OmniTest™
Materials Tester
featuring VectorPro™ MT materials testing software
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 ±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 ± 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.

For more details see OmniTest Technical Datasheet DS-1173
OmniTest™ accessories

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.

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.

For more details visit https://www.mecmesin.com/browse/accessories

For more details see Extensometer datasheet DS-1129
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.
### Specifications

<table>
<thead>
<tr>
<th>OmniTest</th>
<th>5</th>
<th>7.5</th>
<th>10</th>
<th>25</th>
<th>50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated capacities</td>
<td>kN</td>
<td>5</td>
<td>7.5</td>
<td>10</td>
<td>25</td>
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<tr>
<td></td>
<td>kfg</td>
<td>500</td>
<td>765</td>
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<td>1</td>
<td>2</td>
<td>2</td>
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<tr>
<td>Data-acquisition rate</td>
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<td>500 Hz</td>
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<td></td>
<td></td>
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<tr>
<td>Internal sampling rate (load)</td>
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<td>20 kHz</td>
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</tbody>
</table>

**Displacement**

**Crosshead travel**: 650 mm (25.6") 650 mm (25.6") 950 mm (37.4") 950 mm (37.4") 1100 mm (43.3")

**Accuracy**

±0.1% of indicated position or ±10 microns, whichever is greatest

### Speed

**Calibrated Speed range**

<table>
<thead>
<tr>
<th></th>
<th>mm/min</th>
<th>in/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calibrated</td>
<td>0.01 - 1200</td>
<td>0.0004 - 47.2</td>
</tr>
<tr>
<td>Speed range</td>
<td>0.01 - 1000†</td>
<td>0.0004 - 39.4†</td>
</tr>
<tr>
<td></td>
<td>0.01 - 1000 kN†</td>
<td>0.0004 - 39.4 kN†</td>
</tr>
</tbody>
</table>

**Speed resolution**

0.001 mm/min (0.00004 in/min)

**Accuracy**

At steady state:

- <50 mm/min = ±0.5% of indicated speed or ±0.05 mm/min (whichever is greater)
- 50 - 500 mm/min = ±0.2% of indicated speed
- >500 mm/min = ±1% of indicated speed

### Dimensions

**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)

### Electrical supply

**Voltage**

230V AC 50 Hz or 110V AC 60 Hz

**Maximum power requirements**

150 watts 150 watts 400 watts 450 watts 450 watts

### Enhanced Load Sensors (ELS)

**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

### Environment specification

**Operating temperature**

10°C to 40°C

**Operating relative humidity**

30% - 80% (non-condensing)

### Software and communications

**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

* 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/mm), 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

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

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.

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 Yield (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
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 ±0.5% of reading from 2% to 100% of load cell range.
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.

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

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