove the product safe and free from foreign bodies.

Two operators weighed and packaged the buckets for shipment to food processors such as Sharwoods, Nestlé and McCormicks. Another operator washed down and prepared the system, and two more operators carried out general duties and delivery. Weekly output was limited to 5 tons.

Bulk Handling System Meets Rapid Growth

After trialing a prototype bulk solids handling system, Flexicon Europe Ltd. installed the first of two systems to raise output at F&S.

Workers no longer climb and deposit material from the gantry, instead unloading trays of raw material and preservative into a 660 lb (300 kg) capacity loading hopper at floor level. Fitted over the mouth of the hopper is a tray support and safety grill to hold the trays while the operator feeds material. A low-level sensor and vibrator in the hopper promote uninterrupted flow of product into the intake adapter of a flexible screw conveyor.

The 10 ft long, 4.5 in diameter flexible conveyor, at a 45° angle, is routed through the wall separating the storage area from the process area to transfer the raw material and additive into the pulverizer. The conveyor tube encloses a motor-driven, self-centering, flexible stainless steel flat-wire screw, which blends the product in transit as it rotates within the tube. The flat-wire screw conveys the light material by applying a positive directional force while reducing the radial force against the outer tube's walls.

The pulverizer empties the puree into a second 660 lb capacity floor-mounted receiving hopper, also fitted with a low-level sensor. The puree is conveyed through a second 6.5 in (165 mm) diameter flexible screw conveyor, which curves 22 ft (6.7 m) to a height of 8 ft (2.4 m), carrying the product to two gate valves in series. Beneath the gate valves, operators fill either 2200 lb (1000 kg) vats or buckets ranging from 2 to 33 lb (.9 to 15 kg) capacity for palletizing and shipment. The second flexible screw conveyor houses a round-wire screw to move the high mass puree mixture.

From a control panel in the factory storage area, an operator turns the flexible conveyors on and off, selects and controls the gate valves, and indicates the level of material in the hoppers.

System Easy to Clean

The flexible screw conveyors can be reversed, fully evacuated, and cleaned-in-place, streamlining another labor-intensive task. The previous pump circuit, with its series of pipes, seals and clips, had to be disassembled for cleaning — a time consuming process.

Fulfilling food safety regulations, all material contact surfaces of the bulk solids handling system are made of food quality, high-grade stainless steel with continuous welds ground and polished.

Output More than Triples

As the new bulk handling system facilitated the three- and four-fold jump in output, F&S needed a larger facility. After relocating, in September 1999 F&S turned again to Flexicon to design and install another, still faster line paralleling the first.

With both lines fully operational, production has surged to more than 50 tons per week, positioning F&S as a major supplier of vegetable purees.

The bulk handling system delivers a puree of more consistent quality as the raw material and additives are mixed three times: through two flexible conveyors, and in the pulverizer, improving taste and pH consistency while improving worker safety.



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