

# Mecmesin

testing to perfection

## 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

**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

Automotive Stalk Test

**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

**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



User-friendly **touch screen interface**

**Hardwearing and splash-resistant housing** ideally suited to both factory & laboratory conditions

**Torque direction selection**  
Select clockwise/anti-clockwise for manual positioning

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

## “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



# Vortex-xt Key Features

## Operators



## Secure Access

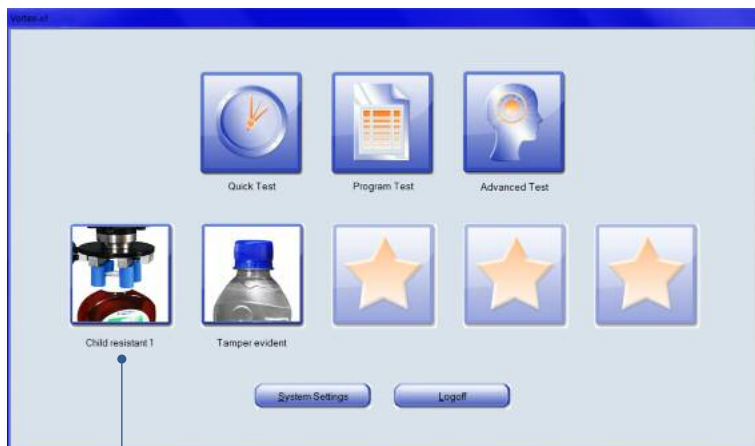


- Multiple levels of password-protected access
- Pre-defined 'read-only' tests can be used by 'operators' preventing inadvertent changes to the test parameters

- 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

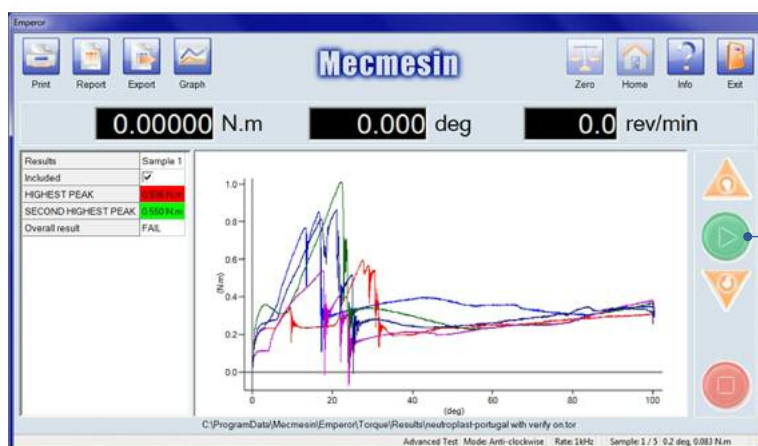


Press 'Favourite' test

### 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



Easy-to-read graphical results

### 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



## Supervisors



### Easy to Program - from Simple to Sophisticated Tests

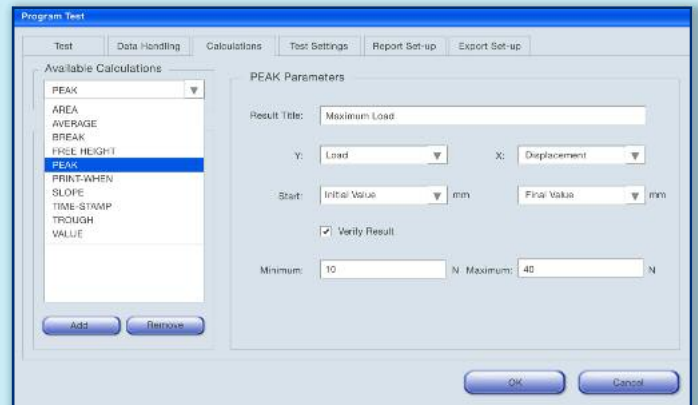


#### Choice of 3 program modes:

- **'Quick Test'** for basic torque testing
- **'Program Test'** for standard test routines
- **'Advanced Test'** for sophisticated test routines

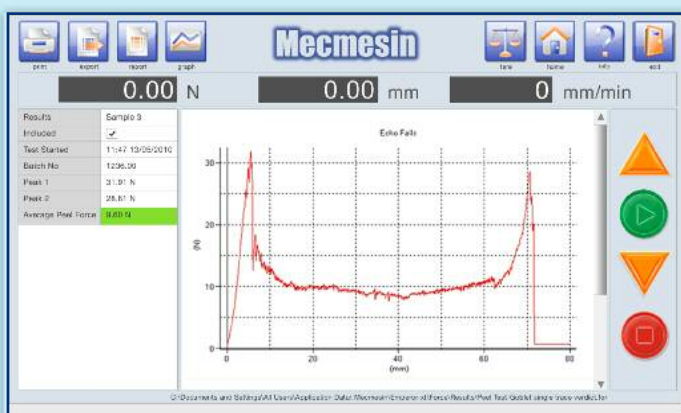
#### What else do i need to know?

- 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

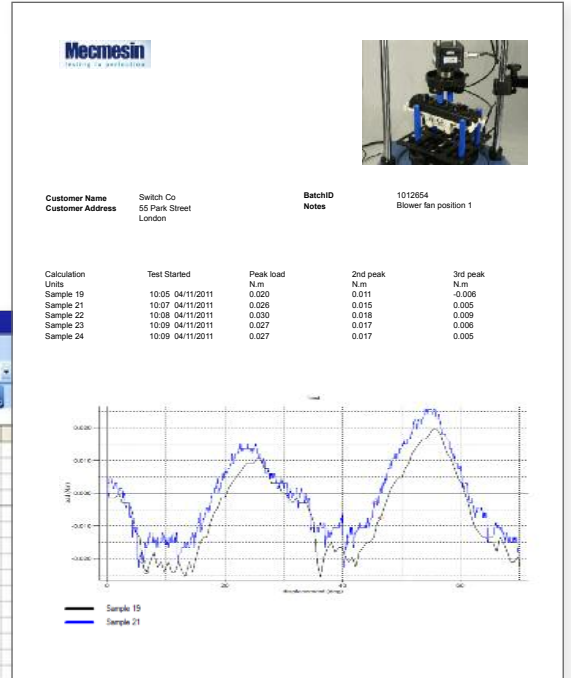
## Reports



- 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

1	Torque	Distance	Time	Event
2	N.m	deg	sec	
3				
4	Sample 1			
2191	0.4035	5.805	2.186	0
2192	0.4035	5.805	2.187	0
2193	0.4035	5.805	2.188	0
2194	0.4035	5.805	2.189	0
2195	0.4050	5.805	2.190	0
2196	0.4065	5.805	2.191	0
2197	0.4080	5.85	2.192	0
2198	0.4080	5.85	2.193	0
2199	0.4080	5.85	2.194	0
2200	0.4095	5.85	2.195	0
2201	0.4125	5.85	2.196	0
2202	0.4140	5.85	2.197	0
2203	0.4155	5.85	2.198	0
2204	0.4170	5.85	2.199	0
2205	0.4170	5.85	2.200	0
2206	0.4200	5.85	2.201	1

Raw data transferred to Excel® workbook



Printable report; can also be saved as a PDF

## 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



Watch bezel holder



Automotive rotary switch torque test

## 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.

# Packaging Industry

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

- ASTM D3198 - 97 (2007) Standard Test Method for Application and Removal Torque of Threaded or Lug-Style Closures
- 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



Bottle top twist-off test



Metal 'Stelvin' caps on wine bottles

# Packaging Industry

## 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 D3469 - 97 (2002) Standard Test Methods for Measurement of Vertical Downward Forces to Disengage Type IIA Lug-Style Child-resistant Closures
- ASTM D3470 - 91 (2007) Standard Test Method for Measurement of Removal Lug Strippage of Type IIA Child-resistant Closures
- ASTM D3472 - 97 (2007) Standard Test Method for Reverse Ratchet Torque of Type IA Child-resistant Closures
- ASTM D3475 - 05 Standard Classification of Child-resistant Packages
- ASTM D3810 - 97 (2002) Standard Test Method for Minimum Application Torque of Type IA Child-resistant Closures
- ASTM D3968 - 97 (2002) Standard Test Method for Monitoring of Rotational Torque of Type IIIA Child-resistant Closures



Child-resistant closure test



Tamper-evident closure on a bottle



Lipstick twist test



Cosmetic packaging test

## 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 & Automotive Industries

## 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.



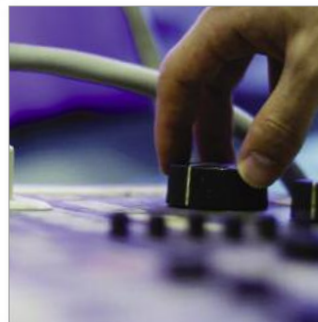
Medical device



Insulin pen twist test



Child-resistant closure test



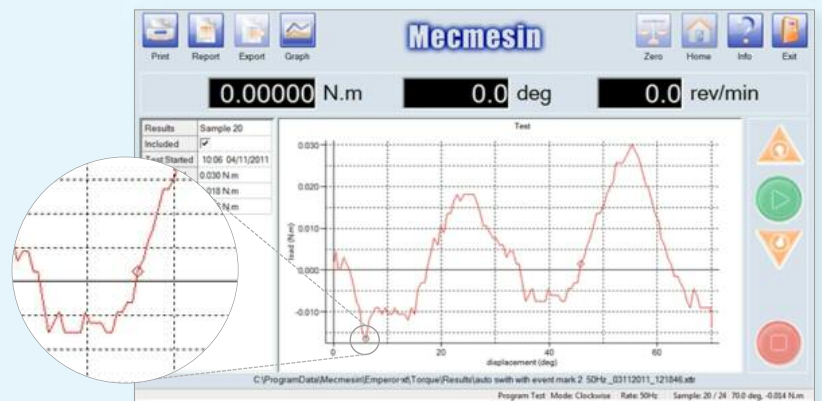
Ultrasound switch



Luer-lock syringe fitting

## Automotive

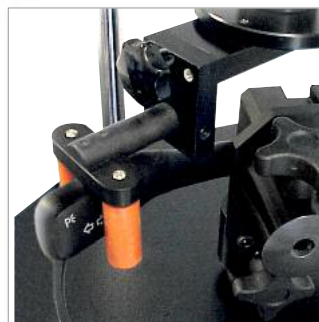
Automotive control designers use the Vortex-xt to measure the force needed to operate rotary controls and switches. For example, to ensure stalk switches are easy enough to twist, but provide sufficient resistance to give a positive 'click' on engagement. The Vortex-xt can be programmed to add event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



Results with event marks



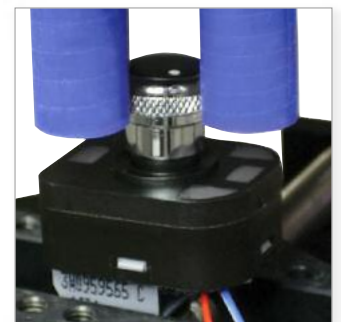
Automotive control test



Headlight stalk test



Automotive dial torque test



Rotary switch test

# Specifications

<b>Vortex-xt</b>		<b>0.3N.m</b>	<b>1.5N.m</b>	<b>3N.m</b>	<b>6N.m</b>	<b>10N.m</b>
Measurement range	N.m	0 - 0.3	0 - 1.5	0 - 3.0	0 - 6	0 - 10
	kgf.cm	0 - 3	0 - 15	0 - 30	0 - 60	0 - 100
	lbf.in	0 - 2.7	0 - 13	0 - 26	0 - 52	0 - 90
<b>SPEED</b>						
Speed range	0.1 - 20 rev/min (clockwise or anticlockwise)					
Speed accuracy	±1% of indicated speed					
Speed resolution	±0.1 rev/min					
<b>DIMENSIONS</b>						
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 (5 4lb)					
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					
<b>LOAD MEASUREMENT</b>						
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					
<b>DISPLACEMENT</b>						
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

## Common Specifications

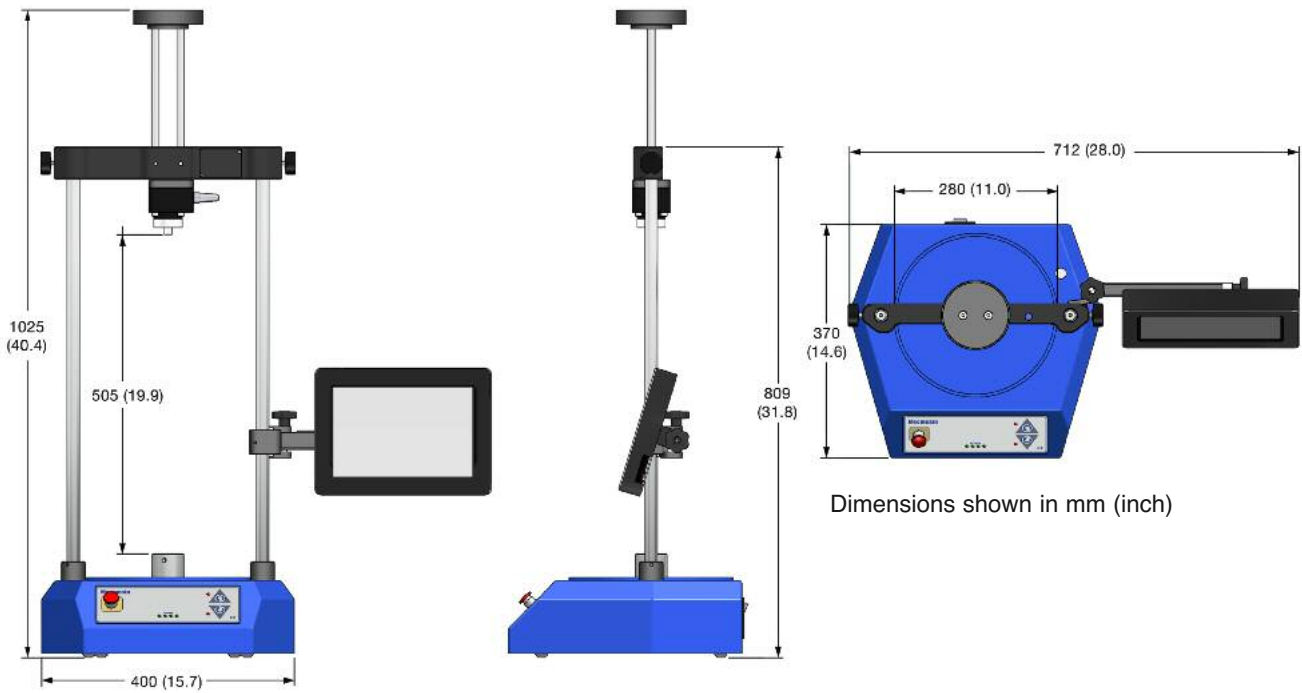
Operating temperature	10 - 35°C (50 - 95°F)
Humidity range	Normal industry and laboratory conditions
Sampling rate (Hz)	Selectable from 1000, 500, 100, 50, 10
Compensation for system movement	Yes
Loadholding	Yes
Digital display of load/angle/speed	Yes
Graphical representation	Yes
Output of test results 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

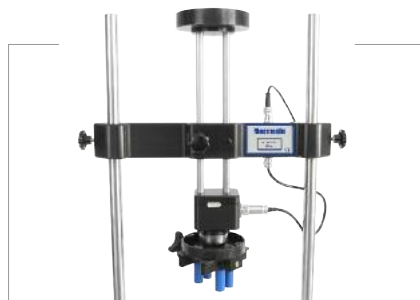
# Dimensions



Dimensions shown in mm (inch)

## Torque Capacity Options

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.



Crosshead & Transducer Carriage



Calibration Certificate

## 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.



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



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

## 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.



Customised Cork Mandrels

# Mecmesin

testing to perfection

## 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](http://www.mecmesin.com)



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