



INTRODUCTION

Torsion is a type of stress that appears when applying a moment or torque on a rod or element. The transverse sections of the rod suffer a twisting around an axis normal to its plane where tangential stresses analogous to the simple shear stresses are developed.

Its application in industry is crucial, since all the axes of the machines that rotate and transfer motion are subjected to torsional stress.

The Torsion Unit "MTB" allows to verify the basis of torsion and to perform practical exercises to demonstrate:

- Circular rods elastic torsion equation.
- The rigidity modulus of different materials.

GENERAL DESCRIPTION

To perform the tests a metallic rod is fastened by clamps and subjected to the testing force. Force is gradually applied on the rod to observe the elastic tension generated. The force moment or torque is applied by a dynamometer with a lever. Deformation generated by the torsional stress is obtained by reading a dial gauge in contact with the arm. The torsional deformation angle is obtained by a simple trigonometric identity, providing the unit with important didactic characteristics.

Steel, brass and aluminum rods are supplied to perform the practical exercises. Additionally, rods made of other materials can be employed.



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

SPECIFICATIONS

Bench-top unit with adjustable legs.

Anodized aluminum frame and panels in painted steel.

The MTB unit mainly consists of:

- Main frame that is supported on two aluminum blocks. It consists of two guides made of stainless steel. The rest of the components are made of aluminum.
- Two guides of the unit on which the mobile clamp slides are for testing rods of different lengths.
- Mobile clamp located at one end that has a crank in the bottom to adjust the test rod to the desired length. It is made of stainless steel.
- Fixed clamp, consists of two bearings which allow it to turn. It has an arm on which the force is applied. It has a notch placed 60 mm from the longitudinal axis of the test rod, to carry out the measurements. The dial gauge should be placed on this notch to properly measure the deformation. The clamp is made of stainless steel.
- Test rods: standard supply of 3 test rods made of steel, brass and aluminum. They are 8 mm in diameter and 350 mm in length. They have marks every 50 mm, to make the performance of practical exercises at different lengths easier.
- A Dynamometer up to 10 Kg, with a 50 g accuracy, to apply the forces on the test rod.
- A Dial gauge of 0- 10 mm, with 0.01 mm accuracy, to measure the deformation of the test rod subjected to the force.



MTB detail

All the necessary tools to carry out the experiments are provided. One Allen key is supplied to adjust the dial gauge and one Allen key is supplied to tighten the clamps.

Manuals:

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

EXERCISES AND PRACTICAL POSSIBILITIES

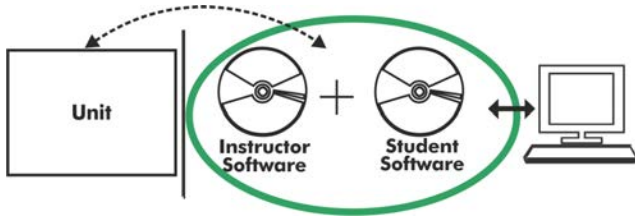
- 1.- Verification of the elastic torsion equation of circular rods.
- 2.- Experimental determination of the relationship between the torsion moment and the shaft angular determination.
- 3.- Experimental determination of the relationship between the test rod length and the shaft turn angle for a same torsional force.
- 4.- Experimental determination of the value of the Modulus of Rigidity for steel, brass and aluminum.

DIMENSIONS AND WEIGHT

- Dimensions: 600 x 400 x 600 mm. approx. (23.62 x 15.75 x 23.62 inches approx.).
- Weight: 15 Kg. approx. (33 pounds approx.).

Optional

MTB/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 Workgroups, Tasks and Training sessions.

Creation and Integration of Practical Exercises and Multimedia Resources.

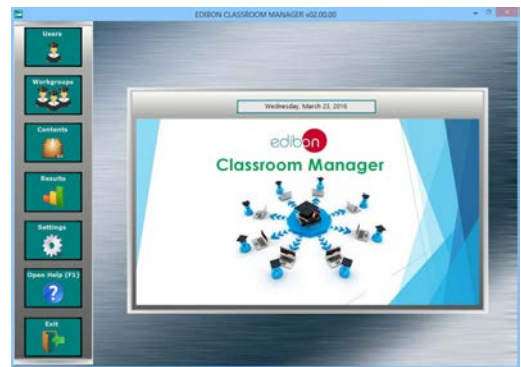
Custom Design of Evaluation Methods.

Creation and assignment of Formulas & Equations.

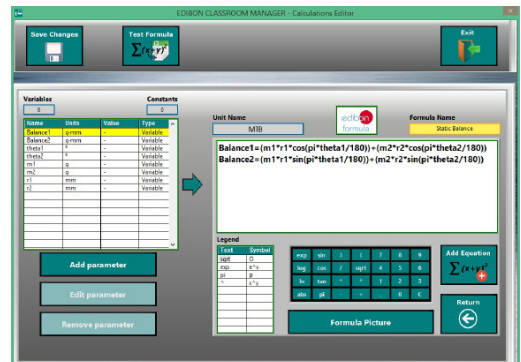
Equation System Solver Engine.

Updatable Contents.

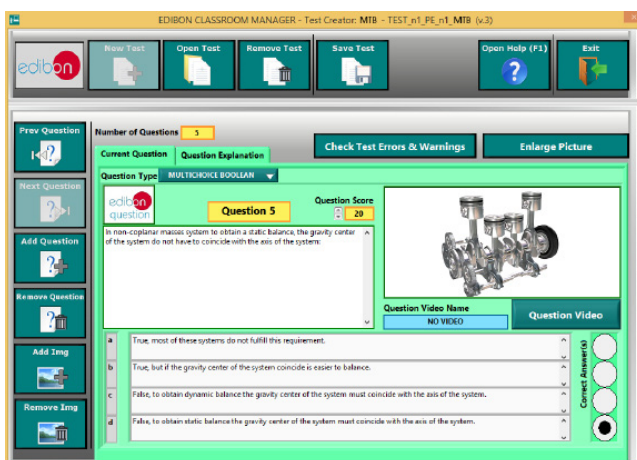
Report generation, User Progression Monitoring and Statistics.



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

-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.

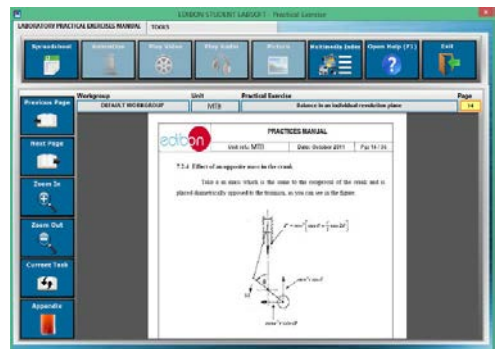
Innovative features:

- 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.**

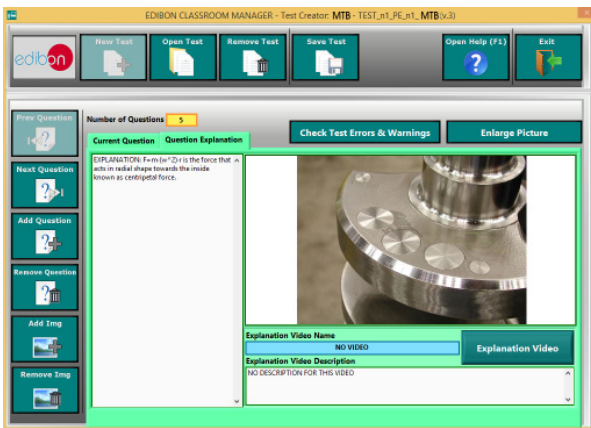
For more information see ICAI catalogue. Click on the following link:
www.edibon.com/products/catalogues/en/ICAI.pdf



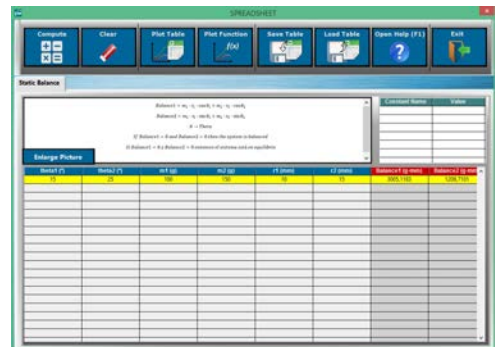
ESL-SOF. EDIBON Student LabSoft (Student Software) Application Main Screen



EPE. EDIBON Practical Exercise Program Package Main Screen



ERS. EDIBON Results & Statistics Program Package-Question Explanation



ECAL. EDIBON Calculations Program Package Main Screen

BDAS. Basic Data Acquisition System and Sensors.

For being used with mechanical modules.
BDAS is designed to monitor the measurements of each mechanical module from a computer (PC).

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



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REPRESENTATIVE:

