High Frequency Fretting Rig
FFT-M

HFRR To Test Diesel, Oil, Additive, Gasoline

Real Time Down Force, Temperature, Humidity, Displacement Control
From 5 micron Stroke, up to 500Hz Frequency

ASTM, DIN, ISO Compliant
Next Generation High Frequency Test Rig

ElectroMotion Actuators

RTEC bench top high frequency fretting tester characterizes the lubricity of diesel fuels, screen the lubrication performance of engine oils and additives, test coating performance and life etc. The tester can run standard HFRR and next generation tests on an easy to use automatic tester.

High speed controllers to monitor and control the stroke in real time even at 500Hz reciprocal motion makes this tester an ideal tool in hands of researcher or quality control team.

The tester is very easy to use and it typically takes less than 10 minutes to train and use.

Fretting & Reciprocating Tests

ASTM, ISO, DIN Compliant

01
Small Controllable Stroke - 5 Microns to 4mm
Real time stroke, frequency monitoring and correction using LVDT up to 500Hz

02
Real Time Down Force Control
Force can be changed during the test automatically

03
High Reliability - No Bearings, Flexure design
The flexural suspension guides the magnet assembly without contact or lubrication.

04
High Frequency Response Friction Sensors
Piezo based sensors that can measure friction force with ultra high accuracy.

05
Close Loop Temperature And Humidity
Humidifier with real time humidity control 5-95% Rh, dual temperature measurement

Unmatched Performance
HFFR For R&D And Production Needs

Enclosure
The partially sealed enclosure allows to do tests under gases and also keep the ambient noise out.

Down Force Control
The applied forces can be controlled to gram force ranges with ease. Real time correction to account for sample wear, force change. The force can be maintained constant or changed during the test.

High Accuracy Position Control
The most accurate and precise displacement sensor control on the market. Up to 1nm resolution and micron level of accuracy. Extremely low noise High responsiveness for dynamic performance of system

Environmental Controller
To generate meaningful data the tester comes with controller environmental chambers - temperature and humidity. Dual high resolution thermocouple allows to measure heater temperature and the oil temperature independently.

Voice Coil - Precise Waveform Control
Without the friction of rolling or bearings, the magnetic flexure based design provides the control required for the most sensitive of tests. The motor controls the smallest of increments of waveform change precisely to stroke control.

Friction Measurement
The tester comes with advanced piezo sensors to measure real time friction at high frequency. Ultra low noise amplifiers allows to detect minute changes in friction in real time with ease.

In-line Sensors
Sensors such as Acoustic emission to detect onset of cracks, ECR to measure surface resistance change allows to gain more insight on the test interface.

Liquid Containers, Sample holder
Liquid and sample holder both for standard and non-standard tests. The holders and liquid container are easy to customise based on specific application need.

3D Imaging using Rtec Lambda Profilometer
3D Wear Scar Mark
Wear Scar 3D Mark
Volume Wear

Test Data, Fretting Loops
Wear Scar 3D Mark
High Frequency Data
Fretting Loops
Software
The tester comes with a powerful operation, statistical and image analysis software. All softwares are windows based and are very easy to learn and operate. The software allows to run the tool in advanced mode for experienced users or just push a button mode for new users or operators. The data can be saved in proprietary format or in ASCII format.

- Stop Criteria
- Recipe based software
- Very easy to use
- Collection of test libraries
- Remote control of platform
- Advanced statistical analysis package

Specification Summary

Platform
• Bench top
• FFT-M1 Peak Z force 1000N
• FFT-M2 Peak Z force 300N
• Enclosure

Actuators
• Displacement 5um-4mm
• Resolution: 0.1 um
• Oscillation frequency: up to 500Hz

Environment
• Up to -40, 180, 500C
• Humidity controlled chamber

Sensors
• Acoustic sensor
• Electrical Contact Resistance
• Potentiostat

Standard Samples
• 3, 4, 5, 6, 9, 12 mm balls
• 10mm, 25mm diameter disks

Computer Console
• Control Software and Data Analysis Software,
• Windows 10 Operating System
• CD-RW drive, Network interface
• Monitor, keyboard, mouse

Standard Test with Reference Oil/Disk
Confirm to ASTM D6079, ISO 12156, EN 590, CEC F-06-A, JPI-5S-50 and IP 450.
Standard reference oils (high and low viscosity) and disk provided for calibration.