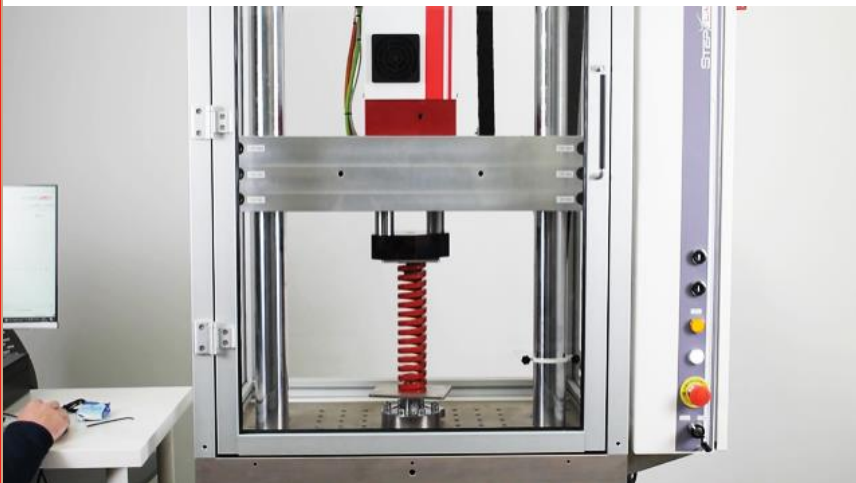


## Electrodynamic Actuators with Linear Motors

Newsletter on Electrodynamic Actuators with Linear Motors



- Electrodynamic Test Systems (Based on Linear Motors)
- Multi-Actuator Systems
- Drop Weight Testing Machines
- Torsional Testing Machines
- High Strain Rate Systems
- Shock Absorber Testing Machines
- Robot-Based Testing Systems

# Electrodynamic Test Systems with Linear Motors

## Features

### Electrodynamic Test Systems with Linear Motors

- Provides high dynamic performance.
- Caters to diverse testing desires and offers precise control over the equipment.
- Highly efficient and low maintenance electric motor.
- Wide range of specifications and utility available.
- Easy installation process.



### Electrodynamic Test Systems with Linear Motor

These high-performance linear motor-based electrodynamic testing machines cater to high-dynamic mechanical testing needs, including high-cycle fatigue and shock absorber testing. They utilize linear motors for precise force and position control in tests on materials and products, enabling cyclic fatigue, static, tensile, and compressive tests at high speeds. Featuring a closed-loop system for accurate regulation of force and displacement, they offer adaptability for diverse testing requirements. Their flexible design allows for easy installation on any structure, and they are compatible with clean room environments, making them suitable for various applications. These electrodynamic systems are available in UD, HUD and XUD series of linear actuators.

UD Series- Designed for continuous dynamic testing over millions of cycles.

- Dynamic Force: 0.7-100 kN
- Static Force: 0.5-60 kN
- Peak Force: 0.5-60 kN
- Test Speed: 2-1 m/s
- Frequency: 250 Hz
- Acceleration: 7-12 G

HUD Series- Designed for high dynamic testing & endurance tests due to high continuous forces.

- Dynamic Force: 4-75 kN
- Static Force: 3-45 kN
- Peak Force: 11-120 kN
- Test Speed: 4-6.5 m/s
- Frequency: 250 Hz
- Acceleration: 25-50 G

XUD Series- Designed for short duration tests with high accelerations.

- Dynamic Force: 1.5-8.1 kN
- Static Force: 1-6.3 kN
- Peak Force: 5.5-31.2 kN
- Test Speed: 6 m/s
- Frequency: 500 Hz; 70-100 G

# Multi-Actuator Systems



## Multi-Actuator System

This system offers an extensive range of dynamic and fatigue test systems, with capacity of up to 200 kN. These systems cater to a broad spectrum of material and product testing needs, facilitating the simultaneous operation of various-sized actuators. The EA Series, comprising Electro-mechanical Actuators, is ideal for tests with accelerations up to 2 g and dynamic loads reaching 200 kN, making it versatile for multi-actuator applications. The UD, HUD, and XUD Series, featuring Electrodynamic Actuators with Linear Motors, can achieve accelerations of tens of G, operating at frequencies up to 300 Hz, and sustaining continuous loads of 40 kN, with peak loads reaching 80 kN. Additionally, the BV Series is tailored specifically for testing requirements involving torsional loads.

Multi actuator system solutions are provided in three types which are as follows:

### Axial Torsion System:

These systems offer optimal solutions for both tensile and torsion testing needs. Available in various load capacities, with torque capabilities reaching up to 200 Nm, their compact design minimizes space requirements while providing exceptional rigidity and alignment.

### Multi-Axial Testing System:

Most engineering structures are affected by complex multi-axial stresses that arise from load inhomogeneity, geometry, and material.

### Planar Cruciform Systems:

Biaxial, low-load testing machine with four high-resolution linear drives horizontally arranged for uniaxial and biaxial testing of natural and artificial elastic tissues.

## Features

### Multi-Actuator System

- This offers a wide variety of dynamic and fatigue test systems, providing options to suit different testing needs and preferences.
- The capability for simultaneous operation of various-sized actuators allows for efficient and comprehensive testing processes.
- The specialized series, such as the BV Series tailored for torsional loads, ensure that specific testing requirements can be addressed with precision and effectiveness.

# Drop Weight Testing Machines

## Features

### Drop Weight Testing Machines

- Wide impact energy range (0.2 to 2000 J) for versatility in testing various products and materials.
- Comprehensive selection of accessories including load cells, anti-rebound systems, spring accelerators, and instrumented impactors.
- Customization options available for developing equipment tailored to specific testing needs.

### Drop Weight Testing Machines

Drop weight testing machines offer a versatile impact energy range from 0.2 to 2000 J, suitable for a diverse range of products and materials. With ample sample placement volume, systems enhance testing capabilities. These machines can be equipped with a comprehensive range of accessories including but not limited to, load cells, anti-rebound systems, spring accelerators, and various instrumented impactors and specimen holders.

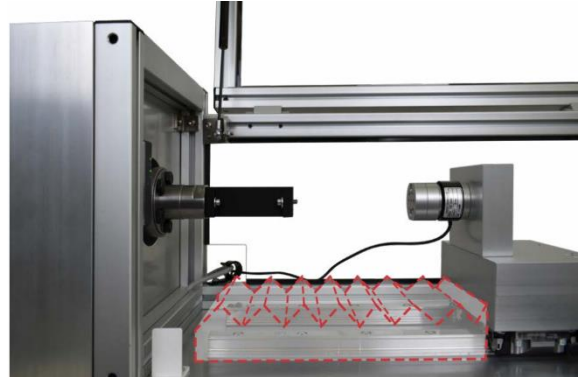
Range of Drop weight towers and impact test systems provide an ideal solution for their test requirements, ensuring accurate and repeatable results. Drop weight testing machines feature direct velocity readout and an automatic impactor recovery and positioning system.

Additionally, the Impact test systems offer easily modified supports, masses, fixtures, and accessories for various tests, including puncture resistance, tensile impact, and compression tests. Customized options are available to develop equipment tailored to specific requirements like:

Spec/Model	DW 750	DW 1000	DW 2000
Impact speed with acceleration	24 m/s	20 m/s	20 m/s
Impact energy	750 J	1000 J	2000 J
Impact Velocity	5.2 m/s	5.2 m/s	5.2 m/s
Force signal resolution	Upto 24 bit	Upto 24 bit	Upto 24 bit



# Torsional Testing Machines



## Torsional Testing Machines

The TM Series of torsional testing machines are designed to exceed the most demanding requirements. Compact yet robust, they seamlessly fit into any lab setup, offering exceptional rigidity and alignment. Powered by STEP Lab's advanced electronics, they are preferred across industries like biomedical, automotive, and aerospace. With dual linear guides for rigidity, direct torque application for zero backlash, and adjustable support locking, they ensure precise testing. Torque transducers spanning 0.2 to 1000 Nm provide accuracy, while Test Centre software offers advanced testing options. Protective features like torsion cell protection and optional preload systems enhance usability and accuracy, making the TM Series the pinnacle of torsional testing.

Specifications' ranges for torsional testing machines are as follows:

- Continuous Torque: 30-520 Nm
- Dynamic Torque: 40-700 Nm
- Max. Test speed: 1000-2000 rpm
- Diameter of spec: 180-200 mm
- Resolution: 0.00069 degrees



## Features

### Torsional Testing Machines

- Exceptional rigidity and alignment due to compact yet robust design.
- Versatility across diverse industries such as biomedical, automotive, aerospace, and more.
- Superior precision ensured by dual linear guide design and torque transducers spanning 0.2 to 1000 Nm

# High Strain Rate Systems

## Features

### High Strain Rate Systems

- High-speed dynamic tests emulate scenarios like car crashes, plane crashes, and munitions explosions, featuring accelerations reaching 40m/s and loads up to 50kN.
- These tests encompass both compression and tensile tests to simulate various high-impact situations effectively.



### High Strain Rate Systems

HTM mechanical systems for high-speed fatigue testing are widely utilized, especially in plastic testing applications. These systems boast high test speeds and broad force ranges, enabling flexible use for both tensile and compression tests. Additionally, they can be outfitted with climatic chambers to facilitate testing at varying temperatures. Their exceptional performance allows for the simulation of extreme tensile situations on materials like metals and plastics, ensuring compliance with ASTM D638 Type 5 and ISO 8256 Type 2 standards.

Specifically designed for High Cycles Fatigue (HCF) tests, they offer the flexibility of operating in multi-actuator or single-actuator mode, with dynamic loads of up to 200kN. With zero maintenance requirements, easy installation, low power consumption, and highly reliable testing, these systems stand as a preferred choice for demanding fatigue testing needs.



# Shock Absorber Testing Machines



## Shock Absorber Testing Machines

Electro-Dynamic Vibration Shaker can be equipped with the slip table to achieve three-dimensional vibration test. The overall load capacity has been improved due to the smaller carrier (table) weight of the slip table, which is able to support payload of larger size and higher weight. The slip table can be divided into the integrated type and split type based on connection, and into the GT, BT and TBT series based on guiding respectively. GT series is available with V-shaped guiding, BT series with hydrostatic guide and with TBT series with medium-pressure rail guiding. The vibration system equipped with the slip table can carry out the X, Y and Z-direction vibration tests for parts/assemblies or entire machines under different temperature and humidity conditions with an integrated environmental testing system.

Following are the series responsible for durability tests, performance tests, quality tests:

- EA series: Reliability
- LUD Series: Performance/Reliability
- UD Series: Performance/Reliability
- EOL Series: End of Line/Quality
- HUD Series: Performance/Quality
- XUD Series: Performance



## Features

### Shock Absorber Testing Machines

- These dynamic mechanical testing systems cater to shock absorbers used in automobiles, motorcycles, and trucks.
- These solutions conduct durability tests, performance evaluations, and other relevant assessments.
- The system lineup comprises of variety of electrodynamic machines like HUD and XUD, as well as electromechanical machines like LUD.

# Robot-Based Testing Systems

## Features

### Robot-Based Testing Systems

- Infinite number of tests the robot can perform
- Highly complex movements
- Easy test programming with Test Center an available software.
- Efficient and low energy consumption
- Simple installation
- Reutilisation of long-term investment

### Robot-Based Testing Systems

STEP Lab specializes in developing and providing modular, dynamic, and precise mechanical test robots capable of achieving high cycle times and remarkable acceleration values. These robot-based testing systems are managed using a specialized version of the Test Center software, facilitating easy management of tests involving 3D movements. They find application in various industries, including automotive and home appliances, for testing doors, seat movements, drawers, and user interfaces.

Additionally, they are suitable for testing any product or system requiring highly complex movements. With a wide performance range, STEP Lab customizes solutions according to specific testing requirements. These systems offer a maximum test speed of 2000 mm/s and a maximum load of 3000 N.

