

Limited space inspires smart custom engineering

In the production of potato specialties, accuracy, hygiene, and flexibility are critical success factors. This was also the case for a major producer in Belgium, where a new installation was required to supply dry ingredients to four specialty production lines. TBMA Belgium delivered a complete, flexible solution for storage, dosing, weighing, pneumatic conveying, and process integration.

Potato specialties

At the Belgian potato products manufacturer's production site, potato specialties such as croquettes and products based on mashed potatoes and potato shreds are produced alongside French fries and potato flakes. Ingredients are received and stored in a separate dry ingredients area and then conveyed pneumatically to the production lines. One of the key challenges for the new installation was that all four lines needed to operate simultaneously and independently of one another.

Limited height determines design

A second challenge emerged early in the project: the restricted installation height within the ingredient handling building. Many standard components, such as sieves, receiving hoppers, and dosing systems, require additional height because of the necessary product hoppers and transition pieces. As a result, there was a risk that insufficient space would remain for an efficient process layout. For TBMA, this meant that, in addition to applying proven technologies, new and more compact solutions had to be developed.

Independent dosing

The potato flakes, which are produced on-site and used as an ingredient in other products, are stored in two existing silos. Since all production lines must operate in parallel and independently, reliable and separate product extraction was essential. To achieve this, a multi-screw dosing system was installed beneath both silos. This system provides fast and accurate dosing to the individual conveying lines and prevents the production of one line from becoming dependent on the demand of another. The multi-screw dosing concept fulfilled an important basic requirement: each line can process its own recipe at any time without affecting the other production lines.



Detail of the multi-screw dosing system for potato flakes



Compact sieve as a key component

In addition to potato flakes, salt, dextrose, and spice blends are added to the products. These ingredients are supplied in big bags. For quality assurance reasons, the customer required a safety sieve beneath each big bag unloading station to capture foreign materials before they could enter the process.

However, due to the restricted height in the building, no standard solution was suitable. TBMA therefore developed its own compact safety sieve with an inlet and outlet diameter of 500 mm.



TBMA compact sieve with inlet and outlet diameter of 500 mm

The design eliminates the need for additional hoppers on both the inlet and outlet sides, minimising the loss of installation height. An additional advantage is that the product is distributed evenly across the entire surface of the feeder below. This prevents capacity losses caused by the material's natural angle of repose and ensures optimal utilisation of the available dosing capacity.

The safety sieve is combined with an LB2 discharging hopper. A large inspection hatch allows coarse contaminants to be removed easily. Thanks to quick-release clamps and flexible BFM connections, the screen deck can be removed quickly for cleaning or inspection.

Precise dosing

Salt and dextrose must be dosed to all four production lines. To maximise flexibility and accuracy, TBMA selected a configuration with four separate weigh hoppers beneath each unloading station.

Each batch is accurately weighed using PCF feeders. These feeders feature a slowly rotating agitator that moves around the dosing screw. This ensures a constant bulk density and filling degree of the screw, resulting in a stable and repeatable dosing performance. Particularly at low feed rates, this significantly improves dosing accuracy. For the dextrose, a quick-release lump breaker was also installed to efficiently reduce any agglomerates before the product enters the process.

Flexible switching between spice recipes

The handling of spice blends presented another major challenge within the project. Because recipes are changed regularly, it is common for a big bag to remain partially filled when a different spice blend is required.

Traditional big bag closure systems are often impractical in such situations. They work mainly when product is actively flowing from the bag, whereas controlled closure of a stationary column of material can be difficult.

TBMA opted for a solution that allows both the remaining contents of the feeder and the product from the connected big bag to be discharged back into an empty big bag in a controlled manner. This provides maximum flexibility during product changeovers while minimising product loss. To further simplify cleaning and product changeovers, the dosing screw can be completely withdrawn from the housing via a linear guide system.

In addition, the feeder features an extra outlet with a manual shut-off valve, allowing residual product to be removed quickly.

Batch and continuous processes

For the two batch production lines, potato flakes are weighed directly into receivers located above the batch mixers. The other ingredients are weighed simultaneously in separate weigh hoppers and then conveyed pneumatically, one after another, to the production lines.

A different configuration was selected for the two continuous production lines. Here, each line is equipped with a continuously operating PFF450 feeder. This feeder is fed from a batch mixer, which in turn is filled from a receiver. All dry ingredients are first conveyed pneumatically to this receiver. After mixing, a homogeneous product is created and continuously fed into the production process. In this way, the accuracy of a batch system is combined with the process stability of continuous production.

From customer requirements to innovative system

The installation was delivered and commissioned in phases. The system is now operating successfully and meets all requirements regarding capacity, dosing accuracy, flexibility, and cleanability.

The project is an excellent example of how specific customer requirements can lead to innovative engineering solutions. In particular, the compact safety screen, the modular dosing concepts, and the flexible handling of spice blends demonstrate that smart custom engineering is often the key when standard solutions fall short.

Focus on maintenance-friendly and easy-cleaning

Because the Belgian potato specialty producer regularly switches between products and recipes, cleanability and ease of maintenance were important design criteria for TBMA when developing the flexible dosing system. The receivers are therefore equipped with a hinged roof, allowing the entire filter package to be removed easily. As a result, all product-contact parts are easily accessible for inspection and cleaning.

The batch mixers have also been designed for quick cleaning. The complete mixing element can be rolled out of the machine, while the end cover on the opposite side opens fully. The HARDG rotary valve beneath the mixer and the PFF450 feeders are quickly demountable and equipped with guide rails. This provides operators with safe and unobstructed access to all product-contact surfaces for inspection, cleaning, and maintenance.



Quickly demountable batch mixer equipped with a rail system and residue collection tray