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## **MGS-2F High speed end face friction and abrasion testing machine specification**

### **One.Product Description**

The MGS new type high speed abrasion testing machine is mainly used to realize the abrasion of the sample at the testing end at the very high speed. The utility model is also used for realizing the sliding friction of the end face and the pin disk, etc. At the same time, the utility model can be extended according to the interface of the main shaft and the lower supporting disk.

The friction pair can be changed at room temperature, high temperature, ultra-high temperature and change the lubrication state (oil-free lubrication or oil immersion lubrication), load, speed, friction mate material, surface roughness of the friction pair, The test can be used to evaluate the friction performance of engineering materials, powder metallurgy, alloy bearings and other materials under different conditions, and can be applied to the selection of friction pair materials and the study of anti-wear performance of materials.

This machine adds the attachment to be possible under the certain pressure of contact surface, has no stage speed regulation, may under the extremely low speed or the high speed condition, Used to evaluate the friction and wear properties of lubricants, metals, plastics, coatings, rubber, ceramics and other materials, such as pin-on-disk friction function, thrust washers, ball-on-disk, slurry wear, rubber seal lip torque and stick-slip friction performance test, the series of end. The surface abrasion testing machine has been widely used in many scientific research institutes. This type of testing machine has a broad application prospect in various professional technical fields of tribology, petrochemical industry, machinery, energy sources, metallurgy, aerospace, colleges and universities, research institutes and other departments.



Reference picture of product appearance

## Two、 Specification Data and Configurations

Specification Data	Configurations
<ol style="list-style-type: none"> <li>1. Test force working range:20~2000 N (stepless adjustable, range optional)</li> <li>2. The relative error of experimental force: <math>\pm 0.5\%</math>.</li> <li>3. Loading mode :Fully automatic program-controlled loading (non-hydraulic servo loading)</li> <li>4. Loading rate:Stepless adjustable</li> <li>5. Friction force measuring range: 1-300N (maximum measuring torque 15N.m)</li> <li>6. Relative error: <math>\pm 3\%</math></li> <li>7.Spindle speed range: 1 ~ 5000 rpm (accuracy <math>\pm 0.5\text{rpm}</math>)</li> <li>8. Temperature measurement range : room temperature~300℃ (optional ultra-high temperature 1200℃)</li> <li>9. Temperature measurement accuracy: <math>\pm 2^\circ\text{C}</math> (<math>\pm 1\%</math> FS)</li> </ol>	<ol style="list-style-type: none"> <li>1. Testing machine frame (with TECO servo motor): 1 set</li> <li>2. PID-HX temperature control system: 1 set</li> <li>3. Servo control loading system: 1 set</li> <li>4. High precision test force sensor (using C2 grade precision sensor): 2</li> <li>5. End face wear friction pairs:1 set</li> <li>6. Special fastening wrench: 1 piece</li> <li>7.1 HP color jet printer:1 set</li> <li>8. Type K thermocouple: 1 set</li> <li>9. One set of pin-disk friction pairs (optional)</li> <li>10.HX anti-torsional deceleration system (selection of imported / Harbin precision P4 bearings) :1 set</li> <li>11.HTMS multi-function measurement and control system:1 set</li> <li>12.Ultra-high temperature furnace (optional):1 set</li> <li>13. Automatic wear mark measuring instrument (optional - can run independently): 1 set</li> </ol>



<p>10. Wear measurement range: 10mm  11. Wear measurement accuracy: 10 μ m  12. Circulating oil tank capacity: 20L, 8L  13. Spray lubrication heat transfer : 100J/min  14. Window size: 2-2*40*15 mm  15. Time control range : 10s ~ 9999min  16. Computer and data processing range: dedicated embedded industrial control motherboard, the whole process can touch screen control, It can record friction-time curve and temperature-time curve automatically. It can save the test data for secondary analysis and research. The intermediate contour line can be divided into two parts.</p>	<p>14. High-speed dynamic circulation system (special double filter-unique technology): 1 set  15. Spatter cooling system for main shaft (special-unique technology) : 1 set  16. Technical Materials: An instruction manual; Software User Manual; Certificate of Conformity, Packing List</p>
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**Three. Functions and features:**

The application of the test force is controlled by a closed loop servo system, which makes the application of the test force stable and reliable. The test force can be set by the operator on the computer interface. Spindle speed, rotation, test force, friction torque, friction temperature, test time and other parameters are controlled by the computer, can be real-time acquisition of test data and can draw the corresponding test curve, can be arbitrary storage, access, print out test data or curve. The spindle motor adopts AC servo integrated speed control system and motor, and the upper part of the spindle and motor are respectively equipped with driven and active special arc-toothed pulleys. Driven pulley torsion resistance design, through the arc tooth synchronous belt to transfer the power of the motor to the main shaft, due to the application of the closed loop speed control system at low speed with high transmission torque, it completely changed the conventional transmission system at low speed The characteristics of the double decrement of the transmission force.

The advantages of Hengxu products are summarized as follows:



1, loading mode: this type of testing machine is the first time in the industry to introduce servo motor loading, strong controllability, low failure rate, after years of continuous improvement, stable and reliable performance, of which

The patented technology of double floating bearing, gap-free guiding and buffering cross balancing is the guarantee of accurate and stable test force, which reduces the system error and ensures the accuracy of real-time tracking measurement of test force and friction force.

2, the main structure: the friction test should be as far as possible to reduce the impact of the vibration of the motor and ancillary components on the wear marks, so we use the overall main body, thickened the support plate, and the use of Taiwan TECO servo motor drive spindle, the relevant transmission components also use imported precision bearings;

3, the electrical part: the equipment uses an independent embedded industrial controller, industrial metal touch screen, acquisition of independent analysis module, effectively ensure that the equipment high-speed or oil film rupture violent vibration on the performance of the control part;

4, wear scar measurement: optional NAM automatic wear mark measuring instrument, can easily achieve the measurement of the three-dimensional structure of the section of the wear mark, optional HXM electronic imaging wear spot measurement system can achieve the plane of the wear spot capture, friction surface topography measurement and analysis, and directly save the wear spot image;

5,Control software: Generally, the software can realize real-time data acquisition, but we are independent research and development of special software (for universal material testing machine transformation software). Professional test scheme can be established according to different standards, Pb value can also be judged according to the size of the grinding spot, and data table can be saved and exported.

6,Service Team: We not only produce the equipment (no research and development strength enterprise copy the blueprint assembly), but also have an independent technical service department



(friction and abrasion testing machine research and development of more than 100 colleges and universities), for specific issues can be real-time analysis and solution, At the same time, the Hengxu Testing Machine-Research and Exhibition Center invested and built by us in the National New Materials Industrial Park has been put into operation, providing a solid base for the company's later R & D development (renting factories, undocumented production, safety hazards, quality and service can not keep up).

The friction and abrasion testing machine consists of main shaft driving system, friction bearing system, testing force sensor, friction measuring system, automatic loading system, computer control system (including Each main parameter setting, control, alarm and other units) and other components. The utility model is arranged in a machine frame which takes a welding machine base as a main body.

### 1. Spindle and its drive system

The spindle is driven by a servo motor through a speed regulating system with stepless speed regulation. The power of the motor is transferred to the spindle through the circular arc tooth synchronous belt speed regulating system.

The installation and debugging of the spindle system of the testing machine is technically difficult, so do not easily disassemble and clean. The spindle transmission system can work normally in the range of 10 ~ 5000 r / min. Due to the application of servo control system, it has high transmission torque at low speed. This machine through the servo motor control, when the large load test process suddenly friction torque is larger, the spindle torque increases rapidly, frequency converter overcurrent protection, spindle immediately automatic train stop; This machine is equipped with timer unit (preset minute and second), preset automatic train stop system.

Hengxu special extended spindle, can be used to design other forms of special friction couple, fixture to expand the use of friction testing machine range.

### 2. Microcontrol servo loading system



The traditional end face testing machines are all loaded by hydraulic pressure, with poor controllability and low repeatability. The friction and abrasion testing machine of Hengxu Brand MGS series was introduced many years ago, which adopts servo guidance control technology. Direct measurement of the load of the friction pair, with the new special control system of HTMS, the use of a new tracking column adjustment structure, high accuracy of load maintenance, multi-stage guidance adjustment. Using advanced control concept to distinguish control of different test forms to overcome the hydraulic loading noise, poor stability, cumbersome maintenance and many other problems, effectively improve the reliability and stability of the equipment.

#### **Four. After-sales quality service.**

After the formal acceptance of the equipment, the equipment shall be regarded as a formal delivery. The warranty of the equipment is eighteen months from the date of formal delivery. During the warranty, the supplier timely and free repair service for all kinds of malfunctions of the equipment, and timely and free replacement of all kinds of parts caused by non-human. If the equipment exceeds the warranty period, it will fail during the operation. The supplier will serve the ordering party in time, and assist the ordering party to complete the maintenance task.

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