## Tribometer Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Load</td>
<td>up to 60 N</td>
</tr>
<tr>
<td>Friction force</td>
<td>up to 10 N (option 20 N)</td>
</tr>
<tr>
<td>Rotation speed</td>
<td>0.3 to 500 rpm (option 1500 &amp; 5000 rpm)</td>
</tr>
<tr>
<td>Maximum torque</td>
<td>450 Nm</td>
</tr>
<tr>
<td>Maximum temperature (high temperature)</td>
<td>up to 800°C (option 1000°C)</td>
</tr>
<tr>
<td>Track depth measurement</td>
<td>up to 1.2 mm</td>
</tr>
<tr>
<td>Large range of pin or ball holders</td>
<td></td>
</tr>
<tr>
<td>Linear module frequency</td>
<td>up to 8.3 Hz</td>
</tr>
<tr>
<td>Linear module stroke length</td>
<td>up to 60 mm</td>
</tr>
<tr>
<td>Linear module speed</td>
<td>up to 100 mm/s</td>
</tr>
<tr>
<td>Vacuum System</td>
<td>up to 10 mbar</td>
</tr>
<tr>
<td>Dimensions</td>
<td>500x320x550 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>50 Kg</td>
</tr>
</tbody>
</table>

*Specifications may be subject to change, please contact us for updates*

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**Friction, Wear**

**Tribometer**

**Pin on Disk, Reciprocating, High Temperature, Vacuum**

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**CSM Instruments SA**

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terial combination with or without lubricant. Furthermore, the control of the test parameters such as speed, frequency, contact pressure, time and the environmental parameters (temperature, humidity and lubricant) allows simulation of the real life conditions of a practical wear situation.

The CSM Tribometers are unique instruments because of their ultra high precision force measurement. They can perform both linear reciprocating and rotating modes. One important feature of all the CSM Tribometers is that the experiment stops automatically when the coefficient of friction reaches a predefined threshold value or when a specified number of cycles is reached. Also, the Tribometer is supplied with an enclosure so that controlled atmospheres of varying humidity or composition can be used. Specialized versions of the Tribometer have been developed for high & low temperature operations, reciprocating motion and high vacuum testing. The CSM Tribometers can be equipped with a depth measuring sensor for real-time display of depth information which is important in studying the time dependent wear properties. Furthermore, an electrical conductivity option can enable testing of electrical insulation of coatings.

Linear Reciprocating Tribometer

The Linear Tribometer reproduces the reciprocating motion typical of many real world mechanisms. The instrument produces a friction coefficient for both the forward and backward displacement of the stroke and the software can generate data on Hertzian pressure, static partner and sample wear rates. The reciprocating technique is also very useful for studying the variation over time of the static coefficient of friction - as opposed to the kinetic coefficient measured with the Pin-on-Disk geometry. Most contact geometries can be reproduced including Pin-on-Plate, Ball-on-Plate and Flat-on-Plate (others on request). The Linear Tribometer can be equipped with a heating and cooling plate for testing under a wide variety of temperatures.

Complete software package

The Tribometry software (Microsoft Windows 98/NT/2000 platforms) includes a complete set of features for setting up the Tribometer and handling the data.

Vacuum tribometers

All CSM Instruments tribometers are also available in a high vacuum configuration. These fully automated equipments allows for a perfect control over tribological environmental conditions.

General Applications

- Semiconductor Technology
  - Passivation Layers
  - Metalization
- Mass Storage
  - Protective coatings on magnetic disks
  - Magnetic coatings on disk substrates
  - Protective coatings on CD's
- Optical Components
  - Eye glass lenses
  - Fiber Optics
  - Optical scratch-resistant coatings
  - Contact Lenses
- Decorative coatings
  - Evaporated metal coatings
- Wear Resistant Coatings
  - TiN, TiC, DLC
  - Cutting Tools
- Pharmacological
  - Tablets and pills
  - Implants
  - Biological tissue
- Automotive
  - Paints and polymers
  - Varnishes and finishes
  - Windows
  - Brake Pads
- General Engineering
  - Rubber resistance
  - Touch screens
  - Lubricants and oil additives
  - Sliding bearings
  - Self-lubricating Systems

Check on http://www.csm-instruments.com web site for application bulletins