Vortex-xt Torque Testing System
Easy-to-use Touch Screen Console

Actuation test on medical device
Opening test of beverage closure
Vortex-xt Overview

Top-loading capability to apply set loads during torque testing, particularly suitable for child-resistant closure testing.

Twin-column test frame with a precision drive and real-time controller (RTC) electronics for accurate data acquisition and machine control. Motorised clockwise or anti-clockwise torque application at constant velocity guarantees testing reproducibility. Up to 10 N.m torque may be applied at speeds of 0.1 - 20 rev/min.

Adjustable transducer carriage allows for upward movement of the sensor when torque is applied e.g. for threaded closures.

Adjustable crosshead to accommodate specimens up to 448 mm in height.

Precision Torque Transducer available in different sizes from 0.3 N.m to 10 N.m.

Versatile mounting tables adjustable to hold a variety of forms (sold separately). Custom-designed fixtures available on request.

Emergency stop button for safety and CE compliance.

LED power indication. Mains power inlet at back with on/off rocker switch.


Solid build quality, manufactured under a controlled environment to conform to all relevant European health, safety and environmental protection legislation & carries a CE mark.

User-friendly touch screen interface.

Hardwearing and splash-resistant housing ideally suited to both factory & laboratory conditions.
“Torque Testing... Made Easy!”

Quality managers needing an easy-to-use torque testing system for the production area should look no further than Mecmesin’s range of Vortex-xt torque testers.

Using touch screen technology, static and rotary torque tests are performed at the touch of a button, making the Vortex-xt ideal for routine quality control of a wide array of products and components.

The Vortex-xt is specifically designed for environments where throughput, productivity and minimal training are vital and where the use of a computer is not always suitable.

Whether you are a packaging manufacturer wishing to assess the bridge torque of a tamper-evident closure, or an automotive controls designer looking to perfect the ‘feel’ of a rotary switch, the Vortex-xt offers an intelligent and user-friendly solution to simulating a real life torque application.

Easy-to-use Touch Screen Console

- **Quick Test**: Elementary test without program
- **Program Test**: Standard programs with load & position control
- **Advanced Test**: Upgrade to full programming capability to create & run sophisticated test routines

**Ergonomic Design**: Adjustable console, pivots & tilts for maximum comfortable use & easy viewing

**USB Ports**: Connection to networks, memory stick, printers & other USB devices

**“5 Favourites”**: Customised icons aid selection of your “5 favourite” tests
Vortex-xt Key Features

Operators

Secure Access

- Multiple levels of password-protected access
- Pre-defined ‘read-only’ tests can be used by ‘operators’ preventing inadvertent changes to the test parameters
- Results can be automatically tagged with the operator name and the date/time of the test. This traceability is designed to assist manufacturers wishing to comply with regulatory requirements for the storage of test results

Start Testing in Two Steps

Step 1

Press ‘Favourite’ test

Easy-to-use with Minimal Training

- Touch screen’s simple menu
- Press 2 buttons to recall a pre-set program and start testing
- Designed for use in manufacturing environments, the Vortex-xt can be used right next to production lines, ensuring rapid testing of samples and prompt alerting of operators if problems occur

Step 2

Clear Results with Colour-coded Indication of ‘Pass’ or ‘Fail’

- Interpretation of test results could not be simpler. Sample performance can be easily and swiftly checked using colour-coded indicators; green for ‘Pass’ and red for ‘Fail’

Press ‘Start’ to launch the test

Easy-to-read graphical results
Supervisors

Easy to Program - from Simple to Sophisticated Tests

Choice of 3 program modes:
- ‘Quick Test’ for basic torque testing
- ‘Program Test’ for standard test routines
- ‘Advanced Test’ for sophisticated test routines

What else do i need to know?
- Creating programs on the Vortex-xt is effortless
- Follow the simple ‘tab-style’ menus to setup your test method
- Choose from the list of calculations to obtain your test results
- Once created, save to your library of tests

Easy to Program

Easy-to-use programming menus enable the user to customise the test for a wide variety of torque applications.

Run the Test

Just press Start to run the test and the results will be displayed with colour-coded ‘Pass’ or ‘Fail’ indicators for quick and easy interpretation of results.

Test Library

Select a test to run from your library of programs. The selected test will then be automatically loaded and the software will advance to the run screen.
Vortex-xt Key Features

Reports

- Select standard reports or customise your own using built-in templates
- Data can be exported via a memory stick or to a network using RS232 protocol, making it easy to integrate the Vortex-xt into a Statistical Process Control system or remote data storage facility

Accurate, Repeatable and Reliable Testing

- Highly accurate motor drive delivers application or release torque over a speed range of 0.1 - 20 rpm
- Regardless of who may be operating the machine, consistent repeatable test speeds eliminate the operator variability inherent in manual torque testers

Wide Range of Capacities

- Maximum load rating is 10 N.m
- Choose from a range from 0.3 N.m to 10 N.m giving enough sensitivity to measure delicate medical components or large packaging closures
- For samples with sudden break characteristics a fast acquisition rate of 1000 Hz ensures accurate capture of short duration events

Versatile

The Vortex-xt can be delivered with a standard set of 4 gripper pegs. For more challenging samples it may be necessary to develop dedicated grips - consult Mecmesin for details.
In industries such as beverage, dairy, food, personal care and pharmaceuticals the opening torque of containers with twist-off closures are an important quality parameter; vital for customer satisfaction.

Packaging manufacturers need to ensure their products have the correct level of torque so they:

• Can be easily opened and closed by consumers
• Provide an adequate seal on containers
• Conform to relevant international standards

The Vortex-xt provides the ideal solution for torque testing at the point of production, performing quick off-line quality checks on batches of packaging samples, to ensure that high quality standards are maintained and preventing costly out of tolerance failures.

Closures

The Vortex-xt is used to accurately measure and record the tightness of a wide variety of closures including:

• Metal ‘Stelvin’ caps on wine bottles
• Plastic tamper-evident closures on PET bottles
• Child-resistant (CRC) closures on pharmaceutical containers

Test to Standards

• DIN EN 12377: 1998 Packaging - Flexible tubes; Test method for the tightness of closures
• DIN EN 14401: 2004 Rigid plastics containers; Methods to test the effectiveness of closures
• ISBT Voluntary Standard Test Methods for Plastic Flat Top Closures
Tamper-evident Closures

For tamper-evident closures, the Vortex-xt has the sensitivity to detect:

- The applied torque as the closure is tightened
- The strip torque as the closure is overtightened
- The release (peak) torque as the first seal is overcome
- The slip and bridge torque where the tamper-evident band separates from the screw closure
- To make results easy to interpret on fast moving production lines, upper and lower quality control limits can be set and the individual results coded green for ‘Pass’ and red for ‘Fail’

Child-resistant Closures (CRC)

The Vortex-xt comes equipped with a top-load facility, required for testing child-resistant closures.

Masses are added to the top-load carrier to apply a constant down force while rotating the closure and measuring the release torque.

Test to Standards

- ASTM D3475 - 05 Standard Classification of Child-resistant Packages

Cosmetics

Checking the torque required to remove the lid from a cosmetics jar through to testing the actuation torque of a lipstick barrel - the Vortex-xt helps cosmetics manufacturers assess the performance of their products.
Medical devices

Medical device manufacturers use the Vortex-xt to ensure their devices, often safety-critical, are fit-for-purpose and manufactured to stringent quality standards. For example, assessing the torque of rotary hub luer connectors and torque measurement of dosage selection on pen injectors.

Automotive

Automotive control designers use the Vortex-xt to measure the force needed to operate rotary controls and switches. For example, to ensure stalk switches are easy enough to twist, but provide sufficient resistance to give a positive ‘click’ on engagement. The Vortex-xt can be programmed to add event marks to the test to plot the rotary position with the contact closure or opening of electrical switches.
Specifications

<table>
<thead>
<tr>
<th>Vortex-xt</th>
<th>0.3N.m</th>
<th>1.5N.m</th>
<th>3N.m</th>
<th>6N.m</th>
<th>10N.m</th>
</tr>
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<tbody>
<tr>
<td>Measurement range</td>
<td>N.m</td>
<td>0 - 0.3</td>
<td>0 - 1.5</td>
<td>0 - 3.0</td>
<td>0 - 6</td>
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<td>kgf.cm</td>
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<td>lbf.in</td>
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<td>0 - 13</td>
<td>0 - 26</td>
<td>0 - 52</td>
<td>0 - 90</td>
</tr>
</tbody>
</table>

**SPEED**

| Speed range | 0.1 - 20 rev/min (clockwise or anticlockwise) |
| Speed accuracy | ±1% of indicated speed |
| Speed resolution | ±0.1 rev/min |

**DIMENSIONS**

| Maximum travel of adjustable transducer carriage | 182 mm (7.2") |
| Maximum headroom | 505 mm (19.9") [448 mm (17.6")] |
| Width between columns | 280 mm (11.02") |
| Weight | 24.5 kg (54lb) |
| Capacity of lower mounting table | 10 - 190 mm (0.39 - 7.5") |
| Capacity of upper mounting table | 10 - 78 mm (0.39 - 3.07") |
| Maximum power requirements | 100 W |
| Voltage | 230 V AC 50 Hz or 110V AC 60 Hz |

**LOAD MEASUREMENT**

| Loadcell capacities | 0.3, 1.5, 3, 6 and 10 N.m capabilities |
| Load accuracy | ±0.5% of full scale |
| Load resolution | 1:6500 |
| Load units | mN.m, N.cm, N.m, kgf.cm, gf.cm, ozf.in, lbf.ft, lbf.in |

**DISPLACEMENT**

| Maximum displacement | 2440 revs |
| Displacement accuracy | 0.2° per 36,000° |
| Displacement resolution | 0.001 revs (±0.2") |

* with upper and lower mounting tables fitted

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**Common Specifications**

- **Operating temperature**: 10 - 35°C (50 - 95°F)
- **Humidity range**: Normal industry and laboratory conditions
- **Sampling rate (Hz)**: Selectable from 1000, 500, 100, 50, 10
- **Compensation for system movement**: Yes
- **Loadholding**: Yes
- **Digital display of load/angle/speed**: Yes
- **Graphical representation**: Yes
- **Output of test results to PC/Printer/Datalogger**: Yes - via USB/Network Ports or Wireless Network RS232 via USB/Network converter in ASCII format
- **Communication with PLC/Digital Control Interface**: Yes - via programmable digital ports
  - 6 Inputs + 6 Outputs

**Options**

- **Safety guard**: Available upon request

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Mecmesin reserves the right to alter equipment specifications without prior notice.

E&OE
The Vortex-xt crosshead assembly is supplied fitted with one of five sensors (0.3 N.m, 3 N.m, 1.5 N.m, 6 N.m or 10 N.m). This enables you to choose a system covering highly sensitive, low-range torque measurement up to more robust mid-range torque applications. Sensors are supplied with calibration certificates traceable to UK national standards.

Torque Capacity Options

Mounting Tables

Supplied as an optional extra, the Mecmesin Upper and Lower Mounting Tables offer highly versatile sample fixtures, fully adjustable to accommodate a variety of forms.

Dedicated Fixtures

If required Mecmesin has many years experience in creating tailor-made fixtures to hold closures without distortion. In many cases a dedicated mandrel can be moulded for each closure to ensure a strong grip with very rapid sample mounting.

Dimensions shown in mm (inch)

Crosshead & Transducer Carriage

Calibration Certificate

Upper Mounting Table
(not for use with sensors below 6 N.m capacity)

Lower Mounting Table
(accepts 10 - 190 mm diameter samples)

Customised Cork Mandrels
Mecmesin - a world leader in affordable force and torque testing solutions

Since 1977, Mecmesin has assisted thousands of companies achieve enhanced quality control in design and production. The Mecmesin brand represents excellence in accuracy, build, service, and value. In production centres and research labs worldwide, designers, engineers, operators, and quality managers endorse Mecmesin force and torque testing systems for their high performance across countless applications.

www.mecmesin.com

The Mecmesin global distribution network guarantees your testing solution is rapidly delivered and efficiently serviced, wherever you are.

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