Dynamic Mechanical Analyser

www.prescott-instruments.com
**Dynamic Mechanical Analyser**

Prescott Instruments' Dynamic Mechanical Analyser is a versatile and high precision DMA designed for dynamic and static testing on a variety of materials with a full range of force. From an established global manufacturer in specialist laboratory equipment, this DMA has a unique and rigid design that is easy to operate and maintain, ensuring a reliable and safe testing operation for the user.

Using state-of-the-art linear motor technology, this DMA can efficiently produce over 3kN of static force and 10kN of dynamic force at a frequency of more than 300Hz. With complete user flexibility, the DMA allows you to test a range of materials, components and systems, fixed in place by versatile high-performance clamping fixtures. Capable of performing a range of test methods in different deformation modes, the DMA delivers force control to the most precise accuracies available.

Our innovative and easy to use new Labline software enables the user to set up tests easily with minimal training required, giving test confidence and maximum productivity throughout. Labline software can be relied upon for precise results and a consistent testing process, with a wide range of test modes available.

**Key Features**

- Powerful linear technology
- Compatible with the new Labline software
- Simple installation
- Virtually maintenance free
- Flexibility to use a range of clamps for testing
- Low mechanical noise
- Long term durability supporting a high volume of tests
- Emergency stop button safety feature
- Designed for ease of access
- Stand-alone unit
- High dynamic performance, capable of up to 300Hz
Dynamic Mechanical Analyser

Applications
Perfect for a modern laboratory, this instrument covers a wide range of static, dynamic and fatigue testing applications, making it an ideal instrument for laboratory applications, quality control and research & development.

Non-Linear Material Properties
The application of oscillatory forces enables material effects to be characterised beyond the linear regime. Stiffness, elastic modulus and viscosity can all be expressed as complex quantities that incorporate non-linear behaviours. The reaction of the sample as a function of both amplitude and frequency can be used to build a model of material properties that include both physical and chemical characteristics.

Failure & Fatigue Testing
The expected lifetime of a material or finished component can be deduced using either static or dynamic forces that mimic realistic stresses. The effect of constant stress, strain or strain rate can be used to determine strength, toughness and evaluate modes of failure. With dynamic forces, the repetitive loading of a material can be used to calculate fatigue strength, fatigue life and the dependency on the form, amplitude and frequency of oscillation.

Non-Destructive Testing
The properties of a material, component or system can also be analysed without causing any damage. In this way, discontinuities can be highlighted during inspection without impacting on the future usability of the sample.
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Linear Servo Motor
Capable of producing high forces and velocities, the Linear Servo Motor ensures accuracy and reliability throughout the testing process. When operated, the Linear Servo Motor will begin to apply force to the sample under testing, and the reaction force of the sample is measured on the load cell. The test results are sent through to our new Labline software, which interprets the data and displays the results graphically. Our Labline software can also calculate the viscoelastic properties of the sample including hysteresis effects, complex modulus and tan delta.

Linear Encoder
A high performance Linear Encoder is supplied as part of the Linear Servo Motor, providing precise and reliable position feedback and communication data.

Environment Cabinet
An optional temperature test chamber can be incorporated to give control, stability and flexibility of temperature during testing.

Service Flexibility
This instrument has been designed keeping our customers testing needs in mind. With minimal maintenance required for the DMA, operator productivity levels are maximised. Should a service and calibration be necessary, the integrated high quality parts are easy to access and remove, making it a simple and convenient process.

Low Noise Operation
When in use, this Dynamic Mechanical Analyser will produce minimal mechanical noise enabling a productive test environment for the operators.

Safety
This instrument can be relied upon for a simple and safe operation and has an emergency stop feature integrated into the design to protect users, whilst conforming to international safety standards.
**Dynamic Mechanical Analyser**

**Technical Specification**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Force</td>
<td>0.0001 kN</td>
</tr>
<tr>
<td>Maximum Static force range</td>
<td>3.4 kN</td>
</tr>
<tr>
<td>Maximum Dynamic force range</td>
<td>10 kN</td>
</tr>
<tr>
<td>Frequency range</td>
<td>0.001 Hz to 300 Hz</td>
</tr>
<tr>
<td>Maximum stroke length</td>
<td>50.8 mm (customisable)</td>
</tr>
<tr>
<td>Displacement resolution</td>
<td>0.001 mm</td>
</tr>
<tr>
<td>Test space size (W x D x H)</td>
<td>500 x 550 x 300 mm (customisable)</td>
</tr>
<tr>
<td>Electrical Power</td>
<td>Three phase 15 Amp</td>
</tr>
<tr>
<td>Weight</td>
<td>320 kg</td>
</tr>
<tr>
<td>Dimensions (W x D x H)</td>
<td>800 x 550 x 1500 mm</td>
</tr>
</tbody>
</table>
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Output Parameters

- Stress/Strain
- Young’s Modulus
- Complex (Dynamic) Modulus
- Storage Modulus
- Loss Modulus
- Storage/Loss Compliance
- Tan Delta
- Complex (Dynamic) Viscosity

- Force/Displacement
- Linear (Hookean) Stiffness
- Complex Stiffness
- Complex Stiffness Compliance
- Damping
- Energy Storage & Losses

- Creep Compliance
- Relaxation Modulus
- Percentage Recovery
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Methods of Deformation

A range of high performance clamping fixtures are available that enable testing in more than one mode of deformation. Samples of various dimensions and natures can be accommodated, including but not limited to rubber, polymers, elastomers and composites.

Compression

Tension

Shear

3 Point Bending

Single Cantilever

Dual Cantilever
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Test Modes

Static Stress/Strain
In this mode, stress or strain can either be constant or applied at a uniform rate. Results include Young’s Modulus, Hookean stiffness, elastic limit, material strength and distortion at break.

Dynamic Stress/Strain
At constant frequency, material response is monitored as stress amplitude increases. For each cycle, the complex stiffness, complex modulus and complex viscosity can be calculated. Can also be used to identify the Linear Viscoelastic Range.

Multi-Frequency
At constant stress amplitude, the material response is monitored as a function of frequency. Can be used to determine transitions, crossover points and plateau regions.

Transient Testing
For creep testing, stress is held constant and deformation is measured over time. For stress relaxation, the stress required to hold a constant deformation is measured over time. This mode is used to measure the long-term effects of loading and the ability to return to original shape.

Time-Temperature Scans
With the optional temperature control unit, material response as a function of temperature can be measured. Thermal transitions, rate of cure and operating ranges can all be determined. Samples can also undergo accelerated ageing during testing.
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New Labline Software

Featuring state-of-the-art architecture, the new Labline software comprises of an easy to use interface ensuring our clients have a user-friendly process to increase their production levels and assist in better decision making. Our Labline software enables the user to set up tests with simple and easy steps resulting in minimal training required, providing test confidence and productivity throughout. Labline software can be relied upon for precise results and has a high level of flexibility with a wide range of test conditions available.

Acquire

- View previous test information from the last test that was performed
- Quick decision making with our Pass/Fail colour indicators
- Flexibility to change channel trace colours
- Trend chart alarm indicating quality drift
- Load previous test results while running a test
- Add note option to test results
- Optional screensaver to provide a clear
- Indication when an instrument is ready for testing

Viewer

- The use of tabs allows several sets of results to be viewed

Database

- Get full confidence in your designs with a wide range of test method templates
- All test method details visible in the tab
- Default test points available for each test method type
- Test points can define both Process Limits and Control Limits
- Flexible tabs allowing several test methods to be viewed or edited
- A clear indication of the test type
About Us

Company

Since 1985, Prescott Instruments has been specialising in laboratory instrument and in-house software development for the Rubber, Plastics and Elastomers industry. Whether you need to measure the rheological or viscoelastic properties of rubber and polymeric compounds, perform sample preparation, or require technical support, we have got you covered.

With strong commitment to quality and continuous improvement, all of our equipment is manufactured and calibrated according to precise international standards and is regularly upgraded to incorporate the latest technology.

Services

Prescott Instruments is fully devoted to ensure that all of our customers have complete satisfaction with their goods and services.

Technical Support

An expert team is at your disposal for any technical questions or queries you may have, with their fast and comprehensive customer service via phone, email or remotely.

Agents

We have built strong relationships with our worldwide agents who help support, service and supply our extended clientele across the globe. Operating in over 20 countries our partners to ensure a quick response service.

Parts and Spares

Understanding the importance of consistent and reliable testing over a long period of time, Prescott Instruments offer a wide range of quality upgrades, parts and spares to get the most of your testing equipment.

Supplying all in-house Instruments and other established testing equipment:

» Probes    » Rotors    » Heaters
» Film      » Dies      » Seals
About Us

Service and Calibration
Regular maintenance, service and calibration can ensure the smooth running of laboratory instruments with a longer life with both reliable and accurate results.

Our on demand team of service engineers are equipped to support a vast range of laboratory equipment from in-house to other leading manufacturers:
- Alpha Technologies / Monsanto
- Wallace
- Testometric
- Instron
- Hounsfield
- Lloyd
- Denison
- Avery

Calibration Practices
- Force testing equipment is performed in accordance with our A2LA accreditation
- All calibrations conform to our ISO9001:2008 certification
- All calibrations are traceable to national standards
- Accredited to statically calibrate torque standards to ISO17025 against BS7882:2008.
Our expert team is always at your disposal for any questions or queries you may have regarding Prescott Instruments’ Dynamic Mechanical Analyser.

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