

Dynamic Testing

Dynamic testing is performed on a vast array of rubber articles including belts, biomedical components, bridge bearing pads, dynamic seals, engine mounts, exhaust hangers, shock mounts, tires, vibration isolators, etc. to determine their response to cyclic stress/dynamic load.

ARDL has two servohydraulic load frames along with a Metrovib Electrodynamic Testing Machine that are capable of dynamic characterization of elastomeric parts as well as stroke and load control fatigue testing. In addition, three electrodynamic shaker tables can test loads up to 7,000 lbf and frequencies up to 2,000 Hz. ARDL's engineers can also develop customized test setups to better suit your individual needs.

MTS 831.20 Elastomer Test System

Applications

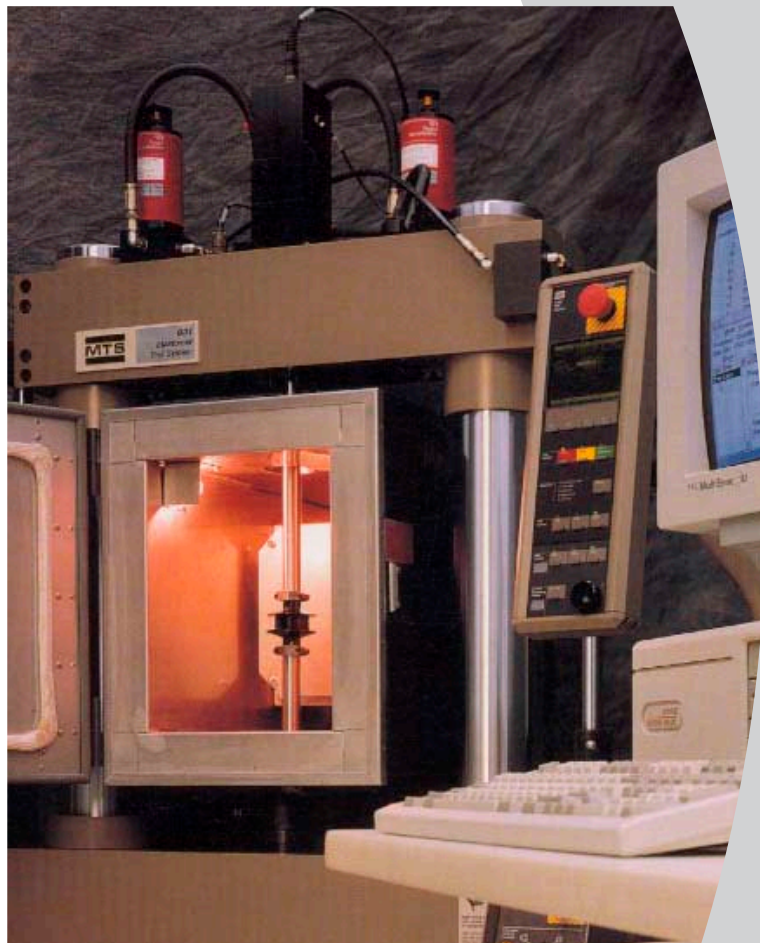
- Biomedical Components
- Bridge Bearing Pads
- Dynamic Seals
- Engine Mounts
- Exhaust Hangers
- Shock & Vibration Isolators
- And Many More...

Specifications

- Frequency: 0.01 Hz to 400 Hz
- Displacement: $\pm 1\frac{1}{8}$ in
- Load: $\pm 5,500$ lbs
- Temperature Cycling Chamber: -100°C to $+315^{\circ}\text{C}$

Measurement Options

- Dynamic Characterization
- Determines the Material Properties of Rubber
 K^* , K' , K'' , $\tan \Delta$, E^* , E' , E'' , C
- Frequency and Strain Sweeps
- Sample Geometry
 - Dual-Lap Shear
 - Hollow Cylinder
 - Product/Parts
 - Quad-Lap Shear
 - Solid Box
 - Solid Cylinder
- Total Energy



Resonant Search

Determines the Resonant Frequency of Rubber Components

Static Deflection

Determines the Static Spring Rate of Rubber Components



Rubber. Plastic. Latex.

Dynamic Testing (cont.)

Metravib – DMA +150 – Electrodynamic Testing Machine

The Metravib Electrodynamic Testing Machine has the ability to generate quantitative dynamic property data for modelers and end-users and can duplicate the shear field experienced at the edge of steel belt radial tires. ARDL can test to ASTM D 2231 and unique customer specifications.

Deformation (Excitation) Modes

- Tension
- Compression
- Simple Shear
- Annular Pumping, Annular Shear, 3-Point Bending, Dual and Single Cantilever Bending

Major Capabilities

- Dynamic Property Measurements: E^* , E' , E'' , Loss Angle, $\tan \Delta$, G^* , G' , G'' , J^* , J' , J''
- Temperature Sweeps
- Frequency Sweeps
- Strain Sweeps
- Creep
- Fatigue
- WLF Master Curves

Ranges

- Frequency Range = 0.001 Hz to 1,000 Hz
- Force Range = $\pm 150\text{N}$
- Displacement Range = $> \pm 6\text{ mm}$

Applications

- Rubber, Plastic, Film and Fiber

DMA

- Kinetic Tests
- Stabilized Temperature Tests
- Temperature Ramp Tests
- Specific Analysis
- Thermo-Mechanical Analysis (TMA)
- Transient Analysis

MTS 312.21 Dynamic Test Unit

The MTS 312.21 Dynamic Test Unit is a hydraulically actuated load frame with load tension and compression capabilities and has static/dynamic programmable cycles. This unit has the stroke capability for special and larger designs.

Capabilities

- Fatigue Testing
- Creep
- Durability Testing
- Specific/Custom Engineering Testing
- Temperature Cycling Chamber

Applications

- Engine Mounts
- Bridge Bearing Pads
- Shock and Vibration Isolators
- Rail Pads
- Special and Larger Design Applications

MB Dynamics Model C10 Electrodynamic Shakers (2)

- 1,200 lbs Force Peak
- 66.6 G Acceleration Peak
- 5-3,000 Hz Peak Frequency
- 1 inch Displacement

Unholtz-Dickie Model T508 Electrodynamic Shaker with Slip Table (1)

- 7,000 lbs Force Peak
- 100 G Acceleration Peak
- 2,000 Hz Max Frequency
- 1 inch Displacement

