Rtec instruments

Multi Function Tribometer

MFT-2000

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

ACCREDITED
MSCB-132
Certified ISO 9001:2015

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 multi-dimension 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 closed-loop 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. For example, the acoustic emission sensor is a wide frequency sensor that detects crack initiation points during the test.

Ease of Use and Automation

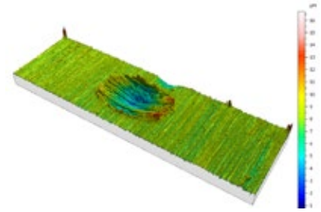
The instrument comes standard with a powerful set of software, from control to post-analysis and imaging software. The data can be exported into many formats, including ASCII format. The software allows the user to stop the test using logic based on signals from several in-line sensors. Each test can 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

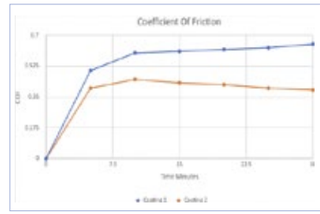
The MFT-2000 comes with a patented in-line 3D profilometer. This sub-nm profilometer provides quantification of topography (roughness, volume wear, cracks, step height, etc.) with nm resolution. This allows the creation of high-resolution maps of surface change vs. time. In addition, the XY stage allows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



Wear Mark Profile



Friction Comparison

Software Interface

Force Sensor

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
- Liquid

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 torque available

- Rotary Drive
- Fast Reciprocating Drive
- Linear Stage

▲ **Rtec-Instruments Office**

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