

MTS Roehrig EMA Damper Test Systems

Portable, cost-effective linear electric load frames for factory, lab and track

be certain.

ELECTRIC **MTS ROEHRIG EMA DAMPER TEST SYSTEMS** ARE RENOWNED AMONG PRODUCT R&D ENGINEERS, LEADING DAMPER MANUFACTURERS AND RACE TEAM ENGINEERS ALIKE FOR THEIR HIGH FREQUENCY RESPONSE, PROGRAMMABILITY AND UNMATCHED OPERATIONAL EFFICIENCY. COMPACT AND PORTABLE, THEY ARE WELL-SUITED FOR FACTORY, LABORATORY, PROVING GROUND OR RACE TRACK DEPLOYMENT.



Electromagnetic actuation (EMA) technology was born of the racing industry's need for portable, programmable damper characterization solutions.

Perform a Broad Range of Single-specimen Damper Characterization

Responding to industry demands for cleaner, quieter and more economical mechanical testing, MTS now offers MTS Roehrig EMA Damper Test Systems, a complete family of portable, cost-effective linear electric load frames for performing a broad range of single-specimen damper testing applications.

High-performance MTS Roehrig EMA systems are deployed worldwide for single-axis damper characterization and in-line production quality testing, as well as custom applications such as NVH,

high-velocity testing and road profile playback. These systems are renowned among product R&D engineers, leading damper manufacturers and race team engineers alike for their high frequency response, programmability and unmatched operational efficiency. Compact and portable, they are well-suited for factory, laboratory, proving ground or race track deployment.

MTS Roehrig EMA systems feature patented electromagnetic actuation (EMA) technology. Originally born of the racing industry's need for portable, cost-efficient damper test solutions, EMA technology delivers higher velocities at higher forces than mechanical or hydraulic solutions, without having to compensate for the temperature, oil column resonance or friction considerations endemic to those technologies. In addition, electrically-actuated systems require far less capital investment and infrastructure than hydraulic solutions, are cleaner and quieter, faster to setup, and easier to maintain and repair.

Contact MTS today and learn how MTS Roehrig EMA Damper Test Systems can help you meet your specific damper performance testing requirements with ease, efficiency and confidence.

BENEFITS

- » Precise and repeatable performance
- » High frequency response
- » Easy-to-use, programmable
- » Low audible noise
- » Portable, lightweight designs
- » Energy-efficient operation
- » Clean, eco-friendly
- » Streamlined installation – minimal new facility impact
- » Low maintenance requirements

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With the addition of all-electric MTS Roehrig Damper Test Systems, MTS now offers the industry's most comprehensive portfolio of damper test solutions.

The MTS Roehrig EMA System Family

The MTS Roehrig EMA family comprises three standard models of varying peak force capacities: EMA 2K - 2,000 lbf (8.9 kN); EMA 4K - 4,000 lbf (17.8 kN); and EMA 6K - 6,000 lbf (26.7 kN). These models are deployed worldwide for performing in-line production quality testing and a full spectrum of damper

characterization. Several application-specific EMA configurations have also been developed to meet more focused, custom needs, including Noise Vibration & Harshness (NVH), Road Profile Playback, high-velocity testing, elastomer analysis, spring testing, strut testing, and integration into production lines.

STANDARD APPLICATIONS:

- » Damper characterization
- » In-line production quality

CUSTOM APPLICATIONS:

- » Damper NVH
- » Road Profile Playback
- » High-velocity testing up to 8.0 m/sec
- » Strut Testing
- » Spring Testing
- » Elastomer Analysis



EMA 2K



EMA 4K
(with safety enclosure)

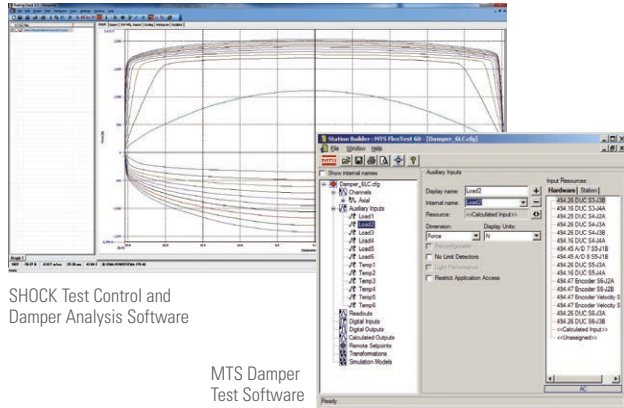


LEMA 2K H
(production line configuration)

Application Software

All EMA systems currently feature industry-proven, Windows-based SHOCK Test Control and Damper Analysis Software. Easy-to-use and versatile, Shock software can be programmed to generate a full spectrum of waveforms, including sinusoidal, triangle, square, sine-on-sine, variable sine, random and frequency sweep. The software also supports the importation of custom waveforms and playback of road load or track data to simulate real-world operating environments.

In the near future, EMA system users will also have the option to run full-featured MTS Damper Test Software. Engineered to meet a complete spectrum of damper testing requirements, this software supports performance, durability and quality assurance applications.



SHOCK Test Control and Damper Analysis Software

MTS Damper Test Software

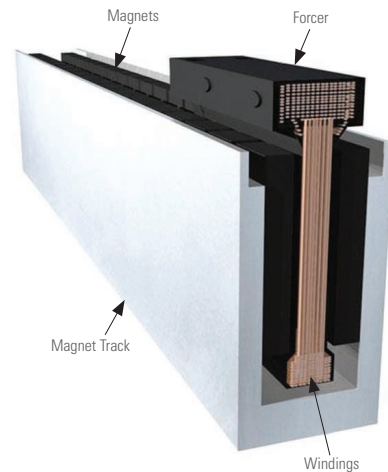
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EMA 6K
(high-velocity configuration)

Innovative Electro-magnetic Actuator Technology

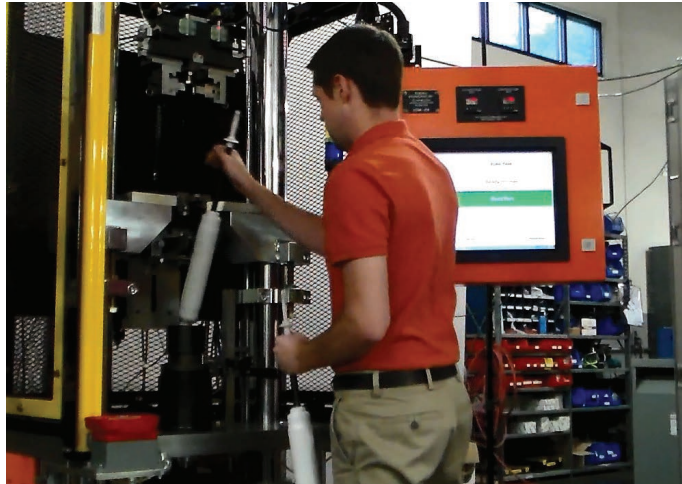
Electro-magnetic Actuator (EMA) technology was developed by Roehrig Engineering, Inc. to provide race teams, Tier 1 OEMs and damper manufacturers/suppliers with a portable, electric damper characterization solution capable of generating a full spectrum of waveforms. To achieve the dynamic force and motion required, these linear electric actuators combine fixed, high-force neodymium magnets with moving ironless core electric motors. The performance and efficiency advantages of this design are numerous. Ironless core linear motors are extremely lightweight, enabling high frequency response and high acceleration. There is no attractive force between the ironless motor and the magnet and therefore no risk of cogging effects that can compromise the velocity waveform. In addition, the motor's focused U-channel magnets minimize radiated electric fields.



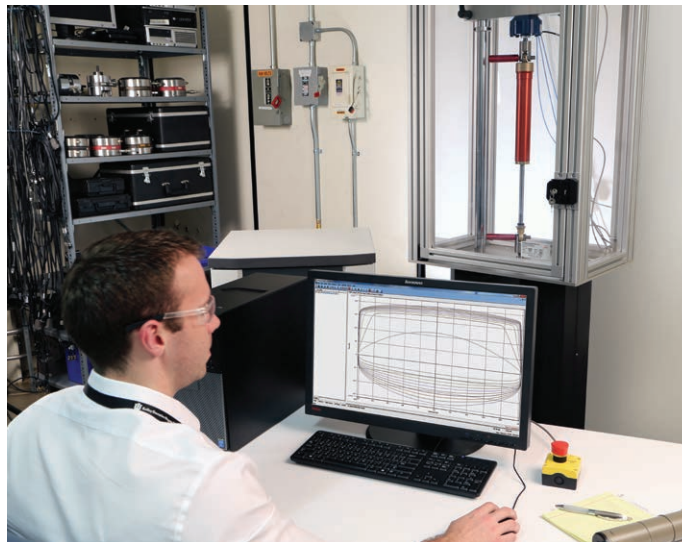
Ideal for all Testing Environments

MTS Roehrig EMA systems are ideal for deployment across a diverse array of damper testing environments, ranging from factory to test lab to proving ground or track:

Factory: EMA system ease of use and low maintenance requirements are especially valued for production quality testing in manufacturing environments, where maintaining high rates of throughput and uptime are critical. The LEMA (Line EMA) systems are tailored specifically for such environments and are available in an H-frame configuration for standalone use or as a C-frame configuration for integration into automated production lines.



Test Lab: The capability to apply complex, programmable inputs and low audible noise (<60 dbA) make EMA systems valuable tools for conducting damper research and development in a test lab environment. A compact system footprint and low infrastructure needs (no need for hydraulic hoses or accumulators) provide for streamlined installation and easy repositioning within the lab, if necessary. Additionally, the fact that linear electric actuators only draw power when a damper test is running aligns well with an emphasis in many labs toward energy efficiency and environmentally friendly operation.



Proving Ground/Race Track: Compact, portable designs make EMA systems the preferred tools for measuring the vehicle dynamics attributes of a prototype at the proving ground or tuning race car dampers at the track - virtually every NASCAR trailer that comes to a track has a portable EMA 2K system on board. In both environments, test speed, efficiency and consistency are critical, so EMA system ease of use and precise, repeatable performance are especially advantageous.



MTS Roehrig EMA System Performance Specifications

EMA Specification ¹	Units	EMA-2K	EMA-4K	EMA-6K
Dynamic Force	kN	8.9	17.8	26.7
	lbf	2000	4000	6000
Static Force	kN	2.1	4.2	6.2
	lbf	475	950	1400
Static Force with Static Load Compensation	kN	7	13	20
	lbf	1475	2950	4400
Peak Velocity	m/sec	4.0	4.0	4.0
	in/sec	157	157	157
Velocity at Peak Force	m/sec	2.5	2.5	2.5
	in/sec	98	98	98
Stroke	mm	203	203	203
	in	8.0	8.0	8.0
Frequency Response	Hz	100	100	100
Temperature Monitoring	Specimen	Non-contacting IR with software monitoring		
	Motor	Non-contacting IR with process meter monitoring		
Digital Encoder Accuracy	μ	1.0	1.0	1.0
Noise Level - Typical	dbA	<60	<60	<60
Load Cell	lbf	2000	5000	10000
	Type	Interface		
Waveforms Supported	Type	Sine, Triangle, Square, Frequency Sweep, Custom Profile		
	Software	SHOCK™ Test Control and Damper Analysis Software		
Bearing Material	Type	Dry Linear Bearing - Maintenance Free Replacement Interval: 2-5 yrs		
Facility Requirements²	V	220	220	220
	A	30	60	100
Air Supply	PSI	100	100	100
	BAR	7	7	7
	CFM	35	35	35

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1. Specifications subject to change

2. MTS can supply transformers for voltages other than 220V III-Phase

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