

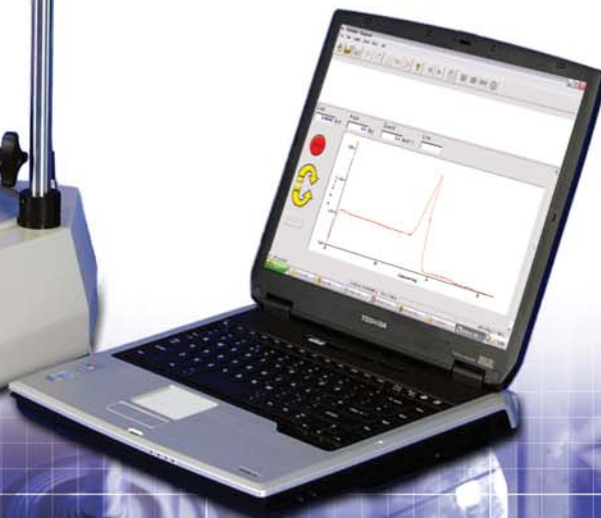
# Mecmesin

testing to perfection

## Vortex-*i*

computer-controlled  
testing system

Torque Test 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

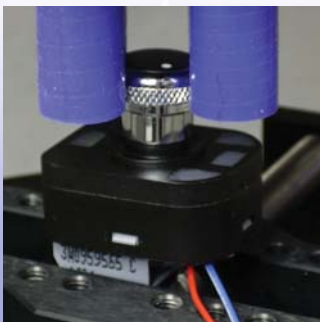
allows for upward movement of the sensor when torque is applied.

### Adjustable crosshead

to accommodate specimens up to 350mm 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 an RS232 port, or via supplied connector lead 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 10N.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.

## 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 and valves
- Mobile phones
- Small screw fasteners

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.



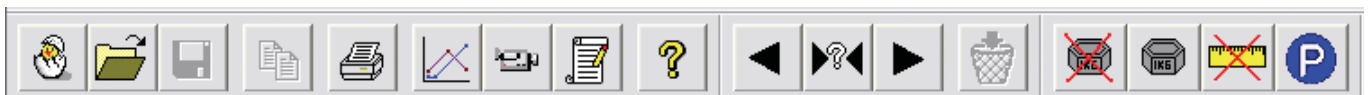
Test screen

## Creating a program

The module 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.



'Report' button

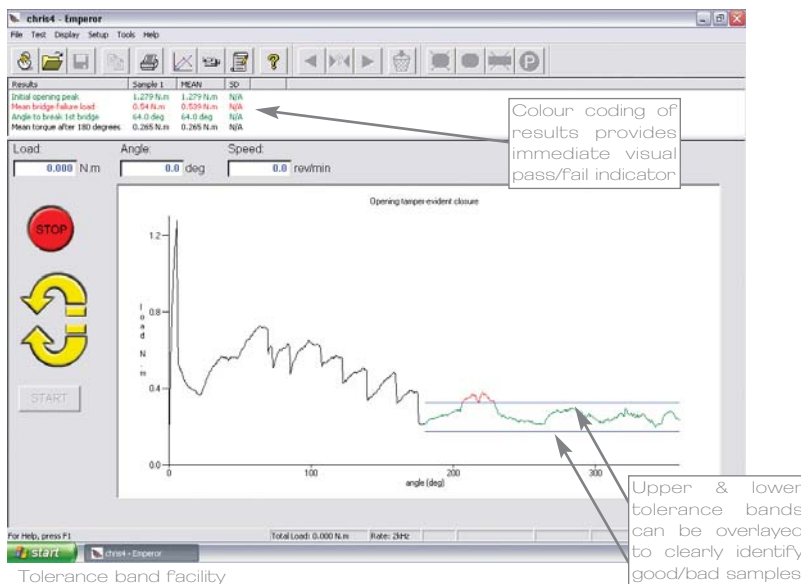
## Performing a test

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.

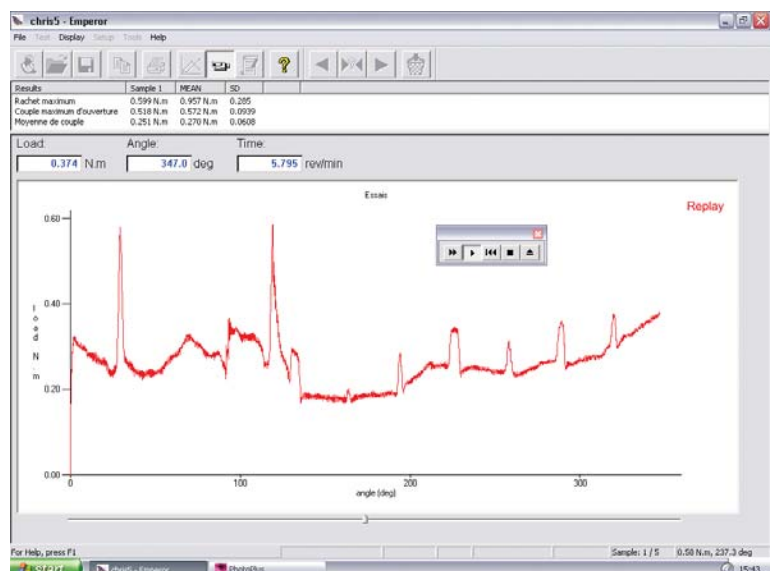
Test procedures can be initiated by selecting an existing library program or by choosing *your own* particular program from the Test menu. The library programs can be easily customised and tailored to meet specific testing needs and then saved in the testing library and recalled as needed - very useful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

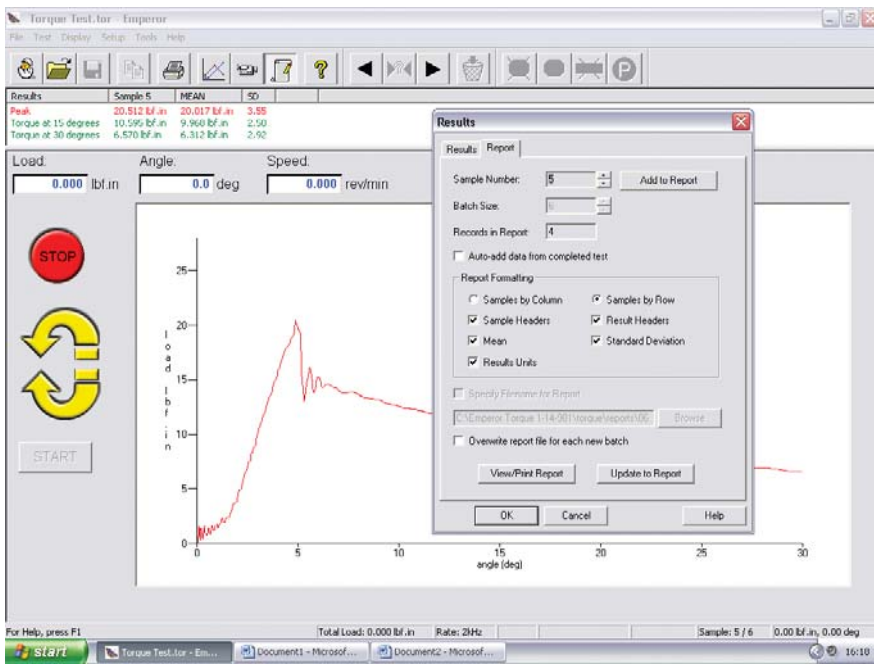
Emperor™ allows development of test procedures that are best suited to individual testing needs. An operator can be prompted at any stage of the program to perform a specific action, so that step-by-step test routines become easy for semi-skilled users.

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.



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

## Data analysis

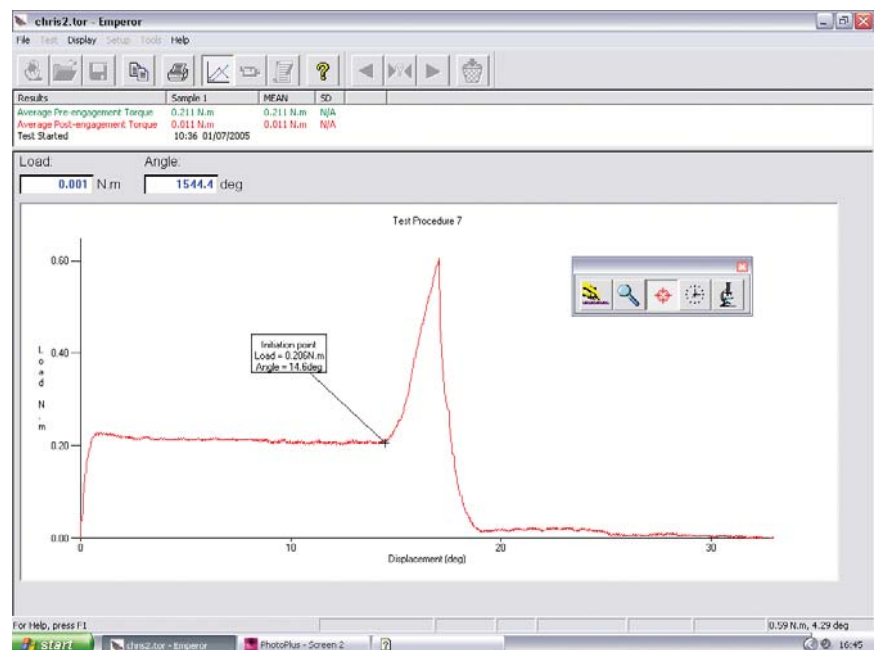
Emperor's™ software capabilities are exceptional,

- 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

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

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.

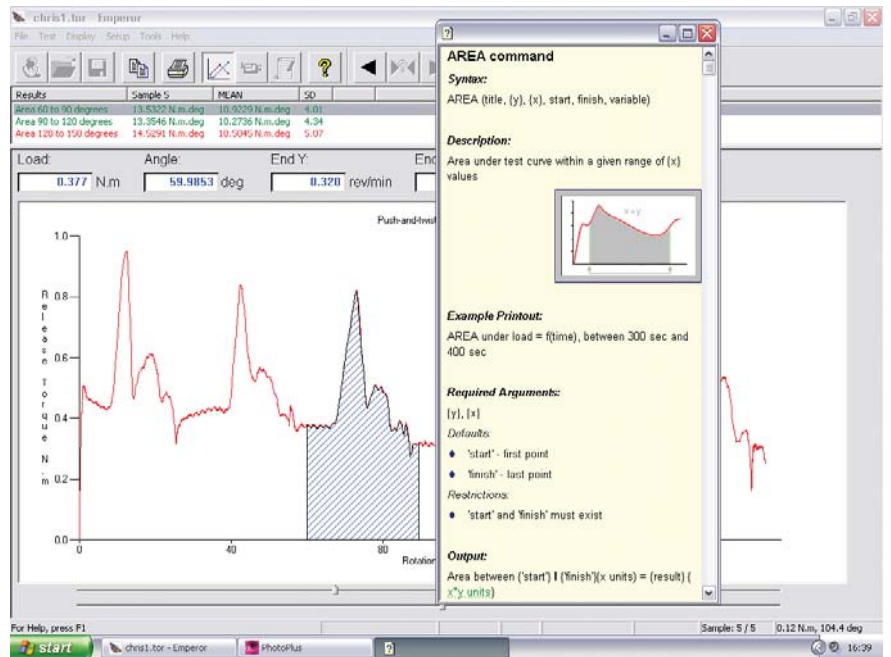
Signals from external devices can also be incorporated into Emperor™ via an 'event' input facility. A switch can, for example, be connected to this port and the state ('open' or 'closed') of the switch can be monitored - ideal for quantifying the 'feel' of rotary controls.



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.



Customised cork mandrels



Car indicator test rig



Inhaler gripping fixture



Bleach bottle test fixture

## 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.

# Specifications

## LOAD MEASUREMENT

Measurement range (0.3N.m loadcell)	0 - 0.3N.m	0 - 3kgf.cm	0 - 2.7lbf.in
Measurement range (1.5N.m loadcell)	0 - 1.5N.m	0 - 15kgf.cm	0 - 13lbf.in
Measurement range (6N.m loadcell)	0 - 6N.m	0 - 60kgf.cm	0 - 52lbf.in
Measurement range (10N.m loadcell)	0 - 10N.m	0 - 100kgf.cm	0 - 90lbf.in
Loadcell capacities	0.3, 1.5, 6 and 10N.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		

## SPEED

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

## DISPLACEMENT

Maximum displacement	2500 revs
Displacement accuracy	0.2° per 36,000°
Displacement resolution	0.001 revs (±0.2°)

## DIMENSIONS

Maximum travel of adjustable transducer carriage	182mm (7.2in)
Maximum headroom	400mm (15.7in) [350mm (13.8in)]*
Width between columns	278mm (10.9in)
Weight	20.4kg (45lb)
Capacity of lower mounting table	10 – 160mm (0.39 – 6.3in)
Capacity of upper mounting table	8 – 55mm (0.31 – 2.16in)

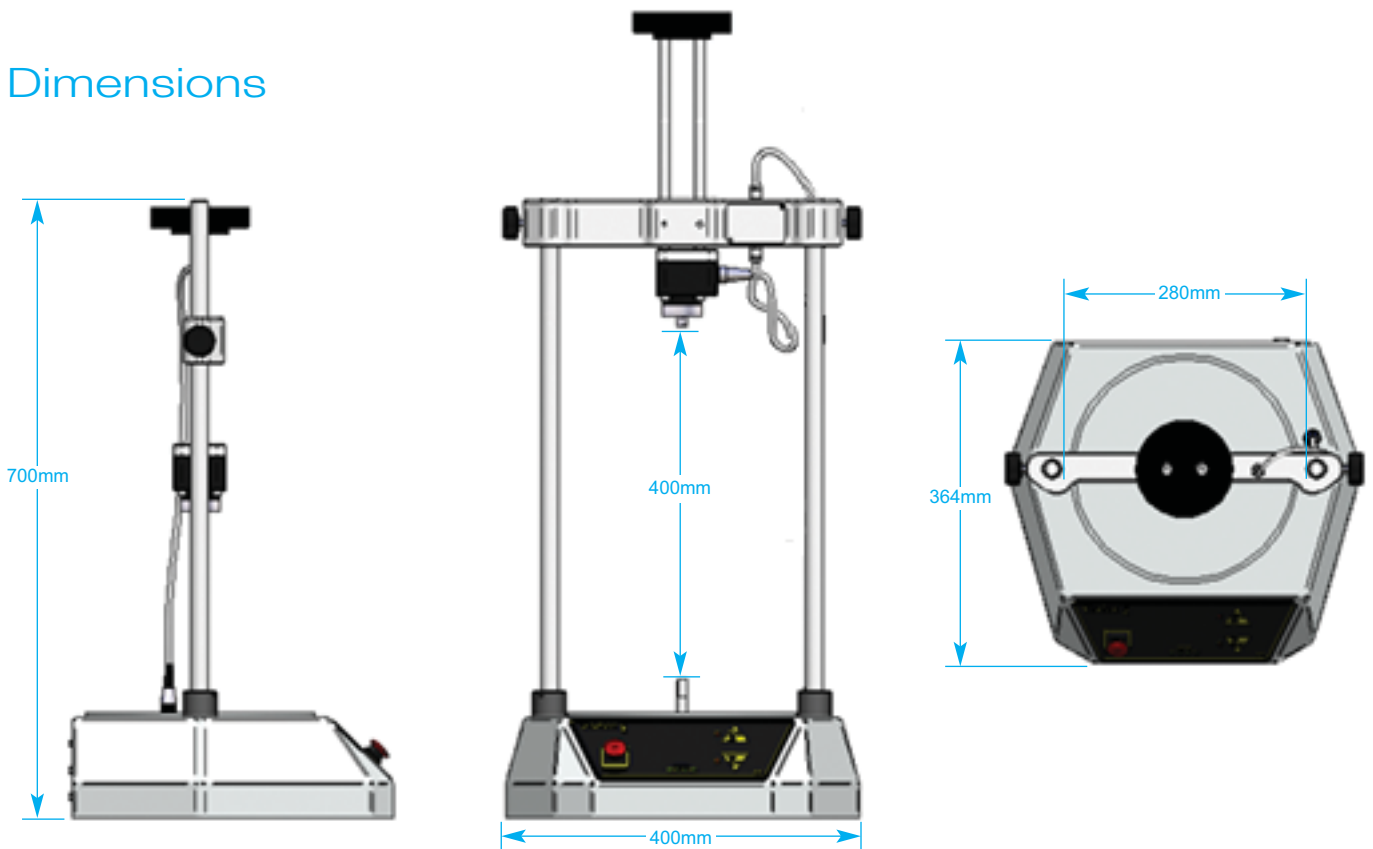
## MISC.

Power	100W
Data acquisition speed	2000Hz
Operating temperature	10 – 35°C
Loadcell calibration temperature	20 ± 2°C

\* with upper and lower mounting tables fitted

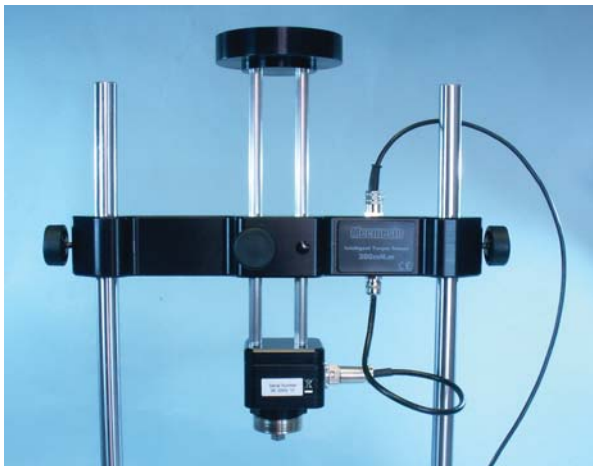
Mecmesin reserves the right to alter equipment specifications without prior notice.  
E&OE

## Dimensions



## Torque Capacity Options

The Vortex-*i* crosshead assembly is supplied fitted with one of four 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 **0.3N.m**, **1.5N.m**, **6N.m** or **10N.m** capacity load cell on ordering.



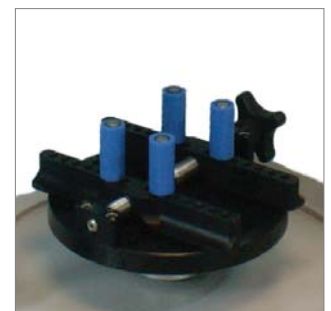
Crosshead and transducer carriage

## Mounting Tables

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



Upper mounting table  
(not for use with sensors below 6N.m capacity)



Lower mounting table

# Applications

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

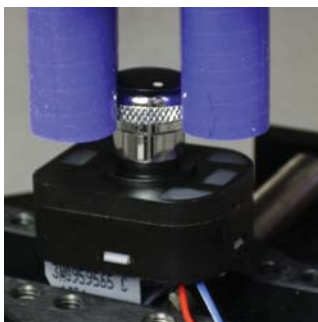
Some typical applications include,



Child-resistant closure test



Infant's bottle lid test

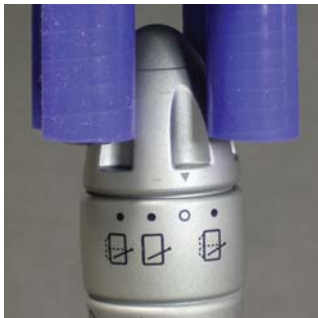


Rotary switch test

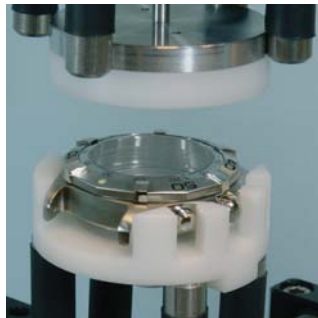
- Medical devices
- Screw closures
- Tamper-evident & child-resistant closures
- Electrical controls
- Automotive controls



Insulin pen test



Automotive control test



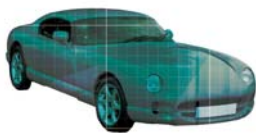
Watch bezel test

- Aerospace controls
- Industrial taps and valves
- Toys
- Mobile phone 'flip'
- Watch bezels

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



aerospace



automotive



electrical



medical



packaging



pharmaceutical



plastics



safety



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 •

24 month warranty •

Calibration, service & repair centre •

Website support •

On-site installation and training •

Accessories •

Application support •



# Mecmesin

testing to perfection

## Over 30 Years Experience in Force & Torque Technology

Formed in 1977, Mecmesin Limited is today widely regarded as a leader in force and torque technology for quality control testing in design and production. The Mecmesin brand stands for excellent levels of performance and reliability, guaranteeing high quality results. Quality control managers, designers and engineers working on production lines and in research laboratories worldwide rely upon Mecmesin force & torque measurement systems for a range of quality control testing applications, which is almost limitless.

Visit us on the web at  
[www.mecmesin.com](http://www.mecmesin.com)



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Wherever you are in the world Mecmesin can help you through its global distribution network.



ISO 9001 CERTIFICATE NUMBER  
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