

Gentle Drying of Tea Ingredients

Salus uses the advantages of a heat pump based technology

For potential investors in a new or better dryer, the following criteria are often critical – gentle, reliable, and energy effective. Health product manufacturer Salus found a technology which meets all demands. The alternative method of dehumidifying tea ingredients they use now is a heat pump based technique.

Harter developed their heat pump based condensation drying more than 30 years ago and has been optimizing it ever since. The German company uses a physically alternative approach for their highly efficient technique – dehumidification using extremely dry and, thus, unsaturated air. This air is continuously passed over the items to be dried in a closed air circuit. The heat pump module associated with each dryer conditions the required process air and is also responsible for the condensation process.

„The dry air alone, however, does not make good drying“, explains Stephan Ortmann of Harter Sales. The air, by its very nature, follows the path of least resistance. So, appropriate routing is essential to accurately pass the unsaturated air over or through the items to be dried. „It is only by the perfect combination of air dehumidification and air routing that we achieve our great technical success“ adds the expert.

Not only Harter but also Salus has devoted themselves to this credo. Dryer expertise meets herb expertise. The German health product manufacturer is known for their high-quality teas, plant juices, tonics, pills, gels, powders and much more. Everything revolves around health supported in a natural way by healing plants. Salus cultivates their own organic-grade plants and processes them in a gentle way to retain the precious ingredients. This is where Harter comes into play – they have the same approach with their low temperature drying.

First contact at the Anuga FoodTec

The two companies, who are both strongly rooted in their home region while having an innovative spirit, met at the Anuga FoodTec in Cologne, Germany, six years ago. Salus's obsolete dryer was to be replaced by a state-of-the-art, efficient, and high-quality system. „We could have tests run in Harter's Test Center to

verify if Harter's technology was right for us“, reports Thomas Guenther, Factory Manager and Environmental Officer of Salus, in retrospect. „This was a huge advantage and also a solid basis.“ Apple and rosehip granulates were dried, and both showed the desired low dry matter content after processing at 50 degrees centigrade for 30 minutes. For Salus, it was

important to be able to use a temperature much lower than before. Equally important was the final dry matter content to ensure that the plant parts could be readily subjected to further processing. Another profit for the organic product manufacturer with a 100 year history was the fact that the Harter system provided some more benefits.

Hygienic design

The system built and installed is a chamber dryer with a multifunctional trolley. The two components are made from 1.4301 stainless steel and meet hygienic design requirements. An air recirculation system with two special process air fans is integrated in the drying chamber. The fan speed is infinitely variable using a frequency converter. An electrical heater battery boosts the process air temperature at the start of the drying process. Temperature and humidity sensors pick up the relevant values at the dryer entrance and exit. Once the desired dry matter content is reached the dryer shuts down automatically. Shut-down may also be controlled as a function of time. The system is controlled through an HMI panel in the control cabinet of the system. The air-flow rate inside the chamber dryer may be varied between 2,000 and 11,600 cubic metres per hour as required for the specific product or programme. The rated power in production operation is twelve kilowatts.

One of the special features of this system is the multifunctional trolley.



Teas play a major role in Salus's range of products.



The stainless steel chamber dryer processes the tea ingredients to obtain the desired four percent residual humidity within six hours. Right: Condensation drying meets highest demands; pomegranate peel is being processed here.

Ortmann explains: „It is capable of accommodating pans and trays of various sizes and may thus be used for various applications and products. This gives the operator extreme flexibility.“ Salus exclusively uses small stainless steel pans for their purposes. The pans are 400 mm in length, 600 mm in width, and 70 mm in height, and have a maximum useful volume of 14.5 litres. Up to 40 of such pans may be placed on the trolley. As Salus wanted to dry granulates as well, it was important to design the pans such that the fine-grained material would not fall through. Harter manufactured special pans for this purpose featuring a stainless steel net with a 0.1 millimetre mesh size.

The pans are loaded manually with cut, sorted, sieved, or compacted plant material. The material is processed later to make various teas. It includes pieces of apples and quince, pomegranate and rosehip peel, hibiscus blossoms, different kinds of berries and much more. The plant parts are loaded in bulk 50 to 60 millimetres high. The grain

sizes are 0.3 to 1.5 millimetres for fine-cut and 1.5 to six millimetres for coarse-cut. A worker loads the filled pans into the chamber dryer and starts the drying process selecting the appropriate programme. The bulk material is uniformly dehumidified at 50 degrees centigrade. The tea ingredients are uniformly dry and have the desired four percent residual humidity after six hours of drying. Salus’s quality requirements were fully met with these parameters. Following drying, a worker empties the pans in sacks using a hopper, and the dried plant parts are forwarded for further processing.

Flexible choice of drying temperature

The heat pump based drying process is capable of dehumidifying food both in an energy efficient way and at low temperatures. The drying temperature may be selected within a range of 20 to 75 degrees centigrade as required for the specific product or process. Temperature equalization or cooling stages may be integrated easily. The drying period depends

on the residual humidity desired or required. For packaged food, where the wet package needs to be dried, processing of often accomplished at minute intervals. For direct product drying, however, the drying period may often be longer and as needed to meet parameters such as consistency, appearance, ingredients retained, and flavour. Another advantage – Harter systems were classified, some years ago, as future fit technology eligible for government subsidy. German, Austrian, and Swiss operators investing in the low carbon and energy efficient heat pump technology may thus obtain grants. Thomas Günther summarizes contentedly: „This drying method is optimal for us. Our tea ingredients are dehumidified in a gentle and uniform way. Today, we have a state-of-the-art system, without any exhaust air, and with a constant process quality of maximum reliability.“

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DRYING TIME



approx. 6 hours

TEMPERATURE



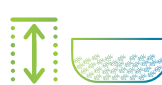
50°C

QUANTITY PER CHARGE



400 – 900 kg

FILL HEIGHT IN TUB



80 mm

MOISTURE CONTENT



12% before drying → 4% after drying