



Production of a wide array of baked goods, fresh every day

Traditional bakery with modern automatic handling of raw materials

Consummate quality and flexibility

Maximum product safety

Documentation of all manual ingredients

Transparency of production and end-to-end traceability

Production rooms with a minimum of dust

The requirements

- Redesigning acceptance of incoming flour and flour storage
- Automatic feeding of flours to kneading bowls
- Exact weighing of all recipe constituents
- Ergonomic design of dough preparation area
- Increase in capacity and flexibility in production
- Ensuring transparency of production and end-to-end traceability
- Interface to the inventory management system with automated data exchange
- Improved convenience for operators

The customer

The Gillen bakery is synonymous in the region with high-quality baked goods and has pursued a course of ongoing development since it was first founded in 1951. The family firm is managed by the third generation and has never lost contact with the traditional baker's trade. In many parts of the business you will notice the care and passion with which a wide variety of baked goods - from savoury to sweet – are produced daily from selected raw materials. 100 tons of flour are processed each week and up to 120 different kinds of products

are made each day. These figures are proof of the flexibility and proximity of the company to its customers.

As part of the project to expand production at the St. Wendel-Bliesen site, the management at Gillen took the time that was necessary and chose partners who had both the technical expertise and who also fitted in with the company on the personal level, in order to be able to achieve the goal together successfully.

THE SOLUTION



The task

Back in 2014, discussions about design options began in close consultations with the management and the heads of production at Gillen. Together with the building planners and the experts for the building services and peripheral technology, a solution for the process engineering was worked out. This formed the basis on which AZO was finally commissioned.

The order included upgrading of the production facility at St. Wendel-Bliesen with a state-of-the-art plant for automatic provision of different flours and a wide variety of manual ingredients. A maximum of flexibility and reliability was paramount. Apart from the process engineering, user-friendly control of the plant, integrating the manual ingredients and an interface to the existing

inventory management system were required.

This resulted in an end-to-end solution from a single supplier – one point of contact, few interfaces, no potential for loss of efficiency.



AZO SOLIDS Solution

Hygienic, sustainable design of acceptance of incoming flour and storage equipment

The AZO solution

Flours are stored in indoor silos with a potential storage capacity of 140 tons in the final stage of expansion. The chosen design and equipment ensure maximum hygiene, good access and optimum protection from environmental factors. This makes it possible to ensure constant, good product quality and high availability of the plant.

Acceptance of incoming products from bulk tankers has been integrated into the façade of the building and screened off. Nonetheless the design is such that it is still easily accessible. Needless to say, there are monitored acceptance routines and operating convenience in addition to integrated silo head space drying to avoid

accumulation of condensate. Storing flours in indoor silos provides many advantages. Unlike the typical narrow skirts for outdoor silos, here all structural components for discharge, screening and distribution of the flours, which are located in the area under the silo, have optimum protection and are easily accessible for inspection and servicing.

Moreover, the space beneath the closed steel construction of the silo is used for installing the vacuum pumps, where they are clean and set apart from the production areas. The waste heat from machinery keeps the entire silo space at a temperature level that ensures nearly constant storage conditions all year round.

Safe discharge and high-performance feeding of flours

All silos have been fitted with the necessary monitoring and deaeration equipment for pneumatic filling. Furthermore, vibration bottoms combined with discharge rotary valves ensure the required mass flow and that silos are discharged reliably to avoid caking.

AZO's cyclone screeners ensure that any foreign matter is ejected before the flour reaches the production area for further processing. Up to four lines can be fed simultaneously from each silo via downstream agitators in the final expansion phase.

This ensures a high degree of flexibility, reduces dependencies

between the kneading lines and supports reliable allocation of flours.



Discharging, screening and distributing flours. Good access underneath the indoor silos



Indoor silos for storing flours safely

AZO vacuum weighing systems for conveying and weighing flours

The time-tested systems perfectly satisfy performance and tolerance ranges for direct weighing of flour in the dough preparation area. The vacuum conveying scales have been installed in the dough preparation area and fitted with all necessary accessories for discharging the flours into the mobile kneading bowls with minimum generation of dust. Apart from aeration jets to assist discharge

at the weighing hopper, this is also helped by the effective design of the hood geometry and continuous aspiration. In addition to the supply of flour to the dough preparation area, the partially expanded production of sourdough and starter dough has also been connected to the flour silos. To do so, a total of four batching tanks were integrated that process their routines according to the workflow and provide the ingredients for the next stage in production.



Connecting four batching tanks to the flour supply

System-assisted, ergonomic feeding of manual ingredients with ManDos



„The ManDos line in a tandem design makes it possible for one baker to produce twice the amount in the same time and, on top of this, all the ingredients are documented. That is ideal.“

Klaus Torsten Müller, authorised signatory and head of production at "Gillen der Bäcker"

The dough preparation area is at the heart of the raw materials provisioning. This is where the kneading bins are fed with the major components and manual ingredients are assembled with gram accuracy.

All manual ingredients at the ready

Another issue important to the customer is, with the wide variety of different manual ingredients, being able to provide the main ingredients ergonomically and to control and monitor adding of all the ingredients into the production process. To achieve this, a custom solution was designed for the Gillen bakery that made it possible to rearrange storage of the main

ingredients, which can be poured at the feeding level into buffer hoppers, which discharge on the side of the outlet directly in the dough preparation area.

The buffer hoppers, which are arranged in a straight line, are filled from sacks via a mobile feeding hopper with minimum generation of dust. They project through the ceiling and open out on the floor below in chutes, from

which the machine operator can remove the ingredients manually.

The central arrangement of this ManDos system in a tandem design, immediately adjoining the feed openings of the kneading bowls, provides optimum working conditions for weighing ingredients.

With the aid of two lineally mobile table scales, the machine operator

can weigh the individual ingredients with gram accuracy into two boxes. Menus prompt operators through the controls via the PC monitors, where great importance was assigned to a user-friendly display and ergonomic operation. Both ManDos systems can be operated by one baker. The manual ingredients can be prepared and added at the same time as ongoing weighing of flour.



Filling the buffer hoppers via a movable feeding hopper at the feeding level



Adding pre-weighed and documented manual ingredients to the kneading bowl

Intelligent process IT from AZO CONTROLS: Plant control and visualization with an interface to the inventory management system

Monitored and documented accuracy for recipes

Every process in raw materials feeding, from acceptance of raw materials to automatic dosing and through to manual weighing of manual ingredients, are managed, monitored and logged using the AZO CONTROLS control system. Modern industrial PCs in the production areas and central computers in the production office provide a transparent indication of ongoing processes and allow convenient operation and evaluation by production staff.

Predictive production planning is carried out after transfer of the jobs from the inventory management system to the controls system. This planning is checked before release to the ManDos PCs. The jobs are processed there and reported back when completed.

The operator preparing the dough is thus provided with all information in one central place. The operator is instructed via the system to identify the ingredients using the barcode scanner installed right there, to weigh them and to prepare a finished kneader batch with them. As all kneading bins have their own barcodes and the cleaning stages are treated like the other process steps, the system depicts their state and contents at all times.

Predictive production planning is also important in preparing the starter dough. To do so, the system provides important information throughout the entire process which allow staff to keep a check on everything and thus achieve production that is expedient and flexible.



The machine operator is provided with all necessary information at the production PCs in the dough preparation area



AZO's process control system gives a complete overview of the entire production line

Communications with the inventory management system

One issue that is regrettably often neglected and underestimated when implementing the specified objectives is the interface to the company's own inventory management system. However this interface is the basis for effective and efficient productivity,

for reliable inventory management and for meeting requirements from the ordering system. Special attention was paid to this, as, although there was an established inventory management system in place, this had previously not been compatible with production processes.

Interfaces were defined and databases were created for connecting to the system and this implemented the required functionality and communication with AZO CONTROLS.

This resulted in a more constant optimum use that is hugely important for production planning. The company is now in a position to react more flexibly during production and still provide traceability at the same time.



Klaus Torsten Müller, Gillen der Bäcker (left) Klaus Minnaert, AZO GmbH+Co. KG (right)

„As a result of the close contact and good working relationship during programming of the controls, we managed to simplify the workflows and recipes and simultaneously increase throughput rates in production.

Overall, the project was planned in great detail from the outset and implementation went very smoothly. Support from AZO was outstanding, from the initial contact to handover of the plant.”

Klaus Torsten Müller, authorised signatory and head of production at “Gillen der Bäcker”