

# Mecmesin

testing to perfection

## Digital Torque Testers

Manually Controlled Torque Systems



# Digital Torque Testers

Mecmesin's range of manually-operated digital torque testers provide a simple and cost effective method of measuring low-level torque.

There are a wide variety of objects that require the application of a torque to operate, from simple packaging and toys, to high-tech automotive and aerospace controls or medical devices.

Whatever its level of complexity, torque measurement is a common crucial ingredient in the delivery of a well designed and reliably manufactured product.

## A Complete Product Range

Mecmesin's comprehensive range caters for almost any low-level torque application. Our three manually-operated digital closure testers- the Tornado, Orbis and CRC Tester- offer a simple, flexible solution to torque assessment. For more technically demanding applications, requiring greater accuracy and repeatability, we also offer a range of sophisticated motor-driven torque systems.



design  
quality  
conformance



# Why Test Torque?

## Perfect Usability

Torque testing enables designers to perfect the 'fitness-for-purpose' of their products.

### *For Example,*

*Car steering wheel stalk controls must be easy to twist, but provide sufficient resistance to give a positive 'click' on engagement.*

*The child-resistant closures on medicine bottles must be sufficiently difficult to compress and twist to stop infants from removing the lid, whilst remaining sufficiently easy to open for frail and elderly users.*

## Guarantee Production Quality

Torque testing at the point of production guarantees superior quality manufacturing.

### *For Example,*

*In a beverage filling plant, in-line checks ensure that capping heads on bottling machinery apply sufficient torque to achieve an hermetic seal in the lid, but not too much as to damage the closure.*

## Conform to Standards

Torque testing can make up a vital component of a manufacturer's quality management system, enabling conformance with relevant national and international standards, as well as in-house specifications.

### *For Example,*

*ASTM D2063-91 (Screw closures)*

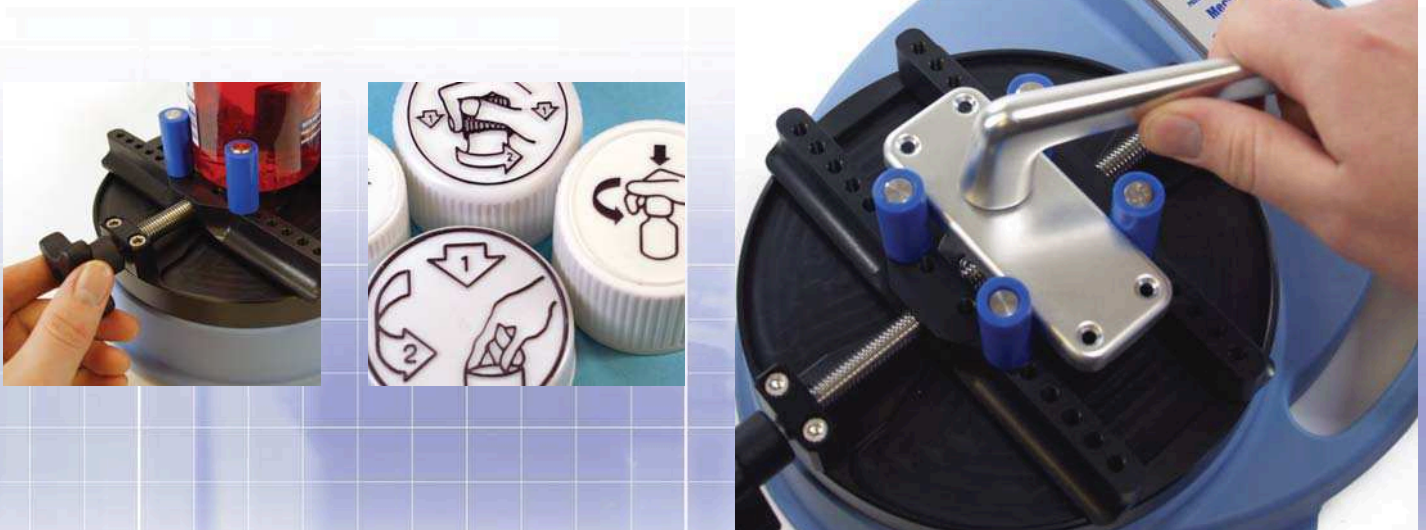
*ASTM D3198-97 (Lug Closures)*

*ASTM D3810-97 (CRC closures)*

*ASTM D3968-97 (CRC closures)*

*ASTM D3469-97 (CRC closures)*

*ASTM D3472-97 (CRC - reverse ratchet torque)*



# Orbis

## The Mecmesin Orbis delivers a simple, affordable solution to low-level torque measurement.


Appropriate for use on any small rotary component, this rugged, lightweight and highly portable tester is ideally suited to both laboratories and production environments. The versatile mounting table sits atop an integrated digital torque sensor, and grips the base of your sample, presenting it for application of torque by hand. The digital tester features high sampling-rate electronics to allow accurate peak torque capture, providing a far greater level of accuracy compared to mechanical spring-type testers.

## Key Features

- Clockwise & Counter-clockwise Digital Torque Capture
- Compact, Portable & Affordable
- Clear, Intuitive Controls
- 6N.m (50 lbf.in) Capacity
- Mains or Battery Powered
- Data Output

A clear, backlit LCD screen displays maximum torques applied in both clockwise and counter-clockwise directions, up to 6N.m. Alternatively, a running torque display may be easily invoked using the system's clear, intuitive controls. Once captured, results may be easily exported to a PC, printer or data-logging device, via a single button press, using the tester's integrated RS232 output.

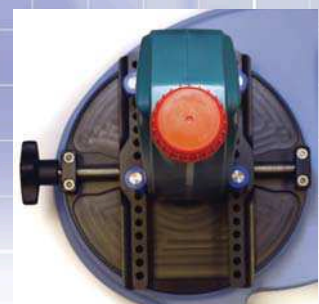
## Orbis Technical Specifications

|   |   |
|---|---|
|  Measurement range | 0 - 6N.m  |
|   | 0 - 60kgf.cm  |
|   | 0 - 50lbf.in  |
| Display resolution  | 0.002N.m  |
|   | 0.02kgf.cm  |
|   | 0.01lbf.in  |
| Container diameter  | 10 - 190mm  |
| Load units  | mN.m, N.cm, N.m, gf.cm, kgf.cm, kgf.m, ozf.in, lbf.in, lbf.ft |
| Sampling rate   | 5000Hz averaged to 80Hz peak capture                          |
| Load accuracy   | ±0.5% of full scale   |
| Overload  | typically 150% of full scale                                  |
| Weight  | 3kg   |
| Dimensions (mm)   | 303(w) x 278(d) x 127(h)                                      |
| Part No.  | 876-107   |

 Clockwise & counter-clockwise



*Gripping pegs are easily adjusted to match sample dimensions.*



*Awkwardly shaped containers are easily accommodated - simply reposition pegs to align the closure over the centre of the mounting table.*



**Versatile mounting table**, adjustable to accommodate a variety of forms. Integrated drip tray to capture spillages.

**Clear digital display** of clockwise & counter-clockwise maximum torque results, or 'running' torque display.

**Mains input** with water resistant cover. Power Orbis directly from mains or internal rechargeable battery.

**Easy export of results** to a PC, printer or datalogging device via integrated RS232 output socket.

**Rugged, Water-resistant Case** (rated to IP 54), ideal for use on the factory floor. Non-painted polypropylene case suitable for use within pharmaceutical laboratories.

**Highly Portable**, moulded carry handle & compact, lightweight design.

**Clear, intuitive controls**, 5 dedicated function keys for ease of operation. Lockable units and 'max display' modes.

simple  
affordable  
accurate



# Tornado

The Tornado is Mecmesin's most advanced manually-operated digital torque tester.

Externally, the Tornado features the same compact, rugged and portable design of the Orbis, and the same intuitive user interface and versatile fixturing. The Tornado's intelligent electronics, however, enable a broad variety of advanced additional functions, to offer enhanced practicality and versatility.

**Test tamper-evident closures**, capture both 'slip torque' and subsequent 'bridge torque' with ease.

**Versatile mounting table**, adjustable to accommodate a variety of forms. Integrated drip tray captures any sample spillage for ease of cleaning.

**Moulded carry handle**, for easy portability.

**On-board memory**, store up to 500 results internally.

**Easy export of results** to a PC, printer or datalogging device via integrated RS232 output socket.



# Advanced Features

## Tamper-Evident Closure Testing

The Tornado allows you to characterise the two critical torque peaks associated with tamper-evident closures, **slip torque**- effort required to initiate movement of the cap, and **bridge torque**- the smaller secondary peak associated with the effort required to break the plastic bridges between the cap and the security ring.

## Four Capacity Models

The capacity of your digital torque tester should reflect the torque range of your application. If it is too low, the torque transducer risks being overloaded, whereas if it is too high, the transducer may not be sufficiently sensitive to accurately detect small peak loads. The Tornado offers four capacity models, a 1.5N.m option for delicate assessments, and 3N.m, 6N.m and 10N.m capacity models for increasingly robust applications.

## Pass/Fail Alerting

Tolerance bands for acceptable torque measurements may be pre-defined, and pass/fail parameters established. Five independent settings can then be stored. LED indicators or an audible alarm (or both) then clearly identify samples that do not conform to your exact requirements.

## On-board Memory

The Tornado can store up to 500 readings in its internal memory, allowing you to perform many tests in quick succession, and then view or export the results at a later time convenient to you.

**Clear, intuitive controls,** dual-purpose membrane keypad allows quick access to common functions & navigation of the advanced options menu. Features lockable units & 'max display' mode.

**LED and audible alarms,** establish pass/fail parameters for torque results, and set alarm notification for instant failure identification. Store 5 separate settings, with easy selection by operators.

**Mains input** with water resistant cover. Power Tornado directly from mains or internal rechargeable battery.

**Rugged, Lightweight & Water Resistant Design** (Rated to IP 54), ideal for use on the factory floor. Non-painted polypropylene case suitable for use within pharmaceutical laboratories.

## Tornado Technical Specifications

|                                | Tornado 1.5  | Tornado 3    | Tornado 6    | Tornado 10    |
|--------------------------------|--|--------------|--------------|---------------|
| <b>Measurement range</b>       | 0 - 1.5N.m   | 0 - 3N.m     | 0 - 6N.m     | 0 - 10N.m     |
|                                | 0 - 15kgf.cm   | 0 - 30kgf.cm | 0 - 60kgf.cm | 0 - 100kgf.cm |
|                                | 0 - 13lbf.in   | 0 - 26lbf.in | 0 - 50lbf.in | 0 - 90lbf.in  |
| <b>Display resolution</b><br>⌚ | 0.0005N.m  | 0.001N.m     | 0.002N.m     | 0.002N.m      |
|                                | 0.005kgf.cm  | 0.01kgf.cm   | 0.02kgf.cm   | 0.02kgf.cm    |
|                                | 0.002lbf.in  | 0.005lbf.in  | 0.01lbf.in   | 0.02lbf.in    |
| <b>Container diameter</b>      | 10 - 78mm  | 10 - 78mm    | 10 - 190mm   | 10 - 190mm    |
| <b>Load units</b>              | mN.m, N.cm, N.m, gf.cm, kgf.cm, kgf.m, ozf.in, lbf.in, lbf.ft    |              |              |               |
| <b>Sampling rate</b>           | 5000Hz averaged to 80Hz or 2000Hz peak capture (user selectable) |              |              |               |
| <b>Load accuracy</b>           | ±0.5% of full scale  |              |              |               |
| <b>Overload</b>                | typically 150% of full scale                                     |              |              |               |
| <b>Weight</b>                  | 2.65kg   | 2.65kg       | 3kg          | 3kg           |
| <b>Dimensions (mm)</b>         | 303(w) x 278(d) x 127(h)   |              |              |               |
| <b>Part No.</b>                | 876-103  | 876-104      | 876-102      | 876-101       |

⌚ Clockwise & counter-clockwise

# CRC Tester

The Mecmesin CRC Tester enables simultaneous measurement of the compressive force and torque employed to open a child-resistant closure (CRC).

From pharmaceuticals and cosmetics to household and industrial chemicals, CRC's are commonly employed throughout an array of industries to avoid children coming into contact with harmful substances. In designing CRC's, however, a fine balance must be struck between security and accessibility. The Mecmesin CRC Tester enables packaging manufacturers to perfect the design of their products and guarantee consistent quality in production, by offering a simple, cost-effective and yet highly accurate solution to characterising the force and torque of 'push-and-twist' closures.

## Key Features

- Simultaneous Display of Top-load & Release Torque
- Accurate Digital Force Gauge & Torque Transducer
- 500N (110lbf) Load Capacity
- 10N.m (90lbf.in) Torque Capacity
- Data Output for Easy Recording of Results
- Mains &/or Battery Powered
- Test to International Standards, including,
  - ASTM D3472-97      - ASTM D3968-97
  - ASTM D3475-97      - ISO 8317
  - ASTM D3810-97



**Clear, dedicated displays** for both torque & compressive force.

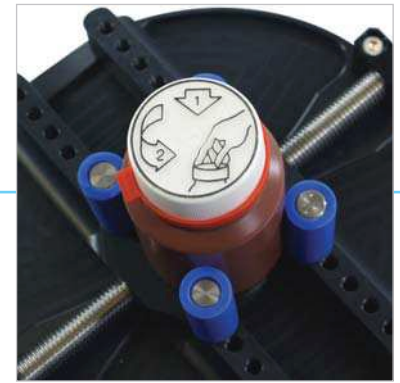
**Solid build quality**, rugged and hardwearing British-engineered chassis.

## CRC Tester Technical Specifications

|                    | Force  | Torque   |
|--------------------|--|--|
| Measurement range  | 500N<br>50kgf<br>110lbf  | 0 - 10N.m<br>0 - 100kgf.cm<br>0 - 90lbf.in ∞                     |
| Display resolution | 0.1N<br>0.01kgf<br>0.02lbf                                       | 0.002N.m ∞<br>0.02kgf.cm ∞<br>0.02lbf.in                         |
| Load units         | N, kgf, gf, ozf, lbf   | mN.m, N.cm, N.m, kgf.cm,<br>gf.cm, kgf.m, ozf.in, lbf.ft, lbf.in |
| Container diameter | 10 - 190mm   |  |
| Sampling rate      | 5000Hz averaged to 80Hz or 2000Hz peak capture (user selectable) |  |
| System accuracy    | ±1% of full scale  |  |
| Overload           | 120% of full scale   |  |
| Weight             | 5kg  |  |
| Dimensions (mm)    | 580(w) x 210(d) x 180(h)   |  |
| Part No.           | PV5066   |  |

∞ Clockwise & counter-clockwise





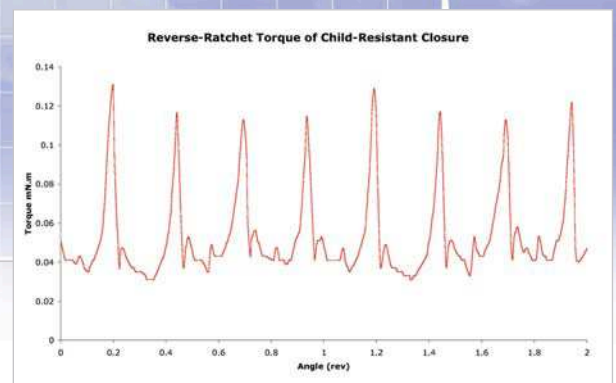
**Mains input**, power directly from mains or by rechargeable battery.

**Intuitive user interface**, with clear membrane keypad controls.

**Versatile mounting table**, adjustable to accommodate a variety of forms. Integrated drip tray captures any sample spillage for ease of cleaning. Custom-engineered fixturing options available upon request.



**Plot force or torque data graphically**, using Mecmesin's optional DataPlot software, useful for determining the reverse-ratchet torque of type 1A child-resistant closures (ASTM D3472-97).

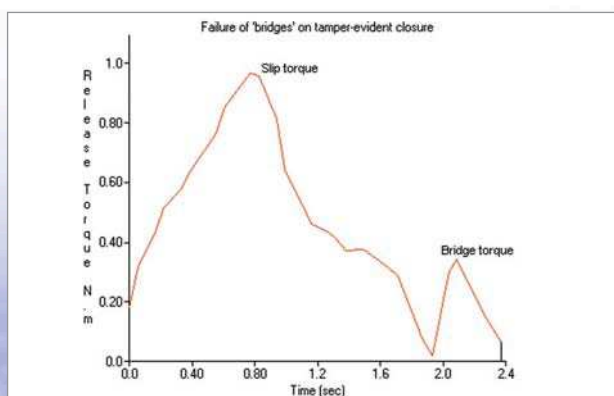


# Accessories



## Check Calibration Kit

This bench-top calibration rig allows you to verify the calibration of your Orbis or Tornado tester on site. Using dead-weight masses, the kit allows you to quickly decide whether or not adjustment or repair is required. Note, the kit does not replace the need for regular professional calibration, under laboratory conditions, by Mecmesin.



## DataPlot Software

DataPlot is an easy-to-use Windows® program for logging, plotting and analysing torque data. Results are plotted as a function of time, and may be easily printed or exported to other programs e.g. Microsoft® Excel. User-defined preferences may be stored for repeat testing.

## Closure Holders

To avoid distortion of the closure on gripping, Mecmesin's closure holders may be custom moulded to suit your specific closure design.



## V-Blocks

This precision-engineered mounting block allows smaller samples to be securely held in position, without excessive clamping force.



## Saddle Plate

To provide a more stable base on which to mount awkwardly shaped samples, a saddle plate is available.

## Printer

A simple method of recording torque readings, the digimatic printer issues statistical reports to include min, max, range and standard deviation.



## Data Cables

Mecmesin supply an accompanying range of RS232, Digimatic and USB data cables for connection to peripheral devices.



# Also Available

If your needs are not met by our range of manually-operated digital torque testers, Mecmesin also offers two automated torque systems to fulfil the demands of your application. Featuring fully motorised torque control, the Vortex and Vortex-*i* digital torque systems offer unparalleled testing reproducibility. For detailed literature regarding these products, please contact Mecmesin or your supplier.

## Vortex

Offering accuracy and consistency at an affordable price, the Vortex is a semi-automated digital torque testing system.

### Key Features

- Motorised clockwise/counter-clockwise torque drive
- Variable speed control
- Digital collection and display of results
- Peak torque capture, pass/fail alarms and overload warning
- Twin column test frame
- Adjustable crosshead (350mm vertical daylight)
- Top-loading capability (pre-apply set vertical loads)
- Versatile upper and lower mounting tables



## Vortex-*i*

The Vortex-*i* possesses all the mechanical features of the Vortex, but is fully computer-controlled for incomparable repeatability. Driven by Emperor™, Mecmesin's powerful yet user-friendly Windows® software, the Vortex-*i* enables advanced programmable functions, such as run to torque, angle, time or break as well as sophisticated graphical interrogation of results.





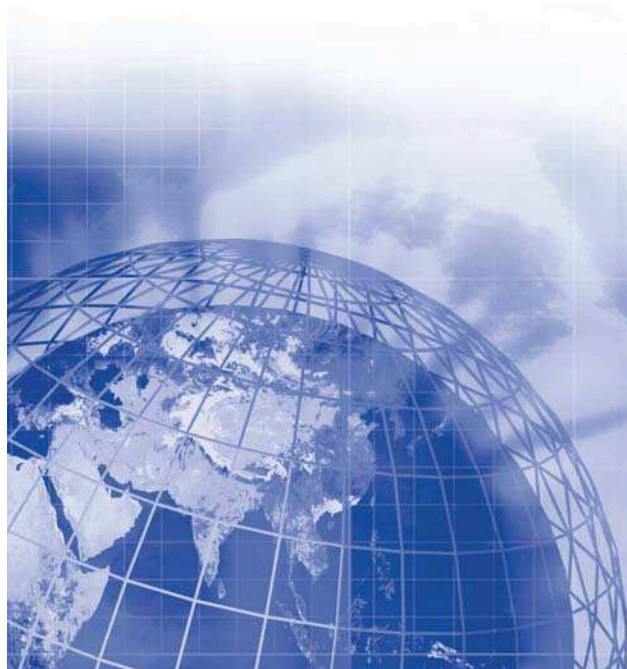
# Mecmesin

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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