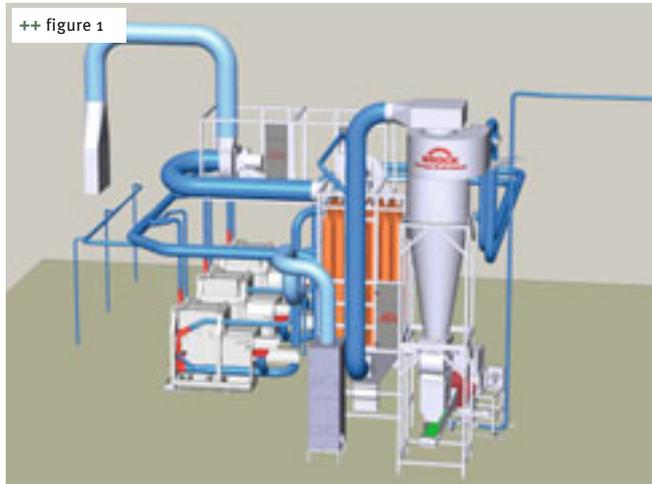
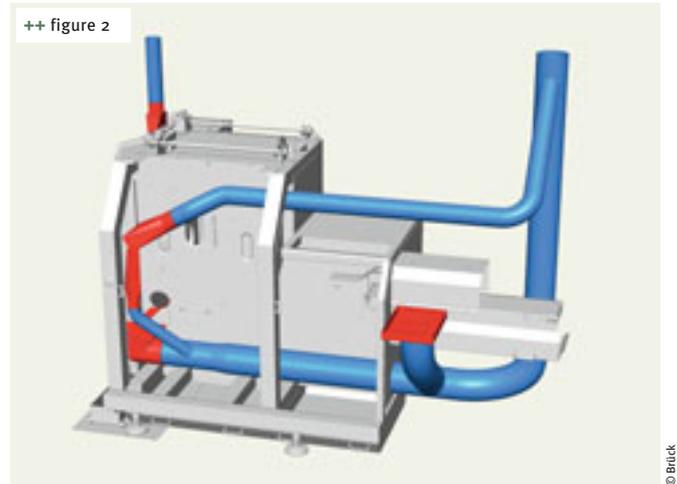


# Suction removal of bread residues

THE BRÜCK'S VACUUM REMOVAL AND DISPOSAL PLANTS ENSURE THE REMOVAL OF END SLICES, BAKED GOODS AND PRODUCTION WASTES. THE COMPANY'S SYSTEM IS IN USE IN BAKERIES SUCH AS GLOCKENBROT AND ÖLZ



**++ figure 1**  
CAD planning of a vacuum removal system for circular knife cutting machines, including suction removal of oil mist, filter plant and cyclone separator with bread residue shredder and vacuum cleaning installation



**++ figure 2**  
CAD planning for a circular knife cutting machine with vacuum removal funnels and a manual loading point

**+** Sliced loaves are often cut and packed in cleanrooms. This reduces the risk of the bread spoiling too quickly due to contamination during further processing after baking. End crusts, crumbs and other waste residues arise during bread slicing. These products must be removed from the cleanroom because they pose a contamination risk. In older plants a conveyor belt is often used to transport bread residues out of the cleanroom. The Technical Manager of an industrial bakery said, "That's expensive and relatively unhygienic, because with such open systems there's still always a lot of dust in the air caused by the slicing." To create an environment that is as germ-free as possible here as well, the Brück GmbH & Co. KG in Bad Camberg, Germany, has developed plants that remove these baked goods' wastes by suction and dispose of them. The above-mentioned bakery has taken advantage of this opportunity. The Technical Manager explained that, "Our main concern was for the hygiene of the plant and the quality of the products in the cleanroom – we wanted the least possible dustiness and the associated contamination by crumbs etc."

Brück's vacuum removal plant is installed on bread slicing machines in industrial lines. By using funnels, the end slices and crumbs produced by slicing loaves (toast-bread, mixed and wholegrain bread, raisin and white bread etc.) are removed by suction through a single-tube piping system with a nominal diameter of 200 mm. The design of the pipeline length is variable and can be up to 80 m long. The bread is treated by suction again before leaving the bread slicing station to ensure it is crumb-free when it enters the packing line.

The end slices and production wastes removed by suction are afterwards passed into a stainless steel cyclone and discharged

via a large compartment rotary cell feeder. A negative pressure is generated in the cyclone separator and sucks the products into it, but the operation of the rotary cell situated below it is non-pressurized, i.e. the products enter the next section, the bread residue shredder, by gravity. The shredder is available in two different sizes; it uses two counter-rotating shredder knives and is self-cleaning.

All the bread residues removed by suction are chopped into pieces measuring approx. 3–5 cm. They can then be fed into the recycling circuit via a bread residue conveyor plant, or can also be disposed of directly. If the bread residues are to be re-used, it is possible for the conveyor plant pipeline, which is operated as a pressurized conveyor, to be up to 150 m long, which enables this system to feed the bread residues automatically into a slurry plant, for example, (or into a mixing plant). The conveyor plant is designed as a pressurized conveyor, so the air in the plant is blown through the pipeline together with the products. Disposal of the material is controlled via a switchover device. Special jet filters are used to remove materials from the bread residue conveying system. The entire system has been patented by Brück and can be used for baked goods of any kind.

A conveyor belt is another way to convey materials from the cyclone to the bread residue shredder, where an additional metal detector can be installed. If metal is detected, the conveyor belt runs backwards, thus automatically rejecting the detected material. The belt switches back to normal operating mode again after a pre-set time. Special weighing devices enable the plant to be designed to allow the client to record and document his wastes automatically. The system can also be used to discharge bread wastes out of the production

rooms. For this purpose the pipeline includes a built-in manual loading point into which bread residues or bread wastes can be put and also conveyed to the cyclone separator. A vacuum cleaning plant can be integrated into the system to clean the rooms and production machines. This high-pressure plant operates at a pressure of 11,000 Pa and is connected to the filter plant. The high pressure pipework can be situated at various places in the cleanroom, or can be positioned directly on the machines. The staff simply need to attach a vacuum cleaner hose, which allows them to clean the machines and premises by a dry method. However, according to Brück there is no need to clean the pipework system and cyclone separator.

**Customized design**

The suction removal and disposal system can be designed for different plant sizes and can also be retrospectively enlarged as desired and custom-adapted to new requirements. Any variant is possible, from one up to ten machines. Irrespective of the size, the plant is controlled via an SPC controller with a touch-panel. Brück designs client-specific solutions with modern 3D technology. Thomas Brück, CEO of Brück GmbH & Co. KG, explains that, "The integration of all the production steps into the disposal system means fewer personnel are needed to dispose of the wastes". The suction removal and disposal plants can be used for the

suction removal of bread residues, baked goods, flour dust, semolina and packaging residues. The system described above is used not only on bread slicing machines but also when cutting other baked goods such as cakes, bread rolls, hot dogs and baguettes, or when peeling the crust from loaves of white bread.

At a product change, the suction removal in the corresponding expansion stages is implemented by automatic changeover flaps. The wastes are then carried directly into the separator responsible for the respective product.

Brück is already using its suction removal plant in various bakeries in Germany and abroad. The system is operating in the Glockenbrot Bäckerei GmbH & Co. oHG, Frankfurt am Main, in the Lieken AG, Düsseldorf, and in the Rudolf Ölz Meisterbäcker GmbH & Co KG in Dornbirn, Austria, among others. For example, a Brück suction removal machine servicing two slicing machines made by the German GHD Georg Hartmann Maschinenbau GmbH in Delbrück has been in operation at Glockenbrot in Bergkirchen since October 2012. According to Glockenbrot's central technology department, the justification is that: "For us the most important reason for the investment was hygiene, because the slices of bread are sucked away immediately instead of dropping into a container or onto a belt which would then also need to be cleaned. That means the machine has definitely been worthwhile for us!" +++

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