

SPECIFICATION

Methods	ISO 12156 (A, B), ASTM D7688, ASTM D6079, IP 450
Frequency	10...200 Hz
Stroke length	2 µm...2 mm
Load	0...1000 g, using weights in increments of 100 g
Maximum friction force	amplitude dependent, maximum 10 N
Temperature	ambient... +150 °C
Ball requirements	6 mm diameter
Plate requirements	10 mm diameter, 3 mm thickness
Condition monitoring system	multilevel access, control of humidity and air temperature in the climate chamber, sample temperature sensor installation control, door position control, calculation of WS1.4
Power supply	100-240V, 50/60 Hz, 320 W
Heaters	Two 24 W cartridge heaters
Climate chamber characteristics	humidification up to 80% dehumidification down to 10% heating up to 35 °C cooling down to +15 °C
Custom functions	chemically resistant 7 inch color touch screen storage for up to 2000 experiments the ability to transfer data to LIMS keyboard and mouse connectivity barcode scanner connectivity
Connections	1 × Ethernet, RJ 45, 4 × USB, Bluetooth, Wi-Fi
Accessories	set of equipment for determining the lubricity of gasoline, printer, standard solution, ball-plate test specimen
Dimensions WxDxH	550x500x850 mm excluding the wear scar measurement system
Weight	60 kg

Due to the constant developments in the analyzers construction, technical characteristics may change without prior notice.

DISTRIBUTOR

MANUFACTURER



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HFRR-MONO

Automated diesel fuel lubricity test system

ASTM D6079
ASTM D7688
ISO 12156 (A, B)
IP 450



FRESH SOLUTIONS FOR YOUR LAB

- All in one: control unit, climate chamber, test module, air preparation unit, computer, storage chamber for balls-plates in a single case
- Specified temperature and humidity are automatically maintained in the climate chamber
- Embedded PC: displays test parameters and processes

- Several tests can be carried out using a single disk plate by its repositioning in the device
- Automatic calculation of wear scar WS 1.4
- Microscope with measurement capabilities conforming to one of two methods: method A - with a digital camera, method B - with visual observation
- The most compact instrument on the market

Test procedure

The HFRR High Frequency Reciprocating Rig (HFRR Reciprocating Rig) is based on devices that have been used for many years in the Tribology (Friction and Lubrication) Department of the Faculty of Engineering at Imperial College London.

Systems of this type are used to determine the lubricity of a sample during slow cyclic sliding. The HFRR system has proven particularly useful in assessing the lubricity of diesel fuels.

The HFRR system uses an electromagnetic motor to provide low-amplitude oscillations of a moving specimen pressed against a stationary specimen. The amplitude and frequency of these vibrations can be changed. In this case, the friction force between the samples and the voltage drop at the point of contact between them are measured.

The lower, fixed specimen is secured in a small tray containing the lubricant to be tested. The lower specimen holder is equipped with an electric heater. Testing specimen of various shapes is possible. The reference materials for testing diesel fuels are a 6 mm ball for the upper specimen and a 10 mm disc for the lower specimen.

Test results			
User:	Admin	Method:	ГОСТ ИСО 12156
Sample name:	СОП	Test time:	01:15:00
Air humidity, %:		Air temperature, °C:	
Before the test:	52.8	Before the test:	25.3
After the test:	40.3	After the test:	24.9
MWSD:	395	HCF:	60.00
AVP:	1.49	WS1.4:	389.86

While using Techno's HFRR, you have two main reasons to be sure of the test results you get:

Our rig outperforms leading devices in both repeatability and reproducibility, while also having a better mechanical design.

The temperature and humidity in the climate chamber are fully controlled by the device, thus the risk of human error is mitigated.

The advantages of the HFRR system

- Best repeatability and reproducibility of measurement results;
- The possibility of assessing the wear spot of standard samples using only one measurement;
- A very small amount of lubricant is sufficient, so testing of experimental lubricating fluids is possible;
- The ability to observe the formation of a thin film because of surface additives through the change in voltage at the point of contact;
- The ability to measure sliding friction at large amplitudes of specimen movement, as well as wear due to friction using the same system.

Method editor			
Method Name:	ISO 12156		
Chamber temperature, °C:	23,0	Frequency, Hz:	50
Air humidity, %:	50	Stroke length, mm:	1,00
Sample temperature, °C:	60,0	Test time, min:	75
Applied load, g:	200		

HFRR-MONO = Monoblock: control unit, climate chamber, test module, air preparation unit, computer, storage chamber for balls-plates in a single case

We know that many laboratories have problems with space, so we tried to make the instrument compact. The device has relatively small dimensions and weight, so it can be easily placed on a regular table.

Automatic maintenance of the set temperature and humidity in the climate chamber

The device has the ability to automatically maintain the temperature and humidity without operator intervention. The climate chamber has humidification, dehumidification, cooling and heating functions. The innovative dehumidification and cooling system is small in size and does not require maintenance throughout its life.

Integrated data processing and color touchscreen display

The built-in data processing system automatically controls the process and analyses the test results. This system allows you to build graphs with a choice of parameters and scaling, and also automatically calculates WS1.4. The HFRR-MONO is capable of remote firmware updates. Data export to LIMS can be performed after analysis is complete, or data can be saved to the internal memory for up to 2000 experiments.

Several tests on one plate for research purposes

The ability to carry out several tests on one plate by changing its position in the device. The plate holder design allows multiple tests to be carried out, which can significantly help save on consumables.



High Frequency Reciprocating Rig	
User:	Admin
Sample name:	SAMPLE
Method:	ISO 12156
Sample temperature, °C:	25.2
Air humidity, %:	21
Air temperature, °C:	24.5

