



A ball-on-plate reciprocating friction and wear test system, assessing the performance of both fuels and lubricants under boundary conditions.

specified

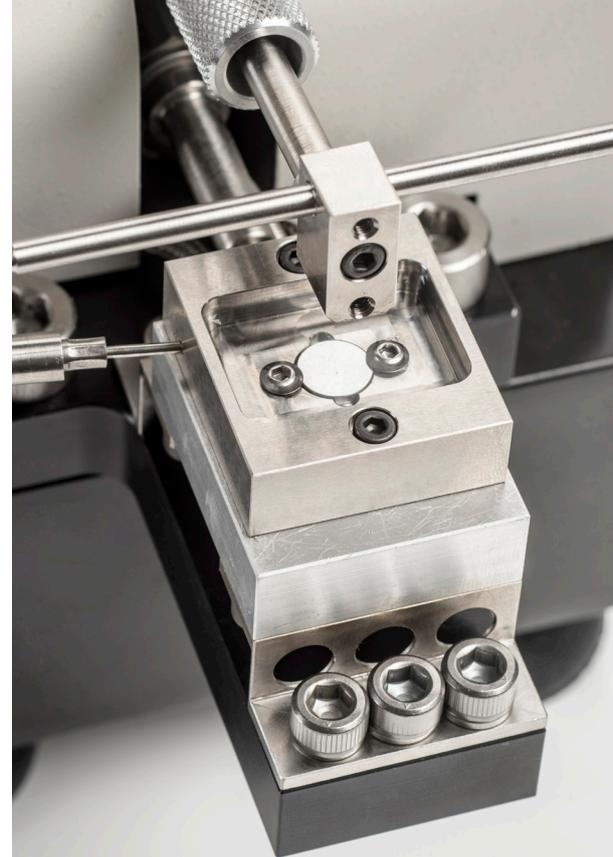
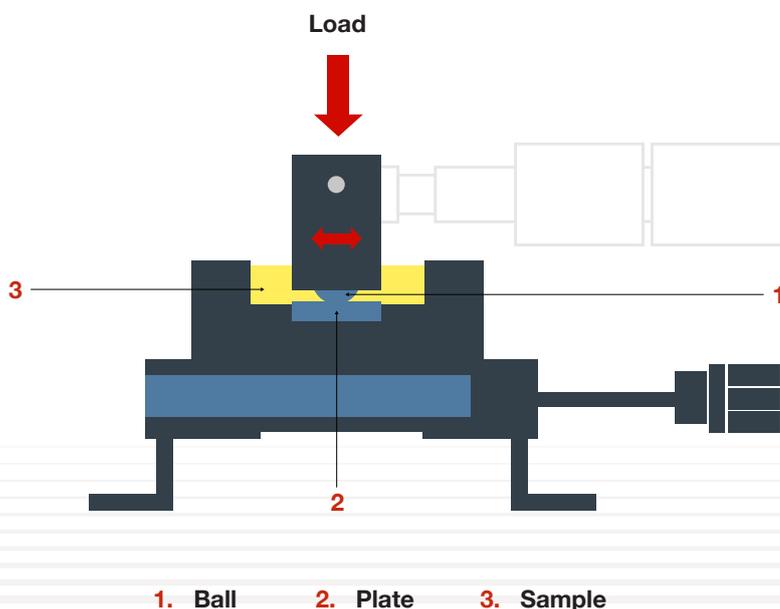
With over 2000 systems worldwide, the PCS HFRR is the industry leading instrument for analysing diesel fuel lubricity. PCS are the original manufacturers of the HFRR instrument, which has been used in the development of all the current related test methods. With over 30 years of development experience and continual design, quality, and user experience improvements, we remain at the forefront of the market.

PCS Instruments is the only instrument supplier specified on the following test methods: ISO 12156, ASTM D6079, ASTM D7688.

Our latest version of the HFRR allows for fully automated testing. A wide range of accessories are available, including the humidity cabinet and temperature control unit (TCU). These enable labs, operating even in harsh conditions, to meet the requirements of the standard diesel fuel lubricity test methods.

The instrument's ability to collect continuous friction measurements, the wide range of specimen materials available, and the ability to customise test parameters also make the HFRR a popular choice for tribology research.

Test Area Schematic:



Features & Benefits:

Manufactured and assembled in West London using high-quality components for unrivalled system longevity, robustness and repeatability of results

Automated test reports provide full traceability between labs

Fully integrated optical package for wear scar measurements improves accuracy of results

Removeable upper and lower specimen holders enable fast turn around between tests

Small sample volume decreases running costs

Compact design keeps required lab space to a minimum

Fully automated software reduces user intervention time

Simple calibration procedure and test setup reduces training requirements



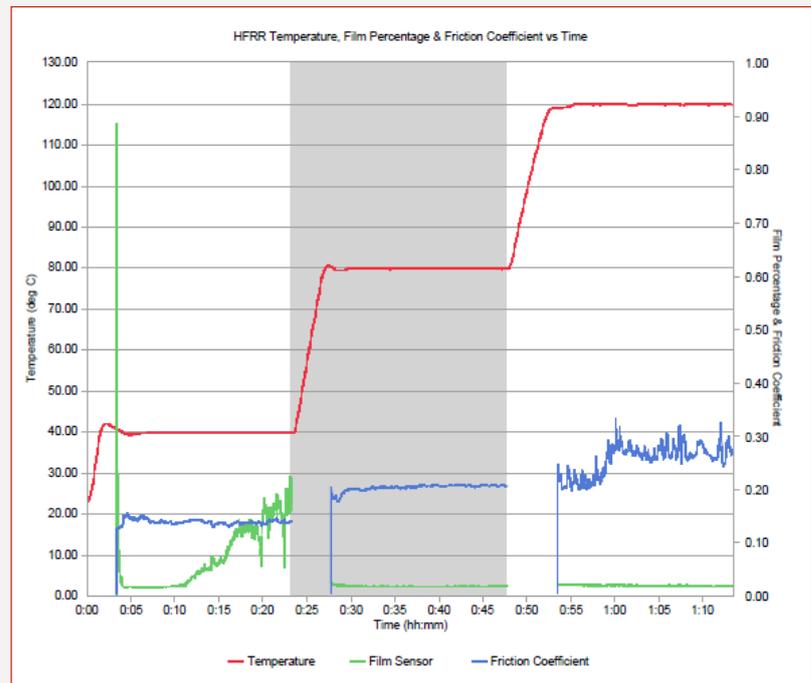
Principle:

The ball and plate specimens are fitted to the upper and lower sample holders, which are then attached to the instrument and the sample fluid added. The test load is applied using a suspended weight, and the test conditions are set in the PC software either automatically, if running a standard test, or by the user for bespoke tests.

During a test, the ball is rubbed against the plate and the friction force is measured using a piezo force transducer and recorded by the software. At the end of the test, the wear scar on the ball is measured to determine the lubricity of the sample.

Results:

Screenshot of the HFRR software during a lubricant test



Applications:

- ≡ Diesel fuel lubricity testing
- ≡ Gasoline testing
- ≡ Grease behaviour research
- ≡ Evaluation of marine engine lubricants
- ≡ Investigation into fretting



▲ Microscope and wear scar camera

Wear scar image of the ball after a test



Technical Specification

The HFRR system comprises a separate electronic and mechanical unit. An optional PC is also available with data logging software.

Industries

TEST PARAMETERS

Load	1 - 10 N
Contact Pressure	Up to 1.4 GPa
Frequency	10 to 200 Hz
Stroke Length	20 µm to 2.0 mm
Temperature Range	Ambient to 400 °C*
Test Sample Volume	2 ml

CONTROL SYSTEM

PC	Custom software running on Windows 10
Safety Checks	Dual Platinum RTDs for temperature measurement, alarm temperature probe
Power Supply	100-240 V, 50/60 Hz, 80 VA

DIMENSIONS & WEIGHT

Control Unit	
Weight	8 kg – 18 lb
Size (h x w x d)	150mm/6in x 305mm/12in x 380mm/15in
Mechanical Unit	
Weight	24 kg – 53 lb
Size (h x w x d)	195mm/8in x 150mm/6in x 330mm/13in



*using additional accessories

For further information or a demo,
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