

At the highest level

Process-optimised feeding of kneading machines for the production of long-life bakery products

Maximum process reliability

Maximum flexibility

Constant product quality

High process transparency

Reliable documentation

The Requirements

- Fully automatic production of long-life bakery products by integrating all bulk materials and liquids in the automatic feed process.
- Adjustment of capacity in case of fluctuations in demand. Constant high product quality.
- Highly flexible recipe changes.
- Maximum process transparency and accurate documentation.

The Customer

Our customer is a highly renowned manufacturer of long-life bakery products, including a variety of biscuit types, e.g. crackers and cookies, with high turnovers.

THE SOLUTION



The innovative solution from AZO integrates all raw materials both, powders and liquids reliably in the automatic feed process irrespective of the packaging type. Process-optimised feeding of kneading machines achieves optimal knead results and therefore ensures constant high product quality.



The Task

The customer's performance requirements specify a complete system that integrates state-of-the-art process control and visualisation to supply several baking lines with a high degree of feed reliability. The main task of the complex automatic charging system is to feed large volumes of products, such as flour or sugar, at the right time in the right quantity to the appropriate

kneading line to guarantee process optimisation. Other ingredients such as conditioned water and tempered oil are also conveyed to each of the kneading lines.

AZO SOLIDS Solution

Automatic feeding of various flour types - Process-optimised feeding of kneading machines

The AZO Solution

The various flours are delivered by silo trucks or in sacks. On delivery by silo truck, a screener type TW is installed between the silo truck and the silo fill pipe to remove any foreign bodies. Alternatively, the silos can be filled from sacks. To achieve a high feeding rate, feeding hoppers with two-sided feed chutes are installed. From there, the flour is conveyed into the indoor silos by pneumatic pressure systems. A strong magnet in the conveying pipe prevents any metal parts from entering the silos. Since the distance from the indoor silos to the kneading lines is very far,

temporary day silos are used to bridge the distance. The discharge of flour from the indoor silos is aided by the use of



Screener type TW to check the flour on delivery

vibration bottoms and then transferred into the pneumatic pressure system. The flour is then conveyed using high pressure into the day silos. Flour for crackers and cookies is stored in the two day silos. The silos are partially equipped with silo weighing systems to monitor the level. The various kneading lines can be served by an agitator with multiple outlets AZO vacuum weighing systems have proven their worth over several years in the efficient automation of large and medium-size ingredients, they are installed to charge the kneaders with large quantities. The vacuum weighing systems draw flour from the day silos into



Twin feeding hoppers to charge the indoor silos from sacks



Indoor silos for flour and sugar

the conveyor scales above the kneaders using a carefully controlled underpressure. Extremely high weighing and dosing precision is achieved even at very high throughputs by means of coarse/fine switchover on the dosing and fine dosing valves. The precisely weighed

batches are fed to the kneading process in partial quantities to achieve an excellent mixing result.



Charging a kneader via flour and sugar scales

Vacuum weighing systems for sugar - very high weighing and dosing precision

Sugar is another important ingredient in the production of long-life bakery products. It can be received either in silo trucks or in sacks. Products in sacks can be fed through the twin feeding hopper in the same way as flour. Since sugar is hygroscopic, sugar silos are additionally equipped with silo head drying to prevent lump formation. From the indoor silos the crystalline sugar is conveyed via pneumatic conveying systems to a sugar mill after which an agitator hopper is used to feed the ground sugar to the day silos. As an alternative, the crystalline sugar can be directly stored in the day silos. The silos are fitted with several

outlets. Feeders discharge the product in controlled quantities into the pneumatic conveying lines. In the same way as for flour, pneumatic suction weighing systems are provided to feed the kneaders with sugar. In this case, sugar is drawn from the day silos by vacuum, deposited in the feeder scales and weighed at the same time. Very high weighing and dosing precision is achieved by coarse/fine switchover.



Day silos which are fed from the large silos by means of pressure conveying.



Conveyor scale above cream mixer

Feeding hopper for adding precisely pre-weighed small quantities

Small quantities, for example cocoa powder, baking powder, etc. are precisely pre-weighed manually at operator-guided ManDos® weighing stations, filled into bags, and issued with barcodes. The bags are sent to the barcode monitored feeding hoppers installed nearby the kneading lines and fed to the

mixing or kneading process in a fully automatic manner. The control only allows the hopper to open if the right ingredient was identified. This ensures that all small quantities are fed to the kneading process in the correct composition and are fully documented and traceable.



Feeding hopper for adding precisely pre-weighed small quantities

AZO SOLIDS Solution

Optimised integration of liquid ingredients into the feed process

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Water required for biscuit production, (hot, cold and municipal water), is handled by water mixing and dosing units and conveyed to a water scale. There, its weight is measured and the water is then pumped in optimised quantities into the kneader. Oils required for the production of long-life bakery products are also fed to the process in optimised quantities. Several oil tanks are available for this purpose. From there, the oils are pumped via heated pipe lines to the kneaders. The precise amount is fed to the kneading process by means of flow meters.



Oil tanks, partially insulated

Central process control and visualisation system - Maximum process reliability

The entire kneader feeding process is monitored by the central process control and visualisation system. Each of the

individual sections has a terminal where important data and information can be entered or displayed locally. In this new

advanced system, all ingredients are fed to the kneading process in the optimised quantity to achieve a constant high product

quality. This means that, when required by special recipes, even large quantities of flour and sugar can be fed to the kneading process in partial amounts. This is the only way to control the precise temperature for dry powders as well as oils and other liquids - a vital requirement to achieve an optimized, constant kneading result. Here too, the complete process is controlled, operated, and monitored by the central process control system. At the same time the permanent documentation function records the constantly high quality. Transparent batch tracking ensures maximum process reliability.



From the central control room the entire production under control