



*The challenge for the confectionery manufacturer's laboratory is to uniformly dry the vegan fruit gum jelly to obtain a precise residual humidity.*



*The versatile compact dryer, which uses heat pump based condensation drying technology, is suitable for determining the new parameters.*

## Low-temperature dryer helps develop vegan sweets

The vegan food train has been gaining tremendous speed in recent years. Happy is the business who takes changing customer preferences seriously and is willing to pursue new avenues. An adequate drying system from Harter helps a confectionery manufacturer realize his ideas.

A German confectionery manufacturer has recognized the signs of the time. Those responsible wanted to develop their fruit gums to become all-vegan. This was in response to consumers' growing desire for non-animal food and, ultimately, to secure the future of their business. For this purpose, they invested in an energy-saving, flexible compact dryer for their laboratory.

Usually, the fluid jelly, once cast in a mould, must be dried. Low drying temperatures and good ventilation are required to obtain the best results. Uniformity of drying and very exact residual humidity are essential. Taste, look and feel, consistency – there are many factors that contribute to commercial success at the end of the day.

The parameters for drying the new fruit gums based on vegan ingredi-

ents needed to be redetermined. And this is where the alternative drying technology by the German drying system manufacturer Harter comes in. They realize low-energy and low-carbon drying systems in many sectors of industry. With their heat pump based condensation drying technology, they were trendsetters more than thirty years ago and have always been ahead of the times ever since. The company has installed almost 2,000 of these low temperature drying systems to date.

The above-mentioned compact dryer in one of the systems offered by Harter. It is intended for use in product development and for drying small production quantities. The user may employ this very flexible dryer to test smallest laboratory quantities in order to redevelop its confectionery. The elaborate design of the dryer allows to

dry both items placed in single layer or in bulk. The company's portfolio also includes such multifunctional dryers in various sizes for production applications.

### Compact dryers offer high energy efficiency

There are many tray sizes and designs available. For the compact dryer, the usable tray area is 12 m<sup>2</sup> maximum. The same applies for pans which may hold up to 0.21 m<sup>3</sup> of bulk material. The operating temperature of the compact dryer is between 15 °C and 75 °C. Thus, the user is given ample opportunity to vary and combine parameters.

Harter dryers remove humidity at low temperature. This provides cru-

cial benefits for any food. For one thing, the appearance of the products remains very stable. You eat with your eyes.

By using this drying, Harter's initial food client was able to do without the questionable sulphurization of its apricots. Another client was much surprised to find the appearance of its apple chips much more appealing. Much the same applies to the improvement and/or retention of flavours, vitamins and other ingredients.

Drying takes place in a system that is closed air-wise, which makes the process independent of climatic conditions. There is no exhaust air emitted from the dryer. This has also very positive effects on aroma. So, this drying method might well be worth a test station in Harter's pilot plant under these aspects.

The compact dryer for the confectionery manufacturer features an additional weighing cell to measure the weight change during the drying process. The operator can thus identify the weight loss and infer therefrom the residual humidity of the product. Drying stops automatically when the desired dry matter content is obtained.

Harter systems also excel by their high energy efficiency – a highly important feature today. The rated power of the laboratory dryer is about 4.2 kW, as required for the degree of capacity utilization. The core of each drying system is a two-stage heat pump system which is intrinsically powerful and economical. The fact that the system is closed in terms of energy further contributes to its efficiency.

### Optimized airflow particularly important

This drying system was classified as future technology eligible for government subsidy in 2017. Clients may obtain grants amounting to as much as 40 % of the acquisition cost. A proficient energy consultant working in close co-operation with Harter sees that grant applications are processed smoothly and successfully.

The success of this low temperature process is based on its physically alternative approach: Drying is carried out with extremely dry and thus unsatura-

ted air, which is passed over or through the products to be dried and which absorbs any humidity present very well. Then, the air is cooled – the humidity condenses to form water –, reheated and returned to the drying chamber. The drying temperature may be set at between 15 °C and 75 °C as required for the specific product or process.

If sterilization is desired or required, Harter adds an optional high temperature process step with temperatures between 90 °C and 110 °C. A cooling step may also be integrated. Drying periods depend on the residual humidity desired or required.

Optimum air routing is critical for drying to be successful. Air, by its nature, follows the path of least resistance. The driest air is of no use if it misses the products to be dried. Only if the air is controlled to follow the correct path and is perfectly routed over or through the items to be dried, drying may be successful. This recipe is part of Harter's extensive know-how, and it is, of course, applied in the German drying specialist's compact dryer.

[www.harter-gmbh.de](http://www.harter-gmbh.de)



For delicate products, five phases with different parameters may be specified in the individual drying profile stored in the controller. (Images: Harter)



The highly efficient heat exchanger system integrated in each dryer heats and cools the process air at two stages.