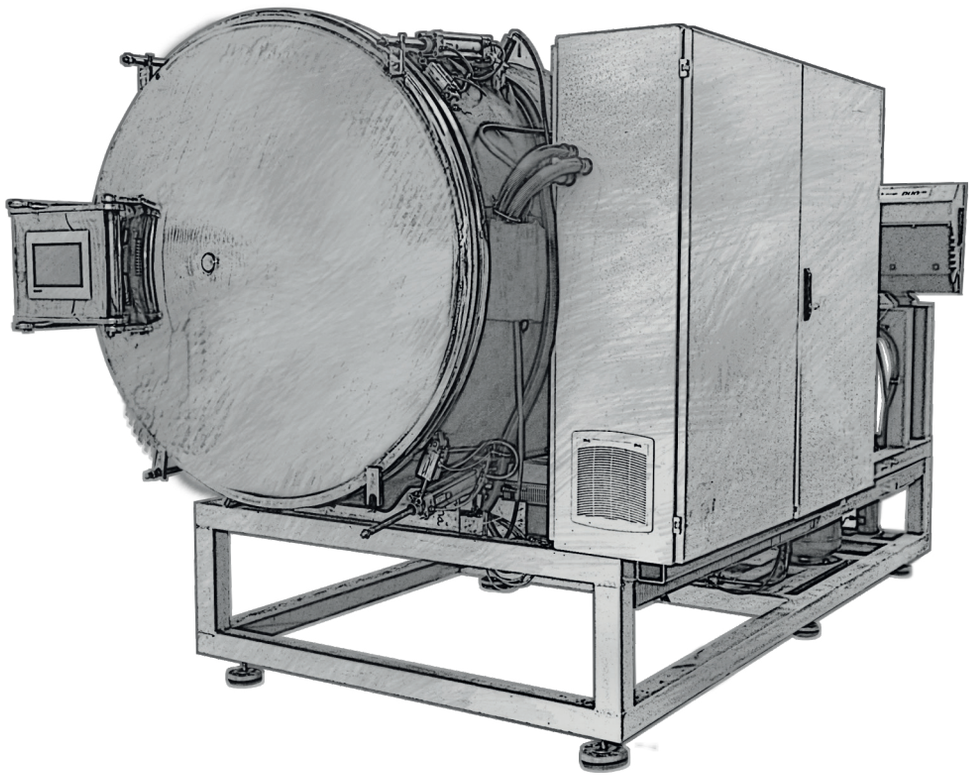
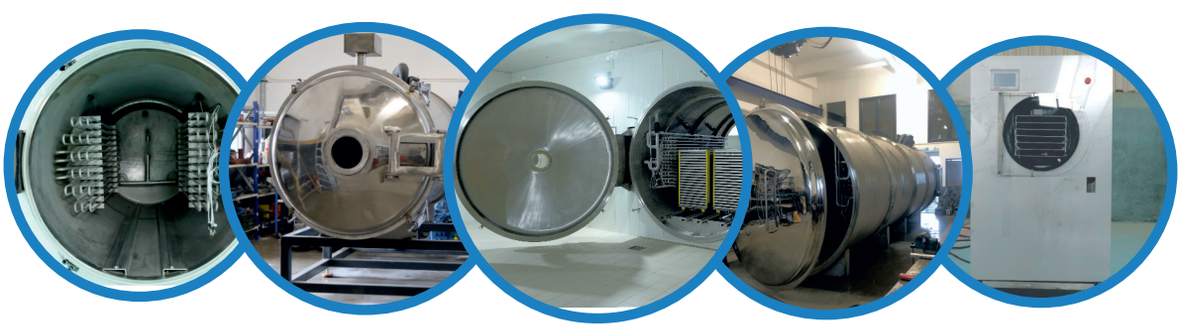
R:EM
FREEZE DRY MACHINES



Achieve High Performance with Our Freeze Dryers



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ABOUT US

Reem Freeze Dry Machines, we are a leading company in the production of lyophilization machines in Turkey. Founded in 2011, we specialize in advanced engineering works and the manufacturing of Freeze Dry Machines.

Our facility, located in the Tuzla Organized Industrial Zone in Istanbul, is where we design, develop, and produce our machines. We have conducted 5 years of engineering and R&D studies for the machines we manufacture.

Reem Freeze Dry Machines offers a wide range of production, from small-scale lyophilization machines to industrial-scale production.

We produce lyophilization machines with condenser capacities ranging from 25 kg to 2000 kg. Our machines are designed to be used in various fields, from research facilities to commercial and industrial drying operations.

Through freeze-drying, also known as lyophilization technology, you can effectively preserve fruits, meats and meat products, dairy products and eggs, vegetables, desserts, various meals, document preservation, museum conservation, and technological industrial products. This method helps to preserve the natural characteristics, flavors, and nutritional values of the products to a great extent. Dried products can remain durable for years, even centuries, when proper storage conditions are maintained.

QUALITY CERTIFICATES

CE

CERTIFIED ISO 9001 CERTIFIED

CERTIFIED ISO 14001 CERTIFIED

CERTIFIED ISO 45001 CERTIFIED

CERTIFIED EN ISO 12100 CERTIFIED

CERTIFIED EN ISO 14120 CERTIFIED

CERTIFIED EN ISO 13849-1 CERTIFIED

CERTIFIED EN 60204-1 CERTIFIED

TRADE MARK

Reem Freeze Dry Machinery takes technology and international standards as a reference, constantly renews itself and identifies risks and opportunities, so that it works with customers, suppliers and business partners within the framework of mutual trust and satisfaction and safe and legal product principles.

We are committed to the following in all our activities;

- To comply with legal regulations, legal regulations and customer requirements,
- To improve the processes we carry out in line with the quality management system and food safety management system,
- To serve our customers, suppliers and business partners with "Reem Quality" in terms of deadline, cost and hygiene in all projects,
- To give importance to training and teamwork so that all our employees can use their talents at the highest level, and to place the quality awareness in all employees,
- To be an exemplary organization that respects society and the environment and to contribute to the country's economy by constantly improving its business volume.

WHAT IS LYOPHYLIZATION (FREEZE DRY)

Freeze-drying, also known as lyophilization, is a process where a substance is frozen at low temperatures and then subjected to low pressure to allow the frozen water to directly vaporize without passing through the liquid phase. It is a three-step process consisting of freezing, sublimation (water vaporization), and desorption (removal of water vapor).

Freezing: *The substance is typically frozen at low temperatures (-50 to -80°C), causing the water molecules to solidify and form ice. Freezing helps preserve the structure of the material and slows down reactions.*

Sublimation: *Low pressure is applied to the frozen material, and its temperature is gradually increased. During this process, water vaporizes directly from the solid ice to the gas phase, bypassing the liquid phase. This step rapidly reduces the water content of the material while maintaining its structure.*

Desorption: *After the sublimation process, the material may still contain a low level of residual moisture. To remove this moisture, the material is subjected to higher temperatures (typically 20 to 30°C) and low pressure, causing the remaining water vapor to be desorbed and completely eliminated. This step increases the material's dryness and yields a stabilized product suitable for long-term storage.*

Freeze-drying preserves the structural integrity of a substance while reducing its water content, allowing for extended shelf life, transportability, and rehydration capability. Therefore, it is widely used in various fields such as the pharmaceutical industry, biomedical research, food industry, and other sectors where the stability of sensitive or thermolabile components needs to be maintained.

USAGE AREAS

Freeze-drying is a method used in various fields, from scientific research to the food industry. In this process, a substance is first frozen and then heated under low pressure to allow the water to evaporate. As a result, the water contained in the substance evaporates while preserving its structural integrity. The applications of freeze-drying include:

Food Industry: *Freeze-drying is used to extend the shelf life and reduce the weight of food products. Many food items such as coffee, fruits, vegetables, seafood, and ready meals undergo freeze-drying to make them more storable for longer periods.*

Pharmaceutical Industry: *Freeze-drying is used to increase the stability and prolong the shelf life of drugs. Sensitive components such as protein-based drugs and vaccines are stabilized using freeze-drying.*

Biomedical Research: *Freeze-drying is commonly used for the long-term preservation of biological samples. Cell cultures, enzymes, blood samples, viruses, and bacteria can be freeze-dried and later rehydrated for use.*

Cosmetic Industry: *Freeze-drying is employed to enhance the stability of active ingredients used in cosmetic products. For example, peptides and plant extracts used in skincare products are processed through freeze-drying to maintain their efficacy.*

Art and Archaeology: *Freeze-drying can be used for the preservation of delicate historical documents, artworks, and archaeological artifacts. This method prevents decay or deterioration of materials by removing moisture.*

Astronomy and Space Research: *In space exploration, freeze-drying is used in the production of long-lasting and rehydratable food supplies that can endure in space for extended periods.*

These are just a few examples of the applications of freeze-drying in various sectors. With the advancement of technology, the use of freeze-drying is increasing in more industries.

ADVANTAGES OF FREEZE DRYING

Freeze drying, also known as lyophilization, offers several advantages as a drying method. Here are some of the advantages of freeze drying:

Preservation of Nutritional Value: *Freeze drying preserves the structure and nutritional value of food by drying it at low temperatures. This method helps retain the vitamins, minerals, and other nutritional components present in the food, resulting in dried foods that closely resemble fresh ones in terms of nutritional value.*

Extended Shelf Life: *Freeze drying removes moisture entirely from the product, which prevents microbial growth and spoilage. As a result, dried foods have a significantly longer shelf life. They are less susceptible to factors such as light, moisture, and oxygen and can typically be stored for years.*

Lightweight and Easy Storage: *Freeze drying reduces the weight of the food by removing water content, making it lightweight and easy to transport and store. Additionally, the reduced volume of dried foods allows for efficient storage, saving space.*

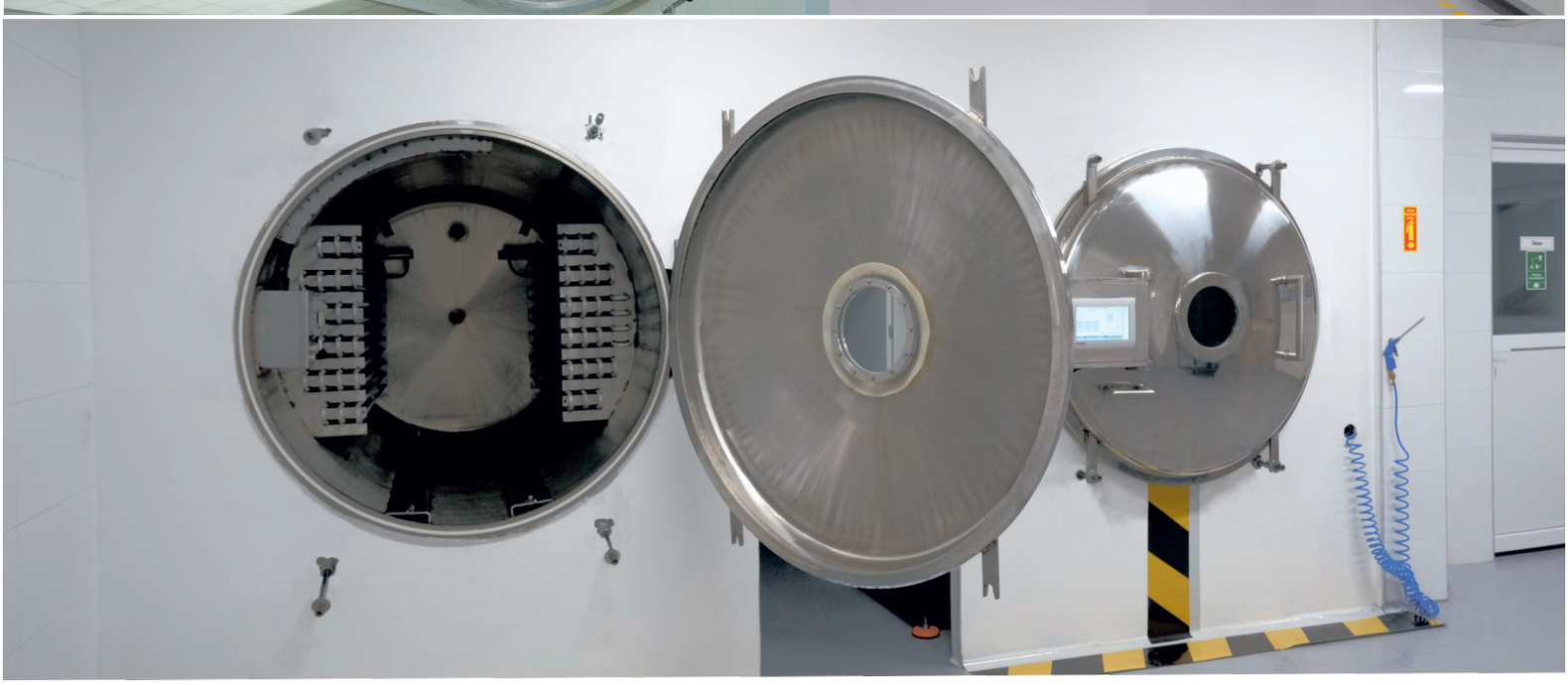
Rehydratability: *Freeze-dried foods can be easily rehydrated by adding water. This feature makes the dried foods convenient and practical to use, as they can regain their original texture and flavor by rehydration.*

Intense Taste and Aroma: *Freeze drying concentrates the flavor and aroma compounds of the food by evaporating the water. As a result, freeze-dried foods have a rich and intense taste and aroma profile.*

Reduced Microbial Activity: *The low temperature and low moisture conditions in freeze drying inhibit microbial growth and activity. This characteristic enhances the resistance of freeze-dried foods to microbial spoilage.*

These advantages make freeze drying a preferred method in the food industry, pharmaceutical industry, biomedical research, and various other fields.

FREEZE DRYER MACHINES



RM25 FREEZE DRYER

The RM25 freeze dryer, designed considering the necessary factors in food drying techniques, is a general-purpose freeze dryer. This freeze dryer has the capability to dry various biological, blood, plasma, and pharmaceutical products.

GENERAL SPECIFICATIONS

Outer Dimensions of the Machine	**Width: 900mm Length: 1400mm Height: 1800mm**
Boiler dimensions	**Diameter: 550mm Depth: 900mm**
Boiler V olume	200 Litres
Ice Condenser Capacity	20 Kg

TECHNICAL SPECIFICATIONS

Physical Specifications

Machine Dimensions
Width: 900mm
Boy: 1400mm
Height: 1800mm

Boiler Volume

200 Litres
Entire Boiler AISI R304L
It is made of stainless steel.

Ice Condenser

SStandard Temperature min -45 Degrees Celsius
Optional Temperature min -75 Degrees Celsius
Ice Condenser Capacity 20 kg

Cooling Group

3HP cooling power
Hot gas defrost
Efficient and effec tive compressor power management with VFD

Shelves

Tray Dimensions 0.34m x 0.4m
Number of Trays 12
Total Tray Area 1.7 m2
Usable Shelf Height 4cm
Tray for Product Loading and Unloading + 12 Pieces

Heaters

Maximum 1 degree surface temperature difference
0.1 Degree Heating Sensitivity
Maximum adjustable temperature 120 degrees
Homogeneous Heat Distribution

Strength

Installed Power: 15 kW
Energy Consumption: 3 kW/hour

Automation System

BECKHOFF PLC
12 Channel PID Temprature Controller
7" HMI
10 recipes with 10 steps
All motors are PID VFD controlled

Vacuum System

25m^3 double rotary vane pump
VFD controlled vacuum stabilizer

Defrost

Hot Gas Defrost
Static heating

RM180 FREEZE DRYER

RM180 general-purpose freeze dry equipment has an ice capacity of 170 kg and 17 m2 of shelf space and can dry a variety of biological, pharmaceutical, nutritional and general food products.

GENERAL SPECIFICATIONS

Outer Dimensions of the Machine	**Width:** 1900mm **Leng th:** 3600mm **Height:** 2300mm
Boiler dimensions	**Diameter:** 1300mm **Depth:** 2200mm
Boiler Volume	3900 Litres
Ice Condenser Capacity	170 kg

TECHNICAL SPECIFICATIONS

Physical Specifications

Machine Dimensions
Width: 1900mm
Boy: 3600mm
Height: 2300mm

Boiler Volume

3900 Litres
Entire Boiler AISI R304L
It is made of stainless steel

Ice Condenser

Standard Temperature min -45 Degrees Celsius
Optional Temperature min -70 Degrees Celsius
Ice Condenser capacity 170 kg

Cooling Group

30HP cooling power
Hot gas defrost
Efficient and effective compressor power management with VFD

Shelves

Tray dimensions 0.4 7m x 0.8m
Number of Trays 46
Product Loading Unloading Change
For Tray +46 Pieces
Total tray area 17 m2
Usable Shelf Height 4cm

Heaters

PID-controlled
Maximum 1 degree surface temperature difference
0.1 degrees Heating sensitivity
Maximum adjustable temperature 120 degrees

Strength

Installed Power Requirement: 50 kW
Energy Consumption: 15 kW / hour

Automation System

BECKHOFF PLC
24 Channel PID Temprature Controller
10" HMI
10 Receipes Fully customizable with 10 steps
Cutomizable heat ramp

Vacuum System

120m^3 double rotary vane pump
VFD Controlled Vacuum Stabilizer

Defrost

Hot Gas Defrost
Fan Dynamic Air Circulation

RM500 FREEZE DRYER

RM500 is an industrial freeze drying machine specially designed for large-scale commercial use. It has a capacity of 1000 kg of ice and a shelf area of 78 m2. It can dry various biological, pharmaceutical, nutritional, and general food products.



GENERAL SPECIFICATIONS

Outer Dimensions of the Machine	**Width:** 2000mm **Length:** 7500mm **Height:** 2500mm
Boiler dimensions	**Diameter:** 1800mm **Depth:** 7000mm
Boiler Volume	17800 Litres
Ice Condenser Capacity	1000 kg

TECHNICAL SPECIFICATIONS

Physical Specifications

Engine Room Dimensions

Width: 1600 mm
Boy: 3100 mm
Height: 2000mm

Boiler Volume

17800 Litres
Entire Boiler AISI R304L
It is made of stainless steel

Ice Condenser

Standard Temperature min -45 Degrees Celsius
Optional Temperature min -70 Degrees Celsius
Ice Condenser capacity 650 kg

Cooling Group

2x30HP cooling power
Hot gas defrost
Efficient and effective compressor power management with VFD

Shelves

Tray dimensions 0.47m x 0.8m
Number of trays 208
Total tray area 78 m2
Usable Shelf Height 4cm Product Loading Unloading Change For Tepi +208 Pieces

Heaters

PID-controlled
Maximum 1 degree surface temperature difference
0.1 degrees Heating sensitivity
Maximum adjustable temperature 120 degrees

Strength

Installed Power Requirement: 120 Kw
Energy Consumption: 40 Kw / hour

Automation System

BECKHOFF PLC
48 Channel PID Temprature Controller
10" HMI
10 Receipes Fully customizable with 10 steps
Cutomizable heat ramp

Vacuum System

225m3 double rotary vane pump and 600m3/hr blower
VFD controlled vacuum stabilizer

Defrost

Hot Gas Defrost
Dynamic Air Circulation with Electronic PWM Controlled Fan

RM1000 FREEZE DRYER

The RM1000 freeze dryer has 2000 kg ice capacity, 156 m2 shelf space and observation ports on both sides of the door. This freeze dryer is ideal for commercial applications such as food processing.

GENERAL SPECIFICATIONS

Outer Dimensions of the Machine	**Width:** 2000mm **Length:** 14500mm **Height:** 2500mm
Boiler dimensions	**Diameter:** 1800mm **Depth:** 14000mm
Boiler Volume	35600 Litres
Ice Condenser Capacity	2000 kg

TECHNICAL SPECIFICATIONS

Physical Specifications

Engine Room Dimensions

Width: 2000 mm
Boy: 4500 mm
Height: 2000mm

Boiler Volume

35600 Litres
Entire Boiler AISI R304L
It is made of stainless steel

Ice Condenser

Standard Temperature min -45 Degrees Celsius
Optional Temperature min -70 Degrees Celsius
Ice Condenser capacity 2000 kg

Cooling Group

4x30HP cooling power
Hot gas defrost
Efficient and effective compressor power management with VFD

Shelves

Tray dimensions 0.4 7m x 0.8m
Number of trays 416
Total tray area 156 m2
Usable Shelf Height 4cm
Product Loading and Unloading
+ 416 Trays for Replacement

Heaters

PID-controlled
Maximum 1 degree surface temperature difference
0.1 degrees Heating sensitivity
Maximum adjustable temperature 120 degrees

Strength

Installed Power Requirement: 240 Kw
Energy Consumption: 65 kW/hour

Automation System

BECKHOFF PLC
96 Channel PID Temprature Controller
10" HMI
10 Receipes Fully customizable with 10 steps
Cutomizable heat ramp

Vacuum System

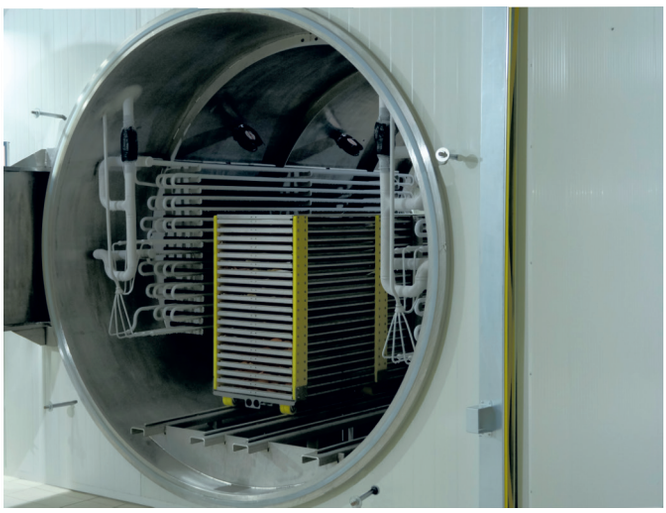
225m^3 double rotary vane pump and 1200m 3/hour blower
VFD Controlled Vacuum Stabilizer

Defrost

Hot Gas Defrost
Dynamic Air Circulation with Electronic PWM Controlled Fan

RM2000 FREEZE DRYER

RM2000 is an industrial freeze drying machine with a capacity of 3,000 kg of ice, a shelf area of 312 m2, and two doors on each end. This freeze drying machine is ideal for large-scale commercial operations, such as food processing.



GENERAL SPECIFICATIONS

Outer Dimensions of the Machine	**Width:** 2000mm **Length:** 28500mm **Height:** 2500mm
Boiler dimensions	**Diameter:** 1800mm **Depth:** 28000mm
Boiler Volume	71200 Litres
Ice Condenser Capacity	3000 kg

TECHNICAL SPECIFICATIONS

Physical Specifications

Engine Room Dimensions

Width: 2500 mm
Boy: 5000 mm
Height: 2000mm

Boiler Volume

71200 Litres
Entire Boiler AISI R304L
It is made of stainless steel

Ice Condenser

Standard Temperature min -45 Degrees Celsius
Optional Temperature min -70 Degrees Celsius
Ice Condenser capacity 3000 kg

Cooling Group

8x30HP cooling power
Hot gas defrost
Efficient and effective compressor power management with VFD

Shelves

Tray dimensions 0.4 7m x 0.8m
Number of trays 832
Total tray area 312 m2
Usable Shelf Height 4cm
Product Loading Unloading Change
For Tray +832 Pieces

Heaters

PID-controlled
Maximum 1 degree surface temperature difference
0.1 degrees Heating sensitivity
Maximum adjustable temperature 120 degrees

Strength

Installed Power Requirement: 480 Kw
Energy Consumption: 120 Kw / hour

Automation System

BECKHOFF PLC
128 Channel PID Temprature Controller
10" HMI
10 Receipes Fully customizable with 10 steps
Cutomizable heat ramp

Vacuum System

Vacuum System
225m^3 double rotary vane pumps and 2500m 3/hour blower
VFD Controlled Vacuum Stabilizer

Defrost

Hot Gas Defrost
Dynamic Air Circulation with Electronic PWM Controlled Fan

REEM
FREEZE DRY MACHINES

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