

# Progress in detail

TWO YEARS AGO, ULRICH KLOTZKI MASCHINENBAU GMBH, NEUTRAUBLINGEN, GERMANY, INTRODUCED TO THE BAKING INDUSTRY A CRATE WASHER FORMERLY USED IN THE BEVERAGE INDUSTRY. TODAY, MANY DETAILS HAVE BEEN IMPROVED



++ figure 1



++ figure 2

**++ figure 1**  
Crate washing on a footprint of only 9 sqm is the further developed concept of the Klotzki washing equipment. The new spiral dryer also needs only 9 sqm space

**++ figure 2**  
De-stacking of crates

**++ figure 3**  
The crates, turned upside down for easy removal of residues, are sent to the de-stacker via a slide

**++ figure 4**  
The crates move on a spiral path through the washer and then onto the blow-off station

**+** The daily washing of all transport crates is a normal procedure for any business that complies with common hygiene rules. However, cleanliness is expensive. Two years ago, a crate washer used in the beverage industry was adapted to the needs of the baking industry. It is mainly large chain store bakeries in Germany that use the vertical spiral crate washer which requires low space, low water and low energy. In the meanwhile, Klotzki has improved many details.

The crates to be cleaned are still automatically de-stacked and turned upside down so that crumbs and dirt fall out. However, in the inlet tunnel the individual crates are no longer sent through a turnstile and then on the spiral path from below to the top as in former plants. Tappets are now used. The bottom panel sheet of the spiral crate washer is shaped like a funnel thus ensuring that the cleaning water can run off without any residues into the center collection vessel above the wedge wire filtration. In the soaking section, dirt residues on the crates are softened by warm splash water in order to achieve a static relaxation of the molecular structure of the plastic material. The softened inorganic and organic contaminations are then treated with pure water sprayed out of a maximum of 140 flat jet nozzles. The water pressure is 3.8 bar and the water is applied from all sides, including from

above and below. Due to the combination of soaking, hard water jets and the upwards spiral on which the crates move, all surfaces are cleaned, even the ones that are hard to reach such as end faces and recessed grips. The next stations are air blowing stations to remove the water, followed by drying and the sorting of the clean crates via control switches. In this way, the discharged stacks each contain only one crate size.

Heinz Bräuer, owner of the Hamburg bakery, “Dat Backhus” was in doubt whether his light colored crates would really come out clean without the use of chemicals. “We have been



++ figure 3

using specific yellow crates since 1995. Our crate washer never succeeded in cleaning them thoroughly enough so that we had to scrub them by hand. With the new equipment, we noticed that after a few days the “grey film” disappeared from the crates.”

A new water treatment using a so called aqua pump has contributed to this result. The pump is activated 1.5 hours before cleaning. It accelerates the water in a cyclone to about 1,000 km/h. A high amount of oxygen introduced into the water in this process clearly reduces the microbial load of the water. Klotzki reports, “The targeted introduction of kinetic energy modifies the viscosity of the water. The capillary and flow properties improve which simply means that the soil is diluted and removed much more easily.” Oxygen enrichment, the permanent heating of the water and the spraying via nozzles usually promote the deposition of limestone which is dissolved in potable water. A limestone protection system prevents the formation of limestone. In this system, the water flows through a specific permanent magnetic device where the ions in the water are rearranged, thus reducing the surface tension by 10-12%. The water experiences a physical softening while preventing limestone deposits or even removing them, if they are present.

Bräuer gets the energy for the heating of the water from the heat recovery system of his baking ovens. This, of course, minimizes the energy consumption of the washer which as a result of the new pumps and drives has been reduced from 38 kW connected load to just 19 kW. Three different types of crates are used at “Dat Backhus”; one flat and one high crate for cakes and a wide crate for bread. In total, about 15,000 crates are washed each day. They are then transported directly into the production facilities from where they are fed into the production process. According to Klotzki, the dimensions for crates to be cleaned are from 600 x 400 x 80 – 220 mm and 624 x 468 x 133 mm

After washing, the water is blown off from the crates. Klotzki has improved this stage as well. The crates stop briefly before the inlet to the blow-off station. A fan is lowered into the crates for the reliable drying of the inside of high crates.

Due to this vertical construction, the entire crate washer only requires a processing path of 48 meters that each crate has to take. The footprint of the washer is 3 x 3 meters and the height 3.8 meters. The drive inside the system is free of chains because the crates are moved upwards using tappets. These tappets are fastened to a central ring and driven from above via a drive motor. The equipment is almost free from wearing parts, with an oil change being one of the few regular maintenance costs.

Although not yet installed at Bräuer, a drying plant is nevertheless scheduled and currently being designed where the crates are also moved spirally instead of vertically. With this arrangement, the space requirement will be even lower. +++



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**EXPOCENTRE**

++ figure 4

