

Reciprocating tribometer

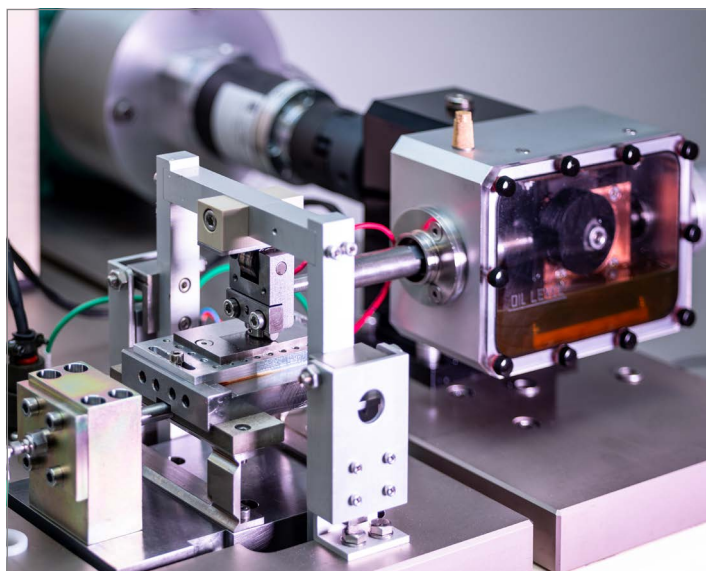


Figure 1: Reciprocating sliding: TE-77 tribometer equipped with spatially resolved friction measurement is capable of dry and lubricated tests up to 600 °C.

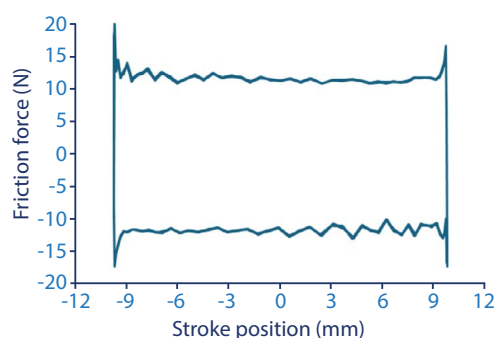


Figure 2: Spatially resolved friction force, for a lubricated reciprocating line contact.

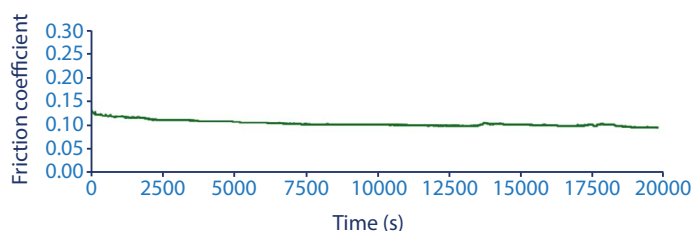


Figure 3: Root mean squared average friction against test time for a lubricated reciprocating line contact.

Description

The TE-77 reciprocating tribometer (manufactured by Phoenix Tribology Ltd.) is used to measure the friction and/or wear of material couples following the ASTM G133 standard. Friction is measured using a high bandwidth piezoelectric transducer and resolved against position. Wear is measured in situ by a capacitance probe that tracks the change in height of the reciprocating assembly as the test progresses. A small electric potential can be applied across the contact of the stationary sample and the reciprocating counterface. This serves as a qualitative measure of coating performance and provides insight into tribo and lubricant film formation and removal. The machine can be adapted for different contact geometries, including point, line and area contacts, and can also be configured for sliding rolling contacts. It can perform both dry and lubricated tests at ambient and elevated temperatures.

Machine capability

Details of contacts: point, line, area. Can be purely sliding or slide-roll (area contacts).

Stroke: 0.4 - 25 mm.

Force range: 5 N to 1 kN.

Stroke frequency: 2 - 50 Hz, or 0.04 - 1.00 Hz if 50:1 gearbox fitted.

Temperature range: ambient to 650 °C.

Contact potential: 50 mV DC signal.

Optional modules: wear, fluid property sensor, lubricant dosing.

Programmable speed, load and temperature during testing.

Sample specification

Typical geometry
38 x 58 x 4 mm – custom
samples can be secured with
M4 countersunk screws.

Evaluation

Measured parameters: load,
friction (rms), friction, contact
potential, stroke position,
temperature, frequency,
number of cycles.

3D optical microscopy/
profilometry of wear scar.