Product Information

Torsion Testing

Special testing possibilities
The following testing methods can be selected for the 1st axis (tensile/compression), as well as for the 2nd axis (torsion):
1. constant holding test
2. constant cycling
3. stepped loading

These selections allow a multitude of testing combinations:
- constant load with torsion testing
  test method “constant holding test” with holding type
  “force controlled” for 1st axis and constant cycling or
  stepped loading for the 2nd axis
- constant travel with torsion testing a test method
  “force controlled” with holding type “position
  controlled” for the 1st axis and constant cycling or
  stepped loading for the 2nd axis (Torsion)
- torque constant with tensile/compression testing a test method
  “force controlled” with holding type “torque controlled for the 2nd axis and constant
  cycling or stepped loading for the 1st axis
- torque angle constant with tensile/compression testing a test method
  “torque angle controlled” for the 2nd axis and
  constant cycling or stepped loading for the 1st axis
- superimposed tensile/compression and torsion testing
- pure tensile/compression testing (torsion axis idle)
- pure torsion testing (tensile/compression axis idle)

In addition, there are several possibilities for synchronisation of the testing axes:
- no synchronisation: after the start, both axes run independently of each other
- synchronisation to pre-load/pre-torque: the test sequence is only continued after a pre-load or pre-torque has been reached
- synchronisation to pre-load and reversal points
- event-controlled synchronisation

Measurement and Control units
The DUPS-Allround electronic are available for realisation of the testing tasks.

Units for torsion testing
Units for torsion testing can be mounted into the materials testing machine for multi-axis loading tests on materials and components.

The Concept
Testing tasks which impose high demands on the materials testing machine, require a clear, well-defined machine concept. This is true of the mechanics and electronics, as well as the software components. The answer to these demands can be summarised in the following concepts:
- modular system principle
- supplemental upgrading
- correct software for the given testing task
- upgrading compatibility

Pic 1: Zwick 2020 Materials Testing Machine with torsion drive
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**System requirements**

Pentium-PC
128 MB RAM-Storage
Microsoft Windows NT 4.0 / 2000
2 free serial interfaces for the testing machine

**Software realisation**

The torsion units can be controlled under the Zwick applications software, testXpert, in connection with the basic software for a 2nd test axis. During this time, the 1st drive axis performs the tensile and compression testing.

Zwick testXpert from Version 6.01

**Additionally required items**

Zwick testXpert TPI BX069804.00.10
Zwick testXpert test sequence BX069902.00.10-01

**Tab 1: Overview of Zwick Torsion drive units ref. Torque load cells**

<table>
<thead>
<tr>
<th>Mmax (Nm)</th>
<th>Fmax (kN)</th>
<th>Torsion Speed in RPM Actuator</th>
<th>Torque load cell</th>
<th>Zwick Materials Testing Machine Z000/xxxx</th>
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<tbody>
<tr>
<td>100</td>
<td>20 kN</td>
<td>B020111 0.002 - 10</td>
<td>B066164, B066165</td>
<td>Zwick Z005 / Z010 / Z020 / Z030 Table-top/Floor Model</td>
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<tr>
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<td>B020121 0.002 - 10</td>
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<td>B066160</td>
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All Data at ambient temperature.
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