FRICTION AFTER POLISHING TESTING DEVICE HTHY PSRT-2

STANDARD: EN 12697-49

This laboratory instrument applies the Wehner/Schulze method to accurately measure post-polish friction on asphalt, concrete, and other material samples.It accommodates samples of various sizes to realistically simulate tire-road skid resistance behavior. The system' s testing technology has been aligned with international industry standards while maintaining the original measurement principle.

FEATURES

- The use of stainless steel provides excellent corrosion resistance and extends the service life of the equipment.
- The test chamber is equipped with an acrylic protective cover to prevent water splashing while allowing clear observation of the experimental process.
- The four-station design facilitates convenient operation and improves efficiency.
- An independent calibration station avoids operational errors caused by repeated installation of standard reference plates.
- An upgraded mixer and water pump are used for mixing and pumping abrasive materials, enhancing experimental efficiency.
- The main skid resistance measurement platform incorporates a high-precision torque measurement system and a fully automated testing program, enabling more convenient and accurate wear and skid resistance performance testing.
- A new corrosion-resistant temperature control system ensures precise and reliable temperature management during experiments.
- The equipment supports programmable test processes, including polishing, cleaning, and measurement, improving experimental flexibility and accuracy.
- It is equipped with a high-quality industrial controller with a touchscreen and graphical display, allowing simultaneous monitoring of measured values and the testing process, while providing multiple control modes and functions with graphical output.

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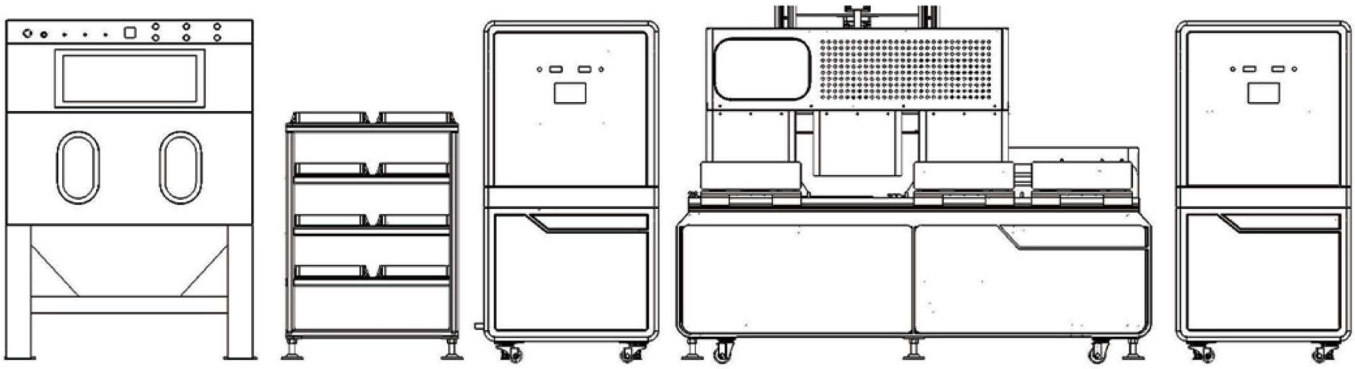

Fully Automatic Abrasion Blasting Unit | Specimen Storage Rack | Quartz Powder Mixer | Dynamic Friction Testing Main Unit | Control console

EQUIPMENT COMPOSITION

Fully Automatic Abrasion Blasting Unit	Test specimens can be either cores extracted from the field or prepared using a laboratory compaction machine. For laboratory-prepared specimens, which have not been subjected to long-term traffic loading, the abrasion blasting process is used to remove the surface asphalt film as much as possible, thereby accelerating the polishing efficiency.
Specimen Storage Rack	Primarily facilitates the storage of test specimens, ensuring they are kept under identical conditions and enabling convenient handling for testing operations.
Quartz Powder Mixer	During the polishing process, a continuous flow of water containing quartz powder is injected. This accelerates the polishing action and shortens the overall polishing time.
Dynamic Friction Testing Main Unit	The main unit comprises a Polishing Station, a Cleaning Station, a Friction Testing Station, and a Calibration Station.
Temperature Control System	Primarily provides set temperatures for the Polishing Station, Cleaning Station, and Friction Testing Station.
Standard Reference Plate	The Standard Reference Plate is a panel with a known and stable friction coefficient, characterized by its high durability and uniform friction properties. It is used to verify the accuracy of the testing unit by comparing the measured friction coefficient against its certified value.

CORE TESTING SYSTEM

MAIN UNIT

The dynamic friction testing main unit comprises four stations: the Polishing Station, Cleaning Station, Friction Measurement Station, and Calibration Station. These stations are interconnected via parallel guide rails, allowing specimens to slide smoothly between them. During testing, this design eliminates the need for manual specimen relocation, facilitating easier operation while enhancing testing accuracy.

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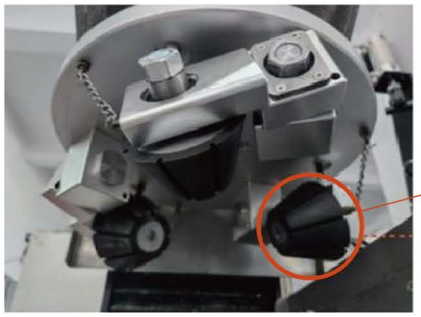
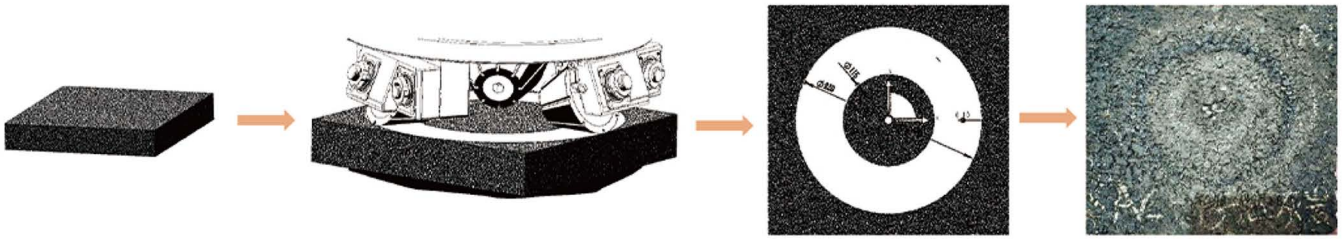
POLISHING STATION

- After installing the pre-treated specimen, adjust the position of the abrasive wheel to align it with the required polishing wheel.
- Set the desired polishing pressure and rotation speed.
- Supply the quartz powder mixture to the polishing interface.
- The polishing head, driven by an electric motor, applies the preset pressure to the specimen and begins rotational polishing.
- Upon reaching the pre-set number of cycles, polishing stops, and the polishing head returns to its home position.



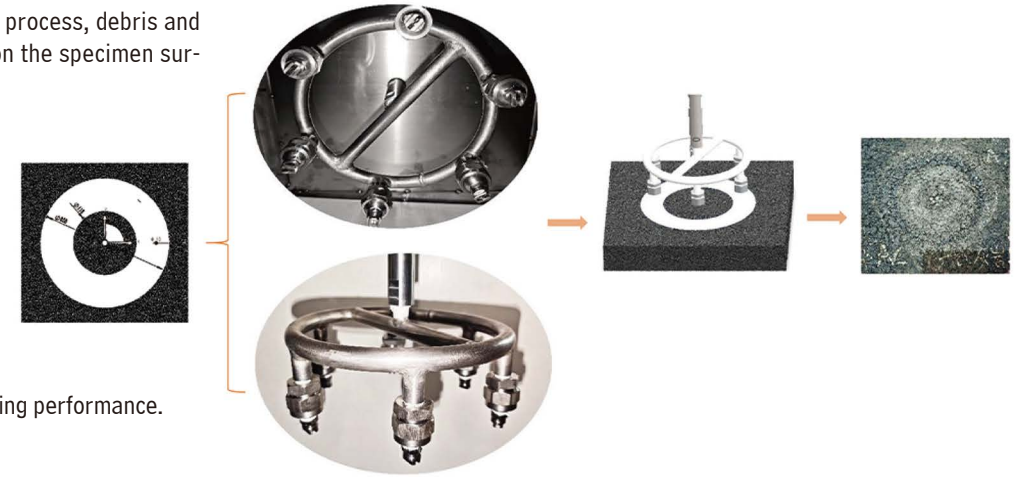
SPECIFICATIONS

Polishing wheel	D1＝Φ36 ± 1mm, D2L: Φ80 ± 1mm，Height: (57.5±0.5)
Polishing ring width	Φ115mm-230Φmm，±1mm
Polishing gyratory speed (RPM)	Ormp~600rmp
Polishing Head Pressure (kPa or N)	392N±3N
Specimen Dimensions (e.g., Length × Width × Height in mm)	300mm×300mm×(40~100)mm
Quartz Powder Mixture Flow Rate (L/min)	5L±0.5/min
Quartz Powder Mixture Temperature (°C)	15°C±1°C
Specimen Clamp Dimensions (mm)	300mm×300mm×50mm



CLEANING STATION

Upon completion of the polishing process, debris and residual quartz powder remain on the specimen surface. Prior to friction testing, the specimen must be cleaned using a water rinse method. The specimen is transferred from the Polishing Station to the Cleaning Station via the guide rails and securely fixed. Depending on the specific condition of the specimen, the nozzle angle and height can be adjusted to achieve optimal cleaning performance.



SPECIFICATIONS

Cleaning head rotation speed	adjustable from 10 to 20 rpm
Cleaning head height	adjustable from 70 mm to 90 mm
Nozzle angle	120°
Water flow rate	5 ± 1 L/min

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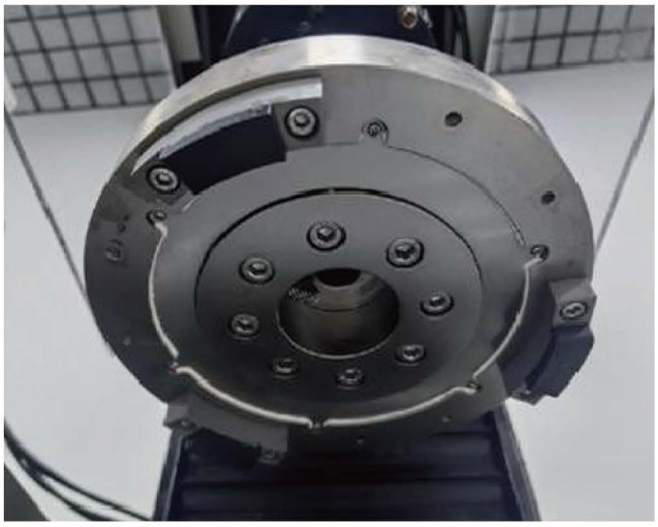
MEASUREMENT STATION

The Measurement Station is the core component of this equipment, designed to measure the friction coefficient within the polished area of the specimen. The measurement principle is based on the ratio of the frictional force acting on an object to the vertical applied pressure, which defines the friction coefficient.

A high-speed rotating measurement head decelerates uniformly from a linear velocity of 100 km/h to 0 under the effect of friction. Throughout this process, high-precision sensors capture the frictional force and normal pressure, which are then used to calculate the friction coefficient.



SPECIFICATIONS

Test area	Φ115mm~230mm，±1m
Maximum rotational speed	3000rpm
Maximum linear velocity	1:105km/h
Pressure sensor	4kN±1N
Torque transducer	15 mNm
Speed Sensor	encoder
Water temperature	14°C±2°C
Water flow rate	20L/min

CALIBRATION STATION

The rubber block on the measurement head may change under the following two circumstances, affecting the friction coefficient test:

1. Long-term storage: The rubber may age, which affects its friction properties.
2. Repeated testing: Its surface will wear down, which also affects the friction coefficient.

To ensure testing accuracy, when either of these situations occurs, the measurement unit must be calibrated. The calibration method is as follows: The calibration unit is moved to the measurement station via the guide rails. By measuring standard reference plates with different known friction coefficients, corresponding readings are obtained. The measured values are then compared to the certified values of the standard plates to establish a correlation, which is used to correct the test results of the specimens.

The equipment is supplied with three standard reference plates made of different materials for performing periodic calibration of the machine.

SPECIFICATIONS

Dimensions	300mm×300mm×10mm	300mm×300mm×15mm	300mm×300mm×15mm
Material	Etched glass	Glazed tile with sandblasted surface	PC synthetic stone
Friction coefficient	0.07	0.17	0.23

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AUXILIARY SUPPORT SYSTEMS

SPECIMEN PRETREATMENT SYSTEM

The specimen pretreatment system consists of an abrasion blasting main unit, a dedicated spray gun, and a fully automatic rotating turntable. The enclosed blasting environment minimizes environmental pollution and protects the operator from airborne particles and dust. A large, high-definition viewing window facilitates observation and operation.

Specimens are loaded through the side door. A dust separator equipped with a filter and exhaust fan is integrated into the instrument and is accessible from the rear for cleaning.

SPECIFICATIONS

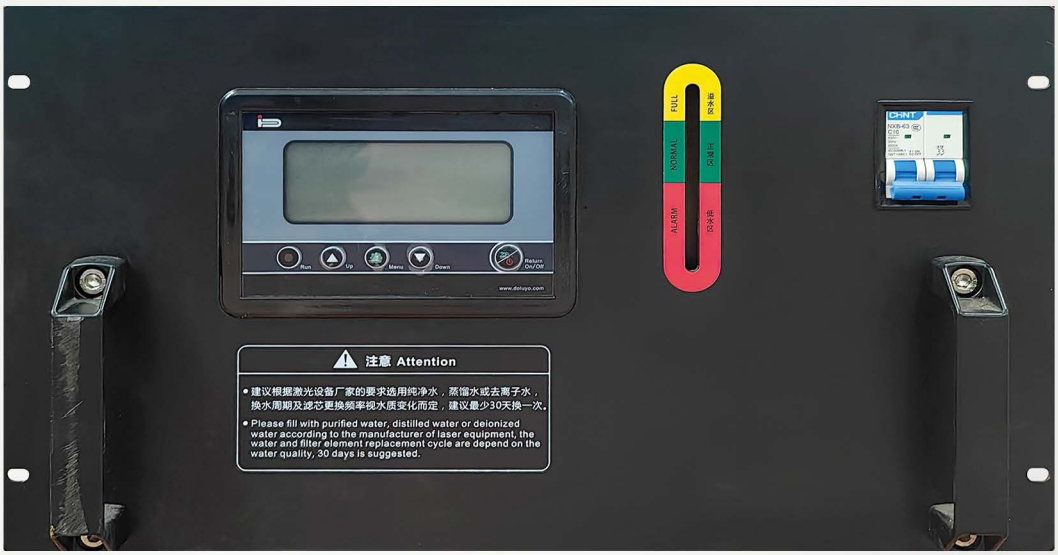
Blasting area	Φ100mm~Φ260mm，±1mm
Rubber gloves	2 pair
Spray gun	2 units
Turntable diameter	Φ500mm
Turntable rotation speed	24r±2r/min

RECIRCULATING WATER TEMPERATURE CONTROL SYSTEM

The recirculating water temperature control system comprises two independent chilling units, which supply temperature-regulated water to the Polishing Station and the Measurement Station respectively. The chiller for the Polishing Station offers a temperature control range of 8–20°C. The chiller for the Measurement Station provides a temperature control range of 2–20°C. This dual-chiller configuration significantly reduces waiting time for water temperature stabilization between tests. All components within the cooling system are constructed with corrosion-resistant materials, enhancing durability and service life.

SPECIFICATIONS

Equipment	Temperature Control Range	Water Tank Capacity	Dimensions
Cooling Station 1	8℃~30°C	2.3L	482mm×600mm×266mm
Cooling Station 2	-10℃~20°C	22.3L	521mm×560mm×1100mm



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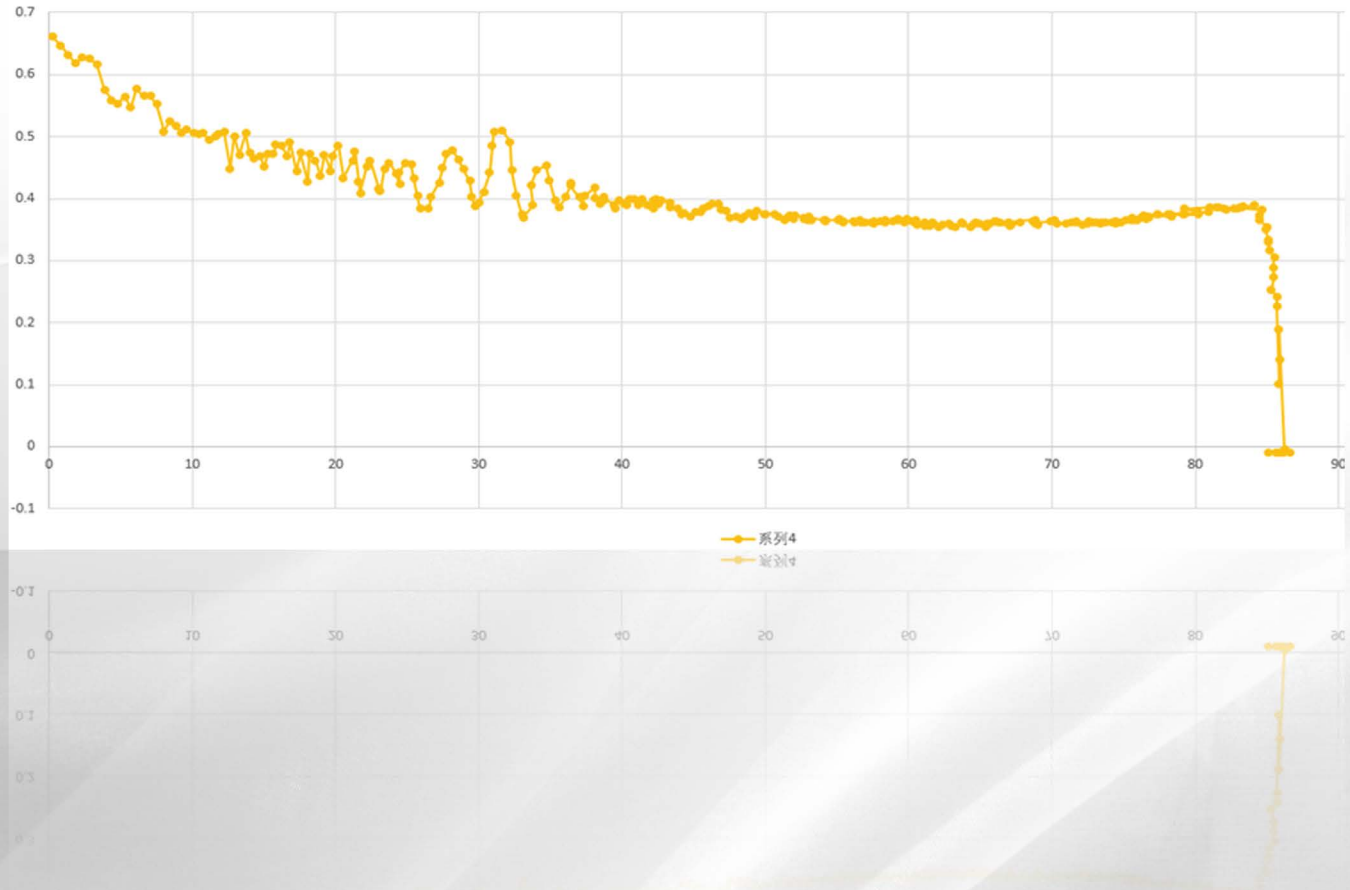
SOFTWARE

The equipment is equipped with dedicated analysis software designed to perform logical control of various modules, collect sensor data for analysis, and ultimately generate test results. Depending on experimental requirements, users can freely select and display graphical curves. The software primarily includes the following functional modules:

- The polishing head, driven by an electric motor, applies the preset pressure to the specimen and begins rotational polishing.
- Water Temperature Control Unit
- On/Off Control of Water Solenoid Valves
- Speed and Pressure Control of the Polishing Unit
- Speed Feedback of the Testing Unit, and Data Acquisition of Torque and Normal Force
- Calculation and Analysis of Friction Coefficient based on acquired values, along with functions to Save and Open Test Results

X-axis	Y-axis	Curve Significance
Time	Friction Coefficient	Friction Coefficient vs. Time
Time	Torque	Torque Dynamic Response
Speed	Friction Coefficient	Friction Coefficient vs. Speed
Speed	Friction Force	Friction Force vs. Speed
Time	Speed & Friction Force	Dual Y-axis Synchronization



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