Allergen-free mixing

The company KaTech GmbH commissioned Daxner to plan, deliver and assemble a mixing system with two separate lines.

Today's KaTech Katharina Hahn + Partner GmbH was founded in 2010 as a manufacturer of foodstuff additives from renewable raw materials. The product portfolio includes stabilising systems for milk and delicatessen products. Katharina Hahn Familien GmbH took over the company in June 2012. The new mixing line from Daxner is used as the base module for the production of high-quality food-powder mixtures. The concept developed by Daxner took the start-up situation of the company into account. The planned investment budget was to be used to plan, deliver and assemble a full gravimetric mixing plant using high-grade system components in a hygienic design, combined with minimum energy costs, maximum plant availability and optimised cleaning options. Another objective was a high degree of mixing accuracy and the possibility of adding micro-components whilst using the best available technologies. This was achieved by reducing reciprocal contamination in order to maintain product quality. And last but not least cleaning times were to be reduced and operational efficiency maximised.

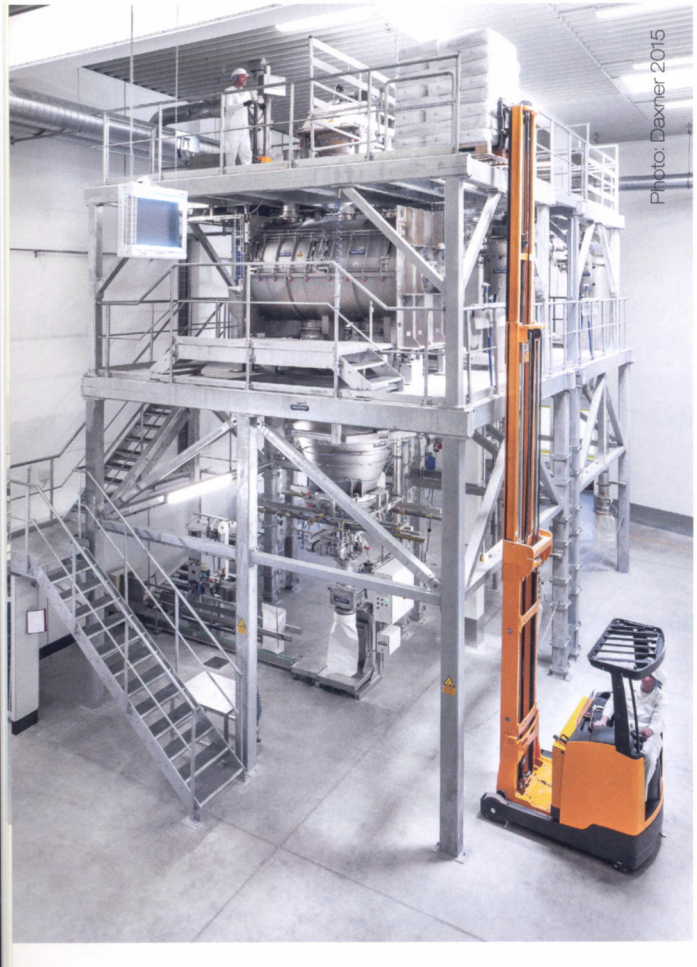
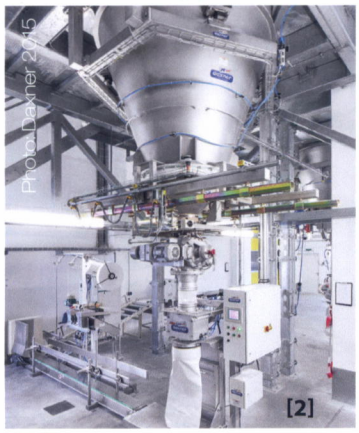


Photo: Daxner 2015

The gravimetric mixing plant with two separate lines combines high availability and mixing accuracy with energy efficiency and ease of cleaning.

Mixing

All pre-dosed small and medium components are solely pre-commissioned in the corresponding allergen rooms. These rooms are physically separated from each other in terms of the specific allergen to be handled and may only be entered with hygienic, protective clothing. Complete bags and pre-commissioned small and medium components are positioned by a forklift truck onto the operating platform, where the ingredients are filled into one of the two VIB and PRESS bag intake stations. The mixing system is selected specifically in accordance with the product features. In order to ensure maximum flexibility for a wide range of mixing tasks at KaTech, Line One was designed with a paddle mixer and Line Two with a ploughshare mixer. The screening machine operates using the VIB and PRESS system, an innovation from Daxner in which two processes are performed simultaneously, namely whilst the product is screened by a vibrating screen (VIB) a slowly rotating paddle presses it through the flat screen (PRESS), in order to gently dissolve agglomerations and lumps in the product. Even if small mesh widths are used, the screen will remain free during its vibrations and will be simultaneously cleaned. They are driven by a geared motor with its speed regulated by a frequency converter. The entire top of can be removed by a tilting mechanism for fast cleaning. A permanent-magnet for the separation of magnetic impurities can also be incorporated. Products with poor flow characteristics, a tendency to lump or with a high fat content can be screened with a small mesh width and with a reasonable throughout capacity. The mixers are designed according to current EHEDG standards and include 2 large cleanout doors. The mixing system achieves a high mixing accuracy (greater than 1:100 000) and short mixing times ranging from 1 to 7 minutes. The mixing of a wide range of different components (bulk density, particle size, and structure) is also possible.



[1] Ingredients arrive either at the paddle mixer or a ploughshare mixer via VIB or a PRESS feeding station. [2] Suitable mixers are selected based on product features and the mixing task to be performed. [3] The receiver bin enables a very fast discharge of the mixers and also a buffer volume for the bag filling station positioned below.

Bag filling

The finished mixes are discharged in the mixer receiver bins which have capacity for the entire mixing volume. The completely round, and therefore very hygienic design of the receiver bin, as well as the combination of the vibration floor and the pressurised air cleaning of the discharge cone results in a largely residue-free discharge of the bins. The receiving bin ensures the very fast discharge of the mixers and also a buffer volume for the bag filling station positioned below. This leads to an increase in the number of batches and in plant performance. Below the receiver bin the DAX-PVS filling and weighing system fills the finished mixes into 15 kg to 25 kg sales packages. The completely gravimetric and very compact design of this bag filling station combines easy, semi-automatic handling with high throughput and ease of cleaning. One highlight is the PVS (Pinch Valve System) dosing system innovation which consists of a pneumatically actuated rubber hose-dosing system. The benefit lies in the fact that the internal sides which come into contact with the products are easy to clean. The hose of the Pinch Valve System has been developed to have a very smooth inner surface, in order to achieve a good level of residue discharge and therefore sufficient dosing accuracy. Immediately after filling, the filled bags are sealed dust-tight by a sewing machine, tipped onto a conveyor belt and then quality-controlled through a tunnel metal detector. Finally the bags arrive on a table to be palletised.

Quality assurance

The Daxner system is a convincing one both due to its overall solution and its innovative details, which include for instance the sophisticated system of control mechanisms which in turn guarantee complete quality assurance. All raw materials pass through a screen and metal detector to detect all metallic impurities, whereby metal search equipment catches all metallic foreign bodies. Furthermore, the dust collection concept selected with its central aspiration filter assigned to each mixing line goes hand-in-hand with the strategy of a contamination-free production of powder mixtures. The following technical detail solutions ensure optimum access and cleanability/maintenance:

- A tilt-up platform which provides access to the cleaning lids of the mixer and also to the hygienic mixer outlet flaps.
- The discharge rotary valve positioned above the DAX-PVS bag filling system for the predosing has a rail system with which both the rotor of the rotary valve and the complete rotary valve can be removed for cleaning.
- The positioning of the filter directly on the platform ensures easy accessibility and convenient cleaning for all aggregates.

It goes without saying that the mixing plant fulfils all valid HACCP and ATEX regulations. Moreover it is IFS and BRC certified in accordance with IFS and BRC (allergen-free production below 10 ppm) and the plant has also been certified by various pharmaceutical test institutes. Therefore, the relevant hygiene regulations and statutory emission and immission limit values are guaranteed. In particular, dust generation has been reduced to a minimum.

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