

# Mecmesin

testing to perfection

## OmniTest™ Materials Tester

featuring VectorPro™ MT materials testing software



Tensile strength



Compression



Flexure / Bend



Stress



Strain



Force control

# OmniTest™

## Materials Tester

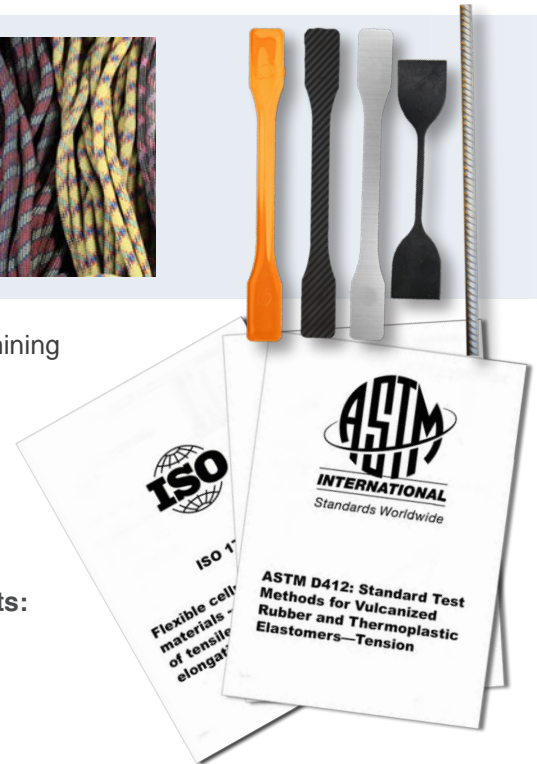
Building on over 40 years experience in force measurement for product testing, Mecmesin has developed the OmniTest with VectorPro MT software to perform a range of materials testing procedures. A range of rigid test frames enables the properties of metals, plastics, polymers, alloys, composites, wood, fabrics, glass, laminates and ceramics to be accurately characterised in tension and compression up to 50 kN.



Testing in accordance with international standards is a key part of determining materials characteristics whether it be for incoming Quality Assurance, R&D or production Quality Control purposes. With this in mind the OmniTest with VectorPro MT software has been designed to meet the challenge of being powerful, versatile yet easy-to-use with minimal operator training.

#### 4 simple steps are all it takes to configure to your exact requirements:

1. Choose your OmniTest bench-top frame to apply loads - from 5 kN to 50 kN capacity
2. Select from the ELS range of precision, interchangeable load sensors to record applied loads
3. To hold your specimen add suitable grips and fixtures from our wide collection
4. Easily configure VectorPro MT software to meet your own specific test methods



### The OmniTest™ Range – up to 50 kN

The OmniTest range comprises four bench-mounted, static-load testing machines allowing tensile and compressive forces to be applied to a wide variety of material properties, specimen configurations and test types.

All frames feature excellent rigidity with minimal deflection, upper & lower safety limit switches and have ample space to accommodate most sizes of test specimen.

Choose the frame load rating and test space suited to your specimen's expected size and stress-strain characteristics.



▲ **Single column**  
OmniTest 5: for loads up to 5 kN  
OmniTest 7.5: for loads up to 7.5 kN



▲ **Twin column**  
OmniTest 10: for loads up to 10 kN  
OmniTest 25: for loads up to 25 kN  
OmniTest 50: for loads up to 50 kN



# OmniTest™

## Key Features

### 5 models

- Test materials with a wide range of strength and elongation properties.
- Load capacity (crosshead travel)
  - 5 kN (650 mm)
  - 7.5 kN (650 mm)
  - 10 kN (950 mm)
  - 25 kN (950 mm)
  - 50 kN (1100 mm)

### Modern design architecture

- Rigid frame with minimal deflection
- Robust construction
- Integrated cable management

### Accurate and versatile loading

- Enhanced Load Sensors (ELS) with excellent accuracy of  $\pm 0.5\%$  of reading
- Active load holding and rate control (load ramping)

### Versatile and precise

- Outstanding speed range
- Precise positional resolution

### Grips and fixtures

- A wide range of grips and fixtures available to hold test specimens

### Control panel and display

- Just four multifunction buttons for settings and operation
- Clear indication of load, displacement, speed and system status

### VectorPro MT software

- Extensive suite of calculations for materials testing
- Database architecture and strict operator permissions ideal for use in FDA 21 CFR Part 11 compliant environments

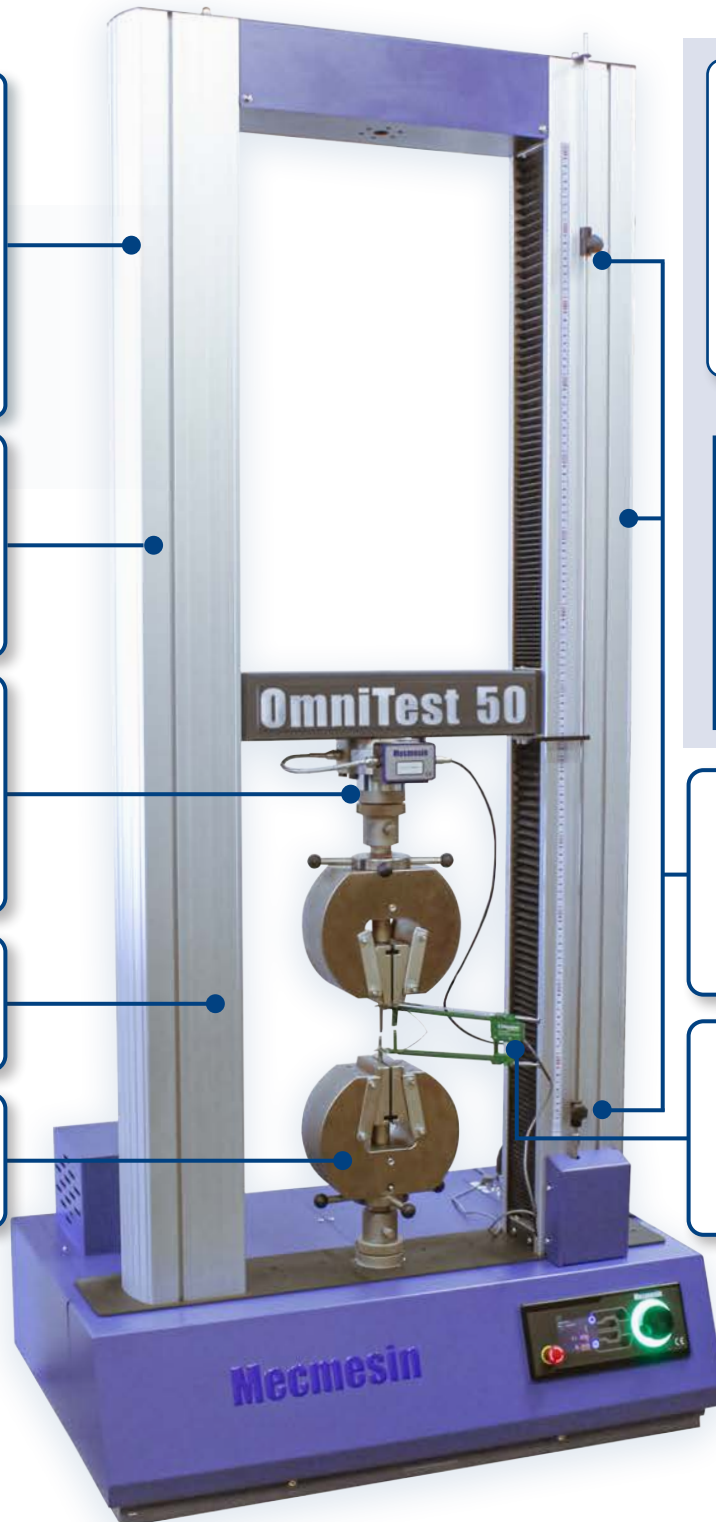


### Convenient workspace aids

- Accessible upper and lower safety limit switches
- T-slots for mounting accessories (e.g. extensometer, touchscreen controller, camera etc..)

### Extensometer ready

- In-built connectivity
- Software for materials analysis
- Strain measurement and control
- Active strain control



### Multifunction wheel

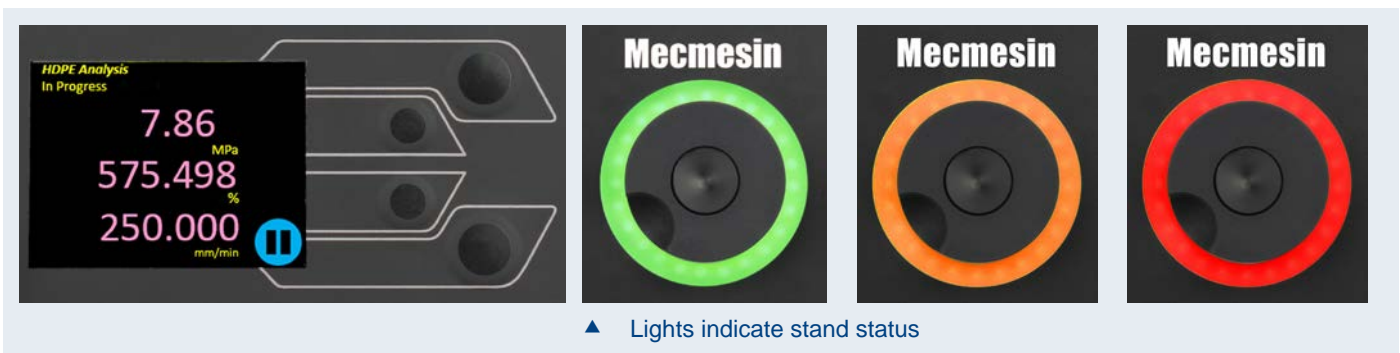
- Fine control allows precise setting of speed and position.
- Coloured LEDs clearly indicate machine status during testing.
- Precision jog mode to finely position the crosshead for fitting of specimens into grips

(Model shown: twin column OmniTest™ 50, features may vary for other models)

## OmniTest™ Controls

The OmniTest has a convenient, simple-to-use front panel for selection of display parameters and precise jog-control for rapid crosshead positioning.

Sophisticated internal electronics communicate seamlessly with VectorPro MT software to efficiently perform the test procedure.



## Enhanced Load Sensors

A comprehensive range of new Enhanced Load Sensors (ELS) has been designed to communicate with the OmniTest, delivering superior performance to meet the specific requirements of materials testing—even for brittle specimens. Improved accuracy of  $\pm 0.5\%$  of reading allows more tests to be performed without changing the load sensor. However, in situations where multiple load ranges are required, the ELS sensors are fully interchangeable in a few seconds with automatic recognition of calibration details by VectorPro MT software when connected.

### Machine control

The ELS integration with the OmniTest and VectorPro MT enables active force control to simulate real-world scenarios.

- Active load holding to apply and maintain a constant stress or load even on very stiff test specimens
- Active load rate control (stress rate control) or load-ramping (N/sec)
- Active strain control, independent of the crosshead displacement, to avoid pre-stressing the specimen

An internal sampling rate of 20 kHz is standard with data transfer via USB at a maximum of 500 Hz to prevent noise and spikes being erroneously presented.



## Grips and Fixtures

To complete your OmniTest system Mecmesin offers an extensive array of accessories. Secure, distortion-free gripping which does not damage the specimen, introduce localised stresses, or restrict its deformation is fundamental in obtaining repeatable and valid test results.



Selection of grips ideal for materials testing

The top-quality range of standard compressive and tensile fixtures includes application-specific options such as jaw size and surface finish to comply with the specifications of international standards. If custom grips are required our in-house application engineers can design and manufacture these to suit your needs.



## Axial Extensometers

OmniTest has a direct input connection for an extensometer, to correctly measure the true elongation of the gauge length region of the specimen, enabling VectorPro MT to accurately calculate the strain for elastic, ductile and brittle materials.

Mecmesin offers a choice of digital contacting extensometry recommended for use with OmniTest.



▲ Short travel Epsilon



▲ MLTE long travel





## Touchscreen Controller

The Touchscreen Controller has been designed as an alternative to a desktop or laptop PC for use with the twin-column models of the OmniTest Materials Testers.

It provides full PC capability, operating with an embedded version of Windows 10, specifically optimised for and pre-installed with Mecmesin's VectorPro™ software making it ready for immediate use with the OmniTest.

For complete flexibility it is attached directly to either side of the test stand column and can be tilted for optimum ease of viewing.



## Safety Guards

Health and safety are of paramount concern when using machinery with moving parts and motorised test equipment is no exception.

Mecmesin test systems can be supplied with a standard safety guard. These have a rigid metal frame with integrated polycarbonate panels to allow the operator to view the test area from outside. Hinged doors are fitted with switch-activated interlock mechanisms that prevent system operation when open.



Standard guard - twin-column test stands ▲



# Specifications

OmniTest		5	7.5	10	25	50
Rated capacities	kN	5	7.5	10	25	50
	kfg	500	765	1000	2500	5000
	lbf	1100	1686	2200	5500	11000
Number of ballscrews		1	1	2	2	2
Data-acquisition rate		500 Hz				
Internal sampling rate (load)		20 kHz				
<b>Displacement*</b>						
Crosshead travel‡		650 mm (25.6")	650 mm (25.6")	950 mm (37.4")	950 mm (37.4")	1100 mm (43.3")
Resolution		1 µm				
Accuracy		±0.1% of indicated position or ±10 microns, whichever is greatest				
<b>Speed</b>						
Calibrated Speed range	mm/min	0.01 - 1200	0.01 - 1200	0.01 - 1000†	0.01 - 1000 to 10 kN† 0.01 - 500 from 10 kN to 25 kN†	0.01 - 400 to 25 kN†† 0.01 - 250 from 25 kN to 50 kN† / ††
	in/min	0.0004 - 47.2	0.0004 - 47.2	0.0004 - 39.4†	0.0004 - 39.4 to 10 kN† 0.0004 - 19.7 from 10 to 25 kN†	0.0004 - 15.7 to 25 kN†† 0.0004 - 9.8 from 25 kN to 50 kN† / ††
Speed resolution		0.001 mm/min (0.00004 in/min)				
Accuracy		±2% of indicated speed or ±20 µ/min, whichever is greater				
<b>Dimensions</b>						
Distance between columns		–	–	400 mm (15.7")	400 mm (15.7")	420 mm (16.5")
Throat depth‡		125 mm (4.9")	67 mm (2.6")	–	–	–
Height		1089 mm (42.9")	1089 mm (42.9")	1500 mm (59.1")	1500 mm (59.1")	1931 mm (76")
Width		330 mm (13.0")	330 mm (13.0")	826 mm (32.5")	826 mm (32.5")	864 mm (34")
Depth		570 mm (22.4")	570 mm (22.4")	542 mm (21.3")	542 mm (21.3")	572 mm (22.5")
Vertical daylight‡		750 mm (29.5")	750 mm (29.5")	1140 mm (44.9")	1140 mm (44.9")	1330 mm (52.4")
Weight		70 kg (155 lbs)	70 kg (155 lbs)	140 kg (309 lbs)	140 kg (309 lbs)	285 kg (628 lbs)
<b>Electrical supply</b>						
Voltage		230V AC 50 Hz or 110V AC 60 Hz				
Maximum power requirements		150 watts	150 watts	400 watts	450 watts	450 watts
<b>Enhanced Load Sensors (ELS)</b>						
Accuracy		When calibrated as part of a system, ±0.5% of reading down to 2% of range, suitable for use with Class 0.5 systems according to the requirements of ISO 7500-1				
Resolution		1:50000 filtered from 24 bit				
<b>Environment specification</b>						
Operating temperature		10°C to 40°C				
Operating relative humidity		30% - 80% (non-condensing)				

\* Correction for system compliance is available  
‡ Measured without fixtures

† OmniTest 10, 25 & 50. Max time when set to travel at 0.01 mm/min (0.0004 in/min) = 10 minutes when working at constant force.  
†† OmniTest 50. Slowest speed: 0 - 35 kN = 0.01 mm/min (0.0004 in/min), 35 - 40 kN = 0.1 mm/min (0.004 in/min), 40 - 45 kN = 1 mm/min (0.04 in/min), 45 - 50 kN = 10 mm/min (0.4 in/min) when working at constant force.  
‡ Measured on centreline of load sensor

<b>Software and communications</b>	
Connectivity	USB port, extensometer input, 2 x low voltage additional sensor inputs with future expansion capability
PC requirements (recommended)	Intel Core i5 processor, 8 GB RAM, one USB 2.0 or 3.0 port, SSD hard drive with 10 GB free space, screen resolution 1920x1080 full HD
PC requirements (minimum)*	Intel/AMD dual core processor with 2 GHz or faster clock speed, 4 GB RAM, one USB 2.0 or 3.0 port, hard drive with 10 GB free space, screen resolution 1080x720
Operating system (OS)	Compatible OS: Windows 7 or Windows 10 (32 or 64 bit) Recommended OS: Windows 10 Pro 64 bit
Data output	You can export as PDF, XLSX, CSV, TXT, Email and image files

\*. Although the minimum specification will allow VectorPro to operate, the user experience is not guaranteed to be optimal.

# VectorPro™ MT

## Materials Testing Software



VectorPro MT software has been designed to work with the OmniTest range of bench-top frames to efficiently perform materials testing procedures. Its clear icon-driven user-interface ensures it is completely intuitive to use with

the minimum of training. Together with in-built stress-strain calculations and powerful reporting tools, it is the ideal choice for quality assurance checks at the production line and in the QC lab or, for more in-depth analysis of material properties, in the R&D laboratory.

For medical & pharmaceutical clients the database architecture provides audit trail and e-signature functionality to help facilitate compliance to FDA 21 CFR Part 11.



### VectorPro™ MT summary of key features

#### Simplicity

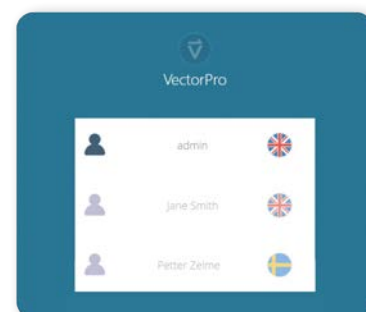
- Simple, workflow-focussed design featuring an intuitive drag-and-drop Graphical User Interface
- Personalised user-accounts with simplified workspaces for quick access to all tests and commonly-used favourites
- 'Prompt for Value' feature requires a compulsory user-input before performing the test to ensure no essential information is missed
- Icon-driven approach to enhance clarity for users
- Instant pass/fail indication according to your specification criteria
- Touch screen enabled

#### Control

- Tensile and compression testing capability
- Stress-Strain machine control and data analysis: test in both tensile and compressive directions by running to target load, position, stress, strain and break
- Permissions-based log-on with password protection to control who can create or run tests, view results, and produce reports
- System Deflection Compensation (known also as 'Correction for Machine Compliance') ensures the most accurate deformation and strain readings when an extensometer cannot be used. This is achieved by compensating for the intrinsic movement of the frame and loadcell during the test leaving only the deformation of the specimen



◀ License key



▲ Log-on with password protection

#### Versatility

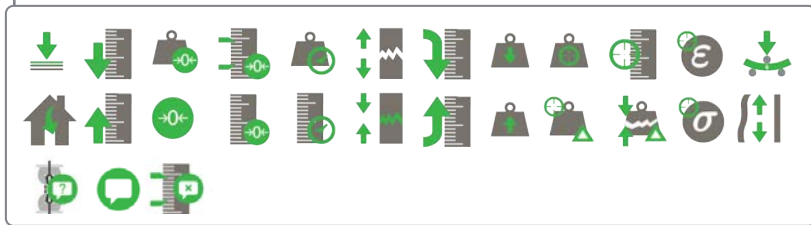
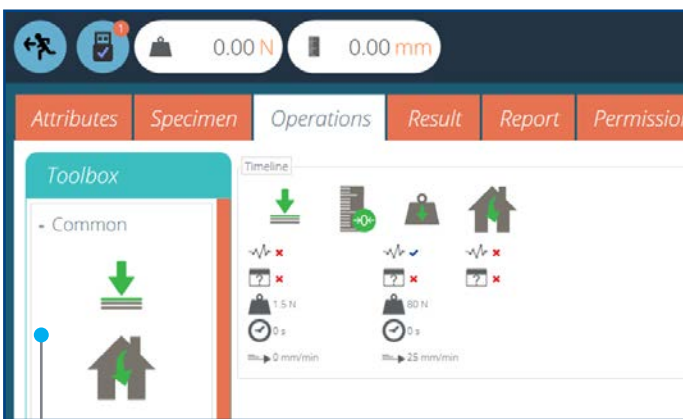
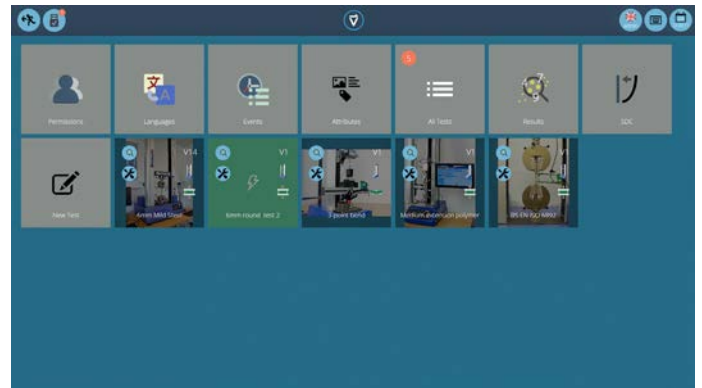
- Ability to change graph axes between stress, strain, load, displacement, time to better understand the test data
- Customisable results table and PDF reporting tool—present the data the way that you and your customer wish to see it
- Export data to Excel or in a format suitable for SPC software packages—easily networkable for remote access by supervisors and managers
- Language customisation—use the same software across your company's world-wide locations. Full support and back-up from Mecmesin's international distributors is assured



## Building test procedures

VectorPro MT features a drag and drop methodology to apply all the operations needed to create a test program, apply common stress-strain calculations and build reports. Using icon-driven prompts create even the most elaborate test routines in moments and refine them as you go.

The interface guides the user to build test sequences and select standard specimen types and operations based on the type of test being conducted.



▲ Select your specimen geometry

◀ Drag pre-test, in-test, and post-test operations to create the procedure

## Apply materials testing calculations and validation criteria

In addition to all common force testing calculations (peak load, average load, load at displacement etc.), VectorPro MT includes a comprehensive range of stress-strain domain calculations, available to be included in the results analysis of the test routine. Pass/fail parameters can be easily added for each calculation and clearly displayed to operators.

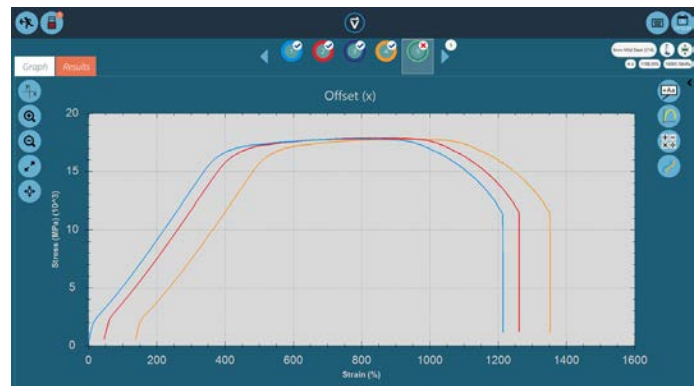
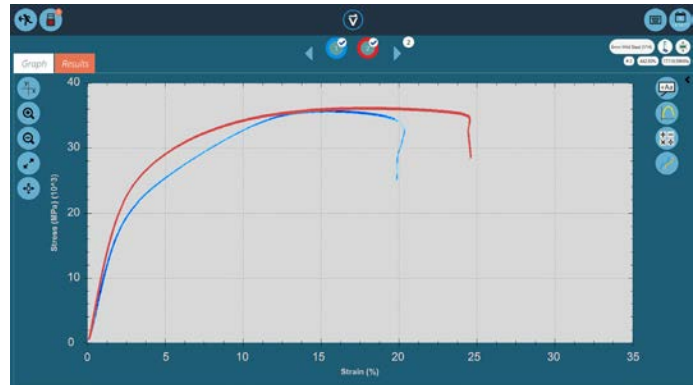


### Included calculations:

- Elastic Modulus (Young's Modulus)
- Offset Yield (Proof Stress)
- Upper and Lower Yield
- Ultimate Tensile Strength (UTS)
- Stress and Strain (Elastic and Plastic regions)
- 3 Point Bend Flexural Testing
- Nominal Strain (using Grip Separation)

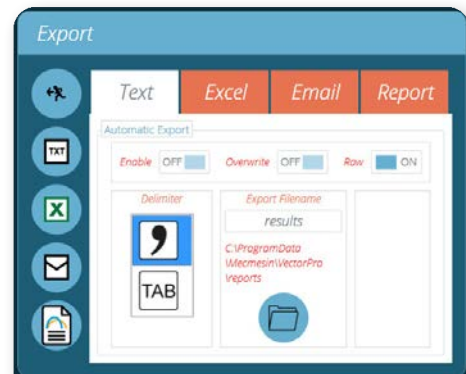
## Real time plotting of test data

- View tests as they run, with instant calculation of pass/fail results
- Get in close to analyse your specimen data—switch axes, zoom in, pan across, view the value of individual data points
- Offset specimen traces on the graph for greater clarity and comparison
- All plots and results are stored automatically for later review at any time
- Switch axes to display graphs in the most relevant view for the data and test type

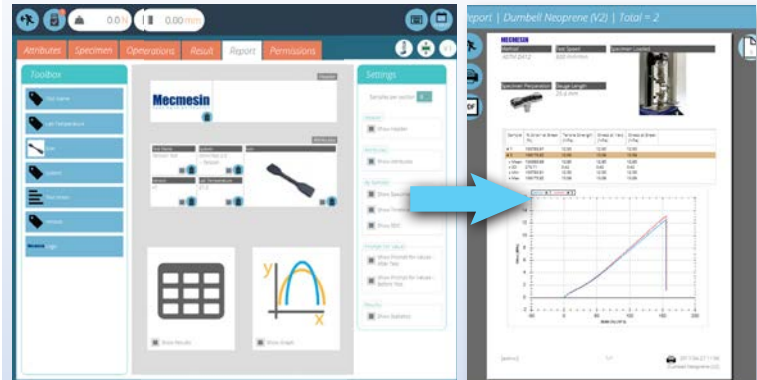


## Results handling and report generation

- Complete flexibility to compare the plots of all tested specimens or simply select out the specimens you wish to compare
- Add spot calculations not included in the original test profile view temporarily
- Select out the specimens you want to compare, and adjust calculation parameters temporarily or to save
- Link to the network so managers and operators alike can review test results remotely at their convenience
- Export raw data or test results to Excel files
- Automatically email a table of results at end of test
- Compare the plots of tested specimens across different test methods
- Create a test report including company logos, test results, graphs and notes, then print or save as PDF



Sample	% Strain	Tensile (MPa)	Stress at Break (MPa)
1	115.785.9	12.5	12.5
2	154.75.8	13.09	13.09
3	150.980.9	12.8	12.8
4	125.75	0.42	0.42
5	150.785.9	12.5	12.5
6	154.75.8	13.09	13.09



▲ Create custom report


# Designed for FDA 21 CFR Part 11 Environments

VectorPro MT is designed to help facilitate meeting FDA 21 CFR Part 11 requirements, incorporating the following features:

- Time stamped Event Log entries:
  - Operator ID
  - Description of action
  - Supervisor comment
- Supervisor authorisation
- Only viewable by the administrator
- Print option






### ▼ Icons to configure and filter the Event Log





Events

Event Log


Σ= 10

Operator	Action	Status	Filter	Notes
admin	Event Log	Open	None	
Jane Smith	Select Test	Close	None	
Petter Zelme	Select Test	Open	None	
admin	Login	Execute	None	
admin	Test Results	Delete	Test Result	Test Notes
admin	Test Results	Delete	Test Result	Timestamp - End
Jane Smith	Report Designer	Delete	Report Item Header	
admin	Report Designer	New	Report Item Header	
admin	Application	Close	None	

Cancel

## Calibration

ELS load cells will be adjusted and calibrated using our proprietary internal methods and issued with certificates conforming to the requirements of ISO/IEC 17025. UKAS accredited calibrations are available on request. Calibrations are carried out using masses and reference sensors traceable to International standards. The design accuracy for ELS load cells is  $\pm 0.5\%$  of reading from 2% to 100% of load cell range.



**CERTIFICATE OF CALIBRATION**

Date of issue: 01/02/2017      Certificate number: MS-0001

Customer reference: 0000      Issued to: ABC

Device manufacturer: Mecmesin Ltd

Device identification: ELS 50N

Date of calibration: 01/02/2017

Location of calibration: Mecmesin Laboratory (UK), Stanford, West Sussex, RH13 0SZ

The calibration was made using the following method and equipment:

Basic of calibration: Mecmesin Internal (Force)

Identification of the standard used: NCS

Allowable tolerance: 0.5%

Summary of results: Based on the measurements in table 2 and the allowable tolerance, this device is considered to be acceptable.

Approved signature: *Alfred*

Name printed here: A Hoagwood (Authorised Calibration Technician)





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## 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)



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



FS 58553  
BS EN ISO 9001:2015

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

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