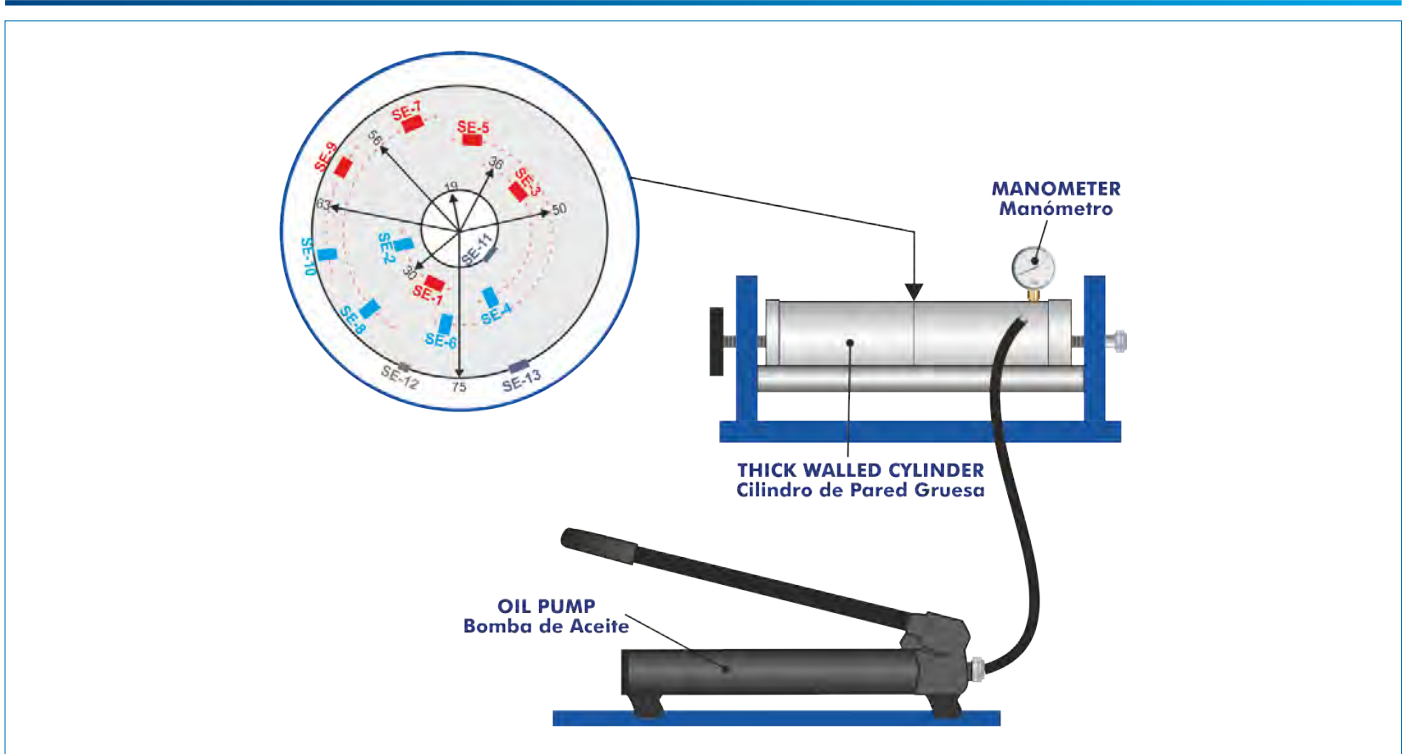




PROCESS DIAGRAM AND UNIT ELEMENTS ALLOCATION



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

A cylinder or vessel has a thin wall when there is a great difference between the thickness of the wall and the diameter of the cylinder or vessel, whereas it does not occur in thick-walled cylinders.

On the other hand, the distribution of stress in the thickness of the walls of the thin-walled cylinder is uniform. As the walls offer little bending strength, it can be assumed that the internal forces exerted on part of the wall are tangent to the surface of the vessel. While this is not the case in the thick-walled cylinder and an unequal distribution of the tension in the thickness of the wall must be considered, forming three tensions: radial, tangential and axial.

Examples of thick-walled cylinders are the barrels of firearms.

The Thick-Walled Cylinder Unit, "MCPG", has been designed to study stresses and strains in a thick-walled cylinder under internal pressures.

GENERAL DESCRIPTION

In the Thick-Walled Cylinder Unit, "MCPG", the stresses are determined through the measurement of the strains produced on the surface. These strains are measured by strain gauges.

The thick-walled vessel consists of an aluminum cylinder of length 300 mm, whose walls have a thickness of 50 mm. It is divided into two parts (closed on both sides) and the strain gauges are arranged in different radii in the center, in an eccentric slot.

In addition, there are also gauges on the inner and outer walls of the cylinder, allowing the measurement of strains in radial, tangential and axial direction.

Pressure inside is generated with oil by means of a hand-operated hydraulic pump and measured by a manometer located in the cylinder.

SPECIFICATIONS

Bench-top unit with adjustable legs.

Anodized aluminum frame and panels made of painted steel.

Diagram in the front panel with distribution of the elements similar to the real one.

The MCPG unit mainly consists of:

Cylinder made of an aluminum alloy:

Length = 300 mm.

Diameter = 140 mm.

Wall thickness = 50 mm.

Internal pressure: max. 7 N/mm² (70 bar).

Manometer, range: 0 – 100 bar (10 N/mm²).

Hydraulic pump. Maximum pressure: 70 bar.

Reinforced coupling.

Twelve strain gauges:

At different radii.

At the inner and outer surface of the cylinder.

Electronic console:

Metallic box.

Connectors of the strain gauges.

Selector of the strain gauges.

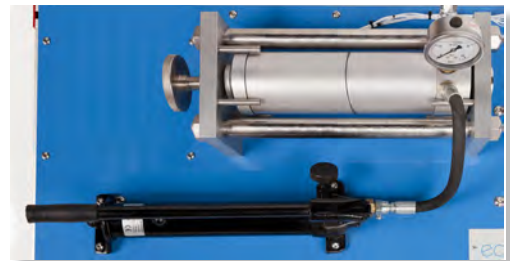
Display of the strain gauges measurement.

Switch to tare the strain gauges measurement.

Main switch.

Cables and Accessories, for normal operation.

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



MCPG detail

EXERCISES AND PRACTICAL POSSIBILITIES

- 1.- Study of stress in a thick-walled vessel under internal pressure.
- 2.- Measurement of strains with strain gauges.
- 3.- Study of stress distribution in three axes. Mohr's circle.
- 4.- Determination of normal stress distribution in radial, tangential and axial direction.
- 5.- Analysis of the existing relationships between strains, pressure and stresses generated.

REQUIRED SERVICES

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

REQUIRED CONSUMABLES (Not included)

- Castor oil: >80% content of ricinoleic acid.

DIMENSIONS AND WEIGHTS

MCPG:

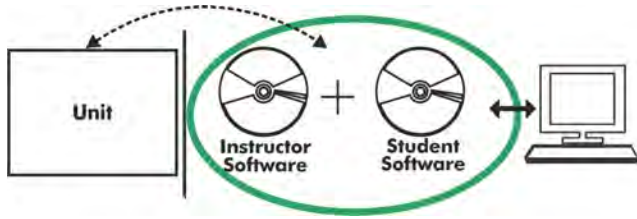
Unit:

- Dimensions: 660 x 400 x 300 mm approx.
(25.98 x 15.74 x 11.81 inches approx.)
- Weight: 20 Kg approx.
(44.09 pounds approx.)

Electronic console:

- Dimensions: 310 x 220 x 145 mm approx.
(12.20 x 8.66 x 5.70 inches approx.)
- Weight: 2 Kg approx.
(4.4 pounds approx.)

MCPG/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.

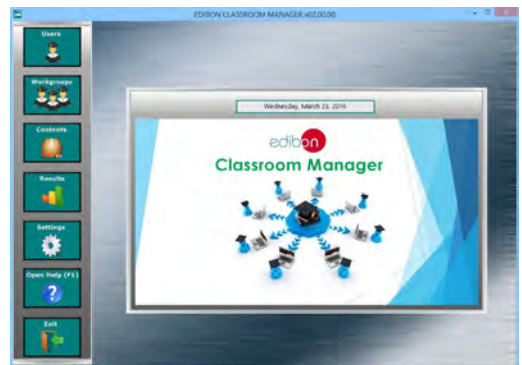
Instructor Software

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

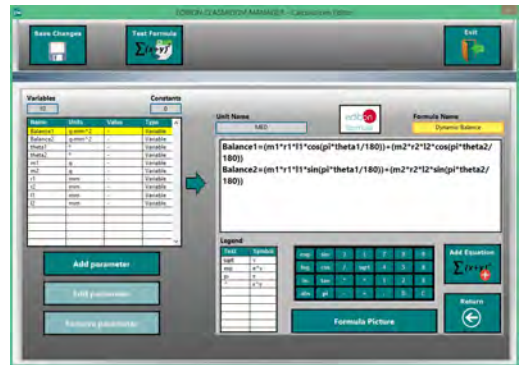
ECM-SOF is the application that allows the Instructor to register students, manage and assign tasks for workgroups, create own content to carry out Practical Exercises, choose one of the evaluation methods to check the Student knowledge and monitor the progression related to the planned tasks for individual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

Innovative features:

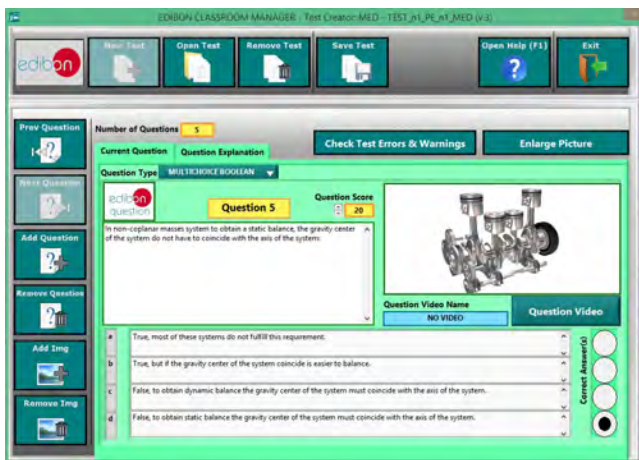
- User Data Base Management.
- Administration and assignment of Workgroup, Task and Training sessions.
- Creation and Integration of Practical Exercises and Multimedia Resources.
- Custom Design of Evaluation Methods.
- Creation and assignment of Formulas & Equations.
- Equation System Solver Engine.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

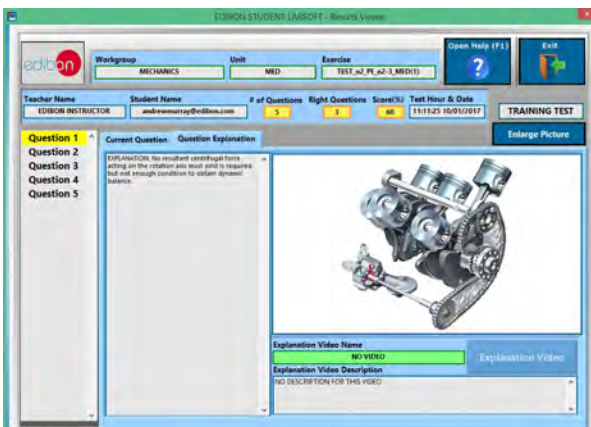
www.edibon.com/en/files/expansion/ICAI/catalog



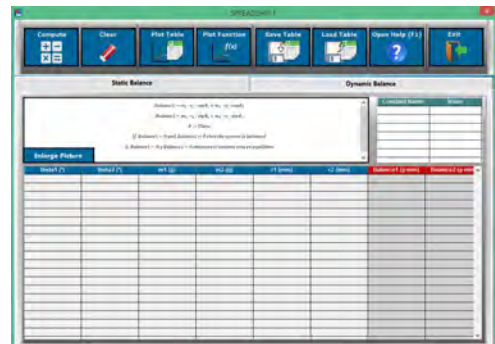
ESL-SOF. EDIBON Student LabSoft (Student Software)
Application Main Screen



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:

