Twin Roller Tester

TwinRoller-3000

Traction, Roller Contact Fatigue, Wear,
Pure Rolling, Pure Sliding, Combo Rolling Sliding

Certified ISO 9001:2015

Research and Quality Control

- Elastohydrodynamic lubrication
- Gear lubricants, materials
- Surface treatments
- Hydraulic fluids
- Pitting
- Rail friction
- Rolling mill
- Sliding-rolling contact
- Traction coefficient
- Traction fluids

Independent Control of Both Rotations

Servo-controlled high torque, precise rotation motors

Wide Load Range - Nano and Micro

Load cells with forces from 1 N to 8000 N

In-line 3D Optical Inspection

Generate sub-nm 3D images of the surface during the test

Environmental Control

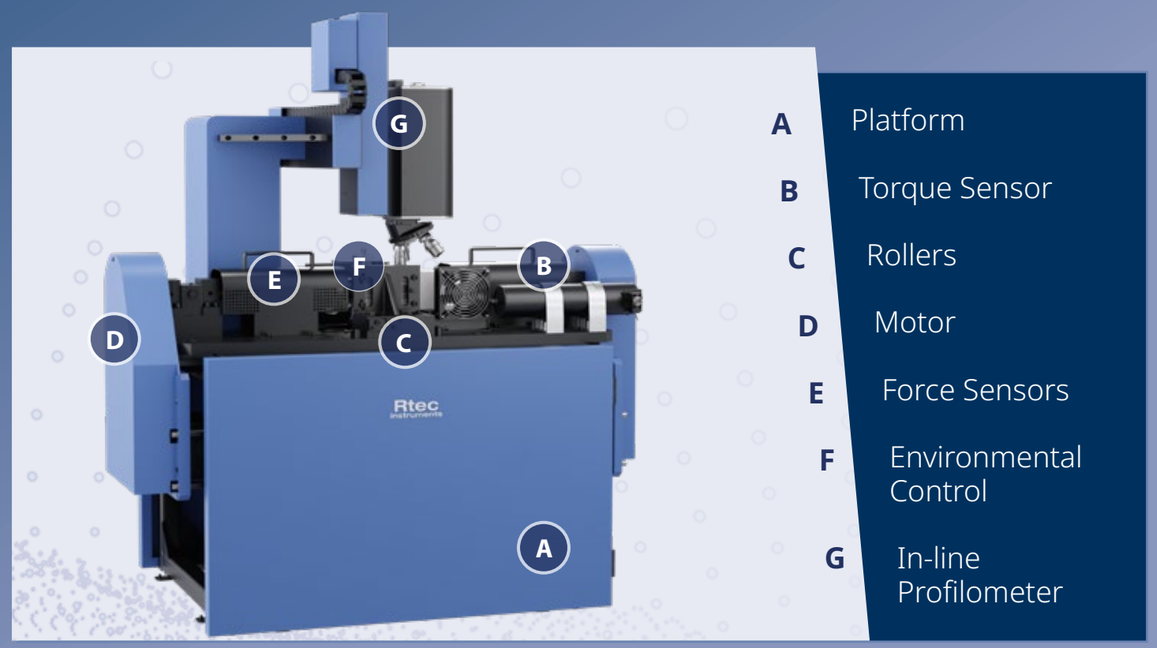
Control temperature with high-resolution controllers

Custom Sample Holders

Unique design to allows for wide sample sizes

Two Independently Controlled High Speed Rollers

Several In-line Sensors to Monitor Real Time Surface Interactions



A	Platform
B	Torque Sensor
C	Rollers
D	Motor
E	Force Sensors
F	Environmental Control
G	In-line Profilometer

Automation and Analysis

Introduction

Rtec-Instruments' TwinRoller-3000 is an ideal twin roller machine to study traction, wear, and rolling contact fatigue under various combinations of rolling and sliding. The tester comprises two high torque independently controlled servo motors with an open platform architecture that allows easy access. Force is applied using electro-servo drives. The tests are done under controlled environmental conditions and run dry and lubricated setups. Lubricants can be contained in a container or circulated during the test. Fully automated test programs and advanced controllers allow high repeatability and precision measurements.

Active Feedback Loop Control

The HFRR tester comes with closed-loop active feedback controls over many parameters. The rotation speed is controlled using servo-controlled feedback, allowing constant or changing RPM testing. The applied force is controlled during the test using electro-servo drives. The force is measured using high-precision force sensors with negligible drift while operating at constant or linear changing force profiles. The tester comes with several environmental control options. The advanced temperature controller allows temperature measurement at multiple points simultaneously.

Accurate determination of failure events

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

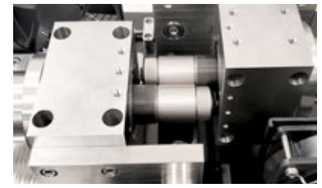
The instrument comes standard with a powerful set of software, including tester control, post-analysis, and imaging. Each test can be controlled by a series of command blocks forming a protocol or "recipe." The data can be export into many formats, including ASCII format.

The software allows the user to stop the test using logic based on signals from several in-line sensors. For example, the user can put the stop test condition 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.

The TwinRoller-3000 has advanced high speed, low noise, fast feedback, multiple channels, and the highest data acquisition rate (200 kHz) controllers.

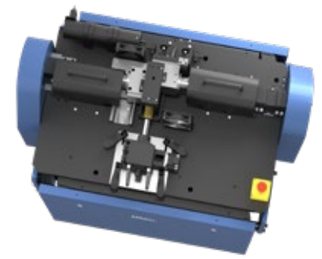
Applications

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



2 Rollers During A Test

Data Showing Friction vs. Sliding Rolling Ratio



Top View of the TwinRoller-3000

Software Interface

Platform Specification

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

Load
- Max load: 5000 N / 8000 N*

Computer console
- Latest Windows OS
- LCD monitor
- 16 bit data acquisition

*Higher ranges available

Additional Sensors
- Acoustic emission
- Eddy current
- In-line Wear
- Potentiostat

Rotary Drive
- Pure rolling
- Pure sliding
- 0-200% Sliding/rolling ratio
- Standard torque 60 Nm*
- Standard speeds up to 3000/6000 RPM*
- 30 to 60 mm diameter*

Facilities Requirement
- Power Requirements: 220 / 380 / 480 VAC

Environmental
- -35 °C to 150 °C
- Dry or with liquids

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