

HST-MRS10A Microcomputer Controlled Four-Ball Friction Tester



Note: The picture is for reference only

Application Range

This tester mainly adopts sliding friction to evaluate the load-carrying capacity of lubricants under extremely high point contact pressure, covering three key indicators: maximum non-seizure load PB, weld load PD, and mean Hertz load ZMZ. It can also conduct long-duration anti-wear tests for lubricants, measure friction coefficients, and record curves of friction force and temperature.



Applicable Standards of This Tester:

GB/T12583-98 Determination of Extreme Pressure Properties of Lubricants (Four-ball Method)

GB3142-82 Determination of Load-Carrying Capacity of Lubricants (Four-ball Method)

SH/T0189-92 Determination of Anti-Wear Properties of Lubricating Oils (Four-ball Method)

SH/T0202-92 Determination of Extreme Pressure Properties of Lubricating Greases (Four-ball Method)

SH/T0204-92 Determination of Anti-Wear Properties of Lubricating Greases (Four-ball Method)

Specification

Item	Specification
Test Force Range (stepless adjustable)	60N ~ 10kN
Relative Error of Test Force Indication	±1%
Friction Force Measurement Range	0 ~ 300N
Friction Force Measurement Error	±3%
Spindle Speed Range (stepless adjustable)	200 ~ 2000r/min
Spindle Speed Error	±5 r/min
Friction Pair Temperature Control Range	Room temperature ~ 75℃
Friction Pair Temperature Control Error	±2℃
Test Time Control Range	1 second ~ 999 hours
Spindle Revolution Control Range	1 ~ 99999999 revolutions
Test Steel Ball	Φ12.7mm
Overall Dimensions	1200 × 870 × 1700 mm
Weight	600kg

Operating Conditions

- Ambient temperature within the range of 10℃ to 35℃;
- Relative humidity not exceeding 80%;
- Install in an environment free of vibration, corrosive media and strong electromagnetic field interference;
- Fluctuation of power supply voltage shall not exceed ±10% of the rated voltage, frequency fluctuation shall not exceed 2% of the rated frequency, and unbalanced voltage of three-phase power supply shall not exceed 10V.

e) The equipment shall be correctly mounted on a stable foundation with the horizontal tolerance not greater than 0.2/1000.

Basic Configuration

- 4.1 Main tester unit: Consists of machine base, spindle drive, piston loading system, electrical control cabinet, etc.
- 4.2 Full-digital electrical measurement & amplification control system and liquid crystal display system: Real-time display of test force, friction force, rotational speed, test revolutions, time and temperature.
- 4.3 Load sensor
- 4.4 Windows-based computer data processing software
- 4.5 Computer: DELL or Lenovo brand computer
- 4.6 Printer: HP color A4 printer
- 4.7 High-precision measuring microscope: Model 15J from Shanghai Optical Instrument Factory, magnification 25×
- 4.8 1 piece of high-temperature platinum resistance sensor
- 4.9 Test friction pairs:
 - a) 1 set of high-temperature friction pair oil cup;
 - b) 1 set of room-temperature friction pair oil cup;
 - c) 200 pieces of special steel balls for four-ball tester.

Functions of Measurement & Control System and Test Software

- (1) Supports test methods including national standards GB/T12583-1998 (Determination of extreme pressure properties of lubricants) and ZB E 34007-87 (Four-ball anti-wear test method);
- (2) Friction force, peak value and load: the indication error is $\pm 1\%$ of the reading starting from 20% of each range, with automatic calibration available;
- (3) Real-time display of motor revolutions (rotational speed) and test duration;
- (4) Multi-protection functions for friction force, load, motor revolutions and other parameters;
- (5) High-speed sampling and real-time recording of friction force-time and load-time test curves;
- (6) Variable-structure PID control algorithm adopted to regulate the loading process; constant-speed control error $\leq 5\%$, pressure-holding control error $\leq 0.5\%$;
- (7) When the test force exceeds a preset upper limit, the system will automatically activate overload protection and take corresponding measures promptly to safeguard the tester.
- (8) Test data is managed via data files; all test data and curves can be saved, and printed test reports comply with the requirements of national standards.

Supplied Accessories

Category	No.	Name	Specification & Qty	Remark
Products	1	Main Unit	1 set	
	2	Computer (LCD Monitor)	1 set	Lenovo
	3	Printer	1 set	HP
	4	15J Wear Scar Measuring Microscope	1 set	

Accessories	1	High-Temperature Wear Pair Oil Cup	1 set	
	2	Room-Temperature Friction Pair Oil Cup	1 set	
	3	Special Steel Balls for Four-Ball Tester	1 box	
	4	Oil Retaining Ring (High/Low Temperature)	1 piece each	
	5	Spring Collet	2 pieces	
	6	Torque Wheel	1 piece	
Tools	1	Lifting Screw	4 pieces	
	2	Anti-Vibration Pad	4 pieces	
	3	Medical Tweezers (Medium)	1 piece	
	4	Medium Waist Plate	1 piece	
	5	Oil Cup Wrench (High/Low Temperature)	1 piece each	
	6	Tool Set	1 set	
	7	Spring Collet Mounting/Dismounting Wrench	1 piece	
	8	Collet Hammer Rod	1 piece	
Technical Documents	1	Product Operation Manual	1 copy	
	2	Software Operation Manual	1 copy	
	3	Temperature Controller Operation Manual	1 copy	
	4	Quality Certificate	1 copy	
	5	Packing List	1 copy	





MACHINERY DIRECTIVE ATTESTATION OF CONFORMITY

Technical file of the company mentioned below has been inspected and audit has been completed successfully.

2006/42/EC Machinery Directive Annex VIII has been taken as references for these processes.

Company Name : **JINAN HENSGRAND INSTRUMENT CO., LTD.**
Company Address : NO.4915, WEST JINGSHI ROAD, JINAN, CHINA
Related Directives and Annex : **2006/42/EC Machinery Directive/Annex VIII**
Related Standards : **EN ISO 12100:2010, EN 60204-1:2018**
Product Name : **TESTING MACHINE**
Report No and Date : TCF-JHIC230128-MD
Product Brand/Model/Type : WDS-1, WDS-2, WDS-3, WDS-5, WDS-10, WDS-20, WDS-30, WDS-50, WDS-100, WDS-200, WDS-300, WDS-500, WDW-1, WDW-2, WDW-3, WDW-5, WDW-10, WDW-20, WDW-30, WDW-50, WDW-100, WDW-200, WDW-300, WDW-500, WDW-600, WDW-1000, WE-300, WE-600, WE-1000, WE-2000, WEW-300, WEW-600, WEW-1000, WEW-2000, WAW-300, WAW-600, WAW-1000, WAW-2000, WAW-3000, WAW-5000, WAW-6000, LAW-1000, JB-300B, JBS-300, JBW-300, JB-500B, JBS-500, JBW-500, JBW-750, CST-50, VU-2Y, VU-1S, DWC-40, DWC-60, DWC-80, DWC-100, DWC-196, YES-2000, YES-300, YAW-1000, YAW-300, YAW-2000, YAW-3000, YAW-5000, NDS-200, NDS-500, NDS-1000, NDS-2000, NDW-200, NDW-500, NDW-1000, NDW-2000, NDW-3000, NDW-5000, NDW-10000, HEZ-3, HEZ-6, HEZ-10, JWJ-10, TLS, TLW, HST-P50, HST-P100, HST-P200, HST-P300, RDJ, NDT, DWTT, GBW-60, GW-50, HST, XNR-400

Certificate Number : **M.2023.206.C81366**
Initial Assessment Date : 31.01.2023
Registration Date : 01.02.2023
Reissue Date/No : -
Expiry Date : **31.01.2028**


UDEM International Certification
Auditing Training Centre Industry
and Trade Inc. Co.

The validity of the certificate can be checked through www.udem.com.tr. Upon completion of EC declaration of conformity, it is used solely at the manufacturer's responsibility. This certificate remains the property of UDEM International Certification Auditing Training Centre Industry and Trade Inc. Co. to whom it must be returned upon request. The above named firm must keep a copy of this certificate for 15 years from the registration of certificate. This certificate only covers the product(s) stated above and UDEM must be noticed in case of any changes on the product(s)

Address: Mutlukent Mahallesi 2073 Sokak (Eski 93 Sokak) No:10 Çankaya - Ankara - TURKEY
Phone: +90 0312 443 03 90 **Fax:** +90 0312 443 03 76
E-mail: info@udem.com.tr www.udem.com.tr



HST GROUP Co., LTD.

Jinan Hensgrand Instrument Co., Ltd.

NO. 4915, West Jingshi Road, Jinan 250012, PR CHINA.

Phone/WhatsApp: +86-159 1008 1986

www.hssdgroup.com - e-mail: admin@hssdtest.com