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Vaccum cooling
Conditioning
instead of cooling

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Conditioning instead of cooling

Increasing numbers of major baked product chain stores are acquiring vacuum cooling plants. In fact this technology has already been available since 2000.


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++ Peter Györgyfalvay, owner of Kuchen-Peter, with vacuum-cooled goods

© Cetravac

++ Vacuum-cooled part-baked products in the as-delivered state and fully baked

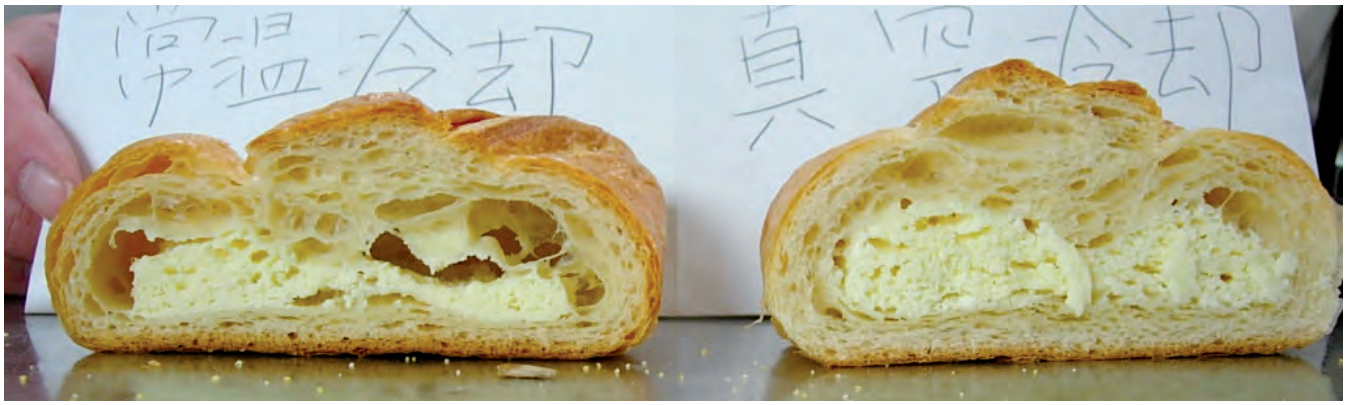
It is well-known that a prophet is not honored in his own country, which in this case we shall generously allow to include the whole of the German-speaking region. Adolf Cermak was the name of the prophet who wanted to make vacuum cooling palatable to baked products manufacturers at that time. The same Adolf Cermak who is currently working through a long list of orders for it, and the list is not only long but also illustrious. Positive experiences spread quickly in the top information exchange groups.

Success is no accident. When Cermak, who had worked for a long time as a mechanical engineer in classical bakery refrigeration, presented the first cooler at the iba trade fair in Munich in 2000, all the artisans and chain stores had already invested massively in deep-freeze technology, and electricity was so cheap compared to today that no-one yet gave any thought to energy management or even energy saving. That has changed. At that time the first plants went to countries in which bakeries were less fully equipped with deep-freeze technology: Japan, Poland, Russia, Greece, Slovenia etc.

Peter Györgyfalvay, who owns Kuchen-Peter Backwaren GmbH and was receptive to the technology, was the first to enter the domestic market in 2004 (Cermak is an Austrian, although his Cetravac company is located in Switzerland). He not only bought batch plants but also ordered the first continuously producing vacuum line 2 years later, consisting of six individual chambers. Györgyfalvay, who supplies the Austrian food retail, still uses them today to chill part- and fully-baked products in a fast process, after which he packs them. They are afterwards delivered refrigerated or frozen without a shock freezer or at ambient temperature. With the technology he uses the fact that the boiling point of water also falls as the pressure is reduced. The energy needed for this is abstracted from the product that is to be cooled. The process has a beneficial effect on the stability of the baked products at the same time, and keeps them crisp for significantly longer, thus also preserving a fresh visual appearance. Györgyfalvay: "Part-baked and white, i.e. really without any browning but with a stable shape – we achieve that by ending the baking process after 10 to 13 minutes and immediately putting the products into the continuously operating vacuum conditioning system. That allows us to carry out the storage and logistics entirely without refrigeration or deep-freezing!

++ Adolf Cermak presented his vacuum oven at the Anuga FoodTec

Adolf Cermak, the founder and CEO of Cetravac, lives with his family in Switzerland. After studying engineering in Vienna, he began as a research engineer for low-temperature engineering and process engineering with Linde AG in Munich. After gaining experience with industrial cooling and freezer technology in Germany and France, he concentrated professionally on the application of cooling and refrigeration engineering in bakery technology. In 1999 he obtained his first patent for the use of vacuum technology to interrupt the baking process.



© Cetravac

++ More volume, an airy filling and a light base

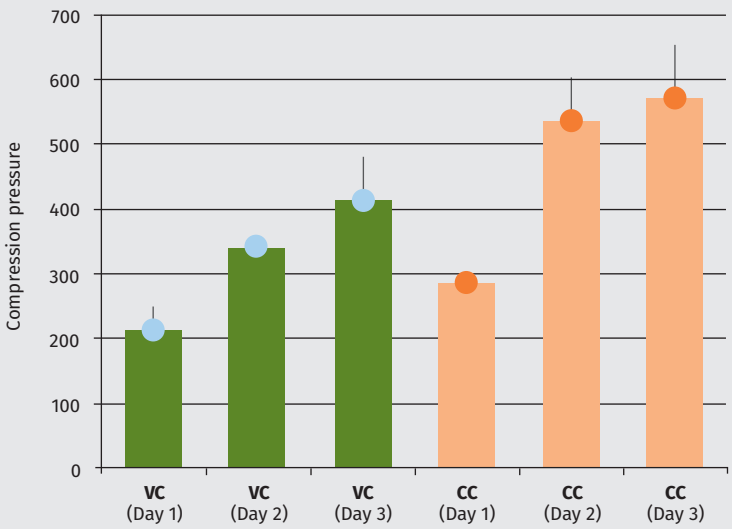
The result is a superb quality that cannot be produced more economically or ecologically. A win-win situation for manufacturers and the retail."

In the meantime, since 2012, a new generation of vacuum cooling plants has appeared. Cermak says: "The construction has become more compact, the new pump technology consumes 30% less energy than the old one, and as a result the noise level has decreased by 50%. The plants are also fitted with an automatic sliding door, so the process is interrupted at the optimum time." In his opinion, however, the factor that is currently causing so many bakers to seize hold of vacuum cooling is not so much the technology but rather the processes, which are aimed much more precisely at the need of the individual product. According to Cermak: "In principle we run with a smaller vacuum nowadays, but we end the process at higher temperatures so we can ensure that finally there is a guarantee of no less moisture, and with some products there is actually more moisture and often, mainly with seeded products, more flavor retained in the product than when using more conventional refrigeration technology. Nowadays it is more a question of conditioning the goods for the respective requirement and less about simple cooling."

The requirement varies greatly. For one chain store operator it is a question of reducing the expensive preparation time in the morning in the widely scattered branches by delivering the first batch of stock in perfect condition from the production unit, while another operator utilizes the long-lasting crispness to get by without baking in the shop. For a third retailer the immediate slicing firmness of vacuum-cooled breads is the decisive argument. Others in turn use vacuum-cooled baked products to save clients in catering and restaurants the need to bake off. According to Cermak, this works even if the goods are stored deep frozen after vacuum cooling. In all cases the electricity bill profits from the fact that the process allows efficient batch sizes without needing to store parts in deep freeze.

Vacuum cooling ceased long ago to be a process that is limited to baked products. The Technology is already used in Japan and will be used soon in Germany where Cetravac has delivered the first plant to one of the biggest sushi producers, to cool down rice that has been cooked particularly gently. In turn Cermak has been working for a long time on other areas where vacuum technology can be used, including a patented vacuum oven that was presented recently at the Anuga FoodTec, the specialist trade fair for industrial food technology in Cologne. +++

Vacuum-cooled (VC) and conventionally cooled (CC) toast breads compared after storage for 1, 2 and 3 days



++ About the study: 6 slices of toast-bread (each 2 cm thick) are laid one on top of another. Using a penetrometer, pressure is applied to the crumb until a defined distance has been traversed (e.g. 2 cm). The force needed for this is measured. The smaller the force exerted, the softer is the crumb and thus the fresher it appears. Toast-bread was compared after storage at ambient temperature for 1, 2 and 3 days. It was apparent that the vacuum-cooled products performed better than the conventionally cooled ones.

Conventionally cooled (CC) – baking time: 38 minutes, dough yield: 170
Vacuum-cooled (VC) - baking time: 31 minutes, dough yield: 174

Quelle: Japanese Institute of Baking (JIB Tokio)