

FREEZE DRYING MACHINES MANUFACTURING

INNOVATION IN MATERIAL
SUBLIMATION FOR FOOD & DRUGS
INDUSTRIES

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ABOUT PROJECT

SUBLIMATION MICROWAVE MACHINES:

Welcome to our presentation. We are a dynamic startup at the cutting edge of food technology, dedicated to redefining the way we approach food preservation and production. Our mission is simple but ambitious - to revolutionize the global food industry through the development and implementation of Microwave-Heated Food Sublimation.

INNOVATIONS:

This presentation will provide an overview of the sublimation process, the benefits of our technology, and its potential applications in the food industry. We invite you to join us on this exciting journey of technological innovation, as we reshape the landscape of food production.

ABOUT SUBLIMATION

Understanding Sublimation: A Modern Approach to Food Preservation

Sublimation is a unique process where a substance transitions from a solid state to a gaseous state, bypassing the phase. In the context of food preservation, this means extracting moisture directly from the food in the form of vapor.

Microwave-Heated Sublimation takes this process a step further. By utilizing the penetrating power of microwaves, we're able to heat food directly and uniformly, turning the water content inside to vapor. This swift process minimizes the time the food is exposed to heat, thus preserving its essential properties, such as color, texture, flavor, and nutritional content.

Unlike traditional drying methods, Microwave-Heated Sublimation does not cause the food to shrink or harden, nor does it lead to significant nutrient loss. Instead, it results in lightweight, dry food that retains its original shape and can be easily rehydrated with water, making it ideal for a variety of applications in the food industry.

WHAT PROBLEMS SOLVE

TARGET MARKET PROBLEMS

AGRICULTURAL PRODUCERS



FAST FOOD & READY-MEAL PRODUCERS



DRUGS & DIETARY SUPPLEMENT PRODUCERS



COMMON

- 1** Relative high cost of freeze drying
- 2** General quality reduction during sublimation or/and raw material loss
- 3** Some products cannot be sublimated without decreasing the quality
- 4** Production time impacts the supply chain

OUR SOLUTION

Our installations deliver lower production cost for the client

Our technologies preserves the quality to a greater extent

We enable to sublimate thermolabile products

Sublimation is reduced 2-3x relative to our competitors

OUR PRODUCT

SUBLIMATION MICROWAVE MACHINES:

- ① Universal **small-sized** machines loading of raw materials up to 40 kg
- ② Universal **medium** machines – loading of raw materials up to 400 kg
- ③ **Mobile** sublimation machine (in the post-project period)
- ④ Machines **for drying liquid and pasty products** (in the post-project period).

INNOVATIONS:

The **innovation core** in the equipment is the **use of microwave emitters** in sublimation technology, which allows to:

- Universalize the process for different products and quantities
- Significantly reduce the drying time of the product and spend it with less energy and time
- Gentle sublimation process (securing quality)

OUR MVP

SUBLIMATION MICROWAVE MACHINES:

- 1 First Minimum Viable Product (MVP) – a cutting-edge machine for laboratory testing and small-scale production.
- 2 This machine has a capacity of 40 kg of raw materials, ideal for testing new recipes and refining the sublimation process.
- 3 One of our notable successes includes developing a rapid drying technique for creating high-quality meat crisps.



MARKET ANALYSIS

KEY FACTS AND PROSPECTS:

AGRICULTURE AND FOOD INDUSTRY IN THE Spain

- Exports of agricultural products > 75 bln € annually ($\approx 17,5\%$ of export structure).
- Leading international knowledge infrastructure in the field of agriculture and food.



Our machines can be widely used in food industry (schools, kindergartens, as food for military personnel, in the HoReCo food system, etc.)

THE PROBLEM OF HEALTHY EATING IN EUROPEAN COUNTRIES

- About 50% of the adult population in EU is overweight.
- Positive changes in the field of food health in the Netherlands (trend towards legislative support for healthy eating).



Our machine can cause a revolution in the field of fast food and street food.

PHARMACEUTICALS AND DIETARY SUPPLEMENTS PRODUCTION

- The market grew by 7,2% per year in 2017-2022.
- There are many ingredients for the production



Our equipment can give a positive economic effect for companies engaged in this production

OPPORTUNITIES:

1

High potential demand for our machines

2

Low barrier of entry to the market

3

The opportunity to take a leading position in the field of sublimation of thermolabile products

COMPETITIVE ADVANTAGE

KEY COMPETITORS:

PÜSCHNER
MicrowavePowerSystems

- SIMILAR TECHNOLOGY, YET ONLY MACHINES WITH A LOAD OF UP TO 20 KG (LOWER LOAD VS. US)

 ENWAVE
CORPORATION

CHINESE
MANUFACTURES

- DO NOT USE MICROWAVE SUBLIMATION TECHNOLOGY
- SOME HAVE LOWER COST OF THE MACHINES VS. US, BUT WITH A LOWER QUALITY OF THE END GOODS
- HIGHER PRODUCTION TIME
- CANNOT WORK WITH ALL PRODUCT TYPES

THE RECONFIGURATION OF THE SOFTWARE USED IN OUR MACHINE; THE TYPE OF FREEZE-DRIED PRODUCTS CAN BE CHANGED WITHOUT MAKING CHANGES TO THE EQUIPMENT ITSELF. **THIS INNOVATIVE TECHNOLOGY ALLOWS US TO CALIBRATE THE EQUIPMENT IN THE SHORTEST POSSIBLE TIME IN ACCORDANCE WITH THE REQUIREMENTS OF ANY CUSTOMER.**



ORGANIZATION PLAN

1-3 quarters 1st year

Relocation,
Obtaining a residence permit,
Obtaining financing

4 quarter 1st year

Registration of a legal entity,
Investment stage

4 quarter 1st year 1-3 quarters 2nd year

Reverse engineering of equipment, Creating showroom, Obtaining drawings and diagrams for production

4 quarter 2nd year

Opening of pilot production

2nd – 3rd years

Equipment certification

3rd year

Production and sales activities

JOB CREATION

Position	1st year	2nd year	3rd year	4th year	5th year
Project manager	1	1	1	1	1
Technologist	1	2	2	2	3
Financier	1	1	1	1	1
Marketing specialist	1	2	3	3	3
Cook-technologist	1	2	2	3	3
Accountant	1	1	1	1	1
Lawyer	1	1	1	1	1
Customer Service Manager	1	2	3	4	5
Total	8	12	14	16	18

INVESTMENTS

Capital investment (creation of prototypes of equipment (two units)

€ 3,850,000

Labor costs (including taxes and fees)

€ 488,000

Marketing expenses at the start

€ 162,000

Total

€ 4,500,000



FINANCIAL PLAN

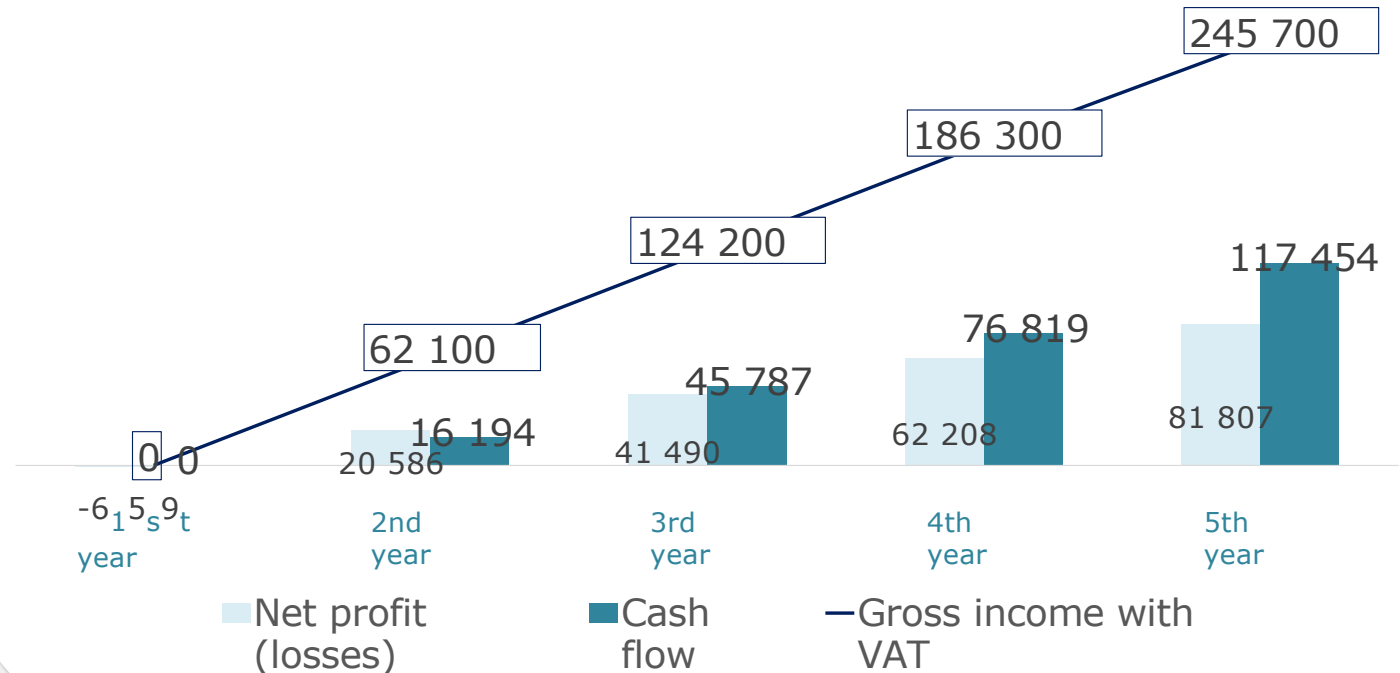
The number of industrial machines **produced and sold** within five years will be at least **1,176 units**

The **growth of tax** deductions to the budget in the amount of **159.9 million euros** over five years

Contribution to the development of the **country's economy and GDP** in the amount of at least **618.3 million euros** over 5 years

The investment will pay off in 2.7 months, which indicates a very high efficiency of the project

5-YEAR PLAN, THOUSANDS EURO



— OUR TEAM



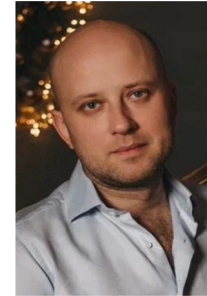
DENIS ALEKSEEV

THE FOUNDER

Education: Economy and Management

Work experience: 19+ years / CEO, Product manager, Sales manager

Skills: Acquiring, Developing and maintaining a customer base; Equipment procurement; Negotiation skills; Direct sales; 1C software, Office software applications; Telephone sales; Teamwork skills; Ability to make independent decisions; Ability to persuade



ALEKSEY DONTSOV

THE CO-FOUNDER

Education: Economist-manager, Process engineer

Work experience: 22+ year /Sales manager, Project manager, Chief manager, Commercial Director, General manager, Chief Technologist, Administrator

Skills: Standardization and certification of production facilities, products and equipment, as well as everything related to the activities of a process engineer. Working with finance