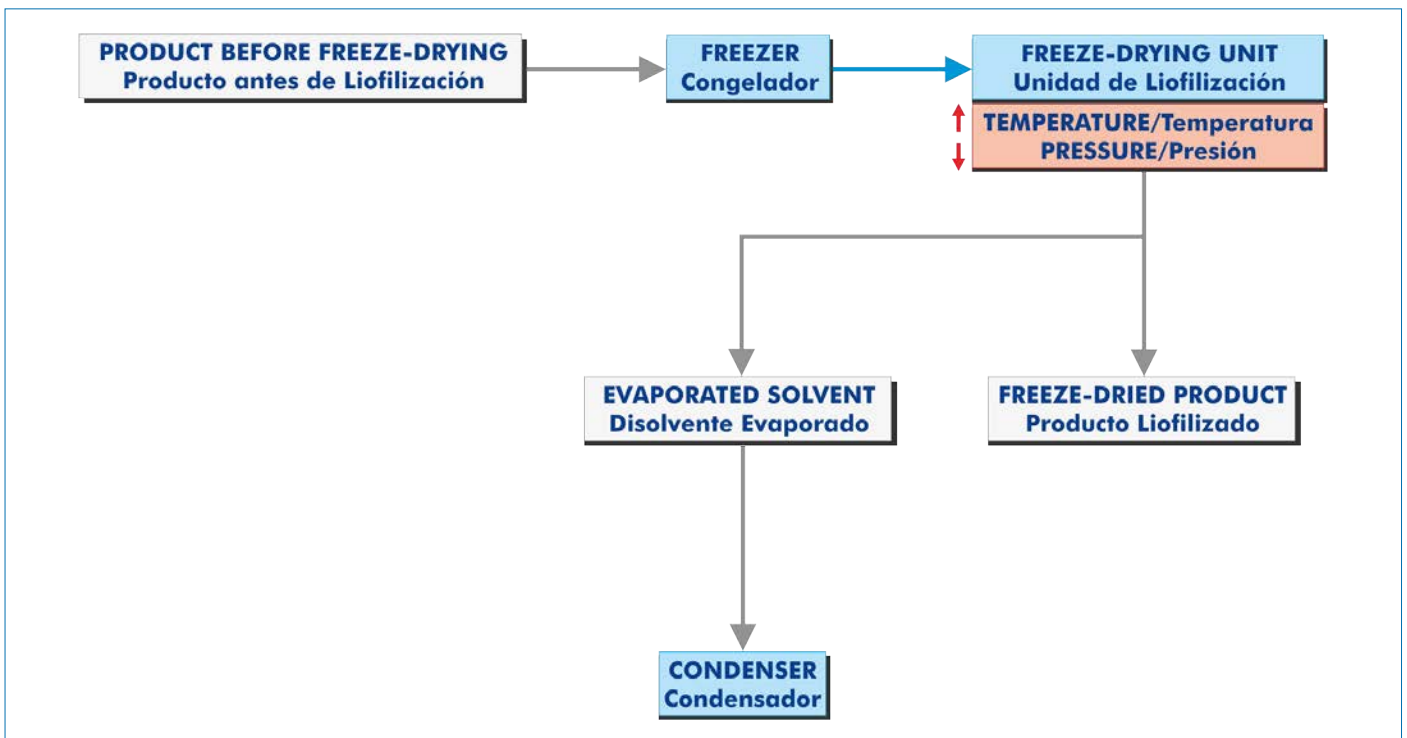


PROCESS DIAGRAM AND UNIT ELEMENTS ALLOCATION



ISO 9001: Quality Management (for Design, Manufacturing, Commercialization and After-sales service)



European Union Certificate (total safety)



Certificates ISO 14001 and ECO-Management and Audit Scheme (environmental management)



"Worlddidac Quality Charter" and Platinum Member of Worlddidac

INTRODUCTION

Freeze drying is a process of dehydration used for the separation of water or another solvent, from a solid or liquid sample by freezing and subsequent sublimation of the ice at low pressure. This process allows for example, dry a perishable food item for their better preservation. The Freeze Dryer, "BLIO", allows the study of the entire process of freeze drying in a compact unit.

GENERAL DESCRIPTION

The Freeze Dryer, "BLIO", is used to carry out the process of freeze drying in transparent unit that allows the entire watching of it.

Firstly, as a pretreatment the samples are frozen in the unit. Once they reach the desired temperature, the samples are introduced in the freeze drying unit to carry out the process. Vacuum pump coupled to the system reduces pressure so that, together with the heating of the samples inside the unit, the sublimation of the solvent contained in the solid is produced.

Finally, the solvent in gas phase goes to the condenser, from where you can observe the accumulation of ice and collect it at the end of the process.

In this freeze drying unit it is possible to make an exhaustive control of the temperature as well as pressure and time during the process takes place.

The entire freeze drying process can be controlled and the results exported, so that the result of different products can be contrasted. In addition, if the optimal parameters of the product are known, they can be programmed previously in the interface for maximum performance.

SPECIFICATIONS

Bench-top unit.

Anodized aluminum frame and panels made of painted steel.

Transparent freeze drying chamber for a complete visualization of the freeze drying process.

Condenser chamber:

Final temperature: 55 °C.

Maximum capacity: 5 Kg.

Heated beakers.

Vacuum pump, maximum Flow: 200 l/min.

Temperature measurer.

Pressure measurer.

Electronic display with microprocessor control:

Digital display that allows a continuous reading of the freeze drying parameters (temperature, vacuum, time ...).

Possibility of programming the process for a correct adjustment of the operating conditions.

Cables and Accessories, for normal operation.

Manuals: This unit is supplied with the following manuals: Required Services, Assembly and Installation, Starting-up, Safety, Maintenance & Practices Manuals.

EXERCISES AND PRACTICAL POSSIBILITIES

- 1.- Study of the freeze drying process.
- 2.- Study of the influence of the heating temperature in the freeze drying process.
- 3.- Study of the influence of the pressure in the freeze drying process.
- 4.- Evaluations of the freeze drying time necessary for each product.
- 5.- Study of the influence of the condenser temperature in the freeze drying process.
- 6.- Calculation of the amount of solvent removed from the solid.

REQUIRED SERVICES

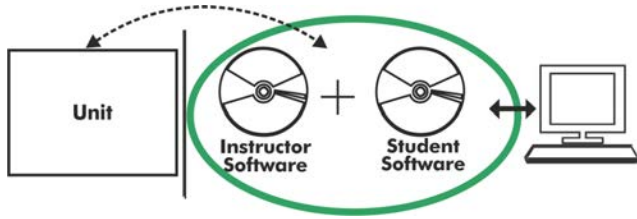
- Electrical supply: single-phase, 220 V/50 Hz or 110 V/60 Hz.

DIMENSIONS AND WEIGHTS

BLIO:

- Dimensions: 450 x 450 x 600 mm approx.
(17.71 x 17.71 x 23.62 inches approx.).
- Weights: 80 Kg approx.
(176 pounds approx.).

BLIO/ICAI. Interactive Computer Aided Instruction Software System:



With no physical connection between unit and computer, this complete software package consists of an Instructor Software (EDIBON Classroom Manager -ECM-SOF) totally integrated with the Student Software (EDIBON Student Labsoft -ESL-SOF). Both are interconnected so that the teacher knows at any moment what is the theoretical and practical knowledge of the students.

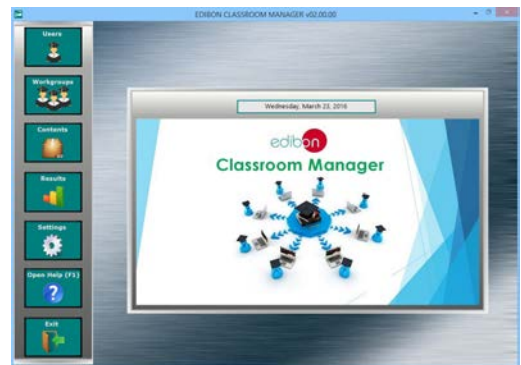
Instructor Software

- ECM-SOF. EDIBON Classroom Manager (Instructor Software).

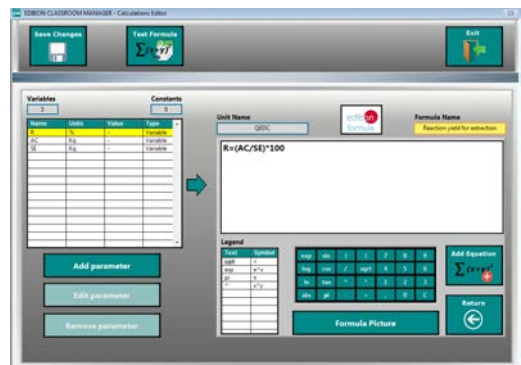
ECM-SOF is the application that allows the Instructor to register students, manage and assign tasks for workgroups, create own content to carry out Practical Exercises, choose one of the evaluation methods to check the Student knowledge and monitor the progression related to the planned tasks for individual students, workgroups, units, etc... so the teacher can know in real time the level of understanding of any student in the classroom.

Innovative features:

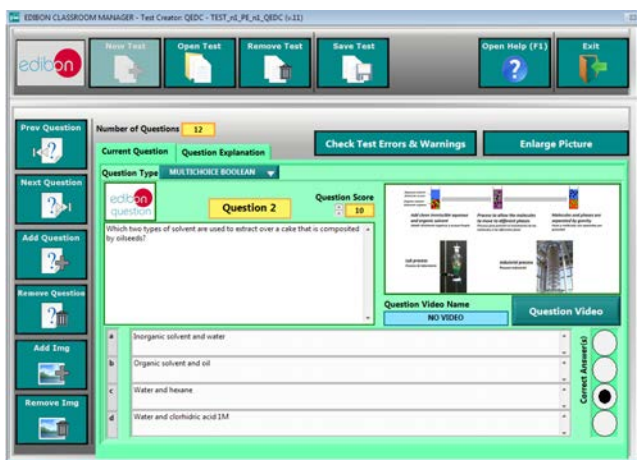
- User Data Base Management.
- Administration and assignment of Workgroup, Task and Training sessions.
- Creation and Integration of Practical Exercises and Multimedia Resources.
- Custom Design of Evaluation Methods.
- Creation and assignment of Formulas & Equations.
- Equation System Solver Engine.
- Updatable Contents.
- Report generation, User Progression Monitoring and Statistics.



ECM-SOF. EDIBON Classroom Manager (Instructor Software) Application Main Screen



ECAL. EDIBON Calculations Program Package - Formula Editor Screen



ETTE. EDIBON Training Test & Exam Program Package - Main Screen with Numeric Result Question



ERS. EDIBON Results & Statistics Program Package - Student Scores Histogram

Optional
Student Software

- ESL-SOF. EDIBON Student Labsoft (Student Software).

ESL-SOF is the application addressed to the Students that helps them to understand theoretical concepts by means of practical exercises and to prove their knowledge and progression by performing tests and calculations in addition to Multimedia Resources. Default planned tasks and an Open workgroup are provided by EDIBON to allow the students start working from the first session. Reports and statistics are available to know their progression at any time, as well as explanations for every exercise to reinforce the theoretically acquired technical knowledge.

Innovative features:

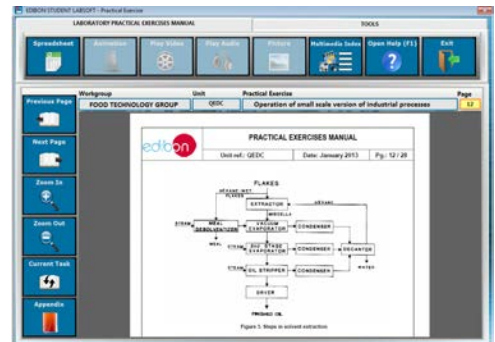
- Student Log-In & Self-Registration.
- Existing Tasks checking & Monitoring.
- Default contents & scheduled tasks available to be used from the first session.
- Practical Exercises accomplishment by following the Manual provided by EDIBON.
- Evaluation Methods to prove your knowledge and progression.
- Test self-correction.
- Calculations computing and plotting.
- Equation System Solver Engine.
- User Monitoring Learning & Printable Reports.
- Multimedia-Supported auxiliary resources.

For more information see ICAI catalogue. Click on the following link:

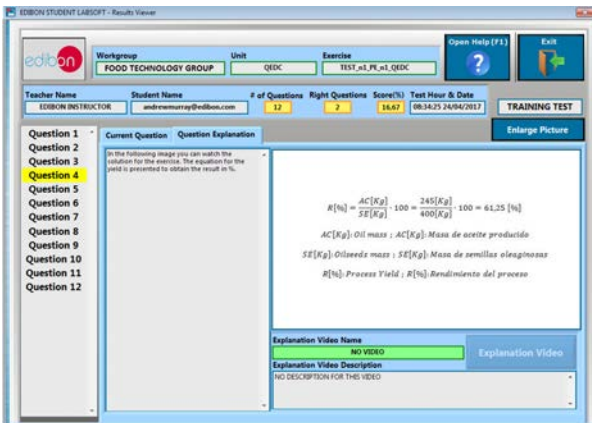
www.edibon.com/en/files/expansion/ICAI/catalog



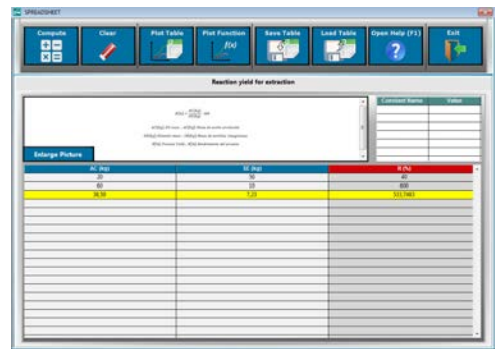
ESL-SOF. EDIBON Student LabSoft (Student Software) Application Main Screen



EPE. EDIBON Practical Exercise Program Package Main Screen



ERS. EDIBON Results & Statistics Program Package - Question Explanation



ECAL. EDIBON Calculations Program Package Main Screen

* Specifications subject to change without previous notice, due to the convenience of improvement of the product.



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REPRESENTATIVE:

