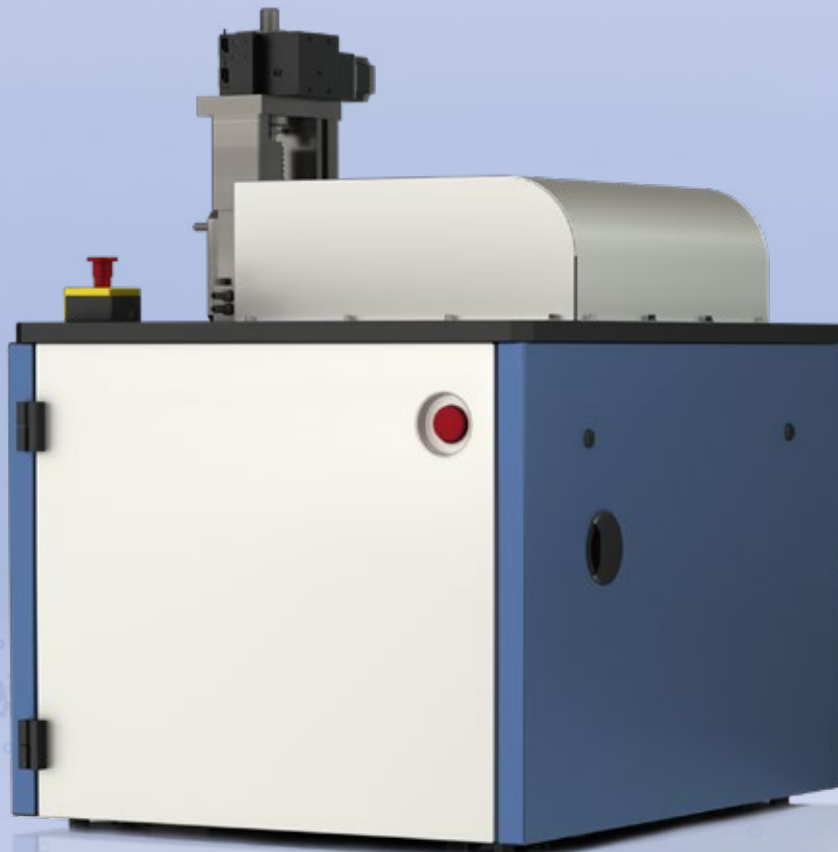




Micropitting Tester

MPT-3000



Pitting, Rail Friction, Rolling Mill,
Sliding-rolling Contact, Traction Coefficient



Certified ISO 9001:2015

Research and Quality Control

- Elastohydrodynamic lubrication
- Electric vehicle
- Surface treatments
- Hydraulic fluids
- Pitting
- Rail friction
- Rolling mill
- Sliding-rolling contact
- Traction coefficient
- Traction fluids

Wide Load Range - Micro and Macro

Load cells with forces up to 5000 N

Rotation Speed Control

Servo-controlled high torque, high-speed motors

Environmental Control

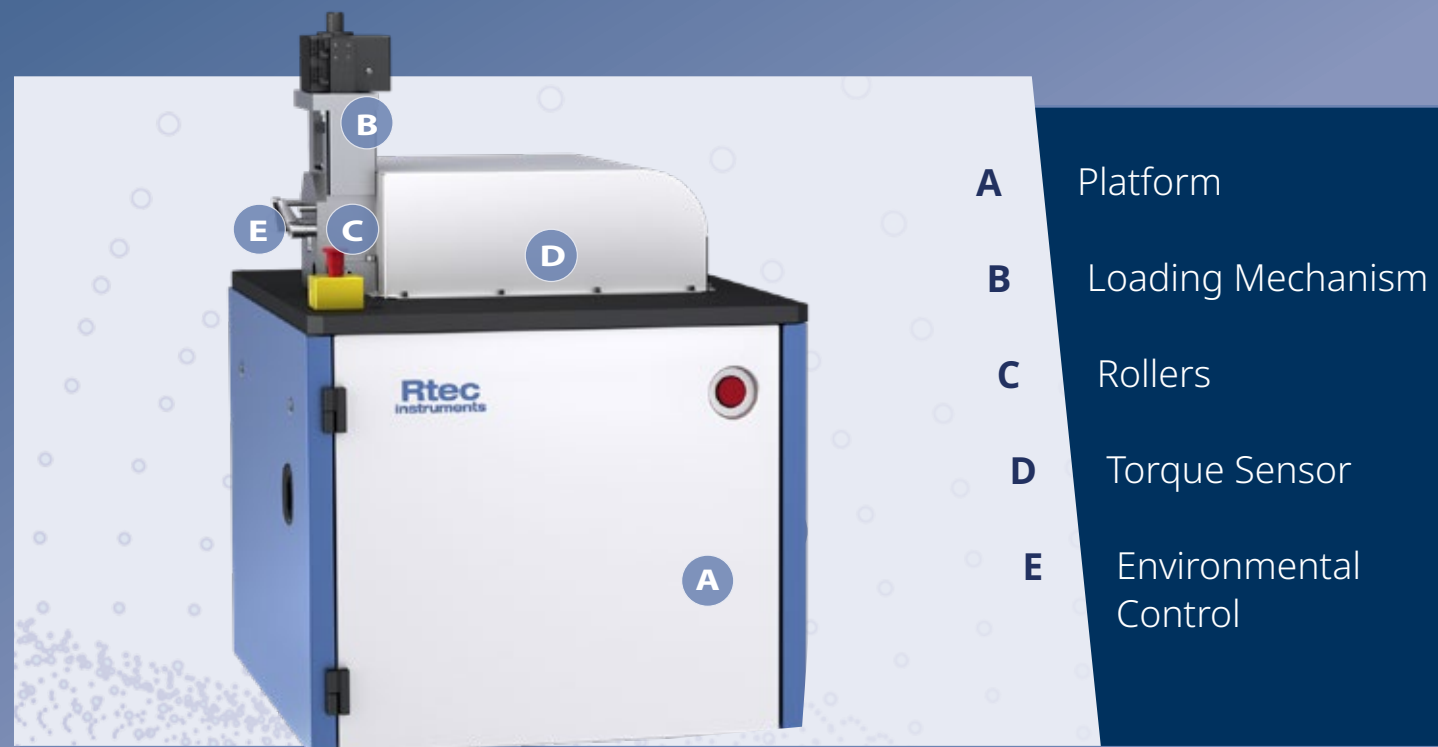
Control temperature with high-resolution controllers

High Torque Motors

High torque motors (up to 60 Nm*) for smooth rotation and a wide range of testing

Run Several Million Cycles in a Short Duration

Several In-line Sensors to Monitor Real-time Surface Interactions



Automation and Analysis

Introduction

Rtec-Instruments' Micropitting Tester or Triple Disk Roller, the MPT-3000 is an ideal rolling contact machine to study pitting, traction, wear, and more under various combinations of rolling and sliding. The open platform architecture allows for easy access to the samples and setup. In addition, the fully automated and advanced controllers allow for high repeatability and precision measurements with the broadest test range in load, temperature, and speed.

Active Feedback Loop Control

The tester comes with closed-loop active feedback control over many parameters.

Rotation speed - Controlled using servo-controlled feedback. The tester can run at a constant or changing RPM.

Applied force - Controlled using electro-servo drives. The force is measured using high-precision force sensors with negligible drift, all while operating at constant or linear changing force profiles.

Environmental Control - The tester allows for testing across a wide temperature range. In addition, the test can be run under dry or lubricated conditions.

Accurate Determination of Failure Events

The MPT-3000 can accommodate various in-line monitoring sensors to quantify real-time surface dynamics. The software allows the user to stop the test using logic

based on signals from several in-line sensors. For example, users can put stop test conditions such as:

“when friction increases by 30% or when the acoustic sensor shows a failure initiation signal, stop the test”. This condition allows the user to do a post-analysis of the sample the moment failure starts to happen. A few commonly used sensors are:

A) Torque Sensor - Patented high-resolution in-line dynamic torque sensor to monitor change in generated frictional forces.

B) Acoustic Emission - Wide frequency sensors to detect crack initiation points during the test.

Ease of Use and Automation

The instrument comes standard with a powerful set of software:

Each test can be controlled by a series of command blocks forming a protocol or “recipe.” The data can be exported into many formats, including ASCII format.

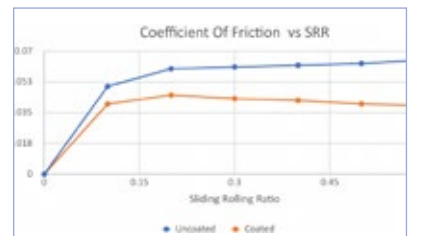
The MPT-3000 comes with advanced high speed, low noise, fast feedback, multiple channels, and controllers with the highest data acquisition rate (200 KHz).

Applications

Wide testing conditions allow the MPT-3000 to be used across several applications, such as automotive, aerospace, lubricant, railways, coatings, EV vehicles, motors, turbines, and much more.



3 Rollers During Test



Data Showing Friction vs. Sliding Rolling Ratio



Side View of the MPT-3000



Software Interface

Platform Specification

Loading Stage

- Motion resolution: 0.1 μm
- Maximum speed: 1 mm/s

Load

- Max load: 5000 N

Computer Console

- Latest Windows OS
- LCD monitor

*Higher ranges available

Additional Sensors

- Acoustic emission
- Electrical resistance
- Potentiostat

Rotary Drive

- Pure rolling
- Pure sliding
- 0 to +/- 200% SRR (sliding/rolling ratio)
- Standard torque 60 Nm*
- Standard speeds
 - Center pin = 4 m/s (@6500RPM)
 - Outside rollers = 18 m/s (@6500RPM)
 - Rolling Velocity = 4 m/s (@SRR=0 Pure Rolling)

Facilities Requirement

- Power Requirements: 220 / 380 / 480 VAC

Environmental

- 35 $^{\circ}\text{C}$ to 150 $^{\circ}\text{C}$
- Dry or with liquids



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