

Force & Torque

Testing Solutions for Quality Control



Providing quality testing solutions since 1977

Since 1977 Mecmesin's force and torque testing solutions have enabled designers and manufacturers to:

- guarantee production quality
- reduce costs, minimise waste and improve yields
- · conform to standards
- · optimise design

From simple instruments to powerful, comprehensive testing systems, Mecmesin provides the expertise to solve your application!

Force Test Systems

MultiTest-i

Our flagship **MultiTest-***i* test stands are our most comprehensive systems. They enable the user to create sophisticated test programs using Mecmesin's EmperorTM Software, together with an advanced level of results analysis.

- Control: greater flexibility to create/develop programs to match exact test requirements
- Visual: test results displayed graphically in real time can be recorded, archived and replayed as required
- Versatile: user interface enables in-depth analysis and easy identification of Pass/Fail scenarios
- Choice: 7 capacities available single-column 0.5 kN (110 lbf),
 1 kN (220 lbf), 2.5 kN (550 lbf), 5 kN (1100 lbf), or twin-column 10 kN (2200 lbf), 25 kN (5500 lbf) & 50 kN (11000 lbf)



Spring tensile test



Aerosol actuation test



Keypad compression test

MultiTest-i single co	lumn	0.5 <i>-i</i>	1 <i>-i</i>	2.5-i	5-i
Rated capacity	N	500	1000	2500	5000
	kgf	50	100	250	500
	lbf	110	225	550	1100
Columns spacing		-	-	-	-
Speed range	mm/min	1-1000	1 - 1000	1 - 1000*	1 - 500
	in/min	0.04 - 40	0.04 - 40	0.04 - 40	0.04 - 20
Crosshead travel**	mm	1200	1000	500	590
	in	47.3	39.4	19.7	23.2

^{* 2.5} kN - above 2 kN, the recommended maximum speed is 750 mm/min (30 in/min)

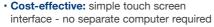
^{**} measured without loadcell or grips

MultiTest-xt

The MultiTest-xt range of affordable, stand-alone test systems are designed specifically for quick and easy tension and compression testing in production areas.

 User-friendly: easy-to-use with minimal training. "Simplicity itself" one button launches the test

 Time saving: fast access to 5 most commonly used tests



- · Control: choice of 3 program modes & unlimited library storage for full test traceability
- · Secure: password protected log-in identifies operator for full results traceability
- Flexible: select standard reports or customise your own using built-in templates
- · Capacities: 7 capacities available single-column 0.5 kN (110 lbf), 1 kN (220 lbf), 2.5 kN (550 lbf), 5 kN (1100 lbf), or twin-column 10 kN (2200 lbf), 25 kN (5500 lbf) & 50 kN (11000 lbf)



Top-load test



Container peel test

MultiTest-xt single column		0.5 <i>-xt</i>	1-xt	2.5 <i>-xt</i>	5-xt
Rated capacity	N	500	1000	2500	5000
	kgf	50	100	250	500
	lbf	110	225	550	1100
Columns spacing		-	-	-	-
Speed range	mm/min	1-1000	1 - 1000	1 - 1000*	1 - 500
	in/min	0.04 - 40	0.04 - 40	0.04 - 40	0.04 - 20
Crosshead travel**	mm	1200	1000	500	590
	in	47.3	39.4	19.7	23.2

^{* 2.5} kN - above 2 kN, the recommended maximum speed is 750 mm/min (30 in/min) ** measured without loadcell or grips

MultiTest-dV

Designed for precision-controlled compression and tension testing, the MultiTest-dV's simple controls, backed by sophisticated electronics, make it the ideal choice for a wide range of routine testing.

- · Affordable: suitable for limited budgets
- · User friendly: easy-to-use straight out of the box
- Precision: speed range from 0.1 to 1200 mm/min and displacement resolution to 0.001 mm
- · Control: rapid crosshead positioning and easy setting of test parameters
- · Visual: coloured LEDS around the multi-function wheel indicate machine status during testing
- Choice: models available with extended travel for elongation testing of highly elastic materials such as rubber and film



Tensile strenath

Add **VectorPro™ Lite** software to a **MultiTest-dV** with Advanced Force Gauge (AFG), for data acquisition, reporting and exporting, graph plotting, results calculation, and storage of regular test routines.

MultiTest-dV		0.5 <i>-dV</i>	1-dV	2.5 <i>-dV</i>
Rated capacity	N	500	1000	2500
	kgf	50	100	250
	lbf	110	200	550
Speed range††	mm/min	0.1 -1 200	0.1 - 1 200	0.1 - 1 200†
	in/min	0.004 - 47.2	0.004 - 47.2	0.004 - 47.2
Crosshead travel*	mm	1200	1000	500
	in	47.3	39.4	19.7

† 2.5 kN : recommended maximum speed = 750 mm/min (30 in/min) above 2 kN †† Where mains voltage is unreliable, the machine may not run above 1000 mm/min * Measured with force gauge and short extension rod fitted

High Capacity Test Systems

Twin-column test frames provide the opportunity to test physically larger specimens and apply loads of up to 50 kN (11000 lbf).

- Versatile: tests samples up to 400 mm (15.7") wide and 950 mm (37.4") high (10 kN & 25 kN) and 420 mm (16.5") wide and 1100 mm (43.3") high (50 kN)
- Enhanced: combines the features and functions of the MultiTest-*i* and MultiTest-*xt* systems to provide you with a comprehensive and powerful testing platform
- · Choice: computer-controlled or touch-screen controlled

MultiTest 10-i, 25-i & 50-i

- · Computer-controlled
- · Limitless programming capability
- · In-depth analysis

MultiTest 10-xt, 25-xt & 50-xt

- Touch screen controlled
- · Quick and easy to operate
- · Stand-alone system no PC required



MultiTest twin-colum	ın	10-xt & i	25-xt & i	50-xt & i
Rated capacity	N	10000	25000	50000
	kgf	1000	2500	5000
	lbf	2200	5500	11000
Columns spacing	mm	400 (15.7")	400 (15.7")	420 (16.5")
Speed range	mm/min	1-1000	1 - 1000*	1 - 1000**
	in/min	0.04 - 40	0.04 - 40	0.04 - 15
Crosshead travel***	mm	960	950	1100
	in	0.04 - 40	0.04 - 40	0.04 - 15

^{* 25} kN - recommended maximum speed = 500 mm/min (20 in/min) above 10 kN ** 50 kN - recommended maximum speed = 250 mm/min (10 in/min) above 25 kN

^{***} measured without loadcell or grips



Torque Test Systems

Vortex-i

The Vortex-i torque testing system has similar features to the MultiTest-i and can measure torque characteristics of samples up to a capacity of 10 N.m (90 lbf.in).

- · Control: used in conjunction with Emperor™ software you have complete control to develop your own test procedures to match your criteria
- · Flexible: tests a variety of sample sizes and shapes up to 448 mm (17.6") in height
- · Versatile: ability to analyse in-depth, maintain a library of test programs and archive test results
- · Choice: 5 capacities available 0.3 N.m (2.7 lbf.in), 1.5 N.m, (13 lbf.in), 3 N.m (26 lbf.in), 6 N.m (52 lbf.in) & 10 N.m (90 lbf.in)



Closure torque test

Vortex-xt

The Vortex-xt is an easy-to-use torque tester, designed to cut costs by improving production line efficiency and reducing wastage.

- User-friendly: easy-to-use with minimal training: press two buttons to recall a pre-set program and start the test
- Time saving: fast access to 5 most commonly used tests
- · Cost-effective: simple touch screen interface - no separate PC required
- · Control: choice of 3 program modes and unlimited library storage of test methods
- · Versatile: apply top-load and torque simultaneously for child-resistant closures
- · Secure: password protected log-in identifies operator for full traceability
- Flexible: select standard reports or customise your own using built-in templates
- Choice: 5 capacities available 0.3 N.m (2.7 lbf.in), 1.5 N.m, (13 lbf.in), 3 N.m (26 lbf.in), 6 N.m (52 lbf.in) & 10 N.m (90 lbf.in)



Wiper

stalk test

Child resistant closure test

Vortex-i & xt	0.3 N.m	1.5 N.m	3 N.m	6 N.m	10 N.m
N.m	0 - 0.3	0 - 1.5	0 - 3	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
Speed range	0.1 -	0.1 - 20 rev/min (clockwise or anti-clockwise)			

Helixa

The Helixa precision torque tester provides the ideal solution for measuring very low to medium torque variations on

a variety of delicate or finely-engineered products.

- Precision: measure low-torque values from just a few mN.m up to 6 N.m
- Alignment: each fixture may be precisely aligned with the torque cell axis for extreme low torque measurement
- Exacting: counterbalance eliminates the weight of a grip being applied to a sample
- Versatile: top-loading capability to apply a predefined axial load, particularly suited to push-down twist testing child-resistant closures
- Flexible: complete with a set of standard accessories for securing even the lightest samples, with custom fixtures also available



Helixa	0.1 N.m	0.2 N.m	0.3 N.m	1.0 N.m	1.5 N.m	3.0 N.m	6.0 N.m
N.m	0 - 0.1	0 - 0.2	0 - 0.3	0 - 1.0	0 - 1.5	0 - 3.0	0 - 6.0
kgf.cm	0 - 1	0 - 2	0 - 3	0 - 10	0 - 15	0 - 30	0 - 60
lbf.in	0 - 0.9	0 - 1.8	0 - 2.7	0 - 8.9	0 - 13.3	0 - 26.5	0 - 53.1
Speed range	0	.1 - 30 rev	/min (clock	wise or ant	i-clockwise	9)	

Vortex-dV

The Vortex-dV is a versatile and affordable motorised torque testing system with simple controls, backed by sophisticated electronics. It is an ideal solution for measuring static and rotary torque up to 10 N.m.

- · Affordable: suitable for limited budgets
- User friendly: easy-to-use straight out of the box
- Control: rapid positioning of drive spindle and easy setting of test parameters
- Visual: coloured LEDS around the multi-function wheel indicate machine status during testing
- Versatile: option to apply downward force by adding weights during test – particularly suited to child-resistant closure testing
- Flexible: accommodates a variety of samples up to 505 mm (19.9") in height

Vortex-dV	1.5 N.m	3 N.m	6 N.m	10 N.m
N.m	0 - 1.5	0 - 3	0 - 6	0 - 10
kgf.cm	0 - 15	0 - 30	0 - 60	0 - 100
lbf.in	0 - 13	0 - 26	0 - 52	0 - 90
Speed range	0.1 - 30 rev/min (clockwise or anti-clockwise)			

Add **VectorProTM Lite** software to a **Vortex-***dV* for data acquisition, reporting and exporting, graph plotting, results calculation, and storage of regular test routines.

Horizontal Testers

FPT-H1

The **FPT-H1** is a dedicated horizontal test system designed for the packaging industry, and for manufacturers, converters and users of sheet materials.



- · Versatile: comprehensive range of friction, peel and tear fixtures
- Easy-to-use: pre-programmed for instant selection of industry standard test methods e.g. BS EN ISO 8295, ASTM D1894, ISO 15359 and TAPPI T 549
- Flexible: interchangeable loadcells: 10 N or 100 N (2.2 lbf, 22.5 lbf)
- Choice: available with integral console, or for separate PC control

CrimpTest-1 kN

The CrimpTest-1 kN is a horizontal, motorised wire terminal strength tester, designed for ease of use, rapid throughput and high duty cycle operation.

- · User friendly: one touch testing, peak force at break automatically calculated
- · Control: motorised operation protects against operator RSI
- · Visual: clear indication of pull-off load and pass/fail status
- · Robust: rugged construction and IP 54 rated against dust and wire fragments
- · Versatile: range of fixtures available

Custom-built Test Systems

As well as manufacturing standard products, Mecmesin is often called upon to custom design force and torque test solutions for special applications. Our engineering team has many years of experience in providing solutions for our customers' testing applications. The team can design and manufacture complex purpose-built, automated test systems through to innovative grips and fixtures, to your exact requirements.



CombiCork complete testing solutions for Champagne, sparkling wine and still wine cork extraction

Automated Test Systems

Mecmesin's automated test systems are designed to relieve operators of tedious or difficult tasks, and to provide greater consistency and speed during material handling and testing. They are particularly suited to production environments, where repetition can lead to operator error, inconsistent test results and RSI, where the volume of throughput is high, and where consistency in sample mounting is important.



Force Instruments

Digital Gauges

AFG

Mecmesin force gauges are specifically designed to measure force in tension and compression with outstanding accuracy, when used either handheld or mounted on a test stand. The **Advanced Force Gauge (AFG)** is the most versatile, fully-featured and precise gauge produced by Mecmesin.

- Tension and compression measuring
- Accuracy ±0.1% of full scale
- · 1st and ultimate peak capture
- · Data output RS232, Mitutoyo, analogue
- Internal sampling rate 5000 Hz
- · Ability to invert display on gauge
- · Test stand mountable
- · Full unit conversion of displayed value
- · Overload warning with trend bar
- · On-board memory 500 readings
- · Pass/Fail alarms
- External trigger (freeze reading of switch contact)
- · Diagnostic check of loadcell
- · Accepts external 'Smart' force & torque transducers
- · Wide range of grips and fixtures

Capacity and Resolution				
Model	N	kgf	lbf	
AFG 2.5	2.5 x 0.0005	-	0.55 x 0.0001	
AFG 5	5 x 0.001	0.5 x 0.0001	1.1 x 0.0002	
AFG 10	10 x 0.002	1 x 0.0002	2.2 x 0.0005	
AFG 25	25 x 0.005	2.5 x 0.0005	5.5 x 0.001	
AFG 50	50 x 0.01	5 x 0.001	11 x 0.002	
AFG 100	100 x 0.02	10 x 0.002	22 x 0.005	
AFG 250	250 x 0.05	25 x 0.005	55 x 0.01	
AFG 500	500 x 0.1	50 x 0.01	110 x 0.02	
AFG 1000	1,000 x 0.2	100 x 0.02	220 x 0.05	
AFG 2500	2,500 x 0.5	250 x 0.05	550 x 0.1	



BFG

The Basic Force Gauge (BFG) is a rugged, easy-to-use measurement instrument that offers value for money with the following features:

- Tension and compression measuring
- Accuracy ±0.25% of full scale
- · Data output RS232, Mitutoyo, analogue
- · Sampling rate 1000 Hz
- · Full unit conversion of displayed value
- · Wide range of grips and fixtures
- · Ergonomic design for handheld use
- · Powered by 4 nickel metal hydride rechargeable batteries

Capacity and	Capacity and Resolution					
Model	N	kgf	lbf			
BFG 10	10 x 0.002	1 x 0.0002	2.2 x 0.0005			
BFG 50	50 x 0.01	5 x 0.001	11 x 0.002			
BFG 200	200 x 0.05	20 x 0.005	44 x 0.01			
BFG 500	500 x 0.1	50 x 0.01	110 x 0.02			
BFG 1000	1,000 x 0.2	100 x 0.02	220 x 0.05			
BFG 2500	2,500 x 0.5	250 x 0.05	550 x 0.1			

CFG+

The Compact Force Gauge+ (CFG+) is a low cost, lightweight gauge with the following features:

- · RS232 for easy data transmission
- · Low cost
- 10-32 UNF loadcell stud thread
- · Data sampling rate 10 Hz
- · Accuracy ±0.5% of full scale
- · Declaration of conformity as standard (Calibration Certificate available on request)
- · Peak hold
- · Wide range of grips and fixtures

AFTI - Force & Torque

'Smart' Sensors

The Advanced Force & Torque Indicator is a high-spec display unit with similar features and benefits to the AFG. The AFTI is used with Mecmesin 'Smart' force and torque sensors, which plug into the AFTI enabling it to automatically register either force or torque readings for a variety of tests.





- Comprehensive: all the benefits of the Advanced Force Gauge
- Intelligent: automatic recognition of external sensors, just 'plug & play'
- Flexible: fully interchangeable range of force & torque sensors (no setup/re-calibration required)

With a wide variety of Mecmesin force and torque sensors available this versatile instrument covers a range of tests beyond the normal capability of a single instrument.

Manual Test Stands

Manual test stands, when combined with a force gauge, provide a simple and affordable way of conducting basic tension and compression tests.

- Easy-to-usePortable
- · Robust
- Lightweight
- · Economical for simple tests

The LCP/S lever-operated is ideal for testing on a repetitive basis up to 500 N (110 lbf) capacity. The MDD has 1000 N (220 lbf) capacity and handwheel operation to allow fine positional control of the crosshead. The ValuTest-D is an economical handwheel-operated test stand, rated to 1000 N (220 lbf) capacity and the ValuTest-L is a basic lever-operated test stand rated to 500 N (110 lbf).



MDD



Textile testing



Spring test

ValuTest-D and ValuTest-L

Model		MDD	LCP/S	ValuTest-D	ValuTest-L
Maximum load	Ν	1000	500	1000	500

Special Force Test Kits

Shotcrete Penetrometer

The Shotcrete Penetrometer is a complete portable system for testing the compressive strength of the initial stage of young sprayed concrete to BS EN 14488-2 (Method A) and related international standards.



Manual Handling Test Kit

Mecmesin's manual handling test kit test the forces required to push, pull, lift and carry loads. It ensures compliance to standards, health and safety regulations, minimises risk of injury or damage and can help improve productivity.



Myometer

Mecmesin's Myometer is a highly accurate digital instrument suited to muscle strength evaluations and for ergonomic testing. Developed in partnership with medical professionals, it features an integral Constant score facility, for shoulder functional strength assessment.

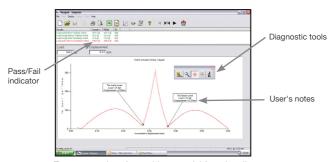


Software

Emperor™ for MultiTest-*i*, Vortex-*i*, Helixa-*i* & FPT-H1-*i* Systems

Created for ultimate force and torque test performance, Emperor™, Mecmesin's flagship software is a fully featured programming environment.

- · Easy-to-use: simple user interface with powerful functionality
- · Programmable: develop sophisticated programmes
- Control: replay, analyse, archive, download data
- · Visual: see test 'live' in real time on-screen
- In-depth analysis: visual representation shown on screen, with easy-to-use diagnostic tools
- Flexible: customise settings and layout to suit your requirements



Easy-to-use interface with powerful functionality

VectorPro™ Lite

VectorPro™ Lite is Mecmesin's powerful data acquisition and plotting software for use with Mecmesin -dV systems and digital instruments, for force and torque.

- · Visual: live plotting of tests with close-up examination
- · Easy-to-use: drag & drop test building & results calculation
- · Control: add pass/fail criteria
- Time saving: store test routines for repeat use
- Flexible: report results & export data to SPC systems
- Secure: personalised user accounts and access
- · Adaptable: multi-language switching



Closure Torque Testers

Tornado

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.

- · Flexible: versatile mounting table, adjustable to accommodate a variety of forms
- Precise: load accuracy ±0.5% of full scale
- · Advanced features: 2000 Hz peak capture, stores up to 500 results in its internal memory
- Tamper-evident closure testing: capture both 'slip torque' and 'bridge torque' with ease
- Protected: integrated drip tray captures any sample spillage
- · Time saving: quick access to common functions and navigation
- · User-friendly: low-cost, lightweight and portable
- Water-resistant: rated to IP54





Bottle cap testing

Model	Tornado 1.5	Tornado 3	Tornado 6	Tornado 10
Measurement	0 - 1.5 N.m	0 - 3 N.m	0 - 6 N.m	0 - 10 N.m
range	0 - 15 kgf.cm	0 - 30 kgf.cm	0 - 60 kgf.cm	0 - 100 kgf.cm
	0 - 13 lbf.in	0 - 26 lbf.in	0 - 50 lbf.in	0 - 90 lbf.in

Orbis

The Orbis enables you to manually test the release action of a screw type closure. It captures data at a fast rate, increasing accuracy and minimising reading variability, caused by the inevitable difference in speed employed by the user to unscrew the sample.





Adiustable pegs

- · Flexible: tests many shapes and sizes of container; 10 - 190 mm (0.4 - 7.5") in diameter
- Precise: load accuracy ±0.5% of full scale
- · Protected: splashproof housing, easy to clean spills
- Time saving: quick, useful for production line testing
- · User-friendly: low-cost, lightweight & portable
- Water-resistant: rated to IP54
- Capacity: 6 N.m (50 lbf.in)

Model	Orbis
Measurement range	0 - 6 N.m
	0 - 60 kgf.cm
	0 - 50 lbf.in

CAPTEST

The CAPTEST is a tough and affordable manual torque tester, for regular, repetitive measuring of screw-caps up to 5 N.m in clockwise and anticlockwise directions.

- Flexible: versatile, adjustable mounting table
- Protected: IP54-rated stainless steel housing for clean environments
- · User friendly: lightweight and portable
- · Control: overload protection
- · Versatile: mains or battery-operated
- Memory: Stores up to 240 peak torque readings



Calibration Equipment

Orbis/Tornado/Vortex Torque Cell Accuracy Check Rig

The calibration check rig is a bench-top unit which allows the on-site verification of the calibration status of Orbis MkII, Tornado MkII testers, and static torque sensors rated from 1.5 N.m to 10 N.m. Using dead-weight masses, the kit allows you to quickly decide whether or not adjustment, recalibration or repair is required. The kit does not replace the need for regular professional calibration.



Torque Wrench Calibrator

The Torque Wrench Calibrator combines a universal display, Mecmesin's AFTI, with a dedicated transducer to assess the torque applied by 'click action', 'break back' or dial torque wrenches up to 1000 N.m (720 lbf.ft).



Torque Reference Bottle

The Torque Reference Bottle (or 'Gold bottle') provides a means of quickly verifying the calibration of motorised torque measuring systems. Its magnetic clutch is set by Mecmesin to slip at a single torque. There are two models, the standard 'Torque Reference

Bottle' (4.5 to 17.5 lbf.in) and the smaller 'Micro Torque Reference Bottle' (1.1 to 1.75 lbf.in), to cover two separate ranges. Both models can be used with the Helixa and Vortex systems.



Accessories

Grips and fixtures are integral components of a complete force or torque testing solution. Our extensive range of accessories enable every industry sector to test their products under exacting test conditions to meet internal or international standards. These include:

- · Cam grips
- Claw type grips
- Roller/Bollard type grips
 - Textile attachment grips
- · Compression plates and probes
- · Flat-faced jaw grips
- Test hooks
- · Wedge grips

For specialised requirements, our team of experienced engineers can design customised fixtures to match your specific specifications.



Wedge grip



Floating peel jig



Cap Mandrels



Vented compression plate



Flip cap test hook



3-point bend fixture

Solutions Provider

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

- Adhesives and coatings
- Consumer packaging
- Construction
- Cosmetics and personal care
- Electrical & electronics
- Education
- · Fabric and textiles
- · Medical and veterinary

- · Food and agriculture
- · General engineering
- · Home and office
- Product safety
- Transit packaging
- · Sports and leisure
- Transport (automotive/aerospace)

Support Services

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



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



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





FS 58553

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

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