

Filling System Mines Competitive Edge for Kaolin Producer

The sunny state of Georgia is famous for peaches, pecans, and southern hospitality, but Georgia is also famous for kaolin. Commonly known as china clay, kaolin is an important mineral used around the world in hundreds of products such as paper, porcelain, paints, sealants, adhesives, plastics, insulation, and more. With more than 2.5 million tons of kaolin shipped out of Georgia's kaolin belt every year, this mineral is the state's largest volume export, worth more than \$800 million.

Given its value and a very competitive marketplace, processing speed and efficiency is extremely important to kaolin producers. Processed kaolin – with its extremely fine particle size – is very powdery, highly aerated, and notoriously difficult to handle. The material is sold in bulk, often in bulk bags, which proves to be a challenging part of producers' operations.

One of Georgia's large kaolin producers needed to streamline a bottleneck in its process operation – filling 2400-lb bulk bags for export. Its existing labor-intensive process yielded only 7.2 bags per hour. Additionally, they couldn't successfully deaerate the material, making it impossible to produce upright, evenly filled, safe, and stable bulk bags. Filled bulk bags sometimes fell over, resulting in safety issues, broken bulk bags, contaminated product, and certain productivity loss. If the kaolin could be reliably densified, and the bags filled faster, production and profitability would be increased and operator safety and productivity improved.

the bagging rate from 7.2 to 12 bulk bags per hour (14,400 lb per hour using 2400-lb bulk bags) and successfully densify the material so the filled bags were upright, evenly filled, safe, and stable. The process must be automated for maximum safety and productivity using a PLC control panel communicating to the plant-wide DCS.

Spiroflow engineers evaluated the current filling system in place and recommended a new dual automated filling system based on their high-speed, densifying CTE (Cone Table Elite) bulk bag fillers. The CTE filler utilizes Spiroflow's patented cone table densification technology for maximum product densification. This ensures that even the most difficult-to-handle products can safely be packaged in stable, uniformly filled bulk bags. The CTE filler also delivers the required high-speed filling capabilities. Depending on the application, CTE bulk bag fillers are capable of filling over 35 bags per hour.

Spiroflow's recommended system included dual CTE bulk bag fillers with an operator platform between the fillers, a slip sheet dispenser beneath the operator platform, an automatic bag removal (ABR) shuttle between the fillers, two powered roller conveyors, two gravity roller conveyors, and a control panel.

The new recommended filling system would streamline process steps:

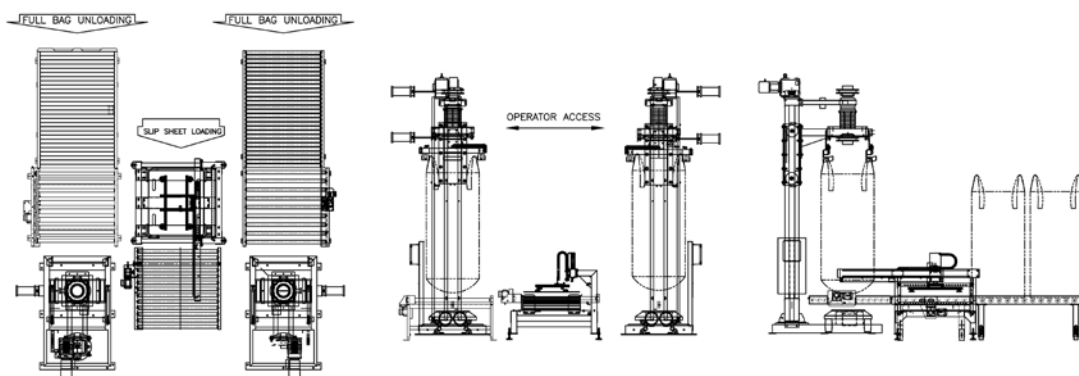
1. The operator installs an empty bulk bag onto CTE filler A and B and starts the automated process from the control panel.
2. Each bulk bag is filled and densified.
3. The slip sheet dispenser places a slip sheet onto the ABR shuttle.
4. The ABR shuttle moves the slip sheet beneath the filled bulk bag for CTE filler A and B.
5. The filled bulk bag automatically advances to the powered roller conveyor and then to the gravity roller conveyor.
6. The filled bulk bag is removed by forklift.

The CTE bulk bag filling system delivered on each requirement and works so well that this major kaolin producer has since added a second dual filling system.

Results

Faster Bulk Bag Filling

- 40% bagging rate increase
- Added capability to fill shorter 1900-lb bulk bags



The CTE bulk bag filler

The company's project engineering manager consulted Control and Metering, a Spiroflow company. The specific objectives were to reliably increase

Increased Productivity

- The required number of operators was reduced from 4 to 2 per shift.
- Filled bulk bags are upright, stable, and no longer fall over.
- A single forklift operator removes filled bags from both systems.
- Filling systems run 24 hours per day, six days each week.

Cost Effective

- By reducing the number of operators required, the company saves \$240,000/year (based on estimated \$40,000/operator/shift/year/system).
- Bulk bags enable more efficient packing into shipping containers, taking up less space and reducing shipping costs.

Safer

- The operator doesn't have to reach into the CTE bulk bag filler to install the bag spout.
- Removing & warehousing filled bulk bags is safer because the bags are upright and stable.

Reduced Waste

- The amount of unsalable contaminated kaolin from broken bags is reduced.
- The number of broken bulk bags is reduced.

Cleaner

- Filled bulk bags no longer fall over and break open, resulting in a cleaner environment.


Spiroflow Systems Inc., Monroe, NC, manufactures equipment for handling dry bulk solids and ingredients in powder, granule, pellet, and flake form, as well as automatic bagging and robotic palletizing. For more information, visit www.spiroflowsystems.com.

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