

Friendly to the environment

ENERGY AND WATER CONSUMPTION LOW, FOOTPRINT SMALL, NO CHEMISTRY –
FEATURES OF AN ENVIRONMENTALLY- FRIENDLY SPIRAL CRATE WASHER BY KLOTZKI



++ figure 1
Crates in the washing tower



++ figure 2
Discharge of stacked crates from the washing plant

+ Bakery branch companies like Sehne Backwaren KG, Ehningen, near Stuttgart, Germany, are complex systems with differentiated production and logistics operations. They are highly demanding when it comes to technical equipment. Apart from large industrial mono-lines, the requirements are constantly changing. This is also true for the cleaning of the delivery crates. At Sehne, they use three different sizes:

- +** Tall crates for bread rolls and 1 kg bread loaves,
- +** medium sized crates, in which certain types of bread are immediately placed at the oven discharge,
- +** flat crates for all other types of baked goods.

About 12,000 different crates are used each day and they all need to be cleaned on a daily basis. This is not only a hygienic and logistical task but also an administrative challenge. Water, power, cleaning agent, space requirement and last but not least the required labor can be calculated in cents and euros and compared. Gerd Sehne is a man who calculates at rock bottom prices as he worked as a trained accountant prior to taking over his father's business.

However, cost savings were not the decisive factor when he decided to go for the spiral cleaning plant by Ing. Ulrich Klotzki. According to Sehne, "The most important aspect was hygiene. The crates travel a distance of 36 meters with different nozzles in the cleaning system. If we only use medium-size crates, the distance extends to up to 48 meters.

The second decisive factor was the relative quietness which came into the bakery with the new system. Crate handling is always noisy, but in this case the noise level is relatively low. Added to that, the system has helped us in controlling processes and lowering personnel expenses."

The system Ing. Ulrich Klotzki developed for Sehne does not only consist of the washing plant. It also comprises the feeding and discharge sections as well as fully automatic crate storage in the basement of the production hall. The washing plant and crate supply for the production are integrated in the production hall. The stacked crates can be transported from the cleaning stage to the respective production lines or retrieved from the central storage in the basement.

The truck drivers deliver the used crates to a ramp from where the disposal station for residual products, etc. can be reached via a separate aisle. The empty crates are stacked on a feeding belt. Up to 10 stacks can be placed on a second belt. The stacks are finally fed into the system and are not sorted but rather randomly mixed in size. First of all, they are de-stacked and turned upside down to remove crumbs and other residues. In the feeding tunnel, the crates pass a turnstile where they are separated. They are then continuously transported on a spiral inside the washing tower. Due to this vertical construction, the entire crate washer only requires a footprint of 3 x 5 meters and a height of 3.8 meters.

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 ►

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softened inorganic and organic contaminations are then treated with pure water sprayed out of up to 220 flat jet nozzles. 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 sorting of the clean crates via control switches. This way the discharged stacks each contain only one crate size.

Considerate to the environment

The most intriguing feature of the spiral cleaning plant is the clever system of its environmentally-friendly characteristics.

The energy consumption needed for the cleaning of 1,500 crates per hour as at Sehne requires only a 38 KW connected load which is less than in comparable plants where the load depends on the acceptable residual moisture at the time the crates leave the cleaning plant.

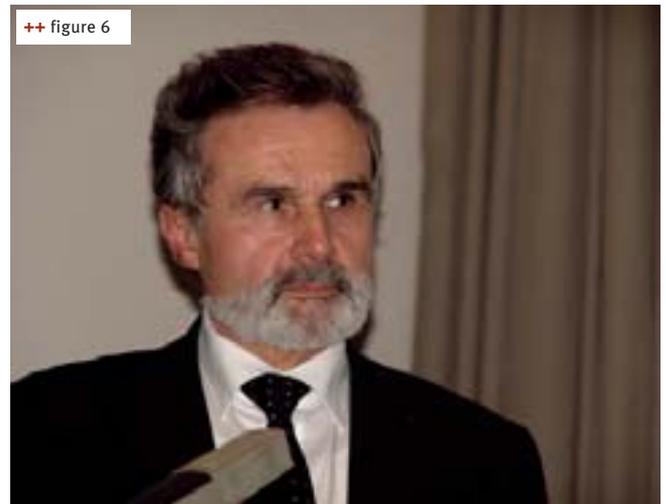
The water runs in a close circuit and can be used for up to a week without being re-freshened. The reason is a multi-stage cleaning and water treatment system that operates without any chemical additives. Large particles are removed via screens. An integrated process ensures the constant cleaning



of the circulating water. This process applies kinetic energy which in turn has an impact on the physical properties of the water and its viscosity. The rotating water stream is relieved abruptly in a multiple reactor. Microorganisms are subjected to a vacuum with the result that they burst and die. The microbial residues are then further degraded by the oxygen that is sucked in with the environmental air. No ten-sides or other cleaning agents are required. The modified viscosity of the water improves the water's capillary and creeping behavior which facilitates the dissolution and removal of the dirt.

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.

The small footprint and the relatively low noise level complete the list of environmental features of the system. The entire plant is supplied pre-mounted so that the commissioning can take place within only a few hours. +++





Sehne Backwaren KG

Böblinger Str. 42, 71139 Ehningen, www.sehne.de

General Manager: Gerd Sehne

The Sehne bakery is a classical branch bakery with more than 130 sales outlets. However, it is also a little bit more than most German bakeries. It is only 50 years old, which is quite young. Senior Heinrich Sehne and his wife Ruth started their business in 1957. They specialized in the production and supply of wood-baked bread. The first equipment consisted of two stone-plate baking ovens and one Volkswagen Bus. Bread was baked from noon to midnight. The oven could accommodate 100 three-pound loaves. Sehne delivered the bread to companies in and around Stuttgart. The bakery grew and transformed itself into one of the most important branch companies in the region. It expanded its activities in the 1980s by introducing a frozen goods production. A legally independent subsidiary now distributes frozen baked goods, predominantly the traditional Swabian soft pretzel, under the "Artic" brand. In 1998, the company moved to the production site in Ehning where another production expansion is currently in progress. In the meantime, son Gerd Sehne has taken over the management.

Senior Heinrich Sehne explains his success: "For my entire life, I have stuck to some fundamentals that are important to me. First of all, it is simply hard work, because no pain, no gain. My second motto is first serving then earning. In my opinion, customer orientation and the will to deliver quality is more important than ever. The third important issue is the way that an entrepreneur treats people. The contact with our customers and our family-run business are what makes the family bakery Sehne what it is today." +++

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++ figure 3

In-feed to the washing plant. In the background, the crates are turned upside down to remove paper and other residues

++ figure 4

Crates of different sizes are de-stacked randomly on the feeding belt

++ figure 5

The crates are sorted after discharge from the washing plant

++ figure 6

Ing. Ulrich Klotzki