Servo-Hydraulic Loading Systems

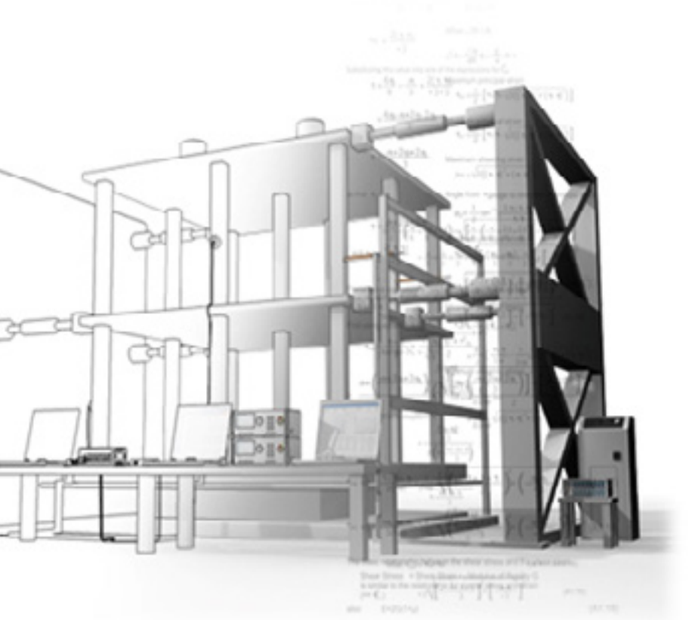
The system is developed by the pioneers of servo-hydraulic loading systems in Turkey : TDG-TESTBOX & IDATEK and is being used for general purpose structure and earthquake tests.

The system can be customized for different force and speed capacities, and installed as a turnkey solution including hydraulic actuator, hydraulic power pack, electronic control system and software.It is possible to use 2 or more actuators in seperate or synchronized modes.

- 20 / 50 / 100 tonf or higher
- Full Control Over Software - Easy and Flexible
- Position Control&Force Control - Instant Transition
- Load Cell and Position Transducer Integrated to the Actuator
- Position Sensitivity up to 0.5 Microns
- Continuous Technical Support

Multi Axes System Designs:

- Synchronization Between Axes
- Force/Displacement
- Special Test Scenarios



A) Quasi-Static Actuators

Capacity: 20 / 50 / 100 tonf or higher

Applications:

- Structural Mechanics Laboratory Tests
- Field Tests
- Push-Over Tests
- Pseudo-Dynamic Tests
- Vertical Load Simulation
- Structural Tests on Reaction Wall

TECHNICAL SPECIFICATIONS	
	ACTUATOR
Force Capacity	100 ton
Stroke	± 250 mm
Max Velocity	10 mm/sec
Position Feedback	SSI Encoder
Position Sensitivity	2 microns
Force Feedback	100 Tons Load Cell
	HYDRAULIC POWER PACK
Flow	28 l/min.
Pressure	210 bar
Installed power	11 kW
Tank Volume	200 l
	ELECTRONIC CONTROL SYSTEM
Control Resolution	16 bit, analog output
Control Type	Closed Loop PID Control with Special Motion Controller
Feedback Types	SSI, Quadrature and Analog

B) Dynamic Actuators

Capacity: Up to 30 tonf dynamic force

Frequency: Up to 30 Hz

Applications:

- Structural Mechanics - Dynamic Tests
- Seismic Isolator Tests
- Cyclic Fatigue Tests
- Shake Tables

TECHNICAL SPECIFICATIONS (Standart 20 tonf Dynamic Loading System)	
	ACTUATOR
Force Capacity	20 ton
Stroke	± 350 mm
Max Velocity	900 mm/sec
Position Feedback	SSI Encoder
Position Sensitivity	2 microns
Force Feedback	20 Ton Load Cell
	HYDRAULIC POWER PACK
Flow	160 l/min.
Pressure	210 bar
Installed power	80 kW
Tank Volume	800 l
	ELECTRONIC CONTROL SYSTEM
Control Resolution	16 bit, analog output
Control Type	Closed Loop PID Control with Special Motion Controller
Feedback Types	SSI, Quadrature and Analog

Multi-axis/Servo-Hydraulic/Field Loading System Developed for ITU

QUASI-STATIC Tests are Moved to the Field!

Civil Engineering Tests are moved to the field. Strucutral Mechanics are now not limited to small scale laboratory test but can be applied on real structures.

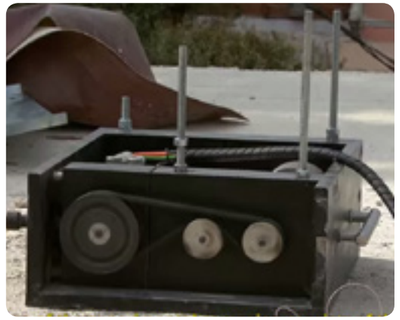
Eccentric Mass Shaker

There are two main methods used in Structural Health Monitoring and dynamic identifications of buildings:

1. Ambient Vibration Tests (Operational Modal Analysis)
2. Forced Vibration Tests

In forced vibration tests, buildings should be exposed to vibrations. However, this vibrations should be in specific frequencies which are controlled by the tester. This allows frequency sweeping over the building. At the same time, the building's reaction is measured and natural frequencies, mode shapes and damping ratios as well as the FRF-Frequeny Responce Function of the structure can be determined. This method is harder to apply compared to ambient vibration tests, however may give more accurate results since the vibrations are well defined and have much higher amplitudes.

Teknik Destek Grubu can manufacture and provide the complete system for test method, including the shaker, measurement system, sensors and software.



Structural Health Monitoring

Frequency Sweeping on Real Structures

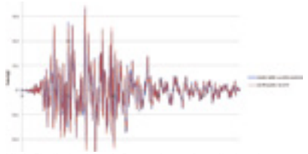
Experimental Modal Analysis

0.5 - 50 Hz Configurable Frequency Range with 0.1 Hz increments

Portable Design

SHAKE TABLES (EARTHQUAKE SIMULATORS)

HIGH-CAPACITY SHAKE TABLE, is designed to test high-scale models, close to real scale. It can simulate any recorded earthquake as well as apply user defined random profiles and common waveforms as sinusoidal triangle, etc.



High Similarity Level: Comparison of applied and measured waveforms on the shake tabe.

- Uniaxial / Biaxial
- Earthquake Simulation
  - Recorded Earthquake Simultaion
  - Virtual Earthquake Simulation
- 20/30 tonf Horizontal Dynamic Force, ±2g Acceleration Capacity
- Frequency up to 30 Hz
- Control Over PC Software
- Common Waveforms :Sinus, Triange, Square
- Unlimited Number of Points in Earthquake and User-Defined Applications
- Position Sensitivity up to 0.5 Microns
- Special Linear Guiding with Low Friction
- Earthquake Tests With Models Close to Real Scale

TESTBOX-SHAKETABLE

Servo-Electrical Small Scale Shake Table

Servo-Electrical Small Scale Shake Table, This DESKTOP SHAKE TABLE is designed for very small scale models and educational/demonstraiton purposes. It can simulate any recorded earthquake as well as apply user defined random profiles and common waveforms as sinusoidal triangle, etc.

- Under-graduate / Graduate Education (Mod Shapes)
- Earthquake / Civil / Geophysical / Soil Eng. Small Scale Tests
- Accelerometer Calibration
- Structural Design Competetion and Model Testing

SERVO-HYDRAULIC LOADING SYSTEMS AND SHAKE TABLES

- Turkey's First High Capacity Earthquake Simulator (Shake Table)
- Turkey's First Single/ Multi Axis Servo-Hydraulic Structural Mechanics Laboratory Loading System
- Turkey's First Multi-Axis Field Test System for Testing on Real Structures
- Turkey's First Eccentric Mass Shaker
- DASK Seismic Design Competetion Technical Solution Partner
- The First and Only Company in Turkey and in the World to Build a Structural Mechanics Laboratory with Authentic Products

Single Axis / Multi Axis
Synchronized Motion Control
High Position and Force Resolution
World Standart Manufacturing Quality
Maintainance Free Mechnalical Design

Test Engineering Support
Price Advantage
Short Lead Time
Strong Technical Support

İTÜ-BOĞAZİÇİ-KANDİLLİ-ODTÜ-KTÜ-DOKUZ EYLÜL-PAMUKKALE-MUSTAFA KEMAL ÜNİVERSİTESİ-BURSA TEKNİK-FATİH-ANADOLU ÜNİVERSİTESİ-ATILIM-SAKARYA ÜNİVERSİTESİ-İSTANBUL KÜLTÜR-ABDULLAH GÜL- NUH NACİ YÜKSEL-ERZURUM TEKNİK-NİĞDE-İZMİR KATİP ÇELEBİ
UNIVERSITY OF HOUSTON-INDIA/BANGALORE-UNIVERSTIY OF GRANADA-THAILAND

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Teknik Destek Grubu

- Structural Mechanics Laboratory Testing
- Earthquake Simulation / Field Testing
- Push-Over Tests
- Pseudo-Dynamic Tests
- Vertical Load Simulation
- Structural Tests on Reaction Wall
- Seismic Isolator Tests
- Cyclic Loading / Fatigue Tests
- Field Tests on Real Structures

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