edibon

Engineering and Technical Teaching Equipment

Torsion and Bend Unit

MTP

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PRODUCTS
70.- MECHANICS

INTRODUCTION

Torsion is a type of effort that appears when applying a momentum or force on a bar or element. The transverse sections of the bar suffer a sliding by rotation around an axis normal to its plane where tangential efforts analogous to the simple shear efforts are developed.

Bending is another type of effort (deformation) that appears in a long structural element in a direction perpendicular to its longitudinal axis.

Bending moments are caused by the application of loads normal to the longitudinal axis of the element, generating a bend.

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

GENERAL DESCRIPTION

The Torsion and Bend Unit, "MTP", is a combined apparatus for the demonstration of both torsion and bend to be used in the laboratory or as a complement of the theoretical study about torsion and bend. Its size and weight facilitate its transport and make it ideal to develop the practical exercises.

It consists of two transverse guides on which the beam supports slide. The supports can be placed different distances apart, thus the student can check the effect produced by this variation in the deformations of the beam subjected to flexion or torsion efforts.

In flexion experiments, the student will be able to calculate the Elasticity Modulus of different materials, demonstrating the relation load deformation.

In torsion experiments, the student will also be able to check the relation load-deformation and get the Rigidity Modulus of different materials.

The test pieces used for flexion experiments are made of stainless steel with different rectangular cross sections. Therefore, circular section test pieces of different materials can be used.

The test pieces used for torsion experiments are made of different materials and with circular cross sections, what will allow the student to compare the Rigidity Modulus of different materials.

A dial gauge with its assembly accessories is supplied to measure the beam deformations both in flexion and torsion experiments.

To complete the supply, a set of weights adequate for the unit is provided, with hooks adapted to each type of experiment.

SPECIFICATIONS

Bench-top unit with adjustable legs.

Anodized aluminum frame and panels made of painted steel.

The "MTP" unit mainly consists of:

- Two stainless steel guides of 800 mm, which allow to displace the supports in the whole range. This allows the student to carry out the experiment of beams of different length.
- Four test pieces with circular section, of 8 mm diameter, of different materials (steel, aluminum, brass, bronze). They have marks every 50 mm to make the measurement of the beam length easier.
- Seven test pieces with different rectangular cross section made of stainless steel. They also have marks every 50 mm to make the measurement of the beam length easier.
- Dial gauge of 0 – 10 mm to measure the deformations with 0.01 mm accuracy.
- The elements required to perform the practical exercises are supplied:
  - Allen key of 3 mm to assemble the beams in the supports.
  - Set of weights adapted to the "MTP" unit with special hooks for each type of experiment:
    - Two weights of 10 N.
    - Four weights of 5 N.

MTP detail

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 beams' flexion for different sections and lengths.

2.- Determination of the Elasticity Modulus for stainless steel.

3.- Study of the relation between the torsional moment, beam length and torsion angle of one shaft.

4.- Determination of the Rigidity Modulus for steel, bronze and aluminum.

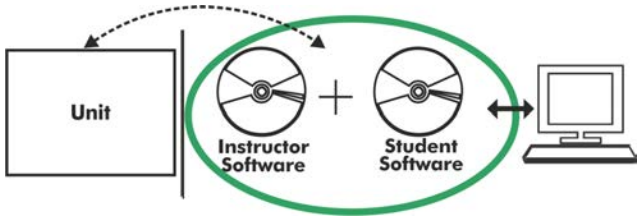
DIMENSIONS AND WEIGHTS

MTP:

-Dimensions: 850 x 500 x 650 mm approx. (33.46 x 19.68 x 25.59 inches approx.)

-Weight: 18 Kg approx. (39.68 pounds approx.)

MTP/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

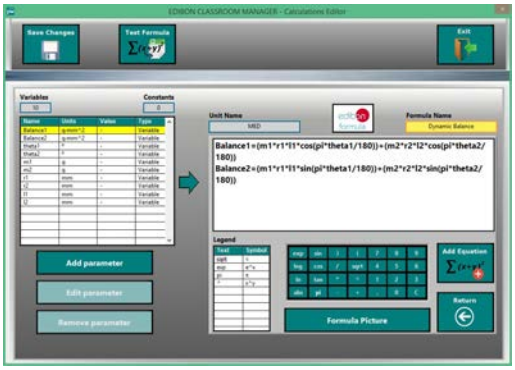
- ECM-SOF. EDIBON Classroom Manager (Instructor Software).

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.

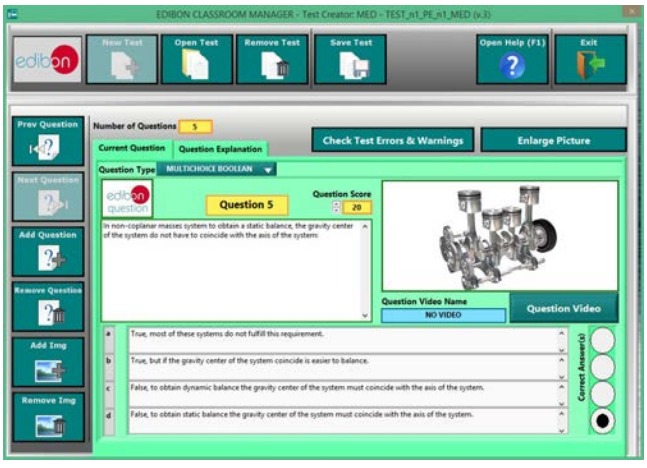
Innovative features:

- **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.

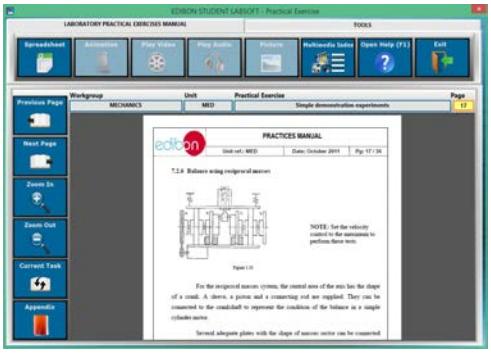
Innovative features:

- **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.**

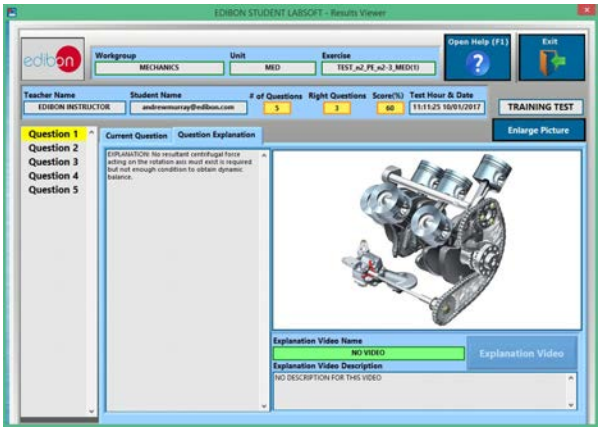
ESL-SOF. EDIBON Student LabSoft (Student Software) Application Main Screen

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

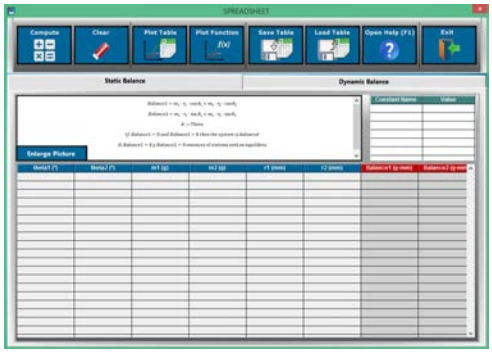
www.edibon.com/en/files/expansion/ICAI/catalog



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.

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

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REPRESENTATIVE: