



FRIEDRICH VACUUM SOLUTIONS



Cooling in Minutes

Quality that lasts.

Vacuum cooling systems from Friedrich Vacuum Solutions reduce the core temperature of baked goods and other food products to the desired level within 2,5 – 8 minutes – without compromising quality. Without lengthy cooling times. Engineered and manufactured in Germany.

Vacuum Cooling – faster, gentler and more efficient cooling

After baking, bread, rolls and other baked goods retain significant amounts of heat. With conventional cooling methods, it can take several hours for products to reach the required temperature for further processing. Only then can they be sliced, topped, glazed, finished, packaged or frozen. Rapid further processing is also crucial for delivery operations. Long cooling times affect production workflows, require valuable floor space and complicate further processing. Vacuum cooling provides an efficient solution: unlike conventional cooling methods, heat is not only removed from the surface but extracted directly from the product core. By reducing the pressure inside the vacuum chamber, a small amount of the product's moisture evaporates even at low temperatures. The energy required for this process is drawn from the product in the form of heat. As a result, baked goods reach the desired temperature within minutes – quickly, uniformly and gently. The result: optimum product quality, reduced process times and greater reliability in production.

More Quality. More Efficiency. More Process Reliability.

Vacuum cooling helps bakeries make their production processes more economical and future-proof.

Rapid Cooling

Cooling times are reduced from several hours to just a few minutes. As a result, baked goods are ready for further processing much sooner. Delivery operations can also be organised more efficiently.

Uniform Product Temperature

Cooling from the inside out ensures uniform temperature distribution and reproducible results.

Preserving Freshness and Quality

The flavour, crumb structure and appearance of baked goods are preserved as effectively as possible. In Danish pastries and puff pastry products, the layering and lamination become significantly more visible, creating a more appealing appearance. Crispy baked goods remain crunchy for longer, while soft products stay pleasantly tender and stable.

Optimised Production Workflows

Shorter cooling times provide greater flexibility in production planning. Process steps can increasingly be shifted to daytime operations, reducing night work and enabling more efficient use of personnel resources..

Less Space Required and Greater Cost Efficiency

Long cooling conveyors and large cooling rooms can be reduced or replaced. At the same time, energy and operating costs decrease. Depending on the production concept, additional process steps can be simplified or eliminated, further improving cost efficiency.

Vacuum Cooling for Baked Goods

Vacuum cooling offers significant advantages, particularly in bakeries. After baking, products can be processed much more quickly. Shorter cooling times create new opportunities for production planning. Workflows can be organised more flexibly and increasingly shifted to daytime operations. At the same time, individual process steps can be integrated more efficiently. Product quality also benefits: depending on the type of baked good, crispness is retained for longer while freshness and product stability are enhanced.



Your Products. Our Demo Unit. Your Competitive Advantage.

Every bakery works with unique products, recipes and production processes. That is why the development of an optimal solution begins with a practical test under real operating conditions.

With the mobile demo unit from Friedrich Vacuum Solutions, bakeries can experience the benefits of vacuum cooling technology directly in their own production environment.

Experience Vacuum Cooling First-Hand – directly in your Bakery

During the practical trial, your own baked goods are cooled and evaluated under actual production conditions. Together with the experts at Friedrich Vacuum Solutions, the optimal settings for your products and production processes are determined. This creates the basis for a customised vacuum cooling system that is perfectly tailored to your bakery.

The Process:

Test

The mobile demo unit comes directly to your site. Your own products and production conditions are the focus of the trial.

Optimise

Cooling processes are individually adjusted to achieve the best possible results in terms of quality, freshness and process reliability.

Decide

The insights gained provide a reliable basis for your investment decision. The trial installation allows you to experience vacuum cooling technology in practice – transparently, without obligation and precisely tailored to the requirements of your bakery.

Because the best solution is developed where it will ultimately be used: in your production environment.

Custom Vacuum Cooling Systems for every bakery

No two bakeries are alike. Production volume, product variety, available space and existing workflows all determine the requirements for the right system. Friedrich Vacuum Solutions develops custom vacuum cooling systems that are optimally tailored to specific production conditions. Whether for individual rack trolleys or high-capacity production environments, every system is designed to meet the exact requirements of the operation and can be seamlessly integrated into existing processes.

The right Solution for your Operation

Compact System Solutions

For smaller production volumes and individual rack trolleys, compact systems provide an efficient entry into vacuum cooling technology.

High-Performance System Concepts

For larger bakeries, systems accommodating up to four rack trolleys are available. These enable even high throughput volumes to be conditioned reliably and efficiently.

Flexible configurations

Various configurations are available depending on available space and production workflow:

- * Systems with hinged, sliding or lifting doors
- * Pass-through solutions for rack trolleys
- * Custom integration into existing production lines

Optimised for your Production Process

Friedrich Vacuum Solutions does not view the vacuum cooling system as a standalone component, but as an integral part of an optimised production process. From the bakery and cooling stage through to further processing, a coordinated overall concept is created to deliver greater quality, efficiency and process reliability.



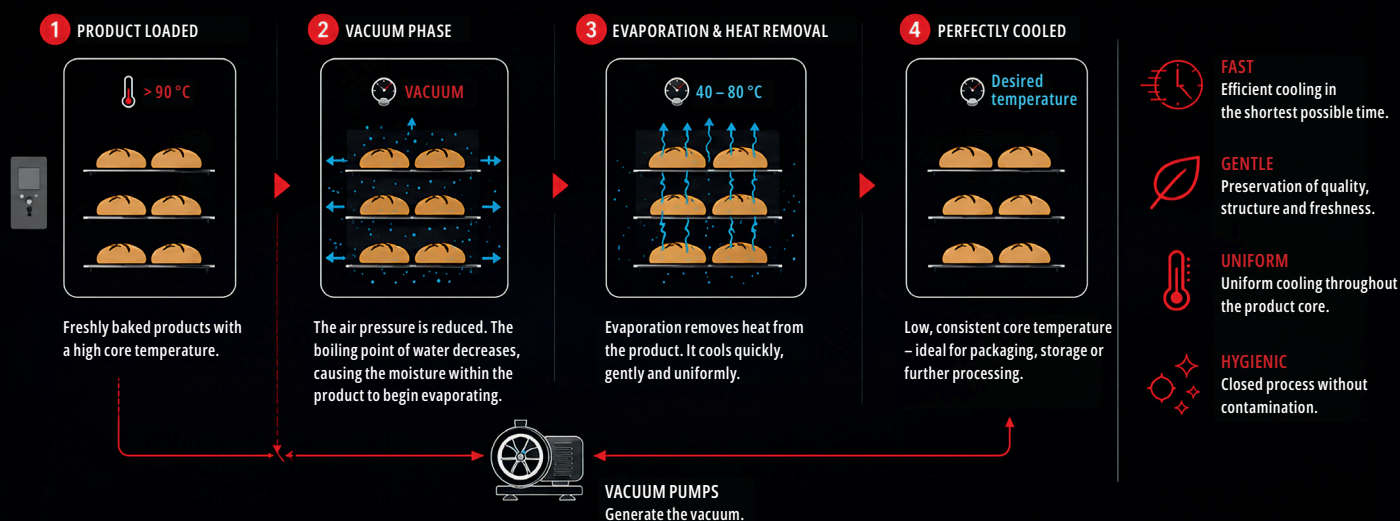
Example of a system
with hinged door



Example of a system
with sliding



Example of a system
with lifting door



The Principle of Vacuum Cooling

Vacuum cooling is based on a simple physical principle: under reduced pressure, the boiling point of water decreases significantly. The baked goods are placed inside a sealed vacuum chamber. Powerful vacuum pumps then remove the air from the chamber. As the pressure drops, a small portion of the product's natural moisture evaporates even at low temperatures. The energy required for this process is extracted from the product in the form of heat. As a result, baked goods are cooled quickly, evenly and gently from the inside out. The desired core temperature is reached within just a few minutes.

Well-Engineered Technology for Reliable Processes

Vacuum cooling systems from Friedrich Vacuum Solutions combine high performance with exceptionally low-maintenance and reliable technology. A key advantage is the use of modern air-cooled vacuum pumps. This eliminates the need for additional components such as cooling water pumps, dry coolers, condensers and chillers. Installation requirements are also significantly reduced: complex cooling water pipework, rooftop installations, additional

structural requirements and costly crane or installation work can all be avoided.

This means:

- * Reduced installation effort
- * Lower maintenance requirements
- * Fewer potential sources of failure
- * High operational reliability and dependable processes

Intelligent Control and maximum Transparency

The systems operate entirely electrically and require neither compressed air nor cooling water pipework. An integrated energy meter continuously records energy consumption and process data. All relevant information is stored and can be analysed at any time. The intelligent control system, based on an industrial PC from Beckhoff, provides extensive diagnostic and analysis capabilities. In addition, the system can be synchronised with existing bakery equipment and seamlessly integrated into established production workflows. Predictive maintenance functions enable service activities to be planned proactively, potential wear to be identified at an early stage and unplanned downtime to be reduced.



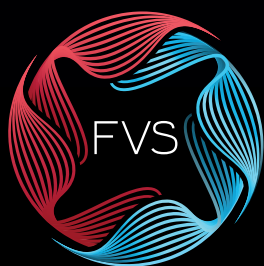
Owner Gero Friedrich

Vacuum Technology for for the Bakery of Tomorrow

Friedrich Vacuum Solutions develops innovative vacuum cooling systems for modern bakeries. Drawing on extensive experience in vacuum conditioning, the company creates solutions that combine baking quality, efficient processes and reliable technology. From the initial trial through

to a customised system solution, Friedrich Vacuum Solutions supports its customers with a practical and partnership-based approach.

**Cool faster. Produce better.
Secure Quality.**



FRIEDRICH VACUUM SOLUTIONS

Friedrich Vacuum Solutions GmbH

Kopernikusstr. 10 | D-49377 Vechta

Mobil: +49 (0) 15167253789

g.friedrich@friedrich-vacuum.de

www.friedrich-vacuum.de

*Get in
Touch*

