

# Mecmesin

testing to perfection

## Vortex-i

Computer-controlled Testing System  
Torque Testing Solutions



# Vortex-i

Mecmesin, one of the worlds leading designers and manufacturers of force and torque analysis systems presents the Vortex-i; a motorised and computer-controlled torque measurement system. Across the globe and throughout many industries the Vortex-i enables:

- **Manufacturers** to guarantee quality production
- **Designers** to optimise product functionality and minimise material usage
- **Quality professionals** to ensure consistent conformance with all relevant industry standards



Child-resistant closure testing

## One System, Limitless Possibilities

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-i can offer an intelligent and user-friendly solution to simulating a real life torque application.

consistency  
simplicity  
versatility

### Adjustable transducer carriage

allows for upward movement of the sensor when torque is applied.

**Adjustable crosshead** to accommodate specimens up to 350 mm in height.

### Computer control of all test

**parameters** for incomparable repeatability. Driven by Emperor™, Mecmesin's powerful yet user-friendly Windows® software. Easily programmable to run to torque, angle, time or break, and features an array of powerful advanced functions (see overleaf). Connects directly to a USB port.



Rotary switch testing



# intelligent command functions



Inhaler cap testing

**Top-loading capability** to apply fixed 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 anticlockwise 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.

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

**Solid build quality**, manufactured under a controlled environment to conform to all relevant European health, safety and environmental protection legislation and carries a CE mark. Hardwearing and splash-resistant housing ideally suited to both factory & laboratory conditions.

**Emergency stop** button for safety and compliance.

**LED power indication.** Fused mains power inlet at back with on/off rocker switch.

**Torque direction selection** (or drive motor control when in manual override mode).



# The Power of Emperor™

Emperor™ software has been specifically designed to work with the Vortex-*i* test frame for ultimate test performance. It combines ease-of-use with powerful programming tools making it ideal for simple, routine analysis on the factory floor and sophisticated test routines in the laboratory.

The powerful yet user-friendly Emperor™ interface is suitable for both simple test frame control and reporting, and comprehensive programming and calculation commands, making it easy to create customised test programs to evaluate the rotary strength of components and products.

## Tests

- Break torque
- Slip torque
- Release torque
- Running torque
- Operating torque
- Shear torque

## Applications

- Electrical controls
- Medical devices
- Screw closures
- Automotive controls
- Aerospace controls
- Toys
- Packaging
- Industrial taps & valves
- Mobile phones
- Small screw fasteners



Console Mode

Emperor™ has two operating modes - **Console Mode** allows tests to be created very simply by selecting options from radio-buttons and drop-down boxes. A number of pre-configured calculations are available and can be included by simply clicking with the mouse. Console mode is ideal for use on the factory floor by operators who need only minimal training to load and run programs directly from one of the five “Favourite” buttons.

For more complex tests, the power of Emperor's™ **Program Testing Mode** is available via a simple user interface. Again, many choices are available from drop-down boxes, making the job of writing sophisticated test programs very straight forward.

## Creating a program

The mode has an intuitive interface, which makes the whole test process easy to manage:

- Setting-up test method
- Running the test
- Making test report
- Storing & exporting data

Toolbars simplify testing by helping operators navigate efficiently to key features.



Test screen



'Report' button

## Performing a test

Emperor™ is supplied with a suite of library test programs for many typical test procedures. Within each test procedure the critical parameters, which determine whether a sample passes or fails, can be automatically detected e.g. peak load, average load, load at a certain angular displacement.

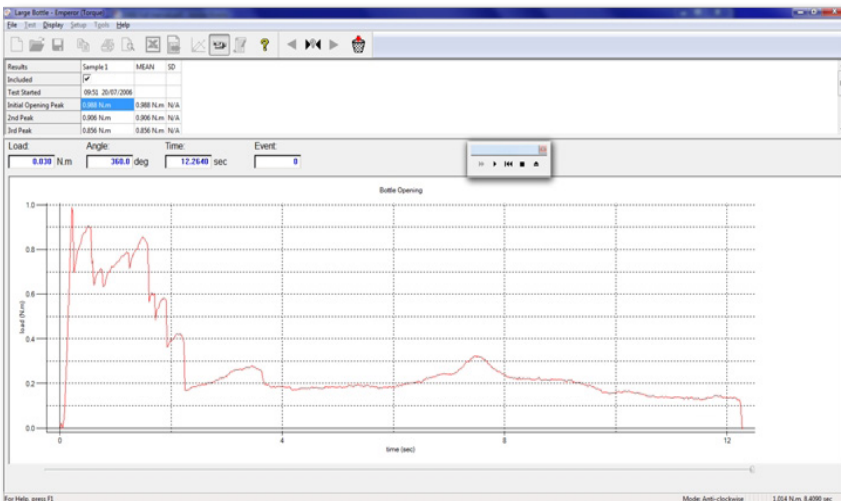
Test procedures can be initiated by selecting an existing library program or by choosing *your* own particular program from the Test menu. The library programs can be easily customised and tailored to meet specific testing needs and then saved in the testing library and recalled as needed - very useful for multiple sampling testing.



Tolerance band facility

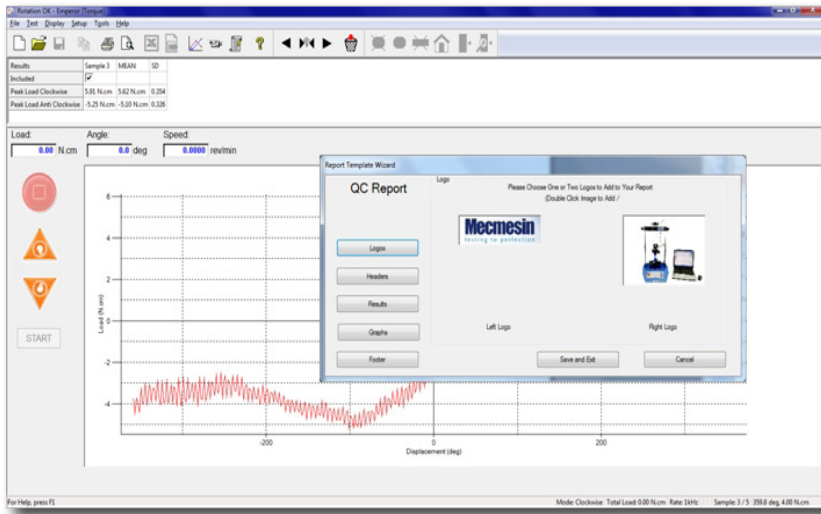
Emperor™ allows development of test procedures that are best suited to individual testing needs. An operator can be prompted at any stage of the program to perform a specific action, so that step-by-step test routines become easy for semi-skilled users.

Another useful function is tolerance alerting. By setting up tolerance bands the option exists for detecting any data that do not fall within specification. In this case a 'tolerance alert' warning will be flagged up on the results screen. There is also an additional facility for detecting when *any particular* result does not fall within predefined upper and lower limits.



'Video' replay screen

A 'video replay' facility is included. A toolbar allows the accumulation of test data to be re-displayed in real-time. 'Fast-forward' and 'return-to-start' buttons are provided. A timeline slider can be dragged to a suitable point, thus allowing critical parts of a test to be replayed as many times as necessary.



Reporting dialog box

Results can be easily manipulated, stored and exported to other software packages such as Microsoft® Excel for trend analysis and reporting, if required.

Signals from external devices can also be incorporated into Emperor™ via an 'event' input facility.

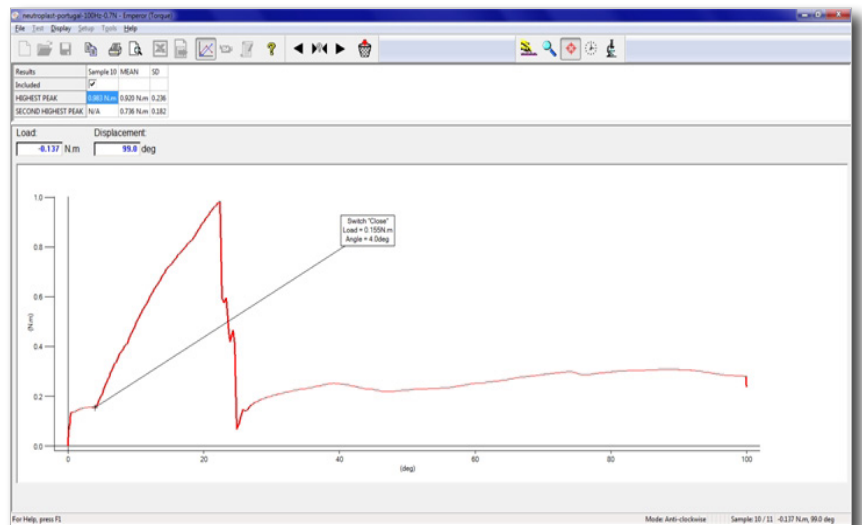
A switch can, for example, be connected to this port and the state ('open' or 'closed') of the switch can be monitored - ideal for quantifying the 'feel' of rotary controls.

## Data analysis

Emperor's™ software capabilities are exceptional:

- Reporting, archiving and exporting of data
- Fast accurate display & analysis of torque data
- Option to display test results graphically
- Graphical interrogation enables calculations to be reviewed and changed

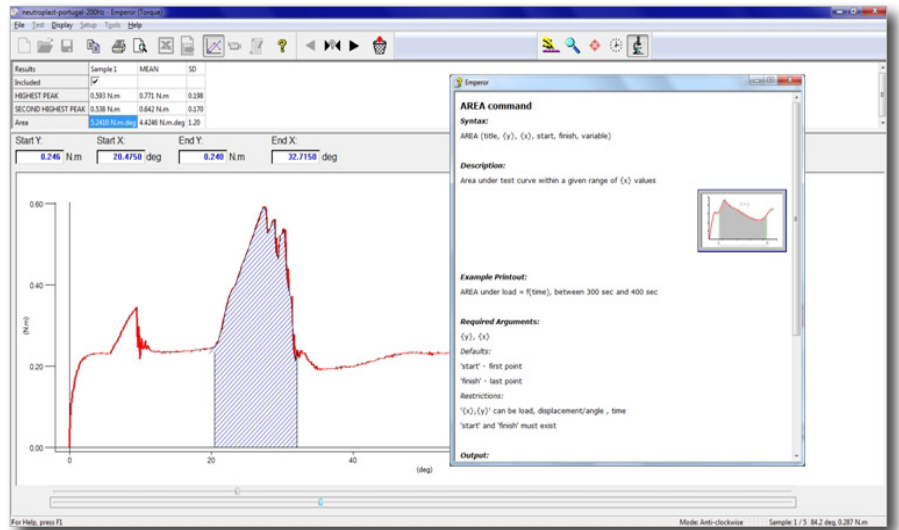
Emperor™ also benefits from a multi-level zooming facility, with timeline function allowing you to home-in on a portion of the curve which is of particular interest.



Cursor drop facility

## Ease-of-use

Emperor™ software is easy and intuitive to use. However, if required, there is a comprehensive Help system built into all aspects of the software and this is never more than a few clicks away. Once the Help system is opened, information can be found using a comprehensive index, a table of contents, text search facility and a glossary of terms.



Review and 'fine-tune' calculations screen (+ Help facility)

The software sets new standards for flexibility and user-friendliness. For example, a comprehensive de-bugging facility enables messages, variables and graphs to be viewed on a real-time or step-by-step basis, so that the test process can be easily refined. Emperor™ also has an electronic notes function to enable test identification, user ID, batch, date and time information to be recorded.

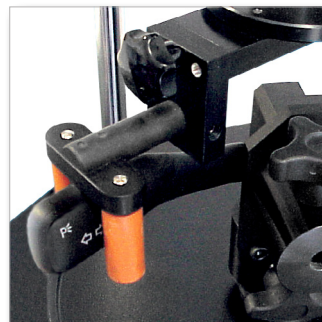
## Custom Engineering

If you are unable to hold an awkwardly shaped specimen in the standard mounting tables, our experienced in-house engineering team would be happy to work with you to design a custom-engineered solution.

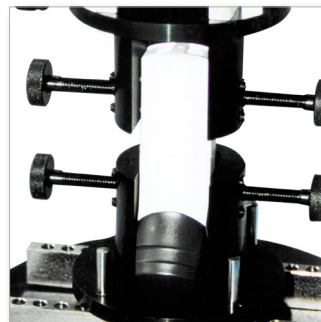
**Please call +44 (0) 1403 799979 for more information, or contact your local Mecmesin representative.**



Customised cork mandrels



Car indicator test rig



Inhaler gripping fixture



Bleach bottle test fixture

# Specifications

<b>Vortex-i</b>		<b>0.3 N.m</b>	<b>1.5 N.m</b>	<b>3 N.m</b>	<b>6 N.m</b>	<b>10 N.m</b>
Measurement range	N.m kgf.cm lbf.in	0 - 0.3 0 - 3 0 - 2.7	0 - 1.5 0 - 15 0 - 13	0 - 3.0 0 - 30 0 - 26	0 - 6 0 - 60 0 - 52	0 - 10 0 - 100 0 - 90
<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	19.5 kg (43 lb)					
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 110 V 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>SPEED</b>						
Speed	0.1 - 20 rev/min (clockwise or anticlockwise)					
Speed accuracy	±1% of indicated speed					
Speed resolution	±0.1 rev/min					
<b>DISPLACEMENT</b>						
Maximum displacement	2440 revs					
Displacement accuracy	0.2° per 36,000°					
Displacement resolution	0.001 revs (±0.2°)					
<b>SOFTWARE</b>						
Digital display of load/angle/speed	Yes					
Communication with test stand	Via RS232 port or USB port (converter supplied)					
Computer requirements	100 Mb available HD, CD-ROM plus available RS232 port/USB port					
Operating system (OS)	Compatible OS installed as listed; Windows® 2000, XP, Vista & 7					
Sampling rate	Selectable from 1000 Hz, 500 Hz, 100 Hz, 50 Hz and 10 Hz					
Secondary input	Event Input (switch), Digital control I/O Ports					
Data output	RS232 Port (direct or via USB/Network converter in ASCII format) ASCII file (Export to spreadsheet, SPC package etc...)					

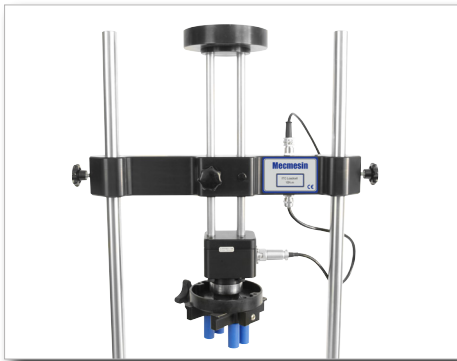
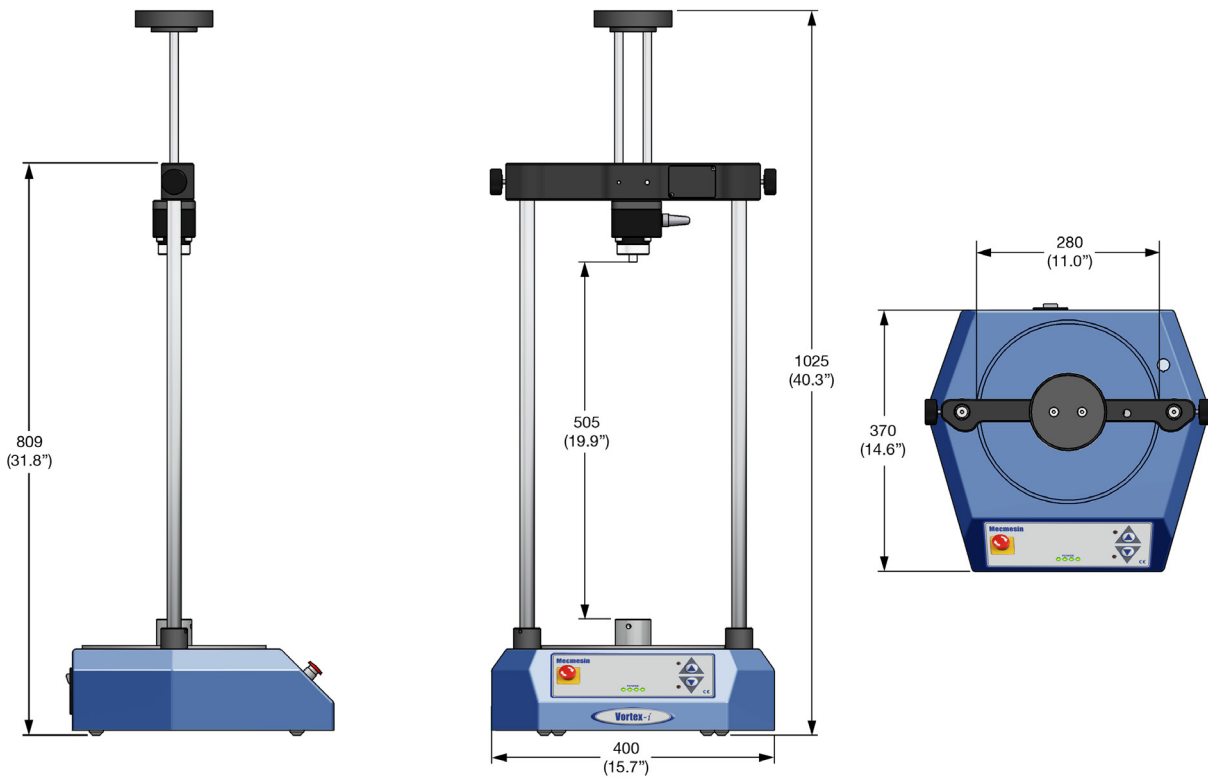
\* with upper and lower mounting tables fitted.

<b>Common Specifications</b>		<b>Options</b>
Operating temperature	10 - 35°C (50 - 95°F)	Safety guard
Humidity range	Normal industry and laboratory conditions	<i>available upon request</i>
Compensation for system movement	Yes	
Loadholding	Yes	
Graphical representation	Yes	
Output of test results to PC/Printer/Datalogger	Yes - includes auto-export to Microsoft™ Excel and 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	

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



# Dimensions



Crosshead and transducer carriage

## Torque Capacity Options

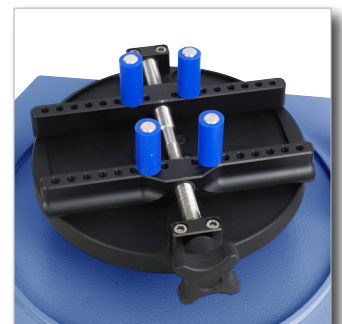
The Vortex-*i* crosshead assembly is supplied fitted with one of five loadcells, each with a different maximum torque capacity. This enables you to choose a system that best suits the nature of your torque application. Our comprehensive range covers highly sensitive, low-range torque applications up to more robust mid-range torque assessments. Choose a crosshead assembly fitted with either a 0.3 N.m, 3 N.m, 1.5 N.m, 6 N.m or 10 N.m capacity load cell on ordering.

## 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)



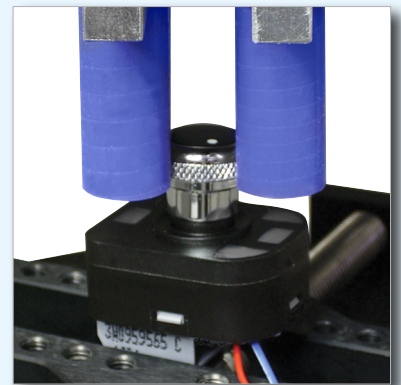
Lower mounting table

# Applications

Major companies worldwide rely upon the Vortex-*i* to establish and comply to stringent in-house test standards.

Some typical applications include:

- Medical devices
- Screw closures
- Tamper-evident & child-resistant closures
- Electrical controls
- Automotive controls
- Aerospace controls
- Industrial taps and valves
- Toys
- Mobile phone 'flip'
- Watch bezels



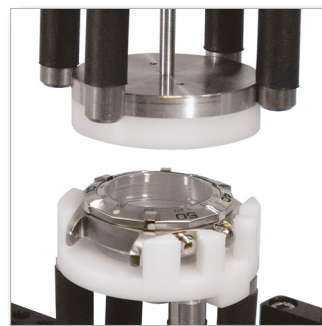
Rotary switch test



Insulin pen test



Infant's bottle lid test



Watch bezel test

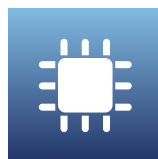


Automotive control test

Mecmesin's range of testing equipment has been successfully used in a number of different industry sectors including:



automotive & aerospace



electrical & electronic



medical & veterinary



consumer packaging



cosmetics & personal care



product safety



fabric & textiles

For further information and case studies regarding applications or products please visit our website:

[www.mecmesin.com](http://www.mecmesin.com) or call: +44 (0) 1403 799979

## Testimonials

“The Vortex-*i* system has enabled us to eliminate the variability of results experienced with our previous manually-operated testing systems, allowing accurate and consistent testing of the performance of our drug delivery systems to our stringent in-house standards.”

**Stephen Byrne**

**BD Medical - Pharmaceutical Systems**

“The success of the introduction of screw cap closures in the wine industry can be attributed to the successful application of the closure itself. In order to determine a good application you require reliable, accurate and consistent testing equipment. The Mecmesin closure torque testers have fulfilled all the criteria and have given us great confidence in our application of the screw cap closures.”

**Dean Zeunert, R&D Technical Manager**

**Orlando Wyndham Group, producers of Jacob's Creek wine in the Barossa Valley**

## Calibration, Service & Repair

Offering a prompt service, our calibration, service & repair centre is able to deal with all your force & torque testing equipment and gauges from Mecmesin and other manufacturers. All gauges and loadcells are supplied with calibration certificates traceable to UK National Standards to meet ISO requirements.



## Support Services

- Comprehensive network of international distributors
- Calibration & service centre
- On-site installation and training
- Application Support
- 24 month warranty
- Website support
- Accessories

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



FS 58553

DISTRIBUTOR STAMP

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