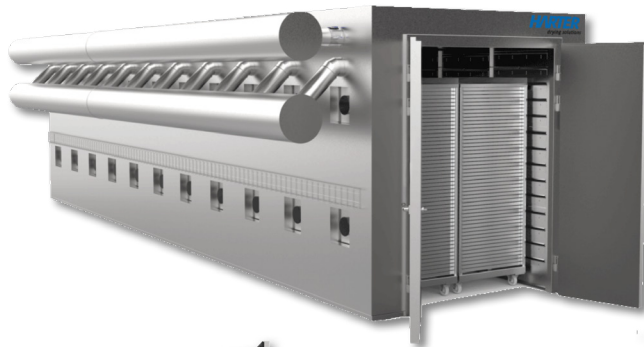


Pharma+Food



EFFICIENCY IN THE HYGIENE PROCESS



SPECIAL PRINT



Pro Guide	
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Cosmetics	● ●
Chemistry	● ●
Function	
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Purchasers	● ●
Manager	●



Ingredients of grasses are preserved by gentle drying.
Image: Harter

Efficient Drying Based on a Heat Pump

Energy-efficient, Gentle and Reliable Drying

Food, food supplements, and pharmaceutical products each have their very specific processes. A dryer manufacturer offers different heat pump based systems for defined dehumidification.

The German dryer manufacturer Harter has realised more than 2,000 projects across all industrial sectors with their specially developed heat pump based condensation drying technology. Their wealth of experience is correspondingly vast. The company's drying systems are capable of targeted dehumidification but may also provide temperature equalisation and cooling. They are energy-efficient enough to be eligible for government subsidy in Germany, Austria and Switzerland as of 2017. Here are some application examples to outline the various capabilities of this technology.

Wet grasses for tablets

Drying grasses in containers was one of the first projects of this kind which Harter realised many years ago. Grasses include wheat, barley, oat, and various millets. They invigorate the scalp, foster hair growth, and help promote healthy skin and nails. A manufacturer cultivates organic grasses, processes them gently, and finally presses them to make tablets marketed as food supplements. Quality processing includes gentle drying so that the precious ingredients of the grasses are preserved. For this application, the German dryer manufacturer designed and built a container drying solution comprising four stations to cope with large

quantity of material to be dried, which amounts to some 800 kg per working day.

The wet grasses are loaded into the containers and dried therein to obtain a dry matter content of about 95 percent. The temperature is about 50 °C. A single heat pump module provides the process air for the four drying chambers. For space restrictions, the module was installed on a separate platform. It is connected to the chambers through insulated piping. The chambers may be operated independently to ensure continuous processing. The containers feature a special bottom which allows the passage of air so that extremely dry and, thus, unsaturated air may easily flow through the material to be dried. Upon completion of the process, the bulk of grass is uniformly dry and may be subjected to further processing.

From Secondary Product to Medicament

The use of horseradish has a long tradition in human history. It was employed as an immune system booster and also as an aphrodisiac as far back as in ancient Egypt. Horseradish root is not only used to give spice to dishes but is also an active agent in many naturopathic applications. The essential oils in horseradish root promote the function of the gastro-intestinal system

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Dried lateral shoots of horseradish, while only a secondary product in the food industry, are highly coveted by the pharmaceutical industry.

and antagonise many harmful substances in the body. To obtain a proper horseradish root, the plant must be trimmed to remove the head and lateral shoots which is a laborious task to do. Processing these shoots is very expensive owing to their properties. A renowned company makes a different use of the lateral shoots today. They dry and then sell them to the pharmaceutical industry. Horseradish root is combined with nasturtium to make an herbal medicament against coughs and sneezes. For drying horseradish shoots, a barrel dryer was the ideal solution.

Barrel drying is suited for smaller production quantities and less sensitive products. The barrel is loaded with 250 kg max. and dwells in the drying chamber for 23 hours. The horse-radish is dried at a temperature of 55 °C to obtain a residual humidity of 5 percent. During drying, the barrel is slowly rotated once an hour. The lateral shoots, which have largely di-verse geometries, are uniformly dry upon completion of the process. The rated power of the drying system in production operation is about 15 kW.

Uniform drying of lozenges

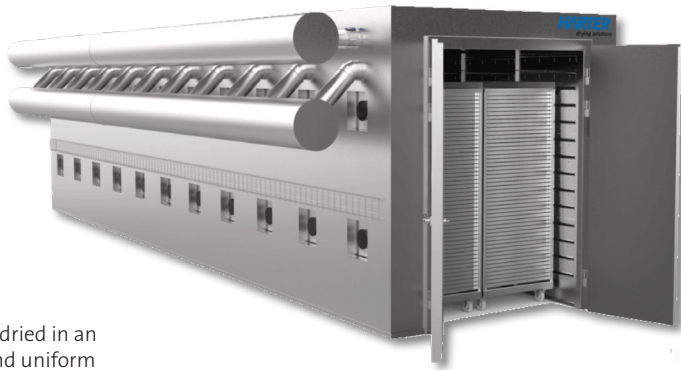
An important development project was the drying of jelly to produce throat lozenges. In an upstream process, maize flour is placed on trays and a lozenge template formed using a stamp. The jelly to be dried is injected in this template. The manufacturer required extremely gentle and absolutely uniform dehumidification of the jelly.

The lozenges were required to have an exactly defined final consistency. The drying period was of minor importance. As a result of comprehensive testing in Harter's own Test Center, a chamber dryer was identified to be the ideal solution. A total of 66 pallets are manually introduced in six chambers. The pallets accommodate a total of 936 trays. The jelly is then dehumidified at a temperature of about 40 °C to obtain the specified dry matter content.

One heat pump module each provides the process air for the six chambers. The air recirculation system

#GENTLE #PROCESS-SAFE
#EFFICIENT#EXHAUST-FREE
#ENERGY-SAVING #STATE SUBSIDISED
**HOW TO DRY YOUR FOOD
PERFECTLY AND SAVE UP
TO 75 % ENERGY AND CO₂!**

HARTER
drying solutions



Jelly for lozenges is dried in an extremely gentle and uniform way.



A stainless steel chamber dryer is best suited for drying cannabis buds.



integrated in each chamber features a total of 22 special fans. The dryer is made of 1.4301 stainless steel and meets GMP requirements. The throughput is 2,300 kg per batch. The entire system is 24/7 in operation and has a rated power of 33 kW per chamber.

Gentle drying of cannabis buds

A Swiss manufacturer of cannabis plants was looking for a gentle drying technique for their high-priced cannabis buds. The ingredients and extracted agents of these buds were intended to be used in pharmaceuticals for oncology and dermatology. For this project, a stainless steel chamber dryer was designed and built. The drying chamber consists of three modules with the footprint of a europallet each, which is required for the existing harvesting baskets. Following harvesting, ten baskets each are loaded and stacked on a trolley. Each module accommodates four trolleys, so there is space for 120 baskets in twelve stacks. The buds are gently processed to become completely dry after a dwell period 24 hours at below 30 °C. The water extraction rate is about 32 litres/hour.

Each of the three modules has two speed controlled process air fans with a connected load of 2.3 kW max.

installed. The fans produce an airflow rate of about 42,000 m³/h. The entire process air is passed through F9 filters with a retention rate of more than 95 percent for particles sized 0.4 µm. The average power rating of the entire system is between 15 kW and 18 kW depending on the parameters selected, which is extremely energy-efficient. The drying system may be operated with full or partial loads as required for the specific batch size. This project constituted the start for another important activity of the drying system supplier – the drying of medical cannabis.

Exhaust air free and eligible for government subsidy

Harter has a Test Center of their own to conduct tests. This is where products to be dried are tested for their properties. The parameters determined are used for drying system layout and design. As the systems operate in a fully closed energy circuit, it is extremely interesting for prospective buyers to see the positive effects of low temperature drying on the ingredients, flavour, and look and feel of their products if important for marketing. The Test Center has meanwhile been extended by adding a belt dryer to satisfy the rising demand for solutions with a higher degree of automation.

Facts for decision makers

- Gentle and customized solutions are often required for drying food or pharmaceuticals.
- The specific drying solutions described above are energy-efficient and qualify for government subsidy in Germany, Austria and Switzerland.