

Multi Function Tribometer MFT-2000



Friction, Wear, Scratch Hardness & Resistance, Coating Adhesion, Friction Coefficient, Roughness, 3D Topography, Film Thickness



Research and Quality Control

- Rotary Friction
- Linear Friction
- Wear
- Hardness
- Adhesion
- Mar Resistance
- Surface Roughness
- Volume Wear

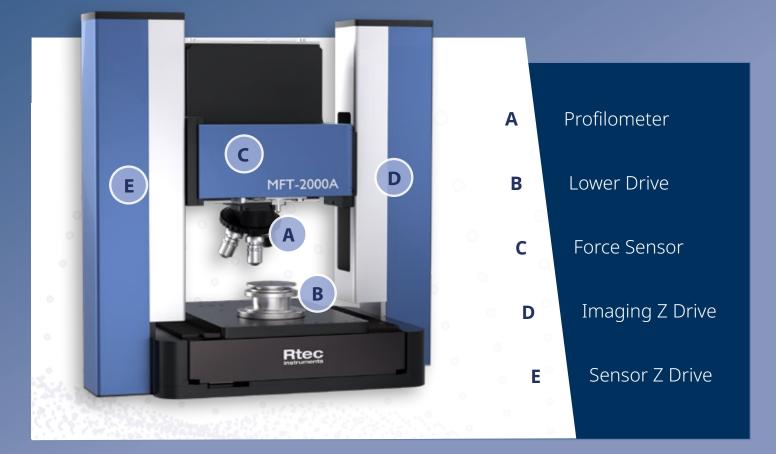
Servo Control Downforce Control Real-time downforce control - linear & constant load

Wide Load Range - Nano and Micro Load cells with forces from mN to 100 N

In-line 3D Optical Inspection Generate sub-nm 3D images of the surface during the test

Environmental Control Control temperature with high-resolution controllers

Scratch, Tribology, and Material Tests XY stage & force control enables wide application use



Automation and Analysis

Introduction

The Multi Function Tribometer MFT-2000 is a versatile and technologically advanced benchtop tribometer for essential mechanical, scratch, and tribological characterization. An open platform architecture design, fully automated test programs, and advanced controllers allow for high repeatability and precision measurements. In addition, the servo control load, patented multidimension force sensors, and XY stage enable the MFT-2000 to run several tests covering scratch, tribology, wear, mechanical tests, and profilometry on the same platform.

Active Feedback Loop Control

The tester comes with closedloop active feedback controls over many channels. The applied force is controlled during the test using electro-servo drives. The force is measured using high-precision force sensors with negligible drift. The tester can operate at constant or linear changing force profiles. The rotation speed is controlled using servo-controlled feedback. This allows tests at constant or changing RPM. The tester comes with several environmental control options. The temperature controller simultaneously maintains chamber temperature and measurements at multiple points.

Accurate Determination of **Failure Events**

The tester can accommodate various in-line monitoring sensors to quantify real-time surface dynamics.

during the test.

Ease of Use and Automation

The instrument comes standard with a powerful set of software, from control to post-analysis and imaging software. The data can be exported into many formats, including ASCII format. The software allows the user to stop the test using logic based on signals from several in-line sensors. Each test can be controlled by a series of command blocks forming a protocol or "recipe." The MFT-2000 has advanced high speed, low noise, fast feedback, and multiple channel data acquisition rate controllers.

Integrated Imaging

The MFT-2000 comes with a patented in-line 3D profilometer. This sub-nm profilometer provides quantification of topography (roughness, volume wear, cracks, step height, etc.) with nm resolution. This allows the creation of high-resolution maps of surface change vs. time. In addition, the XY stage allows for easily and quickly stitching entire wear tracks.

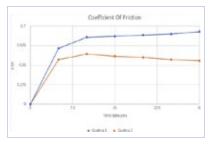
Applications

The versatility of the tester allows the MFT-2000 to play an essential role in several applications. It can be used for thin or thick films, lubricants, materials, soft materials, hydrogels biomaterials, smooth or rough surfaces, transparent or opaque surfaces, nano or macro scale, coating or bulk materials, and more.

For example, the acoustic emission sensor is a wide frequency sensor that detects crack initiation points



Wear Mark Profile



Friction Comparison



Software Interface





Rotary Drive



Reciprocating Drive

Platform Specification

XY stage

•Range: 150 x 200 mm •Position repeatability: 1 μm •Maximum speed: 50 mm/s

Multiple Z stage

•Range: 150 mm •Resolution: 0.1 µm, 0.02 µm •Max speed: 10 mm/s

Computer console

 Latest Windows OS ·LCD monitor, printer

Facilities requirement

•Power: 240 VAC, 50/60 Hz

Environmental chambers (optional)

•-35°C up to 1000°C •5 to 95% RH •Liauid

Surface Inspection

Various Imaging Modules

•3D Microscope •White Light Interferometer Confocal Microscope

Various Other Modules

•Tribo-corrosion •Acoustic Emission •Electrical Resistance

Test Modules

Various Mechanical Heads

•Tribometer

- Indentation
- •Scratch

Lower Drives

Easy to interchange drives. Several combinations of speed and torgue available

- Rotary Drive
- •Fast Reciprocating Drive

A Rtec-Instruments Office

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•Linear Stage



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