

## CIP-Able Ingredient Handling System with an Innovative IBC System

**Daxner's innovative concept meets highest requirements for a modern bakery ingredient mixing facility - high throughput, utmost dosing accuracy, reduced dust generation and cross contaminations, easy cleaning inclusive CIP-cleaning and ergonomic operation. This can be achieved by the pneumatic feeding of large components in combination with a fully automated container system for the collection of medium and small components.**

by DI Christian Daxner

Daxner has designed a flexible, automated blending and dosing system for the production of various ready-made bakery ingredient mixes, which consist of a very large number of different ingredients, such as sugar, various flours, starches, cooking fat etc.

Daxner developed an innovative system with due regard to easy cleaning, dust-free powder handling and prevention of cross contaminations, in order to exclude reciprocal contaminations.

*Flexible, automated blending and dosing system for the production of various ready-made bakery ingredient mixes*



A decisive criterion is the strict separation of components, which contain allergens, from those products, that are allergen-free.

### Project requirements

The system solution for a leading international baking agent manufacturer consists of a flexible automated mixing and dosage system for the production of a variety of prepared baking agent mixtures from many individual components, such as sugar, various

*Mobile intake station Vib&Press for IBC loading of minor ingredients*



flours, starch, cooking fat and other components. Daxner has developed an innovative process for optimum cleanability, dust-free powder handling with no contamination in order, as far as possible, to avoid any cross-contamination (=contamination free production below 10 ppm). A decisive criterion was the strict separation of products with allergens and allergen-free portions. Another requirement was a high performance level of up to twelve tonnes of ready-mix per hour. The cleaning system was selected based on the established hygiene plan. In consultation with the customer, Daxner decided that the best possible way of cleaning the components would be to use the COP (Cleaning Out of Place) principle, dry cleaning and CIP cleaning, i.e. automated wet cleaning based on the Cleaning in Place principle. The Daxner Container-Handling System (DCS) also met the requirement for a flexible product and production changeover. Other important aspects were, in addition to the high mixing accuracy (1:100,000), an ergonomic design, the prevention of dust accumulating and the fulfilment of the hygiene regulations and statutory requirements.

### Process technology

All ingredients are divided into large, medium and small components. Large components are stored into outdoor silos and are pneumatically conveyed to the two mixing lines. Medium components are stored in daily silos which are fed by mobile intake stations with integrated control screens.

The medium components are then dosed and weighed out of the daily silos into the below positioned container or IBC (Intermediate Bulk Container) by the means of a dosing screw conveyor

with rough and fine dosing which is connected to the silo discharge device. A highly precise active and passive valve system enables the fully automated connection to the filling opening of the IBCs.

The mobile intake station VIB&PRESS (inclusive control screen and stirring device) fills the pre-commissioned small components directly into the IBC.

A three-dimensional container transport system, which consists of an automated storage and retrieval system with chain conveyors and a shuttle-system, conveys the IBCs fully automated to all collecting points (medium and small components), subsequently to the mixing line and finally to the discharge of the collected product batches. The IBCs are docked on and off at these stations. The mixing plant consists of a high precision vertical blender. The blending principle is based on a reverse flow which is generated by a rotating screw belt in the mixer. Block fat is dissolved in the mixer through cutting rotors. The geometry of the screw belt ensures that the product always runs through the cutting rotors.

The design of the mixer is in compliance with the highest hygienic regulations - no edges and corners with utmost surface quality. The batch mixer discharges into the mixer receiver bin with an integrated stirring discharger, which simultaneously serves as a receiver bin for the high performance bag filling station. Both the IBC and the entire mixing line are equipped with a fully automated wet cleaning system (CIP), which covers the cleaning cycles, such as rinsing, washing, sterilizing, rinsing the product with clean water and a subsequent drying process.

### Detailed technical solutions

The container connection system using a high-precision double flap system complies with the highest hygiene requirements (pharmaceutical design) and consists of a stationary active valve and a mobile passive valve, which is mounted on the IBCs. Since simply the stationary active valve needs to be provided with electricity and pressurized air, the fully automated docking

of the transport containers/IBCs can be achieved.

During the transport process the passive valves shut the in- and outlet of the IBC hermetically, whereupon the leakage of any transported product (allergene) can be completely prevented. While loading and discharging the IBC any dust leakage and therefore any cross contaminations can be prevented through the locking mechanism when docking onto the IBC. The complete assembly module of the active valve with the corresponding extraction mechanism enables a quick removal and transport of the complete IBC-connection module to the COP-Station.



*Daxner installed a fully-automated mixer loading through suction vehicles for the external silos and a 3-dimensional container transportation system*



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