

Vacuum Drying Systems

Rocket Science in Food Industry



Main idea

Vacuum Drying without water state

Ice



Vapor

The **integrity** of cell membranes, intracellular endomembrane system and cell organelles **is saved**

Usual Drying

Water



Vapor

Denaturation and **breakdown** of proteins, **destruction** of vitamins, sugars and other complex organic compounds

Benefits of the vacuum dried products

- Light weight (up to 10 times lighter than original food)
- Unlimited shelf life without additives/preservatives
- The taste, calories, vitamins are saved



Variety of Business Solutions

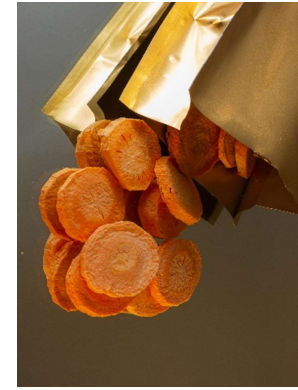
For food production

Humanitarian mission

For restaurants

For agricultural business

For Outdoor/Military MRE



Unlimited possibilities in creating new snacks (based on berries, ice cream, milk, fruits etc.)

Saving products that are about to expire

Fresh seasonal products out of season

Reduction in transportation costs

Reducing the number of chefs in the chain restaurants

Healthy fast food

Our Products

We offer a wide range of Vacuum Freeze Drying Chambers with Capacity from 6 to 200 kg of food to be sublimated



SU-6

Ice condensate vapour capacity: 6 kg
Maximum power consumption, 2,2 kW



SU-20

Ice condensate vapour capacity: 20 kg
Maximum power consumption, 3,6 kW



SU-100

Ice condensate vapour capacity: 100 kg
Maximum power consumption, 6,0 kW



SU-200

Ice condensate vapour capacity: 200 kg
Maximum power consumption, 12,0 kW

All products are CE certified, plug-and-play, utilizing our patented drying technology, operating under digital control system

Examples



Packing



Our solution for packing of the products
We developed a special packing for
sublimated products

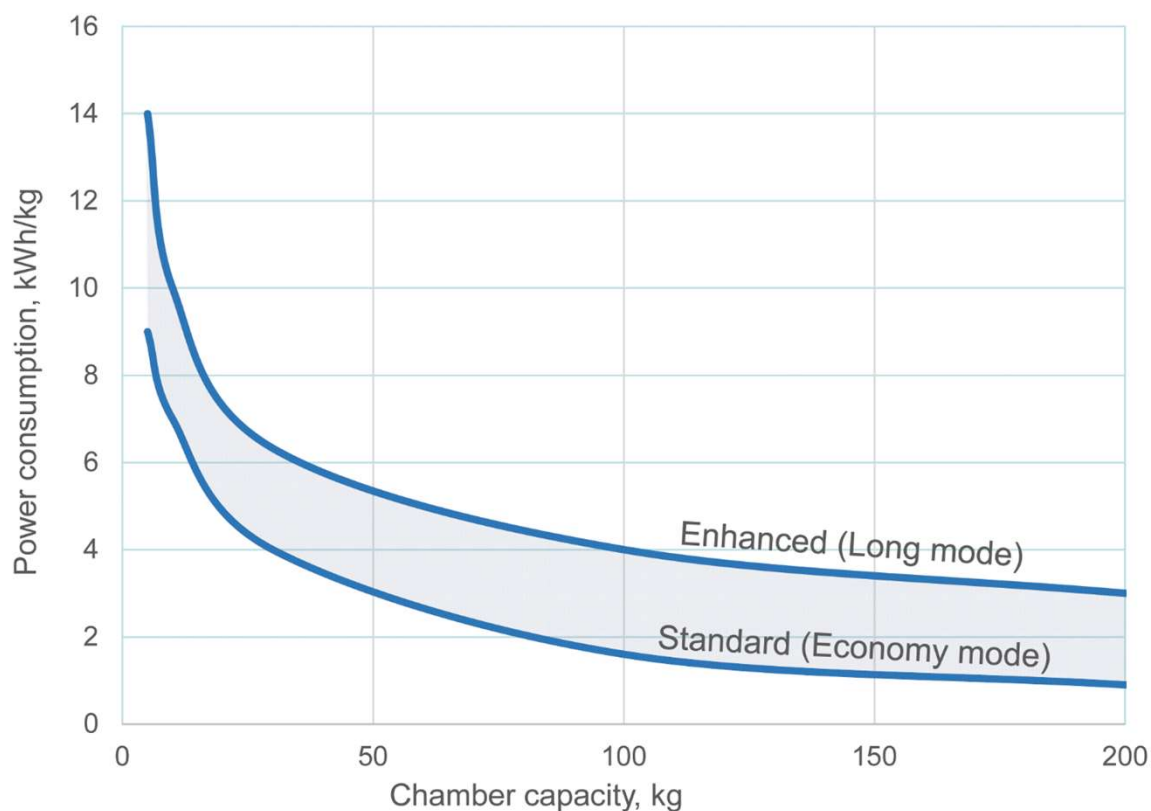


The inner material is human friendly food-
grade polyethylene
The middle material is food-grade
aluminium (stainless steel foil optionally)
The outer material is polyamide (polyimide
optionally)

The packing may be customized
(incl. size) and branded

Power consumption

Energy consumption per mass of water removed from the sublimated product (in the form of ice) depends on the size of the chamber. The larger the chamber, the more profitable is the sublimation process in terms of energy consumption.



Small chambers (6-15 kg capacity)

Suit small business:

- Family agricultural business
- Private restaurant or bar
- Winery

Roughly around 7-9 kWh per kg of removed water

Middle-sized chambers (20-50 kg capacity)

- Universal solution

Roughly around 5 kWh per kg of removed water

Big chambers (60-200 kg capacity)

- Food industry
- Chain restaurants
- International food delivery

Roughly around 2-3 kWh per kg of removed water

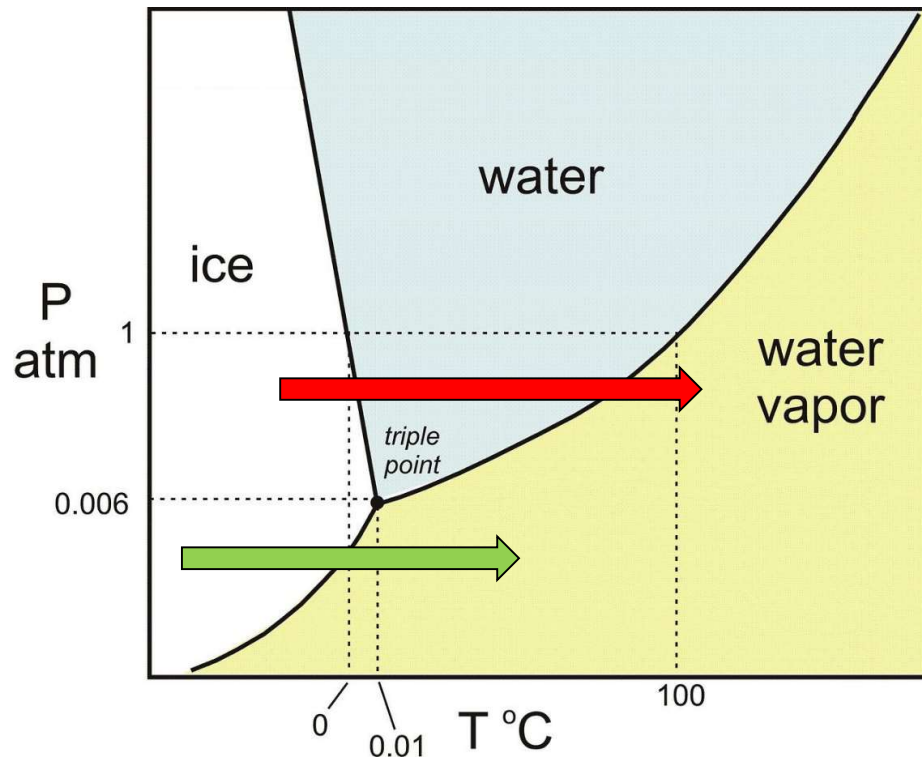
The mode of the sublimating chamber may be adjusted in wide range:

from focus on **Power economy**

to focus on **Maximum quality** of the sublimated product

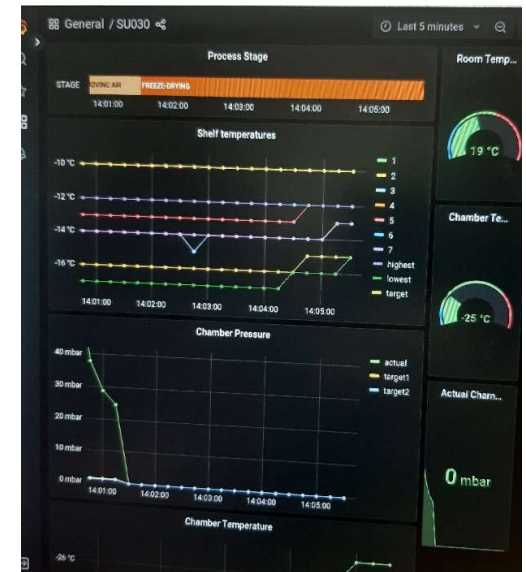
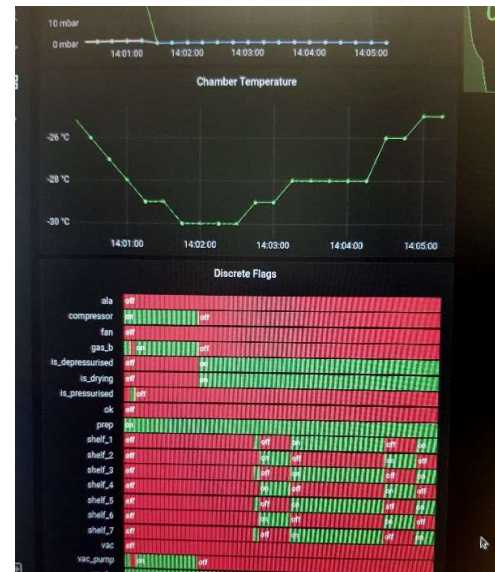
Triple Point

The quality of sublimation depends on the quality of Low Pressure keeping – the pressure must stay under the Triple Point to maintain Ice to Vapor transition and avoid Ice to Water and Water to Vapor transitions.



Scientific approach

The technology is developed by our R&D department (including 7 PhDs) and is based on practical experience in space simulation.



Temperature control

A large number of high-quality sensors allows the control of temperature throughout the volume of the chamber, so that the sublimated product ultimately receives **excellent quality**.

Our Benefits and Experience

Performance

- The **rate and quality** of sublimation is on the highest level that only leaders of the market can offer at a significantly higher (2-5 times higher) cost
- **Weight** of the set in our solution is reduced due to the cylindric implementation of the chamber, which supports itself during vacuum formation

Easy operation and maintenance

- The chambers are digitally controled with the intuitive LED display and/or with mobile app
- We offer different training courses in our training center and online
- The delivery from stock to the European customer may be done in 3-10 days
- 24/7 Support

Huge experience

Today we have hundreds of successful installations in Europe (mostly Estonia, Latvia, Lithuania) and our equipment is used in more than 50 different business solutions in Food Industry and Agricultural business. Many solutions are considered as innovative and thus receive governmental and other forms of financial support



European Components

Sublimation takes place under **digital control technology** protected by European and International patents. All system components, such as sensors, pumps, vacuum gauges, refrigeration units, are made in **Europe by Europeans (Germany, France, Slovenia)**.



Ready for custom branding (optionally)

- Our chambers are manufactured of food-grade stainless steel and have surfaces ready for branding
- The branding may be done directly at our production line

About us



We are a fast-growing Latvian company. Our head office and production line are located in Ventspils, which is a historical place and big Baltic sea port, as well as the European center of Space research and Satellite networks.

We are involved in dozens of Scientific Research projects individually and in cooperation with:

- European Space Agency
- Riga Technical University
- University of Latvia :
 - Institute of Atomic Physics and Spectroscopy
 - Institute of Solid State Physics
- Ventspils University of Applied Sciences

SIA “CRYOGENIC AND VACUUM SYSTEMS”
Andreja iela, 7/9, Ventspils, LV-3601

+371 24 80 79 41

www.cvsys.eu

info@cvsys.eu