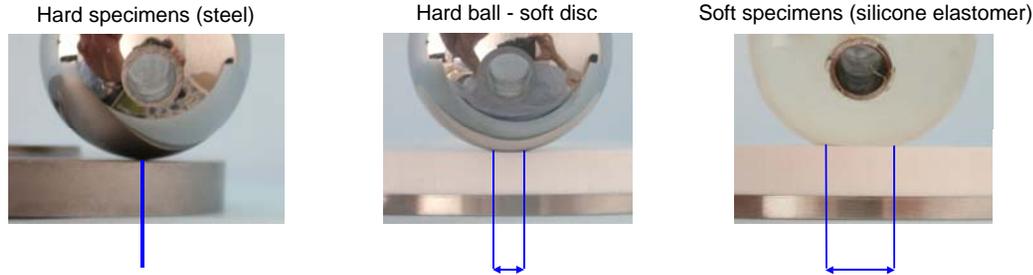


MTM Soft contact option

The characteristics of soft contacts are different from the more usual steel on steel contact. The low stiffness of the soft materials means that there is considerable elastic deformation of the specimens under load. Also the elastic hysteresis of the materials means that there is significant rolling friction in addition to the usual sliding friction. The wide range of applications includes research on food, cosmetics, seals, PTFE contacts, etc.



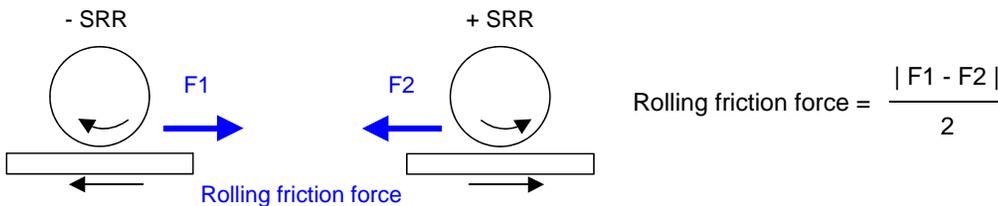
The **contact area** becomes larger as the specimens are softer and the iso-viscous regime can be reached.

The MTM soft contact option is adapted to the study of soft contacts, the main features are:

- a modified loading system that achieves a very accurate control of the load under large deformations, 0.1 to $10\text{ N} \pm 0.02\text{ N}$
- the opportunity to adapt the specimens to test soft materials, special materials, etc
- the calculation of both sliding (Couette) friction and rolling (Poiseuille) friction

Calculation of the rolling friction

With the bi-directional control of the motors, in addition to the sliding friction, the machine can assess the rolling which is important in soft contacts. When measuring the rolling friction at a given SRR, the machine actually needs to run with a +SRR, followed by a -SRR. The rolling friction is the difference of the measured friction in each direction.



Examples of soft specimens

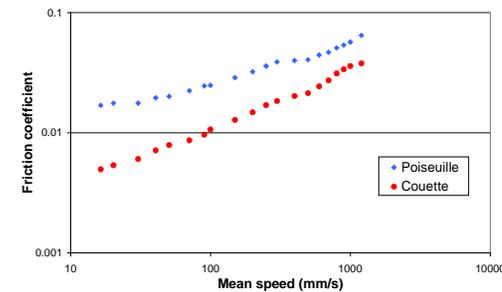
The classic specimens are a steel ball and a steel disc. Nevertheless, virtually any kind of material can be tested with the MTM.



The backing plate shown on the left fits into the MTM and can hold another disc of the softer test material. In the examples on the right, the plate is holding two different grades of silicone elastomer. The ball can be made of different materials such as silicone elastomer or be replaced by an O ring holder, see below.



In soft contacts, the rolling friction is often greater than the sliding friction. Below is a friction trace plotted in log axes from a test performed with a rubber O ring.



Specimens:
Steel disc
Rubber O ring

Conditions
SRR = 50 %
Load = 3N
37 C

PCS Instruments

PCS Instruments Ltd,
78 Stanley Gardens, LONDON W3 7SZ.
Tel: +44 (0)20 8600 9920, Fax: +44 (0)20 8600 9921.
www.pcs-instruments.com