

# MICROTEST

...providing customized  
materials testing  
solutions



## MICROTEST

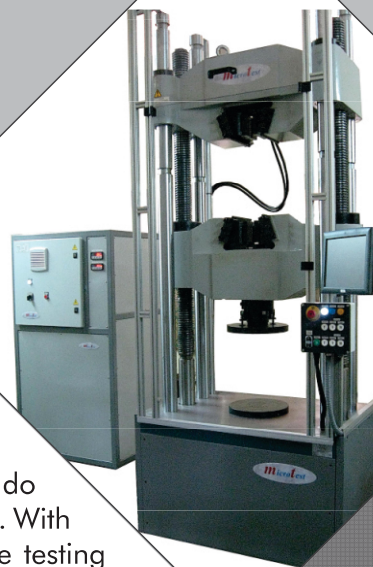
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## Introduction

Offering a diverse range of high quality materials testing systems and solutions, MICROTEST S.A., founded in 1993, is now amongst the leading European companies in the materials testing industry. MICROTEST, S.A. is best-known for its scientific and technical expertise, superior product and service quality, and reliability in materials testing. Our group has great ability to engineer equipment as per individual requirements and applications so that our customers do not have to compromise with their testing challenges. With more than 20 years' experience in the industry, the testing systems provided by us are carefully designed and manufactured to meet the requirements of all common materials testing standards, such as ISO, ASTM, EN, DIN, UNE, BS, TAPPI, JIS, ANSI, NAS, etc.

MICROTEST testing system are high performance and easy to operate, providing an ideal balance between functionality and cost. These testing systems are suitable for performing diverse mechanical tests on a wide variety of materials and components, whether for routine quality control and product testing or research projects and activities. Microtest universal testing systems are extensively used worldwide in universities and research centers as well as a broad range of industries from metals, polymers and composites to concrete, textiles and fibers particularly in the manufacturing, automotive, aerospace, energy, biomedical and construction sectors.

Meeting the criteria of UNE-EN ISO/IEC 17025, MICROTEST calibration laboratory has been accredited by the Spanish National Accreditation Body (ENAC) for the calibration of force measurement instruments according to ISO 376 and verification of static uniaxial testing machines according to ISO 7500-1



## Products

- EM0 Series, Single Column Electromechanical Universal Testing Machines
- EM1 Series, Dual Column Electromechanical Universal Testing Machines with Central Actuator
- EM2 Series, Dual Column Electromechanical Universal Testing Machines
  - EM1/10-50E/H-HTRP Series, Electromechanical Creep Testing Machines
  - EM1/10-50E/H-HTBP Series, Single Lever Arm-Electromechanical Creep Testing Machines
  - EFH Series, Static/Dynamic Servo Hydraulic Universal Testing Machines
  - EFH/2E Series, Dual Zone Test Space Servo Hydraulic Universal Testing Machines
  - ECH Series, Servo Hydraulic Compression Testing Machines
  - F-ECH Series, Creep Compression Testing Machines,
  - Tribology and Indentation Testing Systems
  - Customized Testing Systems and Solutions
    - Biaxial and Triaxial Testing Machines
    - Test Control and Data Acquisition



## Single Column Tabletop Electromechanical Universal Testing Machines, EMO Series

Microtest EMO Series are single column tabletop electromechanical universal testing machines suitable for performing tensile, compression, flexure/bend, shear, friction, peel, tear and low-frequency cyclic tests where the maximum required force is 10 kN and lab space is limited. Under demand machines with capacities higher than 10 kN can also be designed and manufactured.

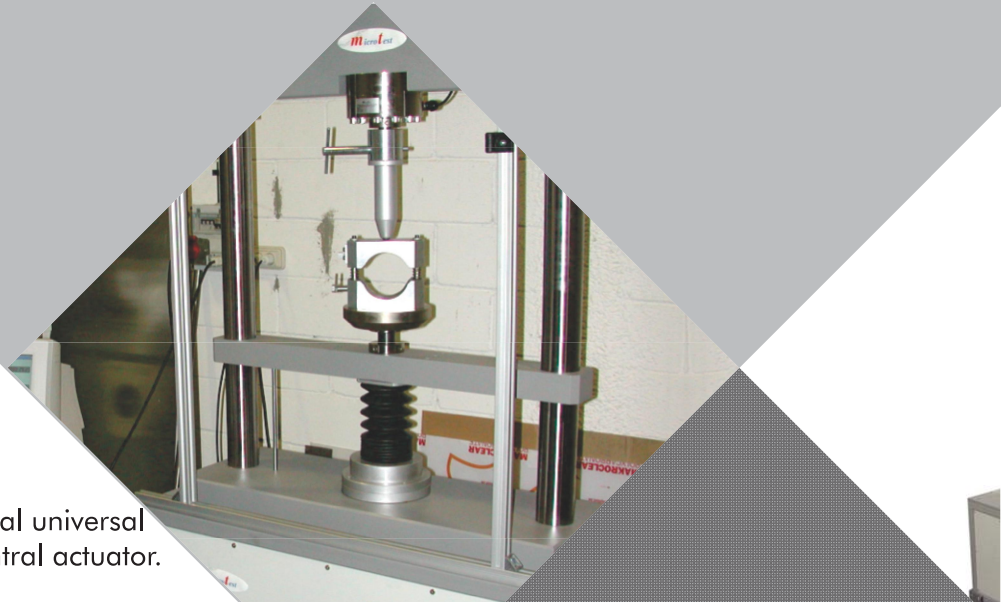
A wide choice of load cells, extensometers, grips, specimen holders, fixtures and other testing accessories allow the EMO Series testing frames to be used for accurate and repeatable mechanical testing of plastics, polymers, composites, rubber, textiles, fibers, wires, cords, yarns, threads, medical devices, small components, thin films, paper products, adhesives, foams and many more.

## Dual Column Table-Top/Floor Electromechanical Universal Testing Machines with Central Actuator, EM1 Series

Microtest EM1 Series are dual column tabletop/floor standing electromechanical universal testing machines with a single screw central actuator.

The test space is configurable to suit the application requirements. For increased usability, the EM1 Series testing machines can be equipped with hydraulic lifts for the upper crosshead. These testing systems are especially suitable for slow speed static (tensile, compression, flexure/bend, shear, friction, tear, peel, etc.) and slow strain rate/quasi-dynamic cyclic (low cycle fatigue, multi-step low frequency cyclic, fatigue creep, creep, etc.) testing over a range of force applications from 10 kN to 300 kN. Under demand machines with higher capacities can also be designed and manufactured.

In EM1 Series universal testing machines, the lower moving crosshead is actuated by a central ball screw and guided by 2 robust guidance columns. Thus, a very good force flow with direct force transmission to the specimen is obtained during mechanical testing. The central ball screw is preloaded for backlash elimination. The precisely-aligned, hard chrome plated guidance columns along with the preloaded central ball screw provide superior axial/lateral stiffness and rigidity for these testing machines.



## Dual Column Table-Top/Floor Electromechanical Universal Testing Machines, EM2 Series

Microtest EM2 Series are dual column tabletop/floor standing electromechanical universal testing machines suitable for performing static (tensile, compression, flexure/bend, shear, friction, tear, peel, etc.) and low-frequency cyclic testing over a range of force applications from 5 kN to 1200 kN. Under demand machines with higher capacities can also be designed and manufactured.

A wide choice of load cells, extensometers, grips, specimen holders, fixtures and other testing accessories allow the EM2 Series universal testing machines to be used for accurate and repeatable mechanical testing of metals and alloys, plastics, polymers, composites, rubber, textiles, fibers, cords & yarns, wires & cables, bolts, fasteners, biomaterials, wood products, building components among many others.

In EM2 Series universal testing machines, the upper crosshead is actuated by double ball screws and guided by two or four robust guidance columns. The lead ball screws are preloaded for backlash elimination. The precisely-aligned, hard chrome plated guidance columns along with the preloaded ball screws provide superior stiffness and rigidity for these testing machines.



## Electromechanical Creep Testing Machines, EM1/10-50E/H-HTRP Series

Microtest EM1/10-50E/H-HTRP Series are dual column floor standing electromechanical testing machines with a single screw central actuator which are well suitable for high temperature creep testing.

These testing machines include a vertical tubular furnace with advanced temperature controller, and are capable of performing creep tests under tension/compression in constant load/stress modes.

The EM1/10-50E/H-HTRP Series creep testing machines can be used to carry out high temperature static, creep, stress relaxation, stress rupture, creep crack growth, creep fatigue interaction, thermos-mechanical fatigue, stress jump/drop, thermal cycling, indirect tensile/compression and small punch tests among many others.

## Static/Dynamic Servo Hydraulic Universal Testing Machines, EFH Series

Microtest EFH Series are static/dynamic servo hydraulic universal testing machines with single test space and two or four robust columns. These testing machines are designed in accordance with individual testing requirements and needs (force capacity, deformation or loading speed, piston stroke, frequency, etc.) to perform only static and/or dynamic tests on a wide variety of materials and components over a range of force applications from 10 kN to 5000 kN.

The EFH Series servo hydraulic universal testing machines can perform a wide variety of static (tension, compression, flexure/bend, shear, etc.) and dynamic (low and high cycle fatigue, crack propagation, fracture toughness, etc.) tests. These testing machines can be readily designed and configured with appropriate sized servo valve, manifold and hydraulic power unit to suit the intended testing applications.

Developed by MICROTEST specifically to meet the requirements of dynamic materials testing applications, SCM4000 testing software provides the necessary platform and tools for running many dynamic tests. Advanced modules of SCM4000 software allow any standard or custom test to be run.

## Dual Zone Test Space Servo Hydraulic Universal Testing Machines, EFH/2E Series

Microtest EFH/2E Series are dual zone test space servo hydraulic universal testing machines with Long and adjustable test spaces for tensile (on top) and compression (on bottom). These testing machines are available in a number of high stiffness six column load frame configurations, all supported by a compact and ergonomic air-cooled hydraulic power supply. The EFH/2E Series testing systems are suitable for static (tensile, compression, flexure/bend, shear, etc.) and low frequency cyclic testing over a range of force applications up to 2000 kN.

The EFH/2E Series servo hydraulic universal testing machines can be used for accurate and repeatable testing of metals and alloys (sheet, plate, bar/rod, rebar, pipe/tube, structures, welds, castings, forgings), structural components, fasteners, chains, springs, cables, wires, wood, rock, pavement, concrete (cubes, cylinders, beams) and many more.

Open-front crossheads with hydraulic wedge action grips simplify test specimen insertion/removal and improve operator's safety and throughput.



## Servo Hydraulic Compression Testing Machines, ECH Series

Microtest ECH Series servo hydraulic testing machines are designed for high capacity compression testing of construction materials, such as concrete cylinders/cubes/blocks, ceramics, rock, stone, wood, etc. Designed with operator safety of critical importance, these ultra-stiff testing frames are ideally suited for advanced testing of concrete. The ECH Series testing machines are available in capacities ranging from 50 kN to 5000 kN. Under demand machines with higher capacities can also be designed and manufactured.

The ECH Series servo hydraulic compression testing machines are designed based on the strength, shape and dimensions of the specimens to be tested. These requirements determine the capacity of the frame, the type of spherical seat and the platen dimension.

Heavy-duty, ultra-stiff design of the ECH testing machines makes them ideal for day-to-day concrete testing as well as concrete mix research and development.



## Creep Compression Testing Machines F-ECH Series

Microtest F-ECH Series hydraulic testing machines are designed to perform creep compression tests on concrete, rock, soil or new materials specimens. The duration of this type of test may range from days to several years. These ultra-stiff testing machines are available in two or four column load frame configurations.

The F-ECH Series hydraulic testing machines are built in capacities ranging from 100 kN to 5000 kN. Under demand machines with higher capacities can also be designed and manufactured. Heavy-duty, ultra-stiff design of the F-ECH testing machines makes them ideal for concrete mix research and development.

## Tribology and Indentation Testing Systems

MICROTEST engineers a family of advanced equipment for instrumented tribological characterization and indentation studies of a wide range of materials. These equipment include:

- Pin-on-Disk Tribometer, MT
- Micro Indenter and Scratch Tester, MTR3
- Abrasion Wear Tester, MTDA
- Multi-Function Tribometer, MTEM4

### Pin-on-Disk Tribometer, MT

Microtest Pin-on-Disk tribometer provides highly accurate and repeatable wear and friction testing using rotary or linear motions compliant to ISO and ASTM standards.

The tribometer determines the magnitude of friction and wear as two surfaces rub against each other. A pin or ball probe of a desired material is placed on the disk-shaped sample and loaded with a precisely known normal force. The sample is either rotating or reciprocating in a linear track. The resulting frictional forces acting between the probe and the sample are measured. Additionally, the wear for both the sample and probe is calculated from the volume of the material lost during the term of the test. The normal force, temperature, wear rate, friction coefficient, number of turns, rotation/reciprocation speed and all other testing parameters are registered and displayed in real time.

The Pin-on-Disk tribometer is compatible with medium/high temperature (furnace), lubrication (spray), electrical resistance contact, tribo-corrosion and triboscopy options to meet individual tribological testing requirements.





## Micro Indentation and Scratch Tester, MTR3

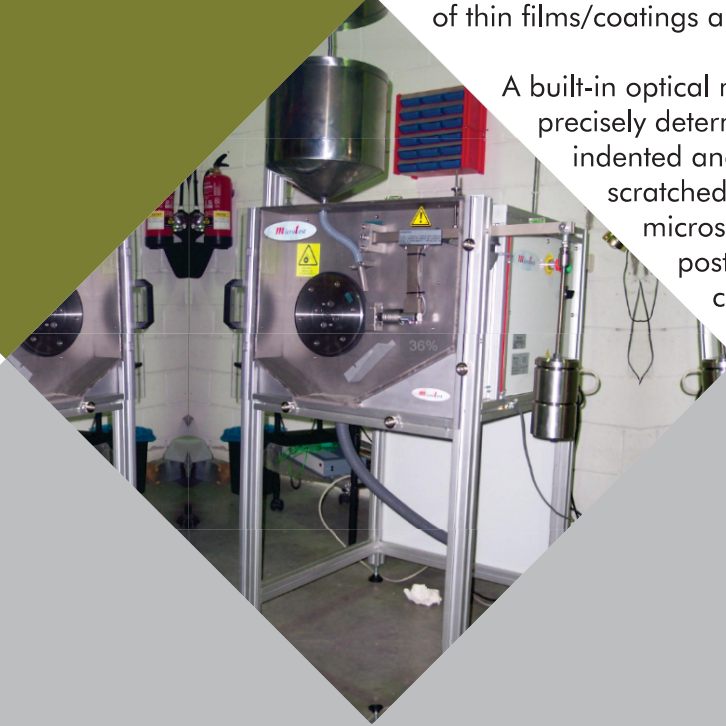
Microtest Indentation and Scratch tester is a high precision, instrumented testing equipment used for characterizing the mechanical properties of thin films, coatings and substrates among the others.

During indentation testing, an indenter (Vickers, Rockwell, Berkovich, etc.) normal to the sample surface is penetrated into the sample by applying an increasing load up to a preset value. The load is then gradually decreased until partial or complete relaxation of the sample occurs. The depth-versus-load curve obtained through indentation can be used to calculate the hardness and elastic modulus of almost any type of soft, hard, brittle or ductile material.

During scratch testing, a sharp tip (commonly diamond or WC) normal to the sample surface is drawn across a selected area under constant, incremental or progressive load.

Scratch testing is generally carried out to characterize the scratch resistance and surface mechanical properties (adhesion, fracture and deformation) of thin films/coatings and substrates.

A built-in optical microscope is used to precisely determine the points to be indented and the areas to be scratched. Besides, this microscope can be used for post indentation/scratch characterizations



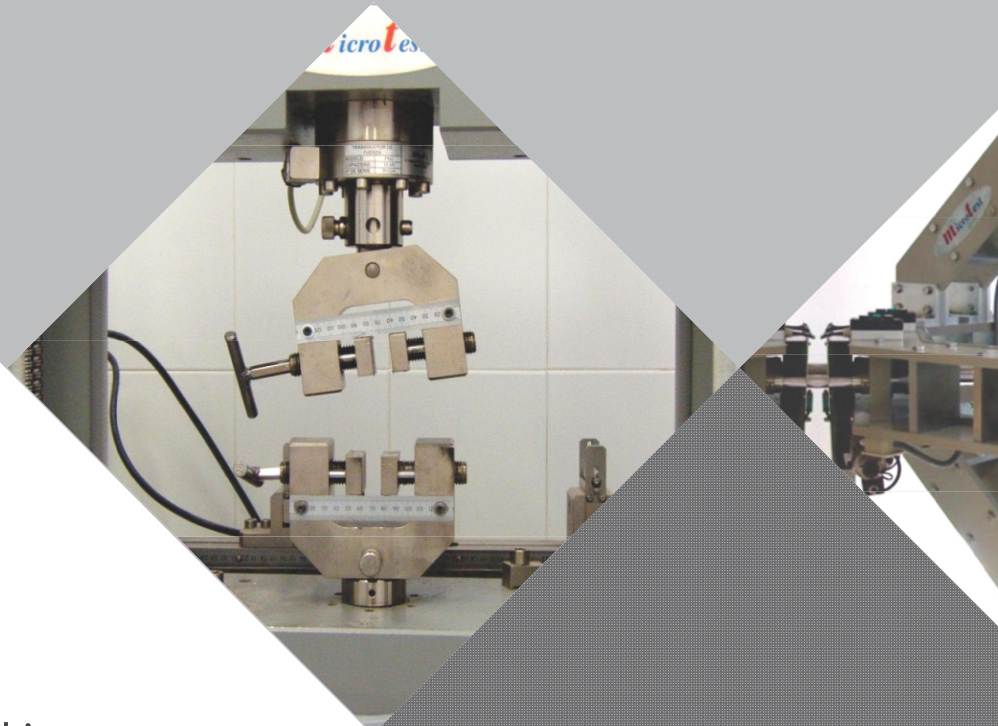
## Abrasion Wear Tester (MTDA)

Microtest Abrasion Wear tester has specifically been designed to perform abrasion tests in accordance with ASTM G65 (standard test method for measuring abrasion using the dry sand/rubber wheel apparatus), ASTM G105 (standard test method for conducting wet sand/rubber wheel abrasion tests) and ASTM B611 (standard test method for determining the high stress abrasion resistance of hard materials).

## Customized Testing Systems and Solutions

MICROTEST has great capability to design and manufacture customized equipment and systems according to individual testing requirements and intended applications.

- Testing equipment with special features and functionalities, such as high capacity or stability, high temperature testing, multiaxial testing, etc.
- Transducers with special requirements in dimension, measuring range, working temperature, etc.
- Control and measurement systems for specific purposes, such as medical instruments, materials R&D equipment, etc.
- Software packages for test control and data acquisition



## Biaxial and Triaxial Testing Machines

Servo-controlled biaxial and triaxial (multiaxial) testing machines feature high-stiffness, precision-aligned load frames with 4 (biaxial) or 6 (triaxial) high performance actuators mounted in-plane and perpendicular to one another. The actuators work in pairs and can be individually controlled and programmed to provide independent or synchronized force, displacement or strain control.

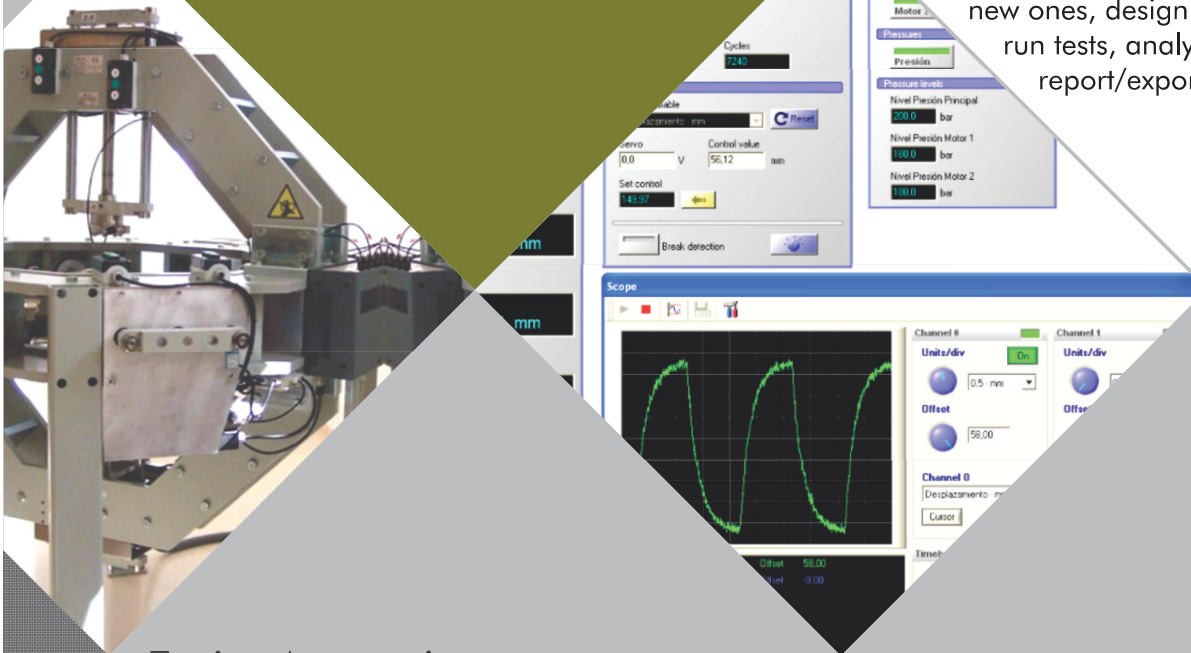
Using an advanced control system to provide translation and deformation control of each axis, these testing machines are ideal for large strain field coverage in two-axis and three-axis tensile and fracture tests over a range of force application from 5 kN to 500 kN. Under demand machines with other capacities can also be designed and manufactured.

## Test Control and Data Acquisition

When coupled with Microtest digital closed-loop servo control systems, the SCM3000 and SCM4000 testing software (developed for static and dynamic testing respectively) enhance the capabilities and versatility of Microtest testing machines for accurate and repeat able mechanical testing of materials, components and finished goods. SCM3000 and SCM4000 are powerful, yet easy-to-use interactive software which feature advanced test control, data acquisition and export options.

Designed and developed by MICROTEST specifically to meet the requirements of the most demanding materials testing applications, the SCM3000 and SCM4000 testing software offer the optimum solution for any testing requirement. Using these software, the user can manually or automatically control all of the functions of the testing system, providing ultimate convenience of operation.

The SCM3000 and SCM4000 software comprises a set of modules, including Configuration, Methods Editor, Test Control, Data Analysis and User Management. Each designed for a specific purpose, these modules provide utmost flexibility to modify the preset standards-compliant test methods or create new ones, design complex test sequences, run tests, analyze test data and report/export results.



## Testing Accessories

The utility of Microtest testing systems is further extended by a broad choice of accessories, including:

### Fixtures

- Flexure/bend fixtures
- Friction test fixtures
- Peel test fixtures
- Burst/puncture fixtures
- Composite fixtures
- Ceramic fixtures
- Paper and board fixture
- Wood fixtures
- Biomedical fixtures
- Food fixtures
- and many more

### Grips

- Mechanical grips
- Pneumatic grips
- Hydraulic grips
- Fatigue rated grips
- Clevis type grips
- Threaded/button end grips
- Fasteners grips
- Cord and yarn grips
- Wire and cable grips
- Self-tightening grips
- and many more

### Other Accessories

- Compression platens
- Jaw faces, specimen holder
- Pull/push rods
- Load cells
- Extensometers
- Environmental chambers
- Furnaces
- Coupling adaptors
- Alignment devices
- Specimen preparation tools
- and many more



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