

MMW-1A Vertical Universal Friction Wear Test Machine



1, General introduction

MMW-1A Vertical Universal Friction Wear Test Machine is similar to an the FALEX MultiSpecimen Test machine in main application and functions, it's widely used as imitation inspection testing machine in design and develop hydraulic oil, combustion engine oil, gear oil etc..

Perhaps the most versatile commercial system for evaluating friction, wear, and abrasion characteristics of materials, coatings, and lubricants. Numerous Standard Test Methods and Application Specific Custom testing programs are possible due to user selected contact geometries, motions, velocities, temperatures, contact pressures, and test specimen materials allow one test apparatus to meet many test specifications and simulate a broad range of field applications.

2, Application

Applications include research and development, quality control, product qualification and the evaluation of physical and performance characteristics of materials, coatings, and lubricants. Test studies and a number of technical publications confirm exceptional correlation with field service.

3, Test Condition for four ball test

MMW-1A is the standard testing machine. Use four ball friction pair measure lubricant relative anti-wear performance, the test condition is:

	Method A	Method B
Oil box temperature	75±2°C	75±2°C
Main spindle rotation speed	1200±60r/min	1200±60r/min
Test time	60±1min	60±1min
Axial load	147N (15kgf)	392N (40kgf)
Axial load zero point sensitivity	±1.96N (±0.2kgf)	±1.96N (±0.2kgf)
Standard steel ball	φ12.7mm	φ12.7mm

The test machine has the friction modes of rolling, sliding or sliding and rolling combined motion in the present of a certain contact pressure, is provided with a stepless speed regulation system, and can be used for assessing the friction wear performance of lubricant, metal, plastic, coating, rubber, ceramic and the like at an extreme low speed or an extreme high speed, such as tests for the friction function of low-speed pin plate (including a large plate and a small plate, one pin and three pins), four-ball long-time wear resistance performance, four-ball rolling contact fatigue, lubrication performance of ball-bronze three plates and stick-slip friction performance of thrust washers and ball-plates.

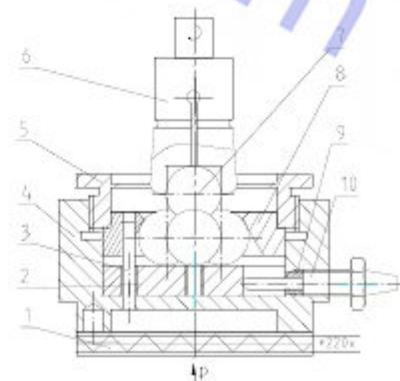
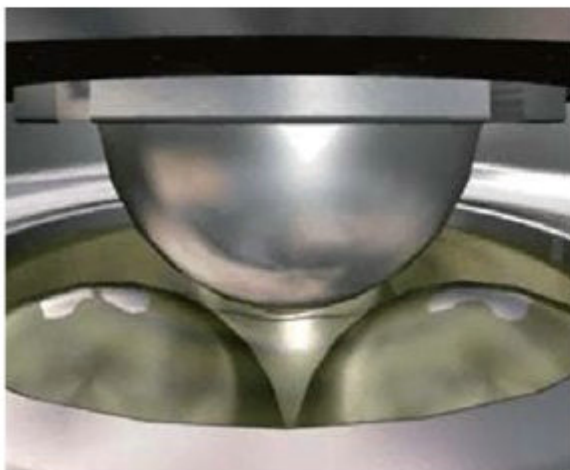
4, References

ASTM G99 "Standard Test Method for Wear Testing with a Pin-on-Disk Apparatus"

ASTM D2266 "Standard Test Method for Wear Preventive Characteristics of Lubricating Grease (Four Ball Method) "

ASTM D4172 "Standard Test Method for Wear Preventive Characteristics of Lubricating Fluids (Four Ball Method)"

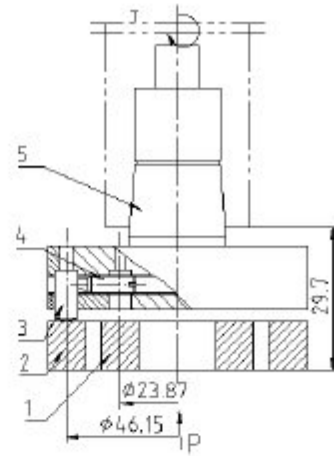
ASTM D3702 "Standard Test for Wear Rate and Coefficient of Friction in Self-Lubricated Rubbing Contact Using a Thrust washer Testing Machine"



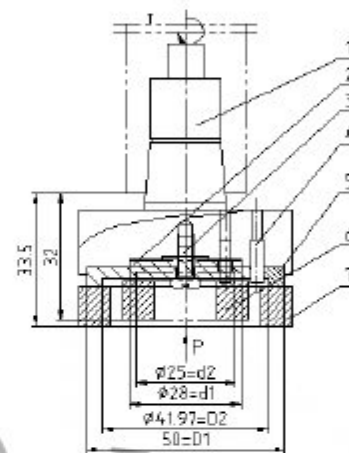
Four ball friction pair



Pio-Disc friction pair



Thrust ring friction pair



Other friction pair like:

- Ball-plate friction pair (one ball and three ball);**
- Bronze ball three pieces of friction pair;**
- Rolling contact fatigue four-ball friction pair;**
- Stick-slip friction pair.**

4, Main technical specification

Model	MMW-1A
1 Test Force	
1.1 Axial load range	10N-1000N
1.2 Load accuracy	±1%
1.3 Load zero point sensitivity	±1.5N
1.4 Loading rate	400N/min
1.5 Load holding accuracy	±1%
2 Friction Moment	
2.1 Max. Friction moment	2.5N.m
2.2 Friction moment accuracy	±2%
2.3 Friction sensor	50N
2.4 Friction arm of force distance	50mm
3 Spindle stepless speed change	
3.1 Stepless variable speed system	5-2000r/min
3.2 Main spindle RPM accuracy	±1%
4 Test Medium	Oil, Water, Slurry, Abrasive, etc.
5 Heating system	
5.1 Heater working range	Ambient temp. to 260 °C
5.2 Disc Type Heating Plate	φ65, 220V, 250W
5.3 Jacket Heater	φ68×44, 220V, 300W
5.4 φ3 twin output platinum thermal resistance	RO=100±0.1Ω (Long, short each one set)
5.5 Temperature control accuracy	± (0.3+0.005t) °C
6. Taper of spindle	1: 7
7. Max.distance between spindle and lower disc	>75mm
8. Spindle control	1, Manual control; 2, Time control ; 3, Revolution Control; 4, Friction moment control
9. Time display & control range	10s~9999min
10. Revolution display & control range	(1~99) ×105
11. Output maximum moment of main motor	5N.m
Dimensions	860*740*1560mm
Weight	650Kg

6, Main accessories

Item	Quantity
Frame	1 set
Computer	1 set
Printer	1 set
Thrust ring end face friction test pair	1 set
Pin-disc friction test pair	1 set
Four ball friction test pair	1 set
Ball disc friction test pair	1 set
Heater	1 set
Microscope	1 set
Professional measuring software in English	1 set
Documents (Manual, packing list, certificate)	



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