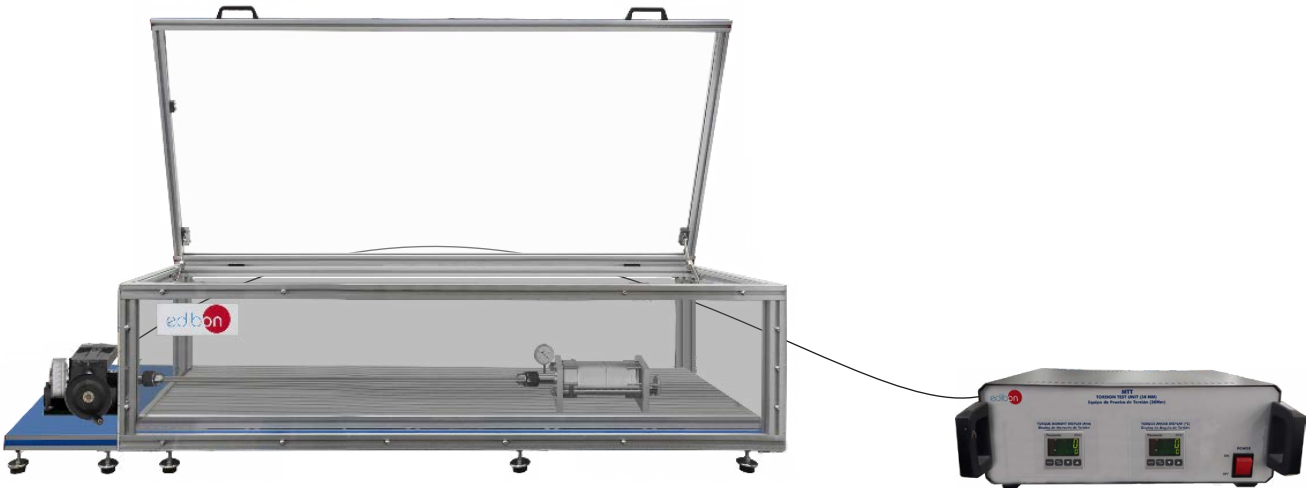
Torsion Test Unit (30Nm)

MTT

Engineering and Technical Teaching Equipment

www.edibon.com
PRODUCTS
7.- MECHANICS



Electronic console

INTRODUCTION

Torsion is a type of stress that occurs when a moment or pair of forces is applied to a bar or element. The cross sections of the bar undergo a sliding by rotation around an axis normal to its plane by which tangential stresses analogous to simple shear stresses are developed. Its application in industry is crucial since all rotating shafts of machines, which transmit motion, are subjected to torsional stresses.

The Torsion Test Unit (30Nm), "MTT", allows to test the fundamentals of torsion in bars, of different lengths and different materials, subjected to torsional loading until shear fracture.

GENERAL DESCRIPTION

To perform the tests, the test specimen is clamped and twisted by means of a flywheel and a worm gear until it breaks. The force is gradually applied to the specimen to observe the elastic strain produced. The specimen will deform and manifest itself as a twisting of the two ends of the specimen relative to each other.

The Torsion Test Unit (30Nm), "MTT", has a shaft attached to the test specimen where the moment of torsion is measured with strain gauges. By means of an angle measuring sensor it is possible to determine the torsion angle. This measuring system is movable by means of guides, so that it can be adapted to the different lengths of the test specimens.

Both moment and angle measurements can be visualized by means of digital displays on an electronic console. These measurement values can also be acquired through a computer with included data acquisition software.

Steel, brass and aluminum specimens of different lengths are supplied for practical exercises. All of them have hexagonal edges for fixing.

The unit has a transparent protective cover that provides protection against breakage of the test specimens and allows observing shear breakage.

SPECIFICATIONS

Bench-top unit.

Anodized aluminum frame and panels made of painted steel.

Main metallic elements made of stainless steel.

Handwheel and worm gear to generate the torsion load.

Maximum moment of torsion: 30 Nm.

Test specimens of different lengths and materials of 6 mm diameter:

- 4 steel specimens of L = 75 mm.
- 4 brass specimens of L = 75 mm.
- 4 aluminum specimens of L = 75 mm.
- 2 steel specimens of L = 175 mm.
- 2 steel specimens of L = 350 mm.
- 2 steel specimens of L = 700 mm.

Measuring device with self-compensation of deformation:

- Strain gauges for measuring moment of torsion, range: 0 – 30 Nm.
- Torsion angle sensor, range: 0 - ±3200°, resolution: 0.1°.

Transparent protective cover.

Software for data acquisition.

Electronic console:

- Main switch.
- Moment of torsion display.
- Torsion angle display.

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.- Performance of torsion tests with different material specimens.

2.- Determination of the resistance to torsion.

3.- Study of the influence of the specimen material on the relationship between the moment and the angle of torsion.

4.- Study of the influence of the specimen length on the relationship between the moment and the angle of torsion.

5.- To determine experimentally the relationship between the torque moment and the angular deformation of the axis.

6.- To determine experimentally the relationship between the length of the test bar and the angle of rotation of the shaft for the same torsional load.

REQUIRED SERVICES

- Electrical supply: single-phase 200 VAC – 240 VAC/50 Hz or 110 VAC – 127 VAC/60 Hz.

DIMENSIONS AND WEIGHTS

MTT:

-Dimensions: 1350 x 700 x 550 mm approx.
(53.14 x 27.55 x 21.65 inches approx.)

-Weight: 40 kg approx.
(88 pounds approx.)

ADDITIONAL RECOMMENDED ELEMENTS (Not included)

- MTT/TM. Torsiometer.
- MTT/SP. Set of 6 Torsion Specimens (Stainless Steel, Aluminum and Brass).

SIMILAR UNITS AVAILABLE

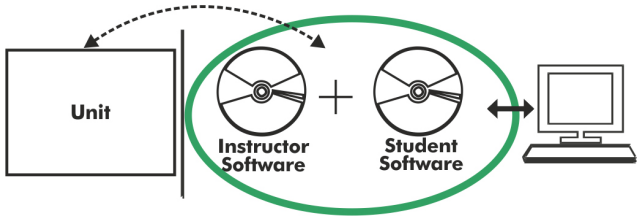
Offered in this catalog:

- MTT. Torsion Test Unit (30Nm).

Offered in other catalog:

- MTP. Torsion and Bend Unit.
- MTB. Torsion Unit.

MTT/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.

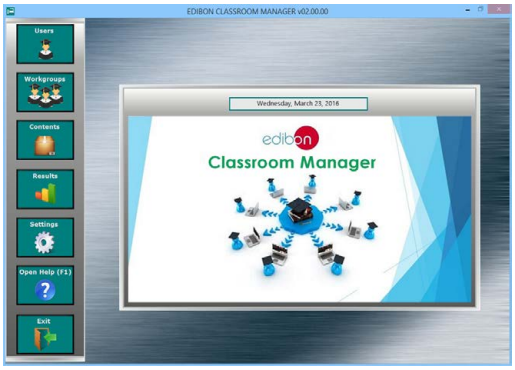
Instructor Software

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

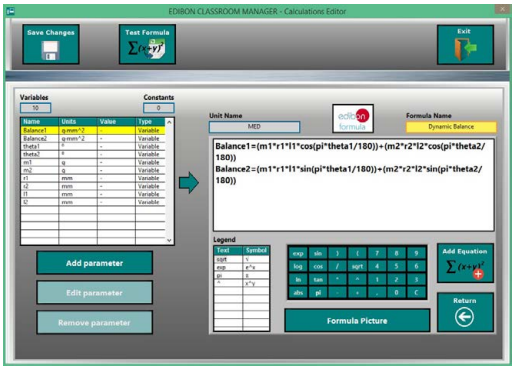
ECM-SOF is the application that allows the Instructor to register students, manage and assign tasks for workgroups, create own content to carry out Practical Exercises, choose one of the evaluation methods to check the Student knowledge and monitor the progression related to the planned tasks for individual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

Innovative features:

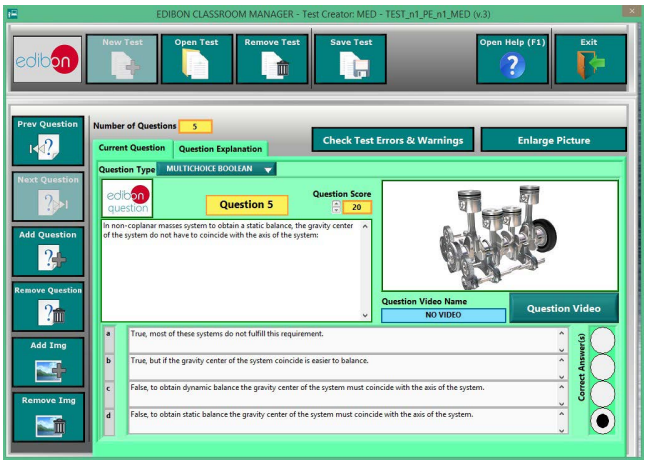
- **User Data Base Management.**
- **Administration and assignment of Workgroup, Task and Training sessions.**
- **Creation and Integration of Practical Exercises and Multimedia Resources.**
- **Custom Design of Evaluation Methods.**
- **Creation and assignment of Formulas & Equations.**
- **Equation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

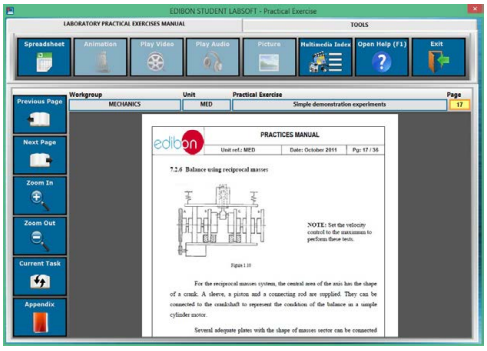
Innovative features:

- **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.**

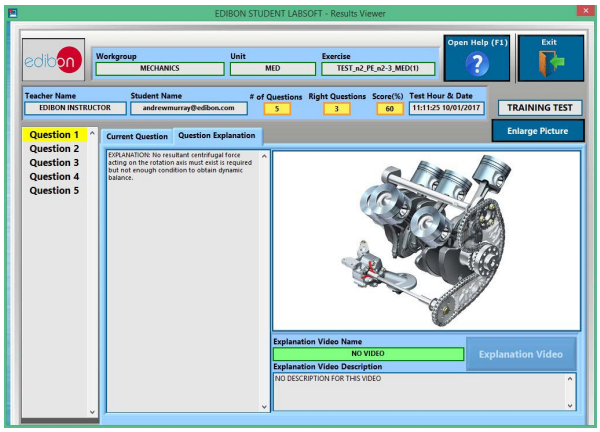
For more information see **ICAI** catalogue. Click on the following link:

www.edibon.com/en/interactive-computer-aided-instruction-software

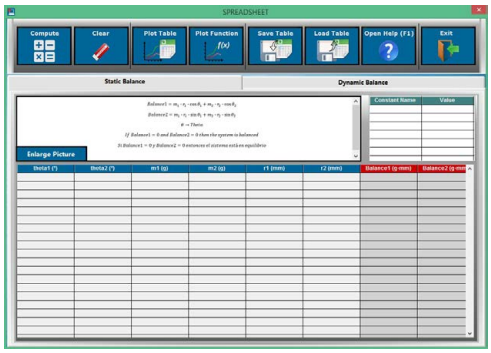
ESL-SOF. EDIBON Student LabSoft (Student Software) Application Main Screen



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: