

# Folding, washing, drying

THÜRMANN IS A PRIME EXAMPLE OF THE FACT THAT FURTHER OPTIMIZATION OF IN-PLANT WORKFLOWS IN BAKERIES IS POSSIBLE, INCLUDING BY USING SPACE-SAVING FOLDING TRANSPORT BASKETS, AS WELL AS BY A CENTRIFUGE TO DRY THESE SAME BASKETS, WHICH RESULTS IN ELECTRICITY SAVINGS OF APPROX. 80%



++ figure 1

The storage capacity when using folding baskets is now 3–5 times as large

**+** “It’s all different in Berlin” – everyone may see that differently, and might thus not agree with the statement by Thomas Drews, Regional Manager of Schäfer’s Brot- und Kuchen-Spezialitäten GmbH in Berlin, Germany, which sells its baked goods in Berlin under the Bäckerei & Konditorei Thürmann brand. However, one thing is certainly different in Berlin compared to Schäfer’s other production sites: the production site in the Mariendorf district of the city had the opportunity late last year to invest not only in a new basket washing plant complete with drying unit, but also in the matching folding baskets. The background was the fact that for building regulations reasons it was not permissible to build an extension for a bigger storage area. However, the factory area of 7,232 m<sup>2</sup> no longer provides any more storage space. So they turned the necessity into a virtue and implemented the idea of space-saving folding baskets for the baking industry, as has been standard practice for decades with fruit and vegetable crates.

Drews developed the design concept for it together with Brüel international a/s, Hjørring, Denmark, and bekuplast GmbH, Ringe, Germany. This gave the Bäckerei & Konditorei Thürmann simultaneous access to a specialized supplier of reusable plastic containers and a supplier of automatic basket washing plant. Gerold Wilms from bekuplast explains that “Our

idea when developing a folding transport basket for baked goods was to transfer to the baking industry the benefits of our many years of experience with folding fruit and vegetable baskets. Initial tests with folding vegetable baskets very quickly revealed that due to their shape and construction they were not able to cope with the daily stresses in a bakery.” Based on this knowledge, a folding basket was developed specifically for the requirements of bakeries. As a result of a novel rib structure, these baskets are particularly robust and can be folded and unfolded quickly by means of a patented locking and unlocking system.

## The route of the plastic containers

20,000 such basket systems in the commonly accepted European dimensions of 600 x 400 x 150 mm are now in use in the Thürmann bakery. The baskets arrive at the factory gates from the branches either empty and therefore folded up, or as open baskets with returns. These baked goods are still being removed by hand and the basket then folded up and placed on the other stack. However, the plan is for this manual removal to be automated as well in 2013, so open baskets can then also be passed into the next step. The stack of baskets is now moved into the unloader by a Rolly, by guiding the rollers into two tracks. Here a lifting device operated by a pushbutton



**++ figure 2**  
In the destacker the baskets are fed into a kind of turnstile in which the baskets are removed from the stack individually, starting at the top



**++ figure 3**  
The new folding basket for the baking industry is scarcely visually distinguishable from the old rigid version

transfers the whole stack of baskets onto the buffer belt, which is approx. 6 m long. The height of the stack varies; it depends on the height of the HGV that delivers the baskets. It is currently 40 closed baskets. The Rolly needs to be removed from the track system again by hand so the next basket unit can be inserted. The stacks are now transported to the real part of the destacker, where they are input into a kind of turnstile. Four pins, i.e. two on each side, now reach into the intervening spaces of the topmost basket, lift it and put it down on two skids. A paddle pushes it onto the next conveyor belt. In this way the whole stack is progressively worked through so the baskets, now one at a time, are carried away on a belt at ceiling height to the S-inverter. On average the destacker accepts a mix of 1,500 closed and open baskets per hour, and operates even faster if only folded plastic containers are used. The purpose of the S-inverter will be to dispose of returns as soon as the steps have been automated. Open and closed baskets follow one another here on the S-curve conveyor belt so the containers are upside down for a moment. This diverts any content that may possibly still be in the basket via a bypass track at the side, and it is disposed of by Schäfer's. During the current year an automatic basket closer will be installed at this point, which will then carry the closed folding baskets forward to be washed.

**Fully wash and centrifuge dry**

The baskets are now transferred into the immersion bath washing plant, which brüel offers as a standard solution. In the plant, water heated to 48 °C together with detergent flows in a closed O-shaped loop in which the dirty baskets are introduced from one narrow side, while they emerge clean and wet at the other narrow side due to the flow pattern. The circulation here contains about 3,850 l of water, and as a rule it is changed twice a week; the throughput can be up to 1,500

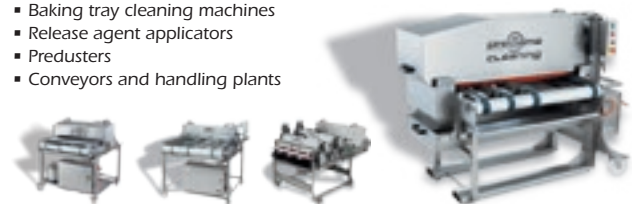
containers per hour. Gerald Helbing, Sales Manager at brüel's German subsidiary based in Worms, says "By using the immersion process in the soaking zone we consume approx. ▶

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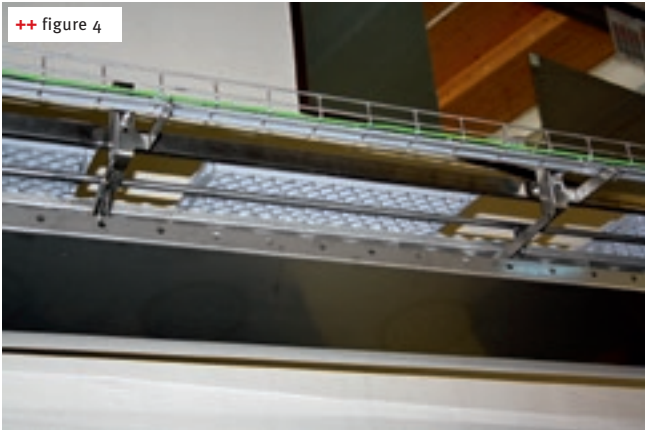
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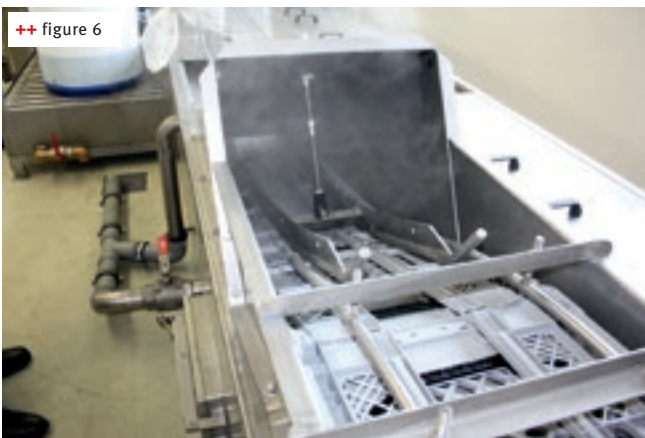
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**++ figure 4**  
There is a collecting tray under the basket conveyor belt on the way to the washing plant, to collect crumbs and other residues from the dirty baskets in the tray



**++ figure 6**  
The folded baskets are fully immersed in the soaking bath

35 % less heating energy than a conventional tunnel plant.” The wash liquor is purified by a rotating self-cleaning drum filter connected to the circulation at the side. For this purpose the water is passed from the inside through a drum in which it passes to the exterior by gravity through 0.8 mm holes. The dirt remains on the inside of the drum wall and is sprayed off by water through spray nozzles which are in turn located on the outside of the drum, and is passed via a collection channel into another tray. Here the water is allowed



**++ figure 7**  
The washing liquor is purified via the drum filter from the inside to the outside installed at the side. The dirt remains on the inside of the drum wall



**++ figure 5**  
The S-inverter disposes of returns

to drain away again, leaving the residual dirt in a collection basket. It can be removed easily and disposed of as residual waste.

The baskets that have been soaked in the immersion bath are sprayed with a high pressure of 6 bar. In the secondary rinsing zone, which has a separate rinsing tank with a pump, a further spray-cleaning takes place at approx. 2 bar in a loop. This is followed by a final “shower” using potable water. The immersion process that is used has the advantage that there is no



**++ figure 8**  
In the drying centrifuge the stacks of 10 baskets land on the white turntable, where they are held in position by the descending basket before being spun for approx. 5 sec

++ figure 9



++ figure 9

Hearth-baked rye breads such as the “Berliner Landbrot” (70/30) or the “Tiefenfort” bread (90/10) are the most popular classics

spraying in the soaking area, and the plant is sealed off by the tank at the basket entry point. Helbing explains that as a result there is no need to suck away any vapor on the inlet side. This means the consumption of fresh makeup water is only approx. 0.3 l per basket.

The wet closed containers are now stacked again ten at a time one on top of another in an automatic high-speed stacker and transferred to the dryer centrifuge. However, rigid baskets can also be run through the centrifuge. Here the baskets land on the white turntable, where they are held in position by a basket that descends onto the stack from above. A motor rotates the whole unit at 800–850 rpm for approx. 5 sec. With some pride, Helbing says “The baskets emerge with a residual moisture content of approx. 0.5 g per basket, whereas a blower dryer never achieves such a drying result, even with a considerably larger energy consumption. As far as electrical energy consumption is concerned, that means we are about 80–90 % below that of blower dryers, and the excess water is recycled back into the washing plant, just like in the high-speed stacker.” He says the electricity consumption also speaks for itself: although the motor has a power rating of approx. 11 kW, effectively it only consumes 2.3 kW. According to Helbing, the electric current when braking the rotation is fed back into the mains. Finally the baskets enter the basket store, which can now store 3.5 times the quantity of folding baskets, i.e. altogether up to 20,000 baskets. The space saving yields benefits not only in the storage area but also particularly in the branches and in the logistics between the sites. Drews is already planning the implementation in 2013 of the final distribution across three packing points where the baskets, now open, will be reloaded with fresh goods.

The Thürmann bakery plans to utilize the newly won capacities in a meaningful way. A workforce of about 255 staff in the production and shipping units distributes approx. 110 confectionery articles, 60 varieties of bread and 24 types of bread rolls to 206 branches and 69 Edeka customers with bake-off stations. Of these the top-selling product, how could it be anything else, is the “Berliner Landbrot”, a hearth-baked mixed rye bread with a ratio of 70/30. The goods delivered every weekday are worth a total of EUR 200,000–210,000, and EUR 70,000–90,000 on Sundays. “And we must stay on the ball, because the competition from regional bakeries never sleeps. That’s why every optimization yields a cash advantage for our business, which we can make use of again elsewhere.” +++

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