TRIBOLOGICAL TESTS: COEFFICIENT OF FRICTION AND WEAR RATE MEASUREMENTS

**TEC Star** provides to its customers a tribometer to measure coefficient of friction and wear rate of sliding materials.

**Technical Specs**

The **Tribometer** is an instrument that measures **coefficient of friction** (both static and dynamic) and **wear rate** of materials in different reciprocal sliding conditions: varying test speed, applied load and temperature, even in presence of a liquid medium (lubricant, grease, water, etc.),

The instrument allows to choice a wide range of contact pressures (0,1 MPa ÷ 10 GPa), speeds (0 ÷ 500 rpm) and temperatures (-10°C ÷ 170°C).

It is also possible to choose among different configurations of contact geometry of sliding materials, in order to simulate the real working conditions of the tested samples:

- **Ball on disc** (static sphere on a rotating disc)
- **Pin on disc** (static pin on a rotating disc)
- **Block on ring** (static block on a rotating ring)
- **Ball on flat - “fretting”** (linear reciprocating motion of a sphere on a flat surface)
The tribometer allows accelerated wear test, in order to have a quantitative evaluation of tribological and mechanical performances of the sample over time, as a quality standard for products.

**Field of Application**

The tribometer is able to reproduce, in a controlled environment, the real behaviour of the tested materials in terms of friction and wear characteristics. This instrument is very useful to solve problems of contact between sliding samples.

Here some examples are reported:

- Analysis of lubricant properties, even at different temperature (both high and low) and load conditions (Stribeck curve);
- Quantitative measurement of the effectiveness of antiwear coatings and self-lubricant coatings (with the possibility to measure the coating adhesion to the substrate);
- Certification of the tribological properties (coefficient of friction and wear rate) according to ASTM or ISO standards of materials developed by R&D or purchased by different suppliers;
- Determination of static friction of self-lubricant polymers in contact with metallic counterparts.

**Case Histories**

_Tribological preformances of three different types of self-lubricant surface coatings:_ in order to choose the best coating that gives the lowest coefficient of friction in the sliding condition of interest, a tribo test between a steel sphere and the coated samples, without any lubricant, has been carried out.

![Coefficient of friction vs. time](image)

The above graph reports how the coefficient of friction varies during the test; showing the different behaviours of the three samples: coating A needs a run in to have good self-lubricant properties, while coating B has an excellent self-lubricating behaviour just from the beginning of the test.