

WP 510

Torsion test 200Nm, motor drive



Description

- **measure the test moment by means of strain gauge**
- **incremental encoder for measuring the twisting angle**
- **four different deformation rates can be configured**
- **experiments based on industrial standards**

The torsion test is a destructive testing method that studies the plastic behaviour of materials. In practice, components that are twisted in their application (e.g. screws, shafts, axles, wires and springs) are studied with this test method.

The WP 510 experimental unit allows torsion tests in which specimens are subjected to load until they fracture. The clean layout and simple operation mean the experimental sequence can be observed in all details and phases. The power of the experimental unit allows tests to be performed on an industrial scale.

In the experiment, metallic specimens are twisted until they are destroyed by typical shear fracture. The twisting moment is applied from a high-ratio reduction gear motor.

A frequency converter offers four different drive velocities in forward and reverse rotation. The base plate is torsionally reinforced. A transparent protective cover protects against flying fragments.

Specimens of different materials and different lengths are included in the scope of delivery. The measuring device can be moved on the rigid frame to adapt to different specimen lengths.

The effective twisting moment (test moment) is measured by means of a moment-measuring shaft fitted with strain gauges and can be read directly on a display. The twisting angle is recorded by an incremental encoder and can also be read. The microprocessor-based instrumentation is well protected in the housing.

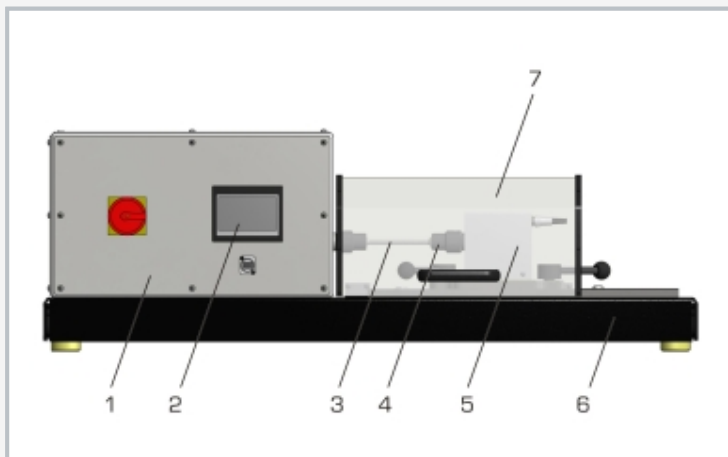
The GUNT software, together with the microprocessor, provides all the advantages of using software to help conduct and analyse the experiments. The unit is connected to the PC via USB.

Learning objectives/experiments

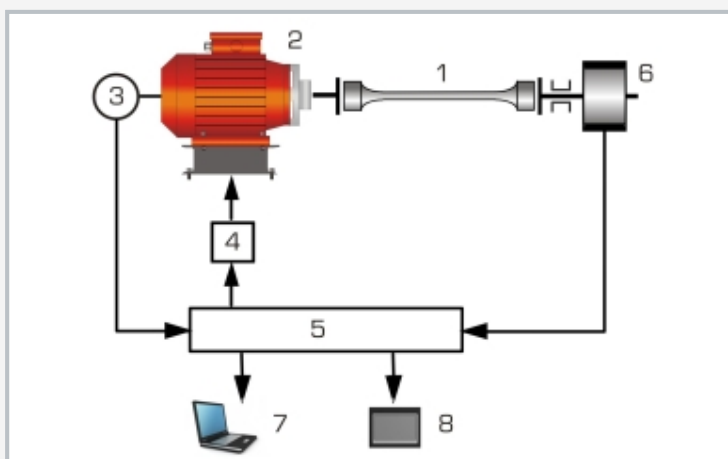
- torsion tests with different materials and load until specimen fracture
- determine the twisting strength
- plot the diagram of twisting moment over twisting angle
- determine the elastic region
- influence of
 - ▶ specimen material
 - ▶ specimen cross-section
 - ▶ specimen length

WP 510

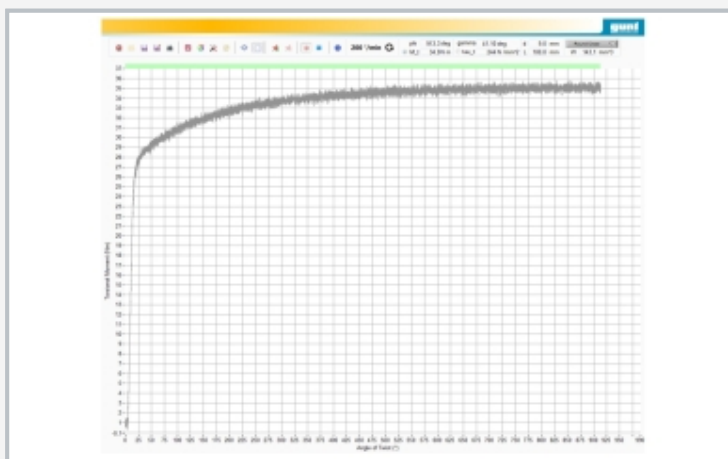
Torsion test 200Nm, motor drive



1 drive unit with gear motor, 2 touch panel for operation and displaying measurements, 3 specimen, 4 specimen holder (commercial 19mm socket), 5 quick-release abutment on guide rails with moment measuring device, 6 rigid base plate, 7 transparent protection



1 specimen, 2 gear motor, 3 incremental encoder, 4 frequency converter, 5 microprocessor, 6 strain gauge measuring shaft, 7 PC, 8 touch panel



Software screenshot: twisting moment over twisting angle

Specification

- [1] motor-supported torsion tests with different metallic specimens to fracture
- [2] generate the twisting moment by means of worm gear motor; adjustable torsion rates, forward and reverse
- [3] worm gear motor, speed controlled by frequency converter
- [4] specimens: steel, aluminium, brass
- [5] measure the test moment by means of strain-gauge measuring shaft
- [6] twisting angle measured by incremental encoder
- [7] measured values displayed and controlled via touch panel
- [8] microprocessor-based measuring technology
- [9] GUNT software for data acquisition via USB under Windows 10

Technical data

Worm gear motor

- max. twisting moment: 200Nm
- torsional velocities: 50, 100, 200, 500°/min
- frequency converter with 4 fixed speeds
- motor output: 0,12kW, forward and reverse

Specimens

- diameter: 9mm, length: 100mm
- 3x steel
- 3x aluminium
- 3x brass
- specimen holder: 2x19mm, hexagonal
- possible specimen lengths: max. 300mm

Measuring ranges

- twisting moment: 0...199,9Nm
- angle of twist: 0...±3200°, resolution: 0,1°

230V, 50Hz, 1 phase
 230V, 60Hz, 1 phase; 120V, 60Hz, 1 phase
 UL/CSA optional
 LxWxH: 1120x550x380mm
 Weight: approx. 95kg

Required for operation

PC with Windows

Scope of delivery

- 1 experimental unit
- 3 set of specimens (9 pieces)
- 1 GUNT software + USB cable
- 1 set of instructional material

WP 510

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Optional accessories

020.51001	WP 510.01	Set of 5 torsion specimens, St
020.51002	WP 510.02	Set of 5 torsion specimens, CuZn
020.51003	WP 510.03	Set of 5 torsion specimens, Al
020.30009	WP 300.09	Laboratory trolley