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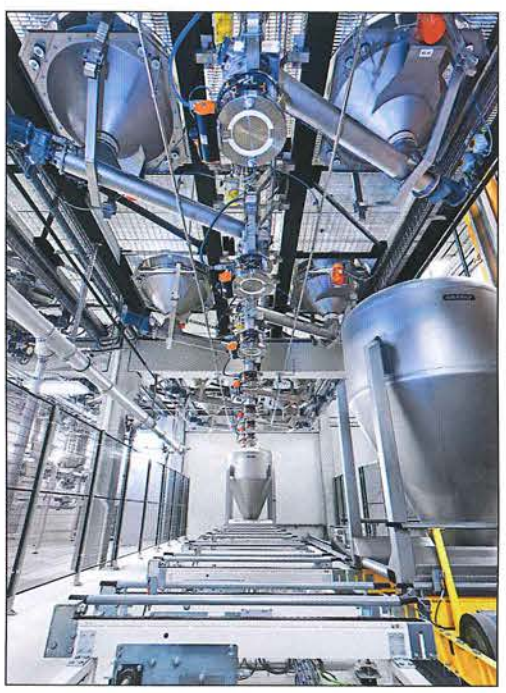
AZO can now offer a sophisticated system which is capable of dry cleaning the interiors of IBCs and similar transport/storage vessels; unlike with wet cleaning, problems and costs associated with disposal of contaminated or toxic wastewater are avoided, as described on p14.

Bunting Magnetics Europe recently supplied advanced metal separation equipment to Recapture Plastics' recycling plant in Rochester, Kent, UK (as described in our special feature on p12); pictured are Bunting managing director Simon Ayling (left) with Neale Buttery, Recapture's operations manager.



Daxner has designed and installed an advanced bakery ingredients mixing plant, featuring an automated IBC transport system, which breaks new ground in terms of powder dosing accuracy, hygiene, flexibility, reduced dust generation and minimal cross-contamination, as described on p10.

The Kinexus rheometer from Malvern Instruments – which offers extensive capabilities in advanced rheology and viscosity measurement – is currently playing an important role in research being undertaken by Germany's Clausthal University of Technology into the physical properties of drilling fluids (see p11).

IN THIS ISSUE

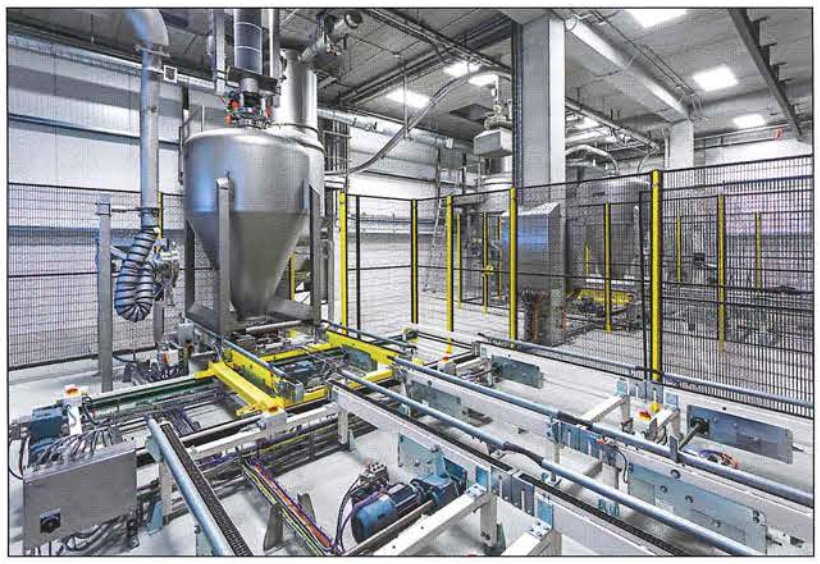
Sophisticated bakery ingredients handling with innovative IBC system

Ing. Johann Daxner, Wels, Austria, recently designed and delivered a flexible, automated blending and dosing system for production of various ready-made bakery formulations comprising a large number of different ingredients such as sugar, a variety of flours, starches, cooking fat, etc.

Project requirements

The system solution for a leading international baking agent manufacturer consists of a flexible automated mixing and dosage system for production of a variety of prepared baking agent mixtures from many individual components, such as sugar, various flours, starch, cooking fat and other ingredients. Daxner has developed an innovative process for optimum cleanability, dustfree powder handling with no contamination in order – as far as possible – to avoid any cross-contamination (with a target for contamination-free production set below 10 ppm). A decisive criterion was the strict separation of products with allergens from allergen-free batches.

Another requirement was high-capacity performance, providing outputs of up to 12t/h of ready-mix. The cleaning system was selected based on the established hygiene regime. 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.



Daxner installed a fully automated mixer loading system through suction vehicles for the external silos and a three-dimensional IBC transport system.

Process technology

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

The medium portions are then dosed and weighed out of the daybins by means of a dosing screw conveyor into the container or IBC (intermediate bulk container) which is positioned underneath. The screw conveyor, which is connected to the silo discharge device, provides coarse and fine dosing. A highly precise active and passive valve system enables fully automated connection to the filling aperture of the IBCs. The VIB&PRESS mobile intake station (with integral control screen and stirring device) fills the pre-measured small portions 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 automatically to all collecting points (medium and small portions), 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 motion which is generated by a rotating screw arrangement in the mixer. Lumps of fat are dissolved in the mixer by means of cutting rotors. The geometry of the screw system 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 equipped 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 provides the various cleaning cycles, including rinsing, washing, sterilising, rinsing the product with clean water and a subsequent drying process.

Detailed technical solutions

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

During the transport process the passive valves shut the inlet and outlet of the IBC hermetically, whereby leakage of any transported product (allergen) 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 on to the IBC. The complete assembly module of the active valve with the corresponding extraction mechanism enables quick removal and transport of the complete IBC-connection module to the COP-station.

An automated storage and retrieval system for containers combined with a sophisticated shuttle-system conveys the hygienically designed IBCs fully automatically to all collecting points of the ingredient portions, and subsequently to the mixing line discharge station.

The hygienically designed mixing systems are fully CIP-enabled in accordance with EHEDG and HACCP norms. A completely rounded mixing chamber, no horizontal surfaces and an optimised mixing technology ensure highest levels of hygiene and easy cleaning. Additional, strategically positioned spray heads and spray nozzles enable completely automated wet cleaning and subsequent drying of the mixer as well as the mixer receiver bin and associated connection piping, all of which are built to the same rigorous hygiene standards.

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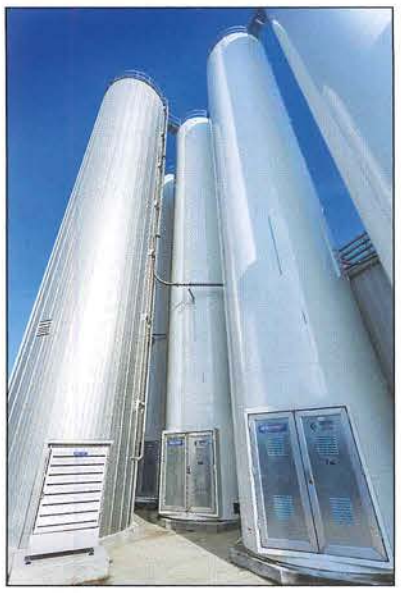
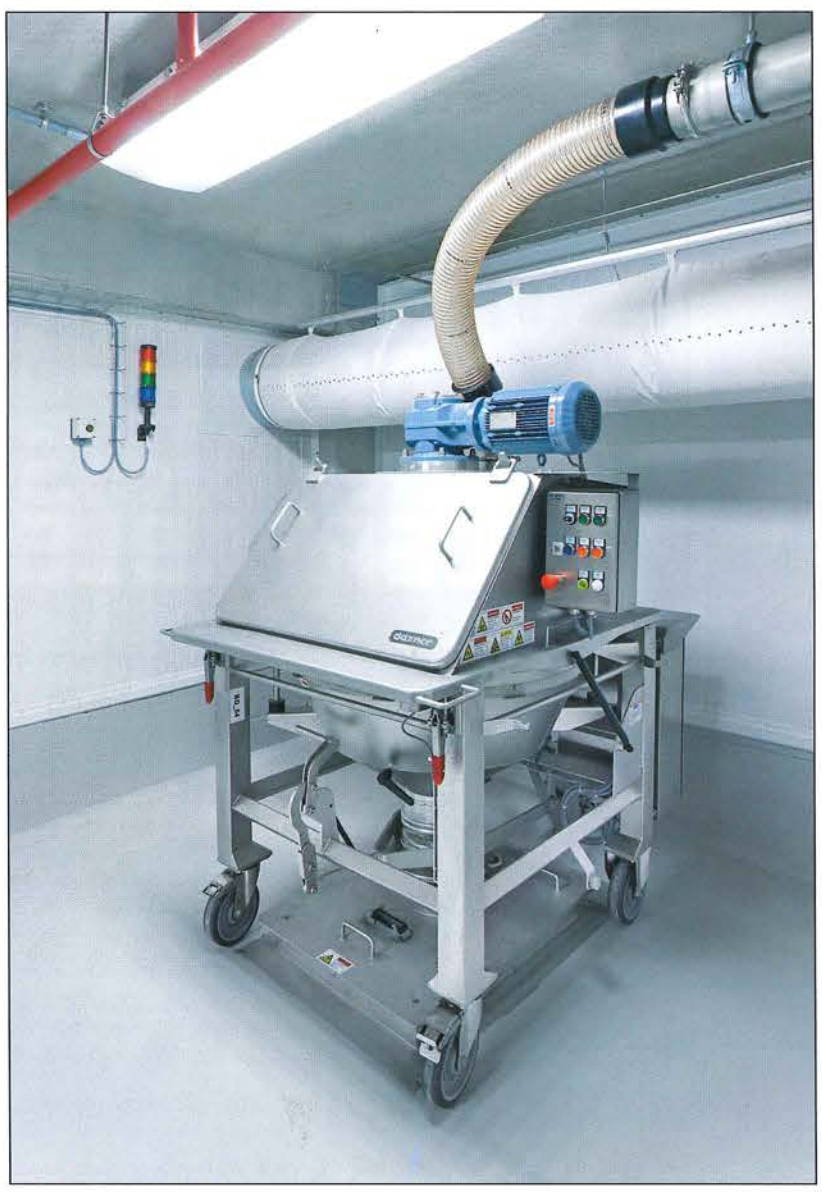
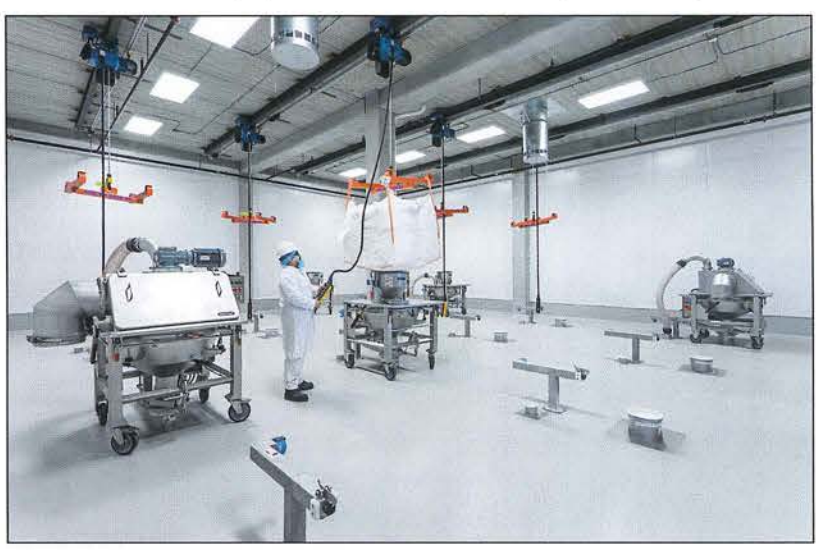


Outdoor silo battery for major ingredients.

Fully automated mixer feeding through receiver bins (outdoor silos) and a three-dimensional container transport system.



Vib&Press mobile intake station for IBC loading of minor ingredients.



Mobile intake stations with integral control screens for daybin loading of minor ingredients.

ATEX-approved vacuum conveyors: making the right choice online

Piab, Täby, Sweden, has extended its pneumatic conveyor product line to include ATEX gas approved piFLOW®p and piFLOW®t models. Previously companies involved in the chemical and pharmaceutical industries have only been able to purchase ATEX gas and dust certified versions of Piab's vacuum conveyors by special order. However, customers can now visit the company's website and configure the most suitable version of Piab's piFLOWp or piFLOWt conveyors online.

Jarno Tahvanainen, vice president of Piab's material handling division, said: "Our easy-to-use product configurator enables customers to choose a conveyor configuration that is certified according to the ATEX directive for both dust and gas, as well as one that is customised to meet the specific requirements of a particular application." With Piab's ATEX certified conveyors, all plastic and rubber parts - including the filters and seals used between sheet metal parts - are made of dissipative (antistatic) materials. Also, all complete modules or units are fitted with seals of synthetic rubber (nitrile butadiene rubber, NBR) which have antistatic properties.

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