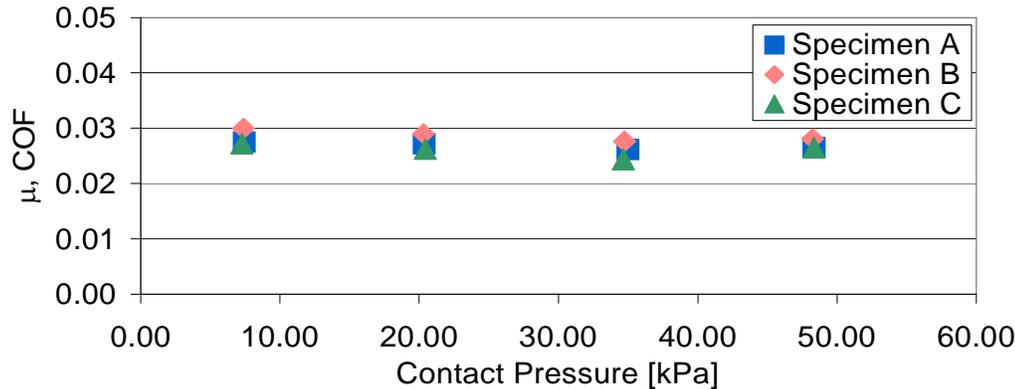


Friction Testing

A highly sensitive method for testing Coefficient of Friction



COF data with varying contact pressures for 3 specimens from the same sample group.

Coefficient of Friction Testing

Cambridge Polymer Group has developed and validated a method for Coefficient of Friction (μ , COF) testing based on the analysis of Kavepour and McKinley [1]. This method takes advantage of the high sensitivity torque and displacement measurement of modern shear rheometer to measure small changes in μ .

The new fixture can be attached to a standard rheometer shaft and therefore allows testing at wide range application-relevant speeds and contact pressures. The setup on the rheometer also allows for the measurement of μ as it evolves over the course of a long test.

Principles of Operation

A new fixture is attached to the rheometer shaft and a normal load is applied at a constant angular velocity. The corresponding torque is measured and converted into a shear stress. The shear stress and normal stress are then used to calculate the coefficient of friction.

A lubricant bath that is temperature controlled externally, or using the rheometer's peltier plate, provides the ability to test different lubricant and temperature situations.

Applications

This method can be used to determine values for the coefficient of friction (μ) between two surfaces in a highly standardized and repeatable procedure. The high sensitivity inherent to modern rheometers mean that these measurements are more reliable than conventional means of obtaining μ . The dependence of μ on velocity, normal load, lubricant and temperature can also be evaluated.

If your application involves continuous articulation between two surfaces, it may be interesting to follow changes in μ with length of travel.

Specifications

- Fixture size: 30 mm outer diameter
- Minimum sample size: 32 mm x 32 mm surface area
- Maximum sample size – limited by instrument
- Ranges - Limited by instrument
- Precision/accuracy – limited by instrument
- Fixture surface finish -

Features

- Uniquely high sensitivity of torque measurements
- Ability to test with lubricants and at temperature
- Testing can be done against a standard material (polished stainless steel or orthopedic-grade CoCr) or against custom counterfaces.

References

[1] Kavepour, H.P. and G.H. McKinley, *Tribo-rheometry: from gap-dependent rheology to tribology*, Tribology Letters, 2004, 17(2), pp. 327-333.



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