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

Custom-made mandrel and driver

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.

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.

consistency
simplicity
versatility

Rotary switch testing

intelligent command functions

Keyless chuck with Stelvin cap

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

Flexible – Choice of 2 Program Modes

Console Testing Mode

The Console Testing Mode is designed for ease-of-use by operators on the production floor, ideal for repetitive, routine testing.

- **Easy-to-use with minimal training** - 'Simplicity itself' one button launches the test
- **Fast access to 5 favourite tests** - customised icons ensure instant test selection


Test screen

Program Testing Mode

Using the Program Testing Mode, the true power of Emperor™ software becomes evident. This mode has an intuitive interface, which makes the whole test process easy to manage:

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

With Emperor™ software's comprehensive programming and calculation commands, it becomes a simple task to create customised test programs to evaluate the mechanical strength of components, products and materials.

Print | Report preview | Transmit to Excel | Delete sample | Return to home position
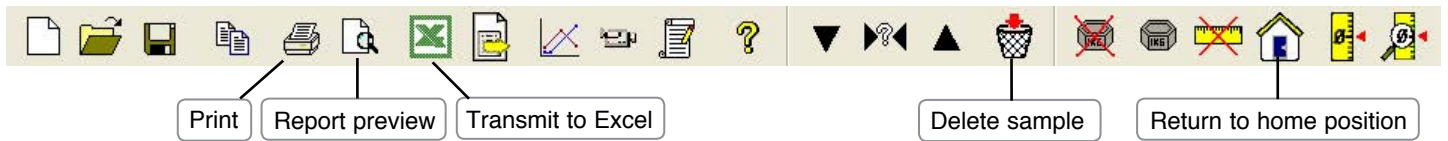
Creating a Program

Using Emperor™ you can create basic tests through to sophisticated cyclic, event-triggered and conditional programs

- **Design & tailor** your torque test to your **precise needs**
- **Intuitive, easy-to-learn** user interface
- **Create pass/fail criteria** for test samples

The test creation wizard is extremely user-friendly, with fully comprehensive commands to control the Helixa from test start to finish. Full parameters of measurement, including data acquisition rate and system behaviour, are set and saved with each test program.

Performing a Test

- Select from a **library of test procedures**
- Samples & operators can be **tagged for traceability**
- Restricted levels of access between supervisor and operator **avoids accidental tampering with test programs**
- **Toolbars allow quick access** to commonly-used functions

Digital I/O ports can be used to start, pause or stop a sequence, enabling tests to be semi-automated. An external 'event input' is also available to detect the torque/angle at which an electrical connection is made or broken, particularly useful when testing rotary switches.
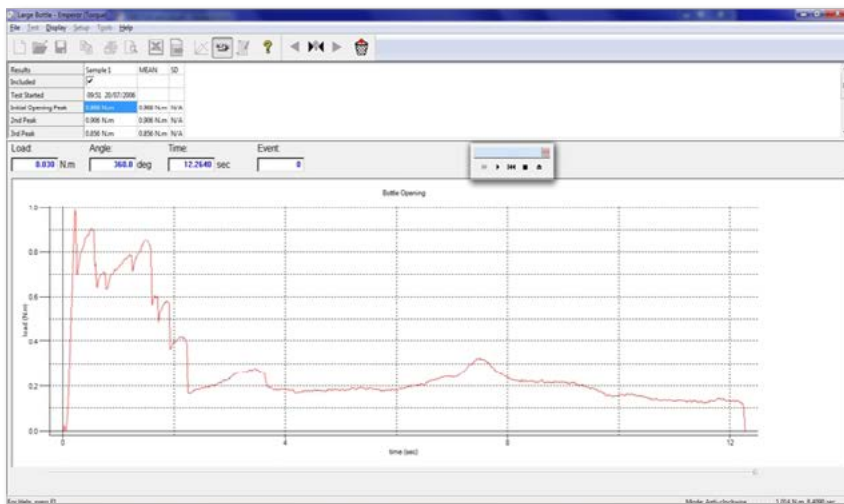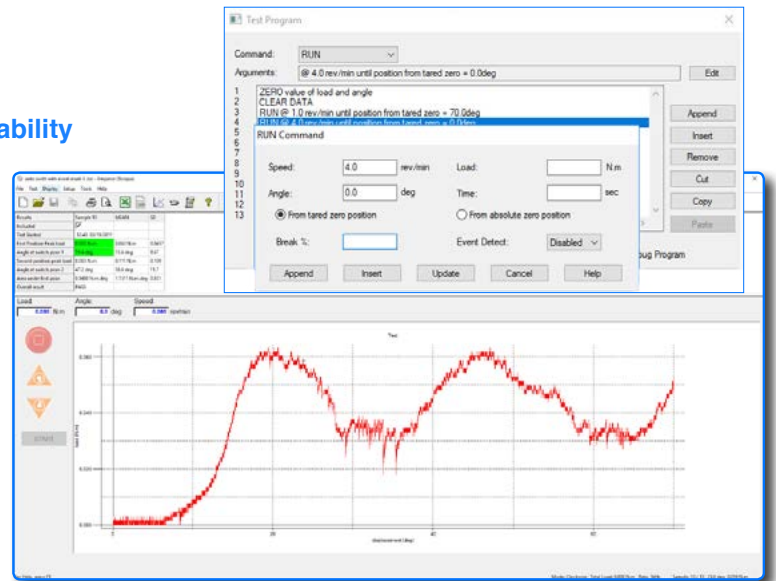

A 'video replay' facility is included. A toolbar allows the accumulation of test data to be re-displayed in real-time. 'Fast-forward' and 'return-to-start' buttons are provided. A timeline slider can be dragged to a suitable point, thus allowing critical parts of a test to be replayed as many times as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

'Video' replay screen

Data Analysis

Examine measurement data by using a wide range of calculations within Emperor™ to report test results. Detect and evaluate sample characteristics and compare against tolerance criteria for acceptability.

- Extensive range of **user-definable calculations**
- **Easy-to-read, comprehensive** display of test results with **colour-coded Pass/Fail notification**
- **Real-time graphs** with overlays in multiple colours and legends
- Simple print function provides an **instant record**
- **Video replay facility** to help identify critical points. Ideal for post-test analysis of product and component testing

Samples can be viewed and analysed individually or as a batch. For more sophisticated R&D analysis new calculations can be added to identify material characteristics.
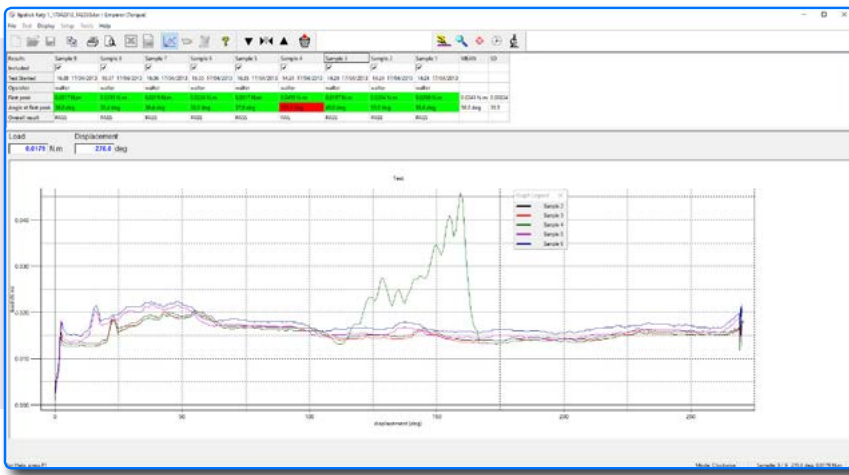
Traces of five Lipstick samples: one shows a test failure
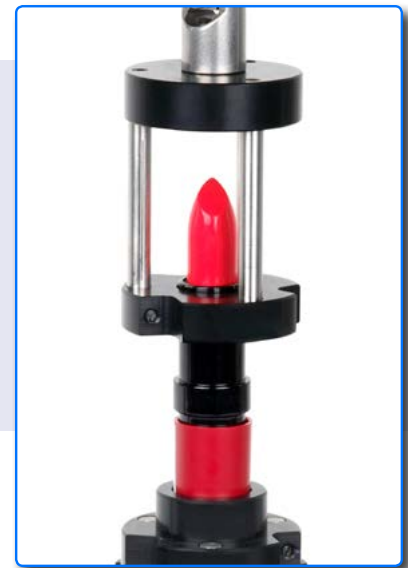
Reports & Exporting

- **Automatic export of data** to Microsoft Excel® and SPC packages
- **Select standard reports** or **create your own** customised templates
- Use 'Print PDF' icon to **create quick PDF report**
- **Collect data at 1000 times per second** for detailed records and results with every sample

Insert your company logo in every report

Customise reports with image of test sample
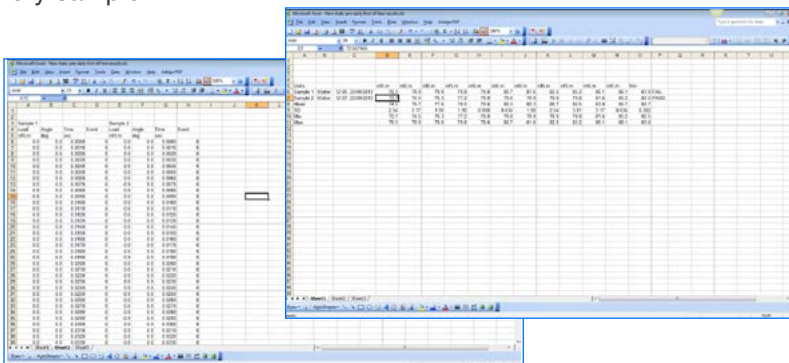
Ease-of-use

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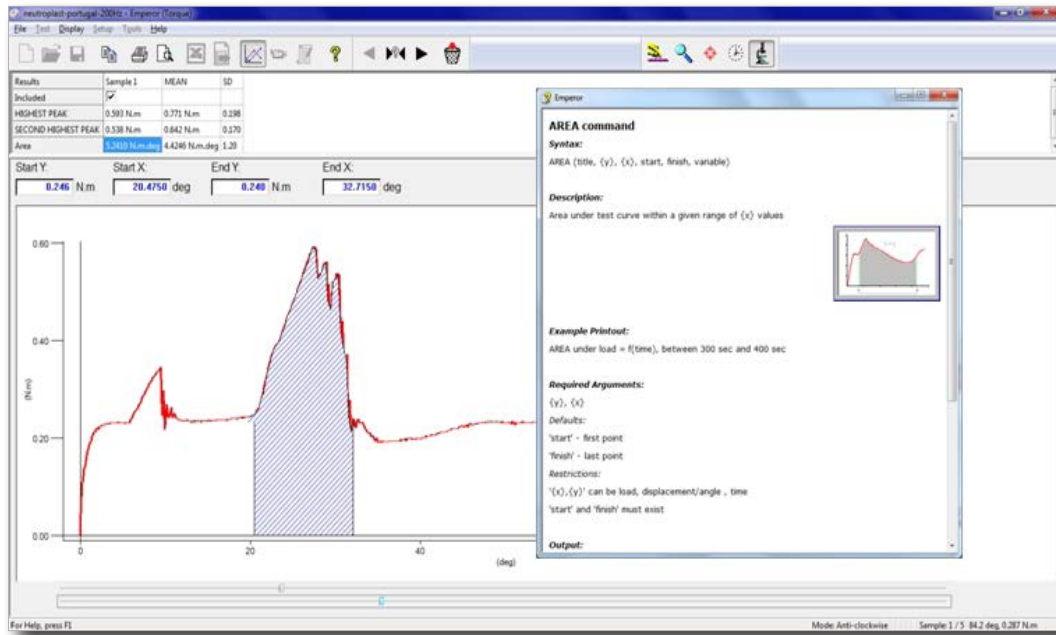
Review and 'fine-tune' calculations screen (+ Help facility)

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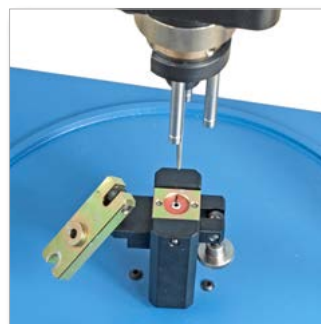
Please call +44 (0) 1403 799979 for more information, or contact your local Mecmesin representative.

Customised cork mandrels

Car indicator test rig

Clamp for dental abrasive disks
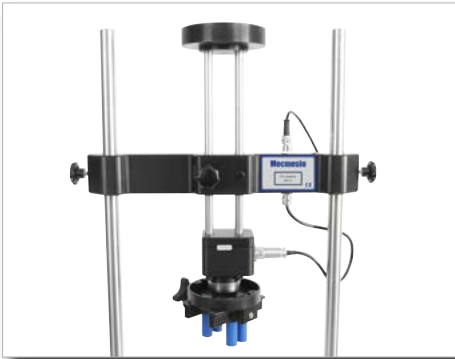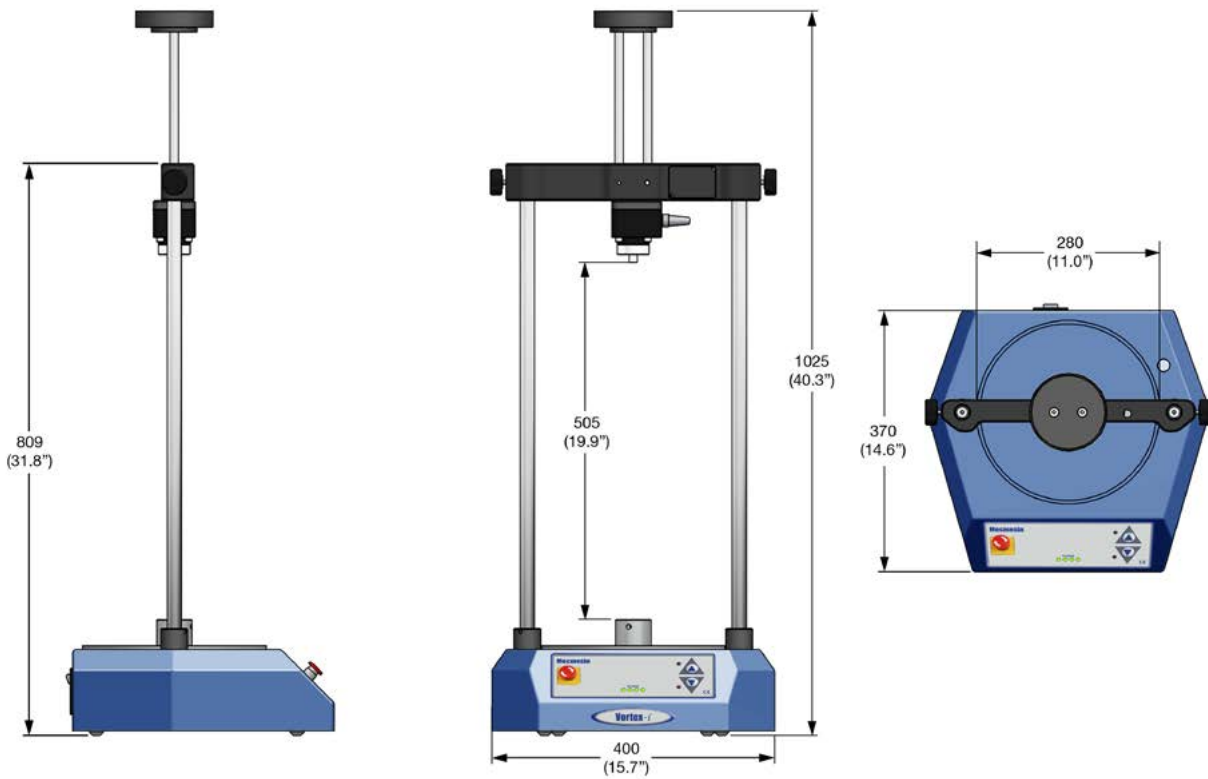

Bleach bottle test fixture

Specifications

Vortex-*i*		0.3 N.m	1.5 N.m	3 N.m	6 N.m	10 N.m
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
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		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				
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				
SPEED						
Speed		0.1 - 20 rev/min (clockwise or anticlockwise)				
Speed accuracy		±1% of indicated speed				
Speed resolution		±0.1 rev/min				
DISPLACEMENT						
Maximum displacement		2440 revs				
Displacement accuracy		0.2° per 36,000°				
Displacement resolution		0.001 revs (±0.2°)				
SOFTWARE						
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, 8 & 10				
Sampling rate		Selectable from 1000 Hz, 500 Hz, 100 Hz, 50 Hz and 10 Hz				
Secondary input		Event Input (switch), Digital control I/0 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.

Common Specifications

Operating temperature	10 - 35°C (50 - 95°F)
Humidity range	Normal industry and laboratory conditions
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

Options

Safety guard

available upon request

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

Dimensions

809
(31.8")

1025
(40.3")

505
(19.9")

400
(15.7")

280
(11.0")

370
(14.6")

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.

Crosshead and transducer carriage

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
with saddle plate

Applications

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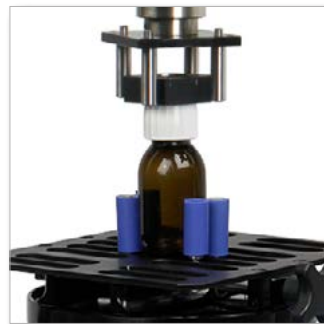
Some typical applications include:

- **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**
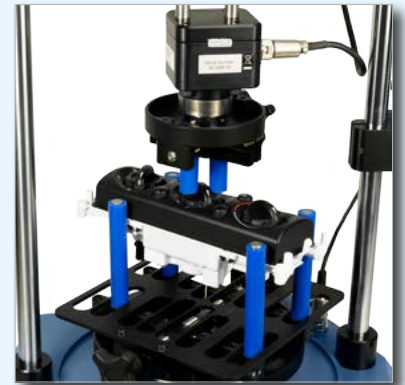
Rotary switch test

Insulin pen test

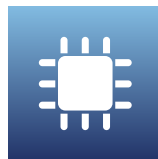Child resistant closure

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 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

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

bsi.

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