

# Resting is the secret

QUALITY IS AN ASPECT WHICH HAS RECENTLY BEEN REVIVED ON THE EUROPEAN FOOD MARKET AND THIS INCLUDES THE BAKERY SECTOR



**++ figure 1**  
Each of the three mixers produces 300 kg dough per batch. The dough batches rest in plastic vats in a computer-controlled storage system until they are moved on for further processing

**+** Producers of baked goods are increasingly investing in systems engineering solutions which allow for prolonged dough resting times. For many years now, it has been the case that a front-runner on the European bakery market was somebody who offered his goods as cheaply as possible. The increasing automation of mono-lines supported this trend with respective cost savings. However, times are changing. The new key word is “sustainability” which includes a number of issues. The raw materials should be produced as “ecologically” as possible; the processes should be selected carefully and follow artisan traditions. Energy savings, environmental friendliness, CO<sub>2</sub> footprint – the list of topics is long and they cannot always be narrowed down precisely. Added to this, it is important that all these aspects have a beneficial impact on the quality of the product and add nutritional value.

This trend is currently being forced by globally roaring raw material prices and consequently higher product prices which can be more easily justified when a product has certain benefits or has improved quality that can be labeled at the same time.

When observing the market for industrially produced baked goods in Europe it has shown for quite some time now that many producers have started to reconsider their concepts and opt for premium products. One of the clear signals for this development is the increasing investment in stone-plate baking ovens. Another signal is the growing willingness to influence quality right from the start, which involves the dough preparation. More time for dough development results in a more stable dough structure and with that more stability in the finished bread loaves. Furthermore, the fermentation during the resting time as well ►

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++ figure 2

**++ figure 2**  
After the resting period, bowl lifters dump the dough onto the transport belt and onto the make-up line



++ figure 3

**++ figure 3**  
Depending on the recipe, the dough resting time can be up to 2 hours. Larger systems, with even longer resting times, are also possible

**++ figure 4**  
Before they move underneath the mixers, a fine oil film is applied inside the plastic storage vats. This allows for a gentle discharge of proofed dough

as the oven spring benefit from longer resting times. Also, more time for enzymatic processes which take place in the dough will result in a more distinct flavor.

Therefore the magic word is “dough rest”. Precise control of the dough resting time is required for a targeted application of this aspect and for achieving reproducible quality. There are predominately three system variations on the market for dough resting times:

- + Mixer carousel or stationary linear systems – a defined number of vats are moved on rails from the mixers to the dough make-up section. The resting time is defined via the transport speed of the vats in the system. The time can only be varied for the entire system and not for individual vats.
- + Linear transport systems – floor conveyors pick up the bowls which contain the kneaded dough at the mixing station and transport them to dough resting places. After a pre-defined time, the systems collect the bowls again and bring them to the bowl lifter from where the dough is transported to the make-up. Such a system is highly flexible because, in theory, each dough batch can be given a different time to rest. However, the number of vats used in such a system is limited. Furthermore, expensive mixing bowls

are occupied with the dough during the entire resting time.

The most advanced type of dough resting systems which provide maximum flexibility can handle large amounts and can be expanded at any time, are systems that operate with special dough vats.

In general, such a dough supply system consists of a dosing station, one or more mixing stations as well as a “marshaling yard” for the dough storage containers which are usually made of plastic in different sizes. The storage containers’ movements are PLC-controlled. For example, the system consists of three double spiral mixers with a 500 l bowl in each. The dosing station and all three mixers are positioned on a platform. After mixing, the dough can slide gently through the bottom opening via gravity into the 700 l dough resting vats positioned underneath the mixers. A rail system transports the dough resting vats which have been coded with recipe and batch number to one of the 24 positions in the resting system. They are then stored for a pre-defined period. In theory, each dough batch can be given its own individual resting time. After the resting time has elapsed, the system picks up the respective dough resting vat and trans-

++ figure 4



ports it to the bowl lifter from where the dough is moved to the dough make-up station. The main advantage of such a system is the parallel production of different products – in this case pizza, bagels, bread and rolls – which require different dough resting times. Before the dough resting vats are moved underneath the mixers, a fine oil film is applied on the inside of the vats at an upstream station. This prevents the dough from sticking to the walls of the vat.

The arrangement of dosing station, mixer, and oil spraying station on a platform combined with a bottom discharge of the mixers minimizes the number of expensive mixing bowls required. The dough resting vats are moved on a slide with a simple and low-wearing chain transport system. Due to the special arrangement on the platform, the floor underneath the mixers and the oiling station can be easily cleaned. Catwalks run parallel to the resting places so that the staff can monitor the processes in the vats, take samples or conduct measurements if needed.

Each resting vat is filled with a maximum of 300 kg dough leaving sufficient room for extensive dough development and proofing. For the processing of wheat dough, the hourly capacity of the plant with its three existing mixers is about 2,500 kg. The plant can be expanded by adding more dosing stations, mixers or resting places at any time. +++

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