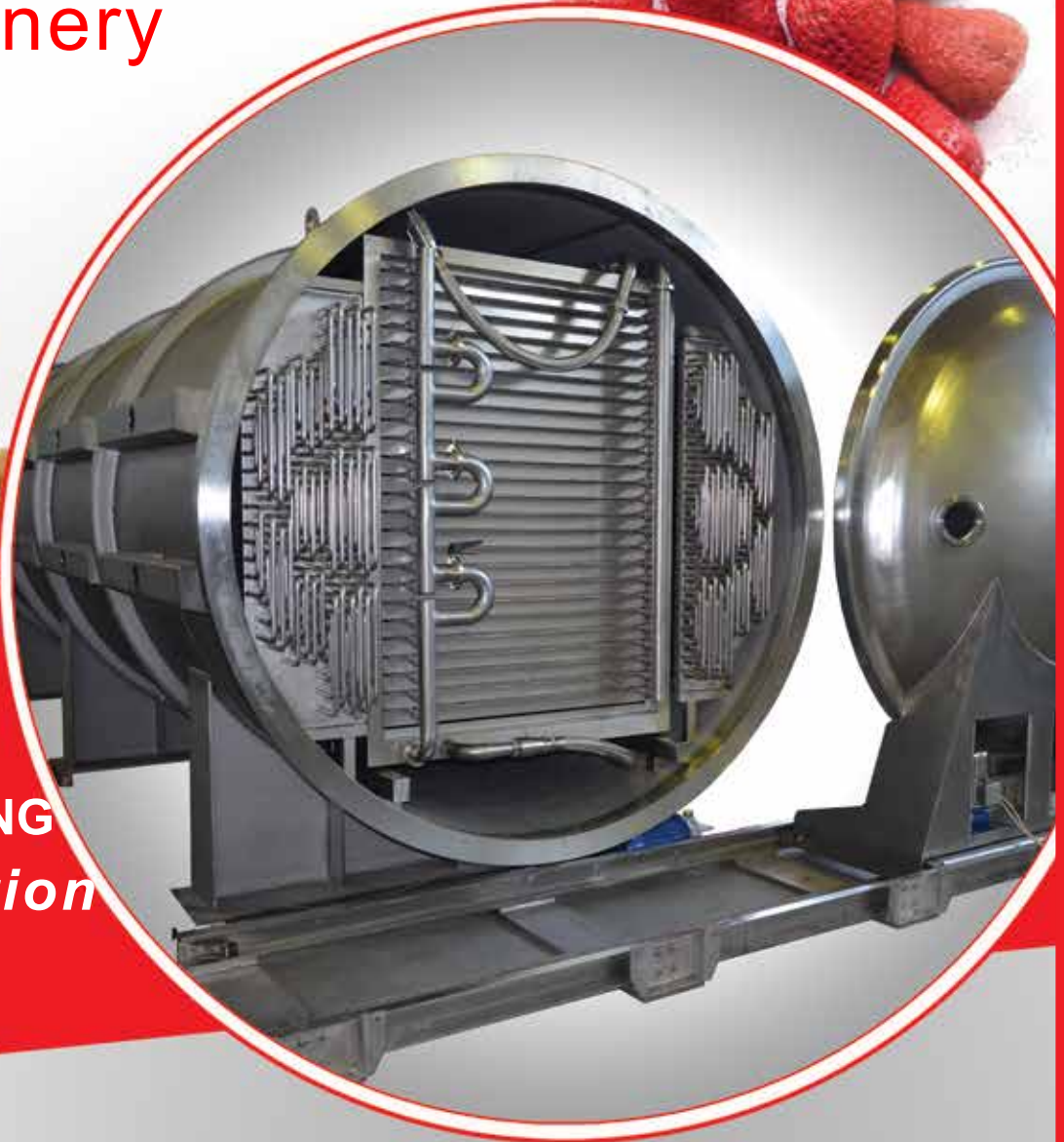




www.pigo.it
MADE IN ITALY

Food Processing
Machinery



FREEZE DRYING
Lyophilisation

EASY Freeze DRYER

Lyophilizer



**DUNKLEY
INTERNATIONAL, INC.**

MANUFACTURERS OF QUALITY MACHINERY SINCE 1885

USA Representatives

www.DunkleyInternational.net

www.pigo.it

EASY Freeze DRYER

Lyophilizer



PIGO EASY Freeze DRYER - EFD

PIGO srl designs and fabricates advanced technology sophisticated industrial freeze dryers – lyophilizers, product line which includes a broad range of standard and custom units. All units are constructed following maximum hygienic standards and providing perfect sanitation with possibility to have empty tank to walk in, after each cycle! Sanitation system includes also possibility of sterilisation by steam!

PIGO systems are concepted to create a “High Tech” freeze-dryer which contains dozens of small innovations and a few large improvements for a more dependable system

The key differences between PIGO EASY Freeze DRYING (LYOPHILISATION) Technology and competitive technologies:

FASTER DRYING WITH LESS ENERGY - Our proprietary freeze drying method reduces drying time by up to 15-20% while consuming less energy.

FOOD SAFETY FRIENDLY - Great care and determination was put into designing a system that makes accessing and cleaning every component very easy, ensuring bacteria or residue will not get entrapped on any equipment or food surfaces. Only design with fully accessible and cleanable machine interior!

OPERATOR FRIENDLY - All steps in the drying process are designed to facilitate simple, fast and efficient operation and maintenance.

FREEZE DRYING

The freeze drying - dehydration technology allows to save delicate aromas while drying the frozen product under vacuum, producing a premium quality product. The ice contained in the product is sublimated, hence transformed from solid to gas and then trapped inside the condensation system. The sensorial properties of the finished product are absolutely superimposable to those of the fresh product.

At the completion of the process, the treated product will have retained its form, volume and original structure, as well as all its physical, chemical and biological properties. It can then be stored (provided packaging is effective to the reduction of moisture migration) for an almost indefinite period of time. As the product is porous, it can be re-dissolved by the simple addition of a proper solvent



Few main features distinguishing EASY Freeze DRYER:

- very efficient heating system, with expanded-pillow plates, making more efficient vapours transfer from the product to the evaporator;
- doubled evaporator is positioned in the same vessel with product, what is giving the shortest possible drying time and fastest ice vapours capturing;
- LOW VOLUME HEATING FLUID SYSTEM, providing very short start-up time and quick process start;
- short distance between product (trays with fruit) and evaporator is helping fruit temperature preservation during vacuuming processing;
- shallow product plates and increased product plates surface are facilitating drying process and shortening drying time;
- the same (all above) is providing drying time of about 16 h for common fruits or vegetables, and 8-12 for products with lower water content or small size cut;
- multiple vacuum suction openings are stimulating vapours extraction and sublimation;
- abundant refrigeration plant dimensioning is providing more efficient "ice catching";
- by all above mentioned is provided MINIMUM POWER CONSUMPTION and MINIMUM MAINTANCE COSTS & REQUIREMENTS, as well as THE LOWEST POSSIBLE PRODUCT LOSS
- complete unit is stainless steel execution, including tank, rack, piping, evaporator, etc



FREEZE DRYING PROCESS

Freeze drying is the drying of a frozen product in a vacuum below the "triple point" (6.2 mbar = 4.6 torr). The water will only be present in two phases: ice and vapour. The vacuum allows the ice to turn directly into vapour without passing through the water stage, in a sublimation process.

Freeze drying is applied to dry a vast number of food products like fruit / berries / vegetables, meat / seafood, soup blocks, rice dishes, pasta, yogurt, ice cream, milk, etc. and this preserves the product's original shape, colour, taste, aroma and nutrients, and at the same time make them easy to store (no need for a cold chain) and serve.

You can roughly estimate sublimated ice (water from the product) amount by determining i.e. 85-90% of product weight (in case of fruit) intended as a typical batch. For example, if the product weight is 100 kilograms wet, you will need to condense capacity of around 85-90 kg or liters to process the batch.

All machinery parts (chambers, shelves, door closing systems, stoppering system, condensers and all interconnections) are manufactured and controlled in-house.

P i G o[®]

EASY Freeze DRYER - BASIC TECHNICAL CHARACTERISTICS:

EASY Freeze Drying model	EFD 600	EFD 900	EFD 1200	EFD2300
Evaporated water capacity (batch):	600 kg	900 kg	1200 kg	2300 kg
Expected loading of product (kg):	700 kg	1050 kg	1400 kg	2600 kg
Vapour Condenser Capacity (24h):	1200 kg	1800 kg	2400 kg	4600 kg
Batch / cycle duration (approx. h):	10-20 h	10-20 h	10-20	10-20 h
Chamber measures (mm):	2300x5200 mm	2300x7200 mm	2300x9200 mm	3000x12000 mm
Area of the heat shelf (m2):	2x105 m2	2x158 m2	2x210 m2	420 m2
Number of the heat shelf (m2):	25	25x2	25x2	31x2
Tray Area (m2):	90 m2	135 m2	180 m2	350 m2
Tray size (mm):	1110x850x28mm	1110x850x28mm	1110x850x28mm	1400x980x30mm
Number of trays	96 (24x4)	144 (24x6)	192 (24x8)	240
System lowest pressure	< 13 Pa	< 13 Pa	< 13 Pa	< 13 Pa
Standard condenser temperature	- 40 0C	- 40 0C	- 40 0C	- 40 0C
Shelves temperature	+25 to +80 0C	+25 to +80 0C	+25 to +80 0C	+25 to +80 0C
Shelves temperature (possibility):	-20 to +80 0C	-20 to +80 0C	-20 to +80 0C	-20 to +80 0C
Heating energy required	80 kW	118 kW	154 kW	306 kW
Refrigeration capacity (max):	Q= 88 kW	Q= 130 kW	Q= 170 kW	Q= 338 kW
Total installed el. Power (with heating)	131 kW	172 kW	225 kW	/
Total installed el. Power (without heating):	106 kW	115kW	143 kW	228 kW
Energy consumption (kW/ kg of wet product)	1,7-2,1 kW/kg	1,7-2,1 kW/kg	1,7-2,1 kW/kg	1,7-2,1 kW/kg
Refrigerating media	forced glycol circulation			
Heating system	Freon R507 or ammonia			
Total unit weight	2400 kg	3300 kg	4400 kg	34600 kg
Refrigeration unit weight	14400 kg	16900 kg	20400 kg	6800 kg

Your future is our future, and we are addressing it today with product-based design and high-technology applied.

P i G o[®]

PIGO provides complete, turn-key freezing and processing solutions:

- Fluidized bed freezers
- Freeze Drying
- Adiabatic Multistage Belt Dryers PG 135
- Spiral Freezers / Coolers / Pasteur
- Pitting systems
- Infused dried fruit plants
- Fresh-cut preservation systems
- Vegetables processing solutions
- Complete processing lines for washing, separating, blanching, peeling, sorting, cutting and more...

Head office:
PIGO srl
Via Visan 46/48,
36034 Malo (VI), Italia
Tel: +39 0 445 165 50 24
email: office@pigo.it



For more information
contact us at:
www.pigo.it
info@pigo.it

