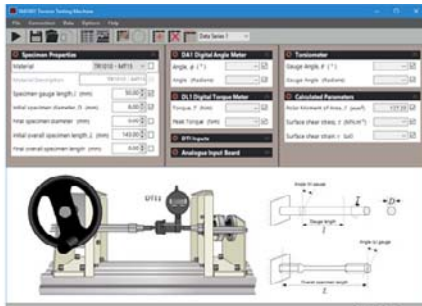




**VDAS® SM1001**

## TORSION TESTING MACHINE (30 NM)

Bench-mounted machine to allow students to perform torsion tests on different materials. Demonstrates Bauschinger effect.



SCREENSHOT OF THE OPTIONAL VDAS® SOFTWARE



### KEY FEATURES

- Ideal for student use and classroom demonstrations
- Torque capacity up to 30 Nm
- Direct readings of torque and strain on digital displays
- Suitable for destructive tests on specimens
- Forward and reverse loading
- For use with specimens up to 750 mm long
- Wide range of test specimens
- Optional Torsiometer (SM1001a) available for tests which need increased accuracy

# TORSION TESTING MACHINE (30 NM)

## DESCRIPTION

The Torsion Testing Machine is a compact machine, ideal for classroom demonstrations and for safe use by small groups of students. Its frame is a rigid, precision-engineered alloy box-section, supported at each end by adjustable feet. It carries two main parts:

- a 'strain head' at one end, and
- a torque reaction and measurement system at the other.

The specimens fit between the strain head and the torque reaction and measurement system.

The strain head is a 60:1 worm drive reduction gearbox, mounted on a platform. The platform can be moved and locked to any point along the frame. To apply torque, students turn a handle at the input of the gearbox. A keyway allows the output shaft of the gearbox to slide freely along its length. This allows for any change in length of the specimen during the tests and for easy insertion of specimens.

An accurate encoder measures the strain (angular movement) at the strain head. The encoder has a digital display and can connect to TecQuipment's Versatile Data Acquisition System (VDAS®).

The torque reaction and measurement system includes a torsion shaft supported by bearings. The shaft reacts on a strain-gauged load cell. A digital display shows the force measured by the load cell. The display can connect to VDAS®.

Hexagonal drive sockets hold the test specimens. The sockets fit on the gearbox output shaft and the torsion shaft. TecQuipment supplies two different sizes of drive sockets.

For safety, a clear guard protects the user when they perform destructive tests on standard-size specimens.

For increased strain measurement accuracy, use the optional Torsiometer (SM1001a). The increased accuracy is useful to help find the modulus of rigidity (shear modulus). The torsiometer has a digital display of angular movement, calibrated to the strain angle (in radians). The torsiometer can connect to VDAS®.

For quick and reliable tests, TecQuipment can supply the optional VDAS® which gives accurate real-time data capture, monitoring and display, calculation and charting of all important readings on a computer. The computer is not supplied.

## STANDARD FEATURES

- Supplied with comprehensive user guide
- Five-year warranty
- Manufactured in accordance with the latest European Union directives
- ISO9001 certified manufacturer

## LEARNING OUTCOMES

- Determination of modulus of rigidity (shear modulus) and yield strength (when used with the optional torsiometer)
- Determination of upper and lower yield stresses for normalised steel specimens
- Reversed torsion tests to demonstrate the Bauschinger effect and the effects of residual body and textural stresses on torsional strength
- Comparison of the different elastic and plastic properties of materials (when used with the optional specimens)

## INCLUDED SPECIMENS

- 10 x TR1010 0.1% Carbon Steel 2030M07 (as drawn)
- 5 x TR1020 0.4% Carbon Steel 212M36 (normalised at 900°C)
- 5 x TR1040 Half-hard Brass CZ121 (60% Copper, 40% Zinc)

## RECOMMENDED ANCILLARIES

- Torsion Test Specimens (TR)
- Bench-mounted version of the Versatile Data Acquisition System (VDAS-B)
- Torsiometer (SM1001a) – Mechanical torsiometer for use with 6 mm diameter specimens in both the elastic and plastic regions

## ESSENTIAL SERVICES

### ELECTRICAL SUPPLY:

Single-phase 100 VAC to 240 VAC, 1 A, 50 Hz to 60 Hz with earth

### BENCH SPACE NEEDED:

1.2 m x 0.6 m



TORSIOMETER (SM1001A)

# TORSION TESTING MACHINE (30 NM)

## OPERATING CONDITIONS

### OPERATING ENVIRONMENT:

Laboratory

### STORAGE TEMPERATURE RANGE:

-25°C to +55°C (when packed for transport)

### OPERATING TEMPERATURE RANGE:

+5°C to +40°C

### OPERATING RELATIVE HUMIDITY RANGE:

80% at temperatures < 31°C decreasing linearly to 50% at 40°C

## SOUND LEVELS

Less than 70 dB(A)

## SPECIFICATIONS

TecQuipment is committed to a programme of continuous improvement; hence we reserve the right to alter the design and product specification without prior notice.

### DIMENSIONS:

1100 x 400 x 300 mm

### NETT WEIGHT:

33 kg

### PACKED VOLUME AND WEIGHT:

0.3 m<sup>3</sup>; 60 kg (approx)

### NOMINAL CAPACITY:

30 Nm

### MAXIMUM SPECIMEN LENGTH:

750 mm

### GEARBOX RATIO:

60:1

### DRIVE SOCKETS:

3/16" Whitworth and 12 mm AF hexagonal (2 off each supplied)

### STRAIN MEASUREMENT:

Electronic encoder and digital display

### TORQUE MEASUREMENT:

Strain gauged load cell and digital display

**NOTE:** All instruments can connect to TecQuipment's VDAS®

### SPECIMENS:

A starter set of specimens is supplied with the equipment:

- 10 x TR1010 0.1% Carbon Steel 2030M07 (as drawn)
- 5 x TR1020 0.4% Carbon Steel 212M36 (normalised at 900°C)
- 5 x TR1040 Half-hard Brass CZ121 (60% Copper, 40% Zinc)

TecQuipment can supply additional specimens, also:

- TR1011: 0.1% carbon steel, normalised at 900°C
- TR1021: 0.40% carbon steel, normalised at 860°C
- TR1040: Brass 60Cu/40Zn, half hard
- TR1050: Cast iron grade 180

The user guide includes a technical drawing of the specimens.