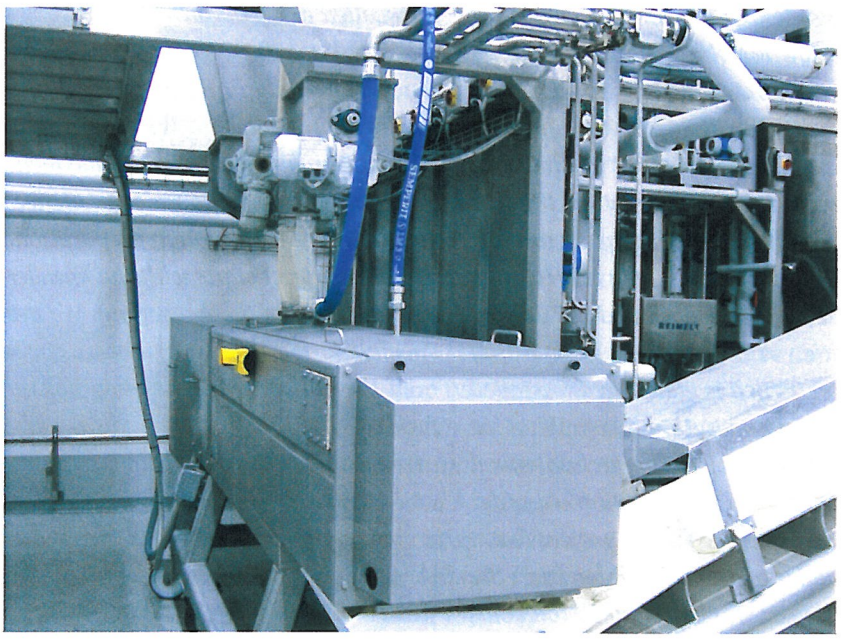
Continuous Production

Wback for the first time in the world uses a continuous kneading system for the production of buns.



The mixer of the Codos system. The system weighs the dry minor and mayor ingredients and mixes them afterward for approximately 90 seconds. This is how the raw materials are homogenised in advance. This mix is then brought together with the liquid components in the exactly defined ratio in the mixer.

IT WAS ONLY last year that we presented as probably most recent line production of buns in Europe the production of Wback in Bönen put into operation in the year 2005 . Now Wback overtook themselves in the fight for this title. In February 2008 the second production site in Leipheim (Bavaria) started to work and at once achieved the certification according to IFS version 5 in the higher level. Also since February Wback has been the only supplier of Burger King in the Federal Republic of Germany and in the Netherlands. Further customers of the bakery are the food retail trade and divers quantity buyers. Now one could suppose that the line productions for buns worldwide do not differ a lot in structure and technique, if only because Hamburger buns are standardised by the customers with regard to weight, volume as well as colour and taste

Photos: Backtechnik

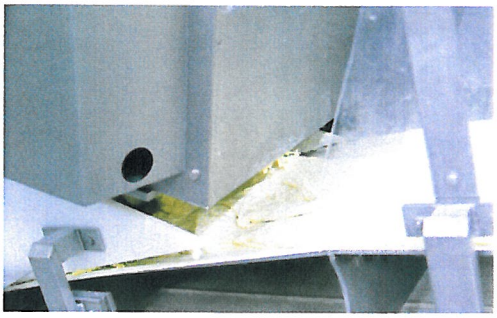
and are only allowed to be in narrow tolerances.
Nevertheless Wback took new ways in the new production and for the first time used a continuous kneading system that has been supplied together with the weighing and the also continuously working pre-dough plant by Reimelt. The new technique could be

Control of the Codos system and the connected weighing. The complete complex can be shown in a graph.

successfully integrated into the production line within a short time. With regard to the product result the factory in Leipheim right from the beginning achieved the same standard as the factory in Bönen.

Change of System

Already during planning of the factory in Bönen the general management went in for the subject of continuous dough preparation, but decided at that time for the traditional well approved batch mixer, as the factory had to be ready for production very quickly. During the planning of Leipheim, Wback had more time for the preparation and already in Bönen carried out tests with different kneading systems. There have been several reasons for Wback to change the system, but above all a continuous kneading system already from the point of view concept goes better with a continuous production process.
Reimelt at that time was the only one to offer the dosing as well as the continuous kneading system, the Codos kneader, from one source. For more than 20 years Reimelt has been planning and building continuous production lines. Part of them are sour dough and pre-dough plants, cooling plants as well



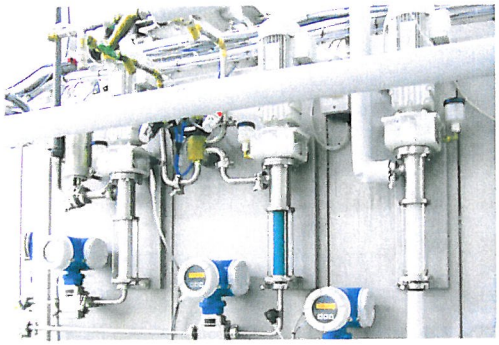
The dough leaves the mixer and arrives in the kneader via a conveyor belt. In the continuous system the working steps mixing and kneading are separated. Each of the two parts of the plant has its own tool defined for its special task.

as recristallisation plants and for some years also the Codos-System (Codos implies continuous double spiral). The weighing respectively precise dosing, one of the core business sectors of Reimelt, moreover is the key technology for the continuous production of dough.
Like the batch system in Bönen also the Codos kneader in Leipheim has been conceived for 3.8 tons of dough per hour. The production process of both lines, however, differs considerably in the weighing and the dough preparation, if directly compared. In Bönen it is always necessary to adapt as exact as possible the batchwise supply of the dough to the speed of the following continuous production line. As a buffer serves the bin of the dough pump. Within this batch that successively is pumped off the bin into the dough divider, the dough has some time to develop. The volume for example increases. This may lead to problems or variations in consistency and weight mainly in small products. In the continuous system in Leipheim the needed dough always comes fresh and in the required quantity from the kneader and via a conveyor belt is immediately transported into the dough divider. Differences in the dough development are therefore completely eliminated. Moreover the generation of stress in the kneader is very low due to the special tool. This is the reason why the dough does hardly need any resting time after kneading. The synchronisation of the kneader and the dough divider or the processing line is carried out by a cross-linked control. The software for the kneading system including the recipe management has been programmed

Like the kneading system also the pre-dough plant works continuously.

Photos: Backtechnik

The layout of the new factory in Leipheim has been optimised once again.



Key technology of the kneading system is the exact weighing. Here the flowmeters for the liquid components.

The dough divider divides 50,000 buns per hour. The dough pieces are brought into a uniform round shape by means of a moulding distance.

by Reimelt themselves. Another advantage is the quick reaction on weighing errors. The batch mixer in Bönen has a volume of 400 kg per batch. This means that always raw materials for 400 kg of dough are in the balance, in the kneader and 400 kg of dough in the bin of the pump. In case of an error in the dosing always 1,200 kg of dough have to be taken off the system. If in the case of the continuous system in Leipheim a dosing does not work only about 150 kg of dough have to be removed. Besides the advantages in the production process further tests with technological aspect, for example with different flour qualities or modified baking agents or the use of yeast still have to be carried out. Advantage is the perfect control of the dough temperature.

Technique Codos System

In principle continuous kneading systems consist of a dry material dosing, a weighing, the dry material mixer as well as a dosing of the liquid components, the mixer and the kneader. The Codos system weighs the dry minor and mayor ingredients and mixes them afterward for approximately 90 seconds. This is how the raw materials are homogenised in advance. This mix is then brought together with the liquid components in the exactly defined ratio in the mixer. This is also valid for the integration of pre-dough and sour dough. Also scrap dough or recycled dough can be added automatically.

It is not necessary to add all the raw materials at the beginning of mixing. Moreover a defined addition at determined positions in the mixer is possible - that means delayed. For example in order to achieve a better volume in the case of baguettes by means of a later addition of salt. There is also the possibility to add products subject to shear (raisins, chocolate chips, etc.) at the end of the kneading process. Everything is automated, a manual addition of raw materials is not possible. Important during dosing are constancy and precision. Each process step has to fulfil the pre-set parameters.

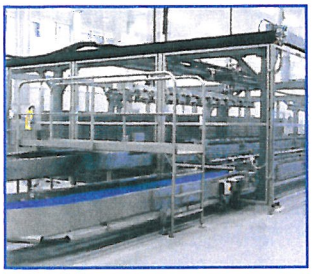
Another evident difference of a continuous kneader compared to a batch kneader or batch system is the kneading tool or the configuration of the kneading process. Whereas a batch kneader uses the same tool for the mixing of the raw materials in the bowl as well as for the kneading of the dough, the processes are in the case of a continuous system separated into mixer and kneader. Each of the two parts of the plant has its own tool defined for its special task. This increases the efficiency of each of theses steps of the dough production and as a result the energy consumption decreases according to Reimelt by up to 30 percent. This is how for example the gluten development can be influenced more precisely and the absorption increases at the same time.

The mixer has the task to process the dry pre-mix and all the other dough ingredients (water, fats, etc.) to a clump-free mix within a very short time. The required ingredient water is mixed of tap water, warm water and ice water. The line control regulates according to the desired dough temperature automatically the required water temperature. Special spiral-shaped two-shaft intertwining mixing tools assure an efficient gentle mixing and an optimal moistening of all recipe components. Already during mixing this achieves a perfect hydration of the flour so that the biochemical processes start immediately. The efficient mixing process leads to an increased water absorption of one to two percent.

Due to the small quantity of dough in the mixing and kneading trough a recipe change-over is possible within a short time. If one stays with the same type of dough, for example wheat dough, it can be carried out immediately. In case of a change-over from wheat to rye the change takes a few minutes. It is possible to either clean the trough with a dry material or to immediately pass the new dough and to sort out the first dough coming out that still contains rests of the previous one. Alternatively the system can also be completely cleaned wet. This is also simple as the components are mobile. It is neither necessary to carry out the cleaning in place.

Photos Backtechnik

Instead of a traditional metal scanner the bakery products pass an X-ray unit. A tribute also to the quality of the new materials in the plant technique that more and more consist of non magnetic stainless steel. At the dark position of the photograph two buns lie one above the other.



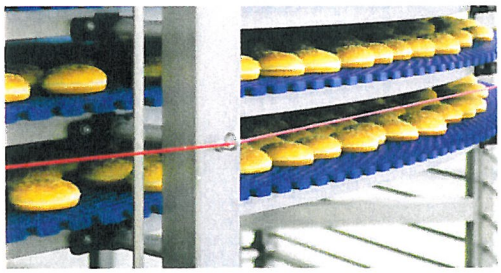
The moulds store. Here, robots fully automatically handle different baking tray shapes for different products.

Basket handling and stacking are carried out fully automatically.

New in the production, however, are the installed monitoring technique and the again improved packaging machines from Hartmann.

Processing

The subsequent processing line does not considerably differ from the line in Bönen. The structure of the line has been optimised and the latest machine generation has of course been installed. Also in Leipheim all the processes are very precisely adapted to each other and the individual machines are linked via interfaces. When the production of a bakery product has been started, all the components of the line are adjusted to the product. The two robots in the mould stock remove the moulds of the previous bakery product off the production circuit and feed the new moulds. In the system there are per type more than 2,000 baking trays or baking moulds. The AMF dough divider reaches a capacity of 50,000 pieces per hour. The dough is pressed with high pressure through plastic hoses. By means of an adjustment wheel the diameter can be regulated and thus the flow rate or the weight of the individual pieces that will be portioned afterwards by means of a guillotine can be influenced. Prerequisite for the weight precision is a regular pressure by which the dough is transported. There is probably no second line that works at such a speed on such a small surface.
After a short resting period for the dough, the dough pieces are sheeted, put into baking moulds and transported into the proofer.



Cooling down of the buns to room temperature.

After proofing as an option the buns can be seeded (i.e. with sesame). Afterwards the buns are baked. A spiral conveyor transports the baking trays at a temperature of round about 250° C through the oven heated with gas. The baking climate is nearly constant over the complete distance. The humidity is adjusted so that the products do not get any crust. The complete plant runs in continuous operation up to the packaging. New, however, is the installed monitoring technique and the again improved packaging machines from Hartmann. Instead of a traditional

Evacuation of the baked buns to the shipment department which is located in a room separated from the bakery.

metal scanner the bakery products pass an X-ray unit. A tribute also to the quality of the new materials in the plant technique that more and more consist of non magnetic stainless steel. Each packaging unit is X-rayed by the unit and it reliably detects beside stainless steel also plastics or other objects and sorts out the package. The X-ray photograph makes it easier for the department for quality assurance to find the detected object. Thus Wback in the new factory in Leipheim sets new patterns for the production of buns in many fields.

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