



INTRODUCTION

Naval architecture is divided into two branches. On one hand, there is the shipbuilding, which studies the structure of the ship, the characteristics of the hull according to the function of the ship and all issues resulting from the structure. And on the other hand, there is the ship theory, which studies the behavior of the ship at sea under different navigation conditions and its stability according to the external shape of the hull.

The stability of a partially or totally submerged body is vertical and is due to the equilibrium between the body weight and the buoyancy force. A fluid is said to be in hydrostatic equilibrium when the forces of the vertical pressure gradient and the gravity are balanced. The metacenter is the point of intersection of the vertical lines traced from the center of buoyancy, center of gravity of the volume of water displaced by a floating body, at small consecutive angles of heel.

The stability is one of the most important aspects to consider, since its study helps to understand the movements and reactions of the ship under different navigation situations, such as loading and unloading maneuvers in the port. Therefore, it helps to prevent accidents, most times directly related to weather conditions and a bad stowage.



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)



Certificate and Worlddidac Member

GENERAL DESCRIPTION

The Unit to study Stability in Boats, "USSB", has been designed to study the stability and hydrostatics of ships. Besides, the buoyancy of the floating body, the metacenter and the center of mass can also be determined.

The unit consists of a flotation tank where different models of ship are submerged held by a clamping mechanism equipped with a clinometer. It allows the performance of rolling and righting experiments.

The unit is supplied with a 1/70 scale model of a cargo vessel that includes several transverse watertight bulkheads in representative positions. Each compartment is equipped with individual flooding valves for the study of the compartments flooding effects.

There are three alternative ship models available for optional study.

A dynamometer is used to measure the righting moment of the ship and a clinometer measures the inclination. Additional ballast and masses may be used to adjust the center of masses and the heel to perform further experiments.

SPECIFICATIONS

Anodized aluminum frame and panels made of painted steel.

The unit includes wheels to facilitate its mobility.

Main metallic elements made of stainless steel.

Flotation tank of 2700 x 525 x 750 mm approx. (106.29 x 20.67 x 29.52 inches approx.). Capacity: 1000 l approx.

1/70 scale floating model of a cargo vessel.

Dynamometer to measure the righting moment of the ship.

Clinometer with battery, over the range of 0 to 360° (4 x 90°), to measure the inclination of the model over the range of 0 to 45°.

Resolution: 0.01° (0° – 9.99°) and 0.1° (10° – 90°).

Set of weights and ballasts.

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

Optional Models and Accessories: (Not included)

- USSB/A. Model of rectangular barge.

Scale model of a rectangular barge equipped with internal bulkheads and flooding valves and supplied with a set of ballasts and weights. Dimensions: 2200 x 400 x 250 mm approx. (86.61 x 15.74 x 9.84 inches approx.)

- USSB/B. Trawler model.

Scale model of a trawler equipped with transverse watertight bulkheads in suitable positions and flooding valves.

- USSB/C. Crane ship model.

Scale model of a typical crane ship used in industry. The hull is ballasted and equipped with a movable derrick supplied with several masses for suspension.

EXERCISES AND PRACTICAL POSSIBILITIES

1.- Study and performance of inclining experiments.

2.- Determination of the effect of a free surface on stability.

3.- Determination of the influence of a suspended mass on stability.

4.- Study of the effect of flooding one or several compartments.

5.- Study and performance of rolling experiments.

6.- Study and determination of buoyancy and center of buoyancy.

REQUIRED SERVICES

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

- Water supply and drain.

DIMENSIONS AND WEIGHTS

USSB:

-Dimensions: 2200 x 2700 x 2000 mm approx.

(86.61 x 106.29 x 78.74 inches approx.)

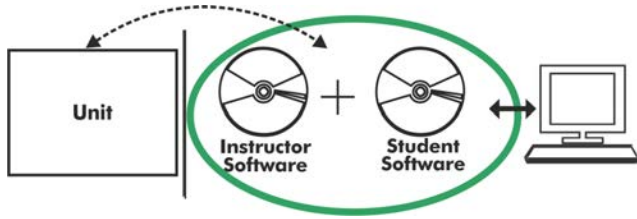
-Weight: 600 Kg approx.

(1322 pounds approx.)

OPTIONAL MODELS AND ACCESSORIES (Not included)

- USSB/A. Model of rectangular barge.
- USSB/B. Trawler model.
- USSB/C. Crane ship model.

USB/ICAI. Interactive Computer Aided Instruction Software System:



With no physical connection between unit and computer (PC), 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.

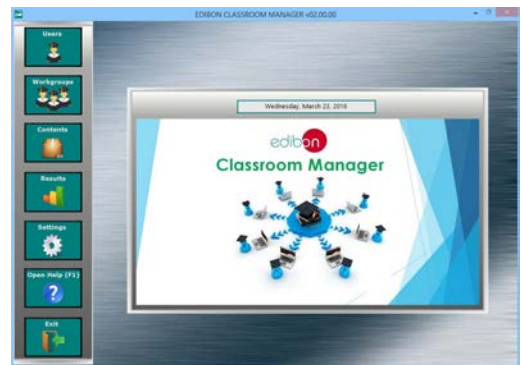
Instructor Software

- 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:

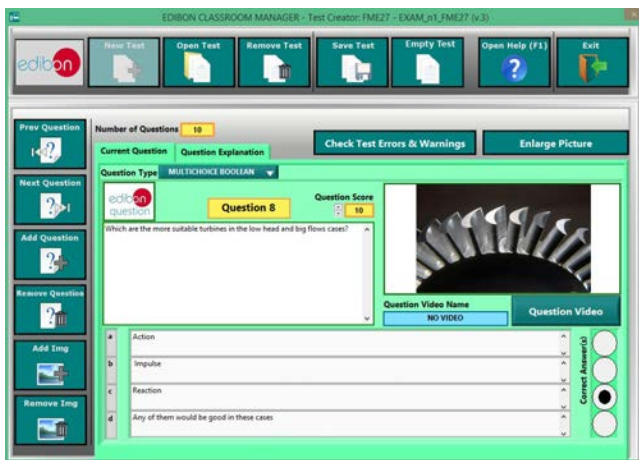
- User Data Base Management.
- Administration and assignment of Workgroup, Task and Training sessions.
- Creation and Integration of Practical Exercises and Multimedia Resources.
- Custom Design of Evaluation Methods.
- Creation and assignment of Formulas & Equations.
- Equation System Solver Engine.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

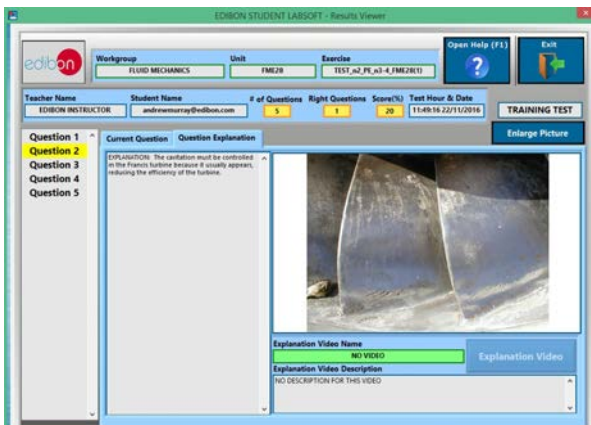
www.edibon.com/en/files/expansion/ICAI/catalog



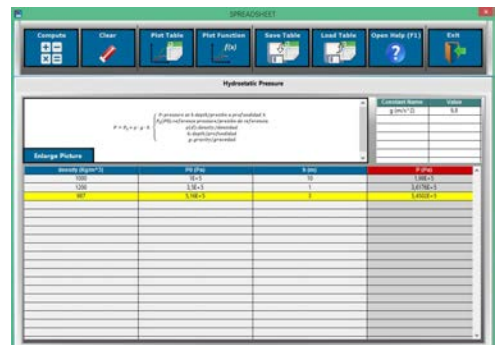
ESL-SOF. EDIBON Student LabSoft (Student Software) Application Main Screen



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:

