



Technologie for Instant Products

From nature to taste...

Innovative drying technology

Bucher Unipektin is a leading manufacturer of equipment and plants for drying of high and low viscosity liquids. In addition we manufacture to free-flowing particulates where retention of flavour, aroma, colour, and functionality is critical. With more than 700 units installed worldwide Bucher Unipektin stands for quality in technology and services.

Our professional technical staff combine the best of knowledge in engineering with extensive experience in the application of freeze drying and vacuum drying technologies of a wide variety of products. This combination allows us to work effectively with our customers to provide innovative solutions for the dehydration of temperature-sensitive in order products.

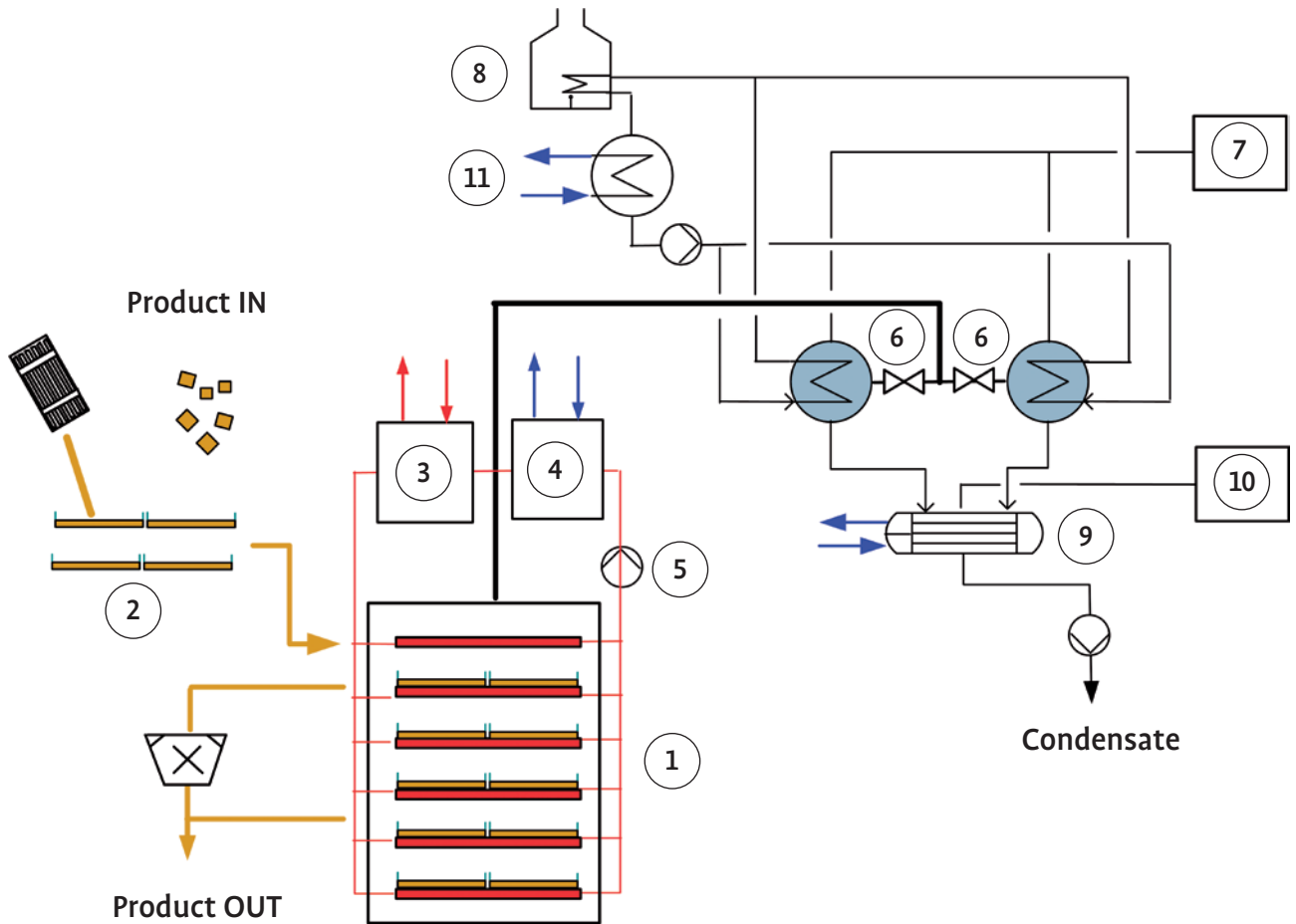
Bucher Unipektin equipment is used in a wide range of applications. Core competencies include the food, beverage, cosmetic and herbal product industries.

Bucher Unipektin – always there when you need us!

Our engineers and specialists are focused on serving you, our customers, in a professional and timely manner. With offices and representatives around the world we are always ready for specific customer requirements.



Vacuum drying cabinet with Zeodration adsorbers



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|-------------------------------|-----------------------------------|
| ① Vacuum drying cabinet | ⑦ Vacuum system for dryer |
| ② Product trays | ⑧ Heating system for regeneration |
| ③ Heater | ⑨ Condenser for regeneration |
| ④ Cooler | ⑩ Vacuum system for regeneration |
| ⑤ Heating cooling loop dryer | ⑪ Cooling system for regeneration |
| ⑥ Zeolith reactors (adsorber) | |

Vacuum drying

Vacuum drying is a highly specialised field within the general “drying technology” category. It is especially useful for foods, cosmetics and natural remedy where the retention of flavour, aroma, color and functionality are critical.

The DryCab vacuum tray dryer provides state of the art batch drying while the DryBand vacuum belt dryer is used for high volume and continuous production. Both systems can manage high viscosity liquids and granulates. The DryBand system includes a mechanism for continuous feeding liquids onto the belt for simultaneously drying in parallel. The solid feeding system can handle granulates of various sizes which are fed to the top belt and then dried in series.

PLCs with visualization technology is our standard for process control.

Freeze drying (Lyophilisation)

During freeze drying the vacuum is set at 6 mbar or less and water is removed from the product through sublimation.

In the vacuum tray dryer liquid or granulates are filled in trays. The product is frozen, and as the vacuum is applied, the water evaporates. The freeze drying process is controlled by precisely maintaining the required vacuum and temperature profile

Free flowing granulates can also be freeze dried in the vacuum belt dryer. Quick frozen products are fed onto the dryer's belt through a vacuum tight rotary valve. Drying is controlled through a combination of vacuum belt speed and plate-temperatures (heating and cooling) as the product travels through the drying chamber.

Zeodration

Bucher Zeodration equipment takes classical vacuum drying one step further with zeolite adsorbers replacing the classical vapour condensers.

During normal vacuum drying both water and aroma molecules are evaporated from the product and ultimately discarded. However, zeolite will only adsorb water molecules; aroma molecules are excluded from entering the zeolite pores due to their size. This improved retention of aroma molecules provides a better product than freeze dried, with improved flavour, colour and aroma.

Our Zeodration drying process has a major advantage over freeze drying. In traditional freeze drying ice crystals penetrate the cell wall. With Zeodration this shape change is eliminated due to higher processing temperatures, resulting in less damage to cell walls and greater product stability.



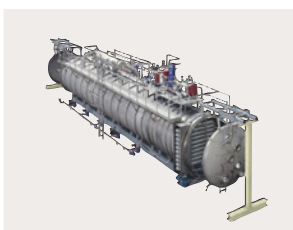
Product and process development

Pilot plant equipment is available for research studies and to assist in design and scale-up for production. Equipment is available ranging from 0.2 to 6 m² heating surface area and capable of maintaining vacuum of 0.5 – 50 mbar.



Vacuum tray dryers – Bucher DryCab

We supply vacuum tray dryers with heated surface areas ranging from 1 – 88 m² and an evaporation capacity of up to 250 kg/h of water vapour. These systems are capable of temperatures from 20 – 160° C (68 – 320° F) and at a vacuum from 0.5 – 50 mbar.



Vacuum belt dryers – Bucher DryBand

Vacuum belt dryers are available in sizes up to 300 m² with throughput up to 3,000 kg/h. They operate in the temperature range of 20 – 160° C (68 – 320° F) and typically at a vacuum from 0.5 – 50 mbar.



Bucher Zeodration system

Zeodration, the removal of water vapour using zeolite adsorption, operates at 0.5 – 15 mbar of vacuum with an adsorption drying capacity up to 360 kg/h water.

Evaporators

The Bucher Unipektin vacuum falling film evaporators are designed for the production of high quality juice concentrates and aroma essences.

They typically combine the process steps pasteurization, aroma stripping and concentration all-in-one system. Short processing time, low heat impact and sophisticated hygienic design prepares the evaporators for the concentration of all kind of fruit juices, e.g. from liquid, grapes and stone fruits.

Due to the unique design liquid distributors they can handle juice with high suspended solids contents and as well with tartrate.



Tubular falling film evaporator system

Vacuum tubular falling film evaporator, with 1 to 7 number of effects. Evaporator capacity 10 to 110 t/h. Mechanical or thermal vapour recompression.

Vacuum systems

To guarantee a hassle free drying process, it is necessary to use powerful vacuum systems with integrated condensation control. Drying of liquids of low or high viscosity typically requires vacuum in the 10 – 50 mbar range. Freeze drying and granulate vacuum drying is typically done at 0.5 – 9 mbars.

Bucher Unipektin designs and supplies complete vacuum systems, including all necessary components, instrumentation and pumps. Depending upon the specific process or customer specification we use liquid ring or dry vacuum pumps. Vapour can be condensed using conventional or our Zeodration adsorption system.



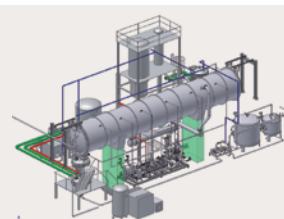
Vacuum systems

Typical vacuum systems operate at 0,5 – 100 mbar with water evaporation capacity of 50 – 600 kg/h.

Turn-key operation

Bucher works with the customer from concept to realisation of a complete plant, including systems for the feeding of raw materials and discharge of finished product. Our core competency is in the field of vacuum and freeze drying of high and low viscosity liquids and granulates of various shapes and sizes. Our Zeodration system can be added to the design to enhance the flavour and aroma of the finished product.

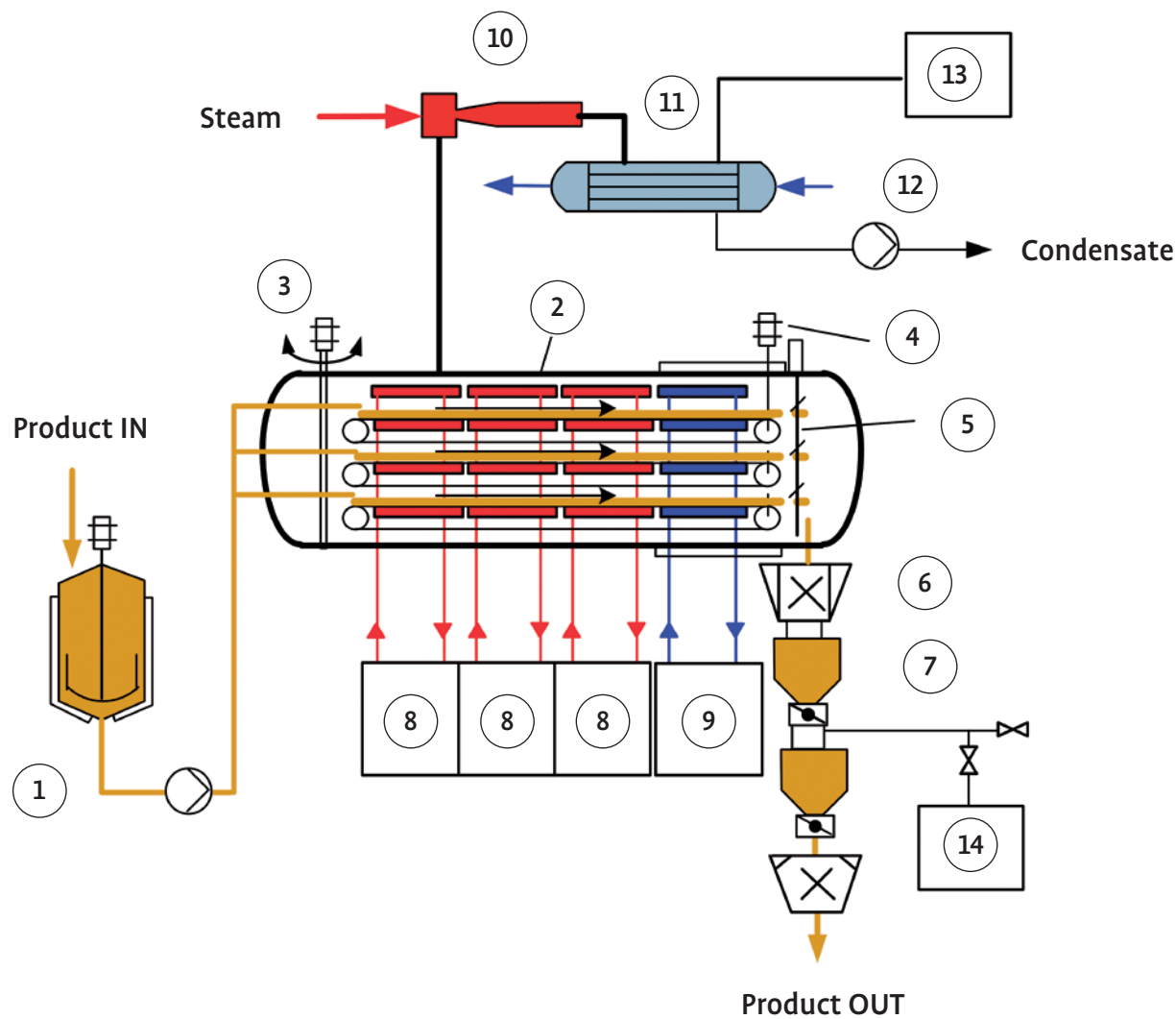
However the scope of our services can extend beyond just drying. We can supply all equipment for front end processes, such as wet or dry mixing, evaporator, heating, cutting and feeding. Likewise we can provide equipment for finished product processing such as milling or conveying. We can do this while integrating the control systems for the entire facility. As an additional service we provide complete installation and commissioning services.



Turn-key plants

Complete process lines for drying of food, cosmetic, and herbal products.

Vacuum belt dryer with liquid feeding system

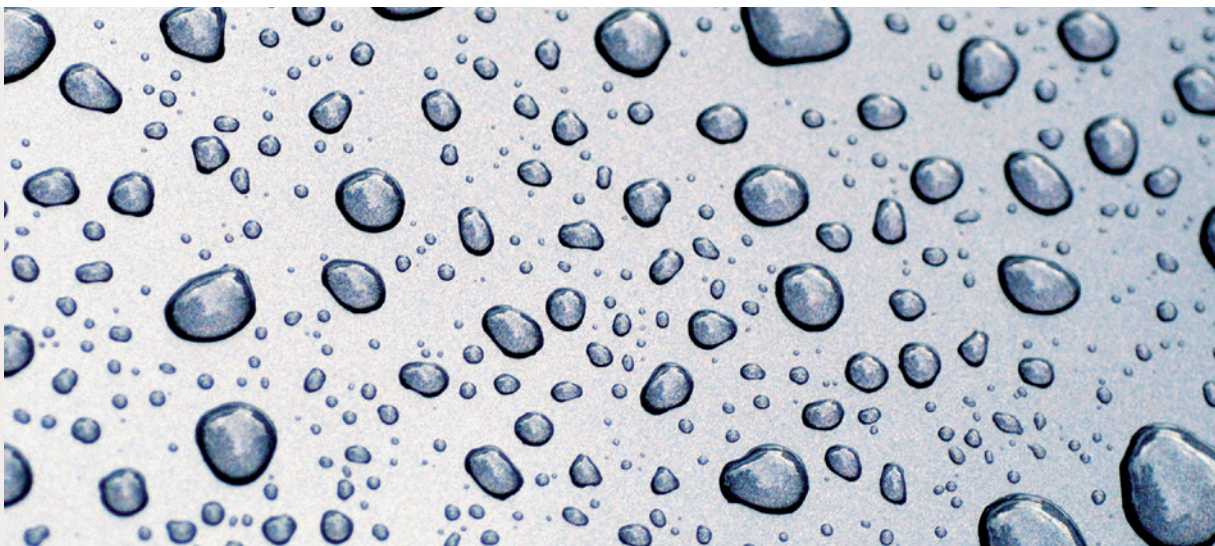


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|----------------------------|--------------------------------|
| ① Liquid feed tank | ⑧ Heating zones 1 to 3 |
| ② Vacuum belt dryer | ⑨ Cooling zone 4 |
| ③ Swivel feeder | ⑩ Steam injector |
| ④ Belt drive | ⑪ Surface condenser |
| ⑤ Pre-Crusher | ⑫ Condensate pump |
| ⑥ Crusher | ⑬ Vacuum system dryer |
| ⑦ Discharge hopper 1 and 2 | ⑭ Vacuum system discharge unit |

Innovation With over 200 years of experience in vacuum drying, Bucher Unipektin pushes the frontier of drying technology with the development of Zeodration adsorption and continuous freeze drying systems. These innovations continue as our highly qualified and experienced engineers develop tomorrow's drying technology to meet your needs. Our in-house laboratory is able to handle a variety of trials using different processing technologies to assist in adapting theory to practice. This ability to prove various processing unit operations helps to ensure efficient scale-up

Quality All orders, whether for spare parts or complete drying systems, are handled with equal care and focus on details. Bucher Unipektin equipment is known for its high quality, availability and consistency, long life span, and efficient energy-use. Furthermore, with our superior equipment we can assure less maintenance is required, so we can assure you peace of mind. We are ISO 9001:2015 certified

Worldwide Service To ensure optimal equipment performance in your plant, our commissioning engineers will appropriately train your responsible on site. The customer service department has experienced engineers available to support you. Our centralised spare parts warehouse ensures part availability with fast and reliable delivery worldwide.



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Bucher Specials comprises machinery and equipment for winemaking (Bucher Vaslin), technologies and systems for processing fruit juice, beer and instant products (Bucher Unipektin), a Swiss distributorship for tractors and specialised agricultural machinery (Bucher Landtechnik) as well as control systems for automation technology (Jetter).

Bucher Municipal is a world-leading supplier of municipal vehicles for cleaning and clearing operations on public and private roads and other traffic areas

Bucher Hydraulics is a leading international manufacturer of advanced hydraulic systems.

Bucher Emhart Glass is the world's leading supplier of advanced technologies for manufacturing and inspecting glass containers.

Kuhn Group is the world's leading supplier of specialised agricultural machinery.