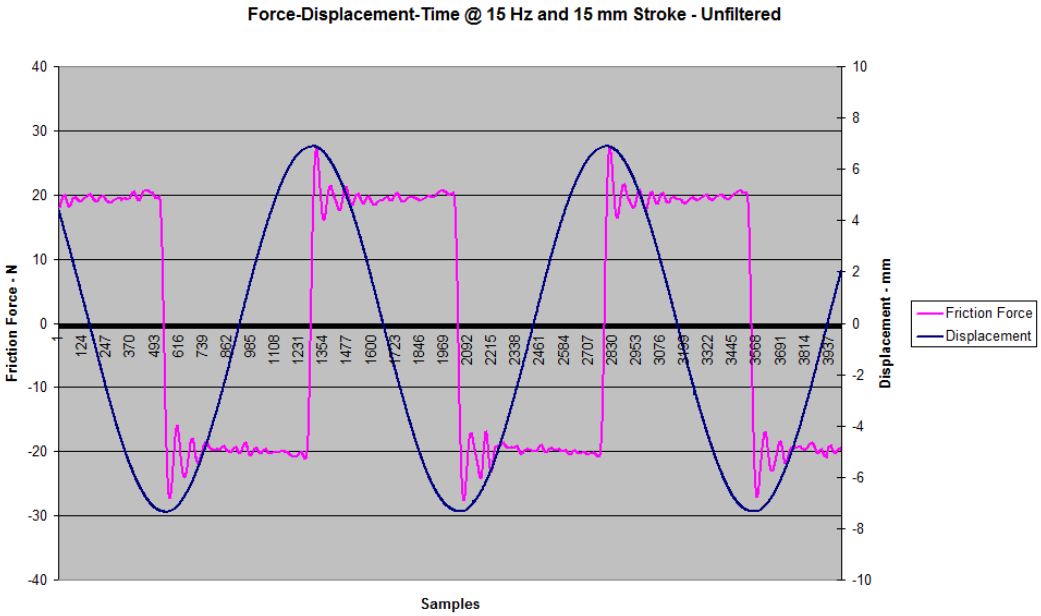
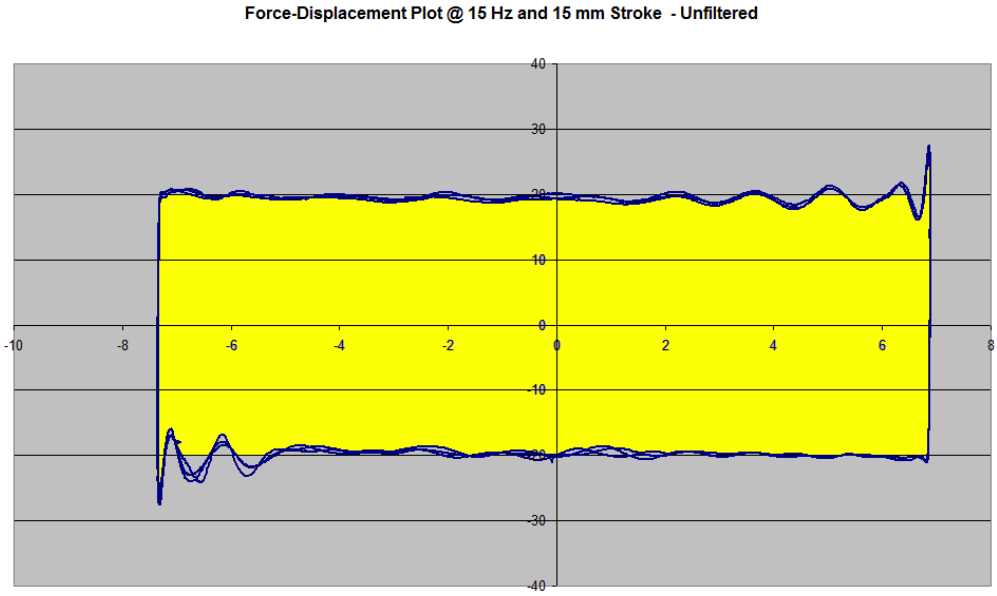
TE 77 High Speed Data

The standard TE 77 low speed data is collected at a maximum signal sampling rate of 10 Hz. This is not sufficient to capture high speed events such as stick-slip spikes or to gather enough instantaneous data for satisfactory analysis of individual friction cycles. In order to collect high speed data and generate Force-Displacement-Time curves, a high speed data acquisition card is included.



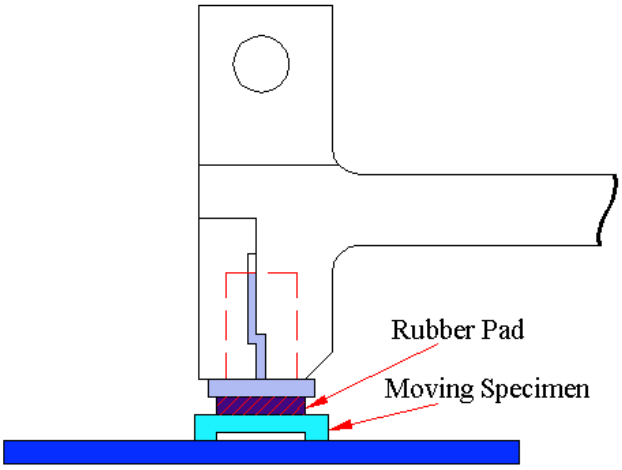
And Force-Displacement curves:



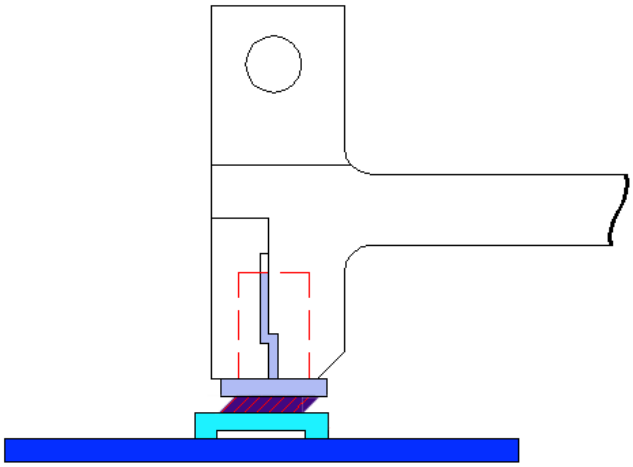
TE 77/GB20 and TE 77/GB100 Options

The TE 77/GB100 gear-box allows tests to be run at very low reciprocating speed, requiring in-cycle analysis of friction force. As the reciprocating motion is sinusoidal, the displacement signal can be used to calculate the sliding velocity and a plot of friction against sliding velocity (Stribeck curve) may be generated with velocities ranging from zero to a maximum at the mid-stroke position.

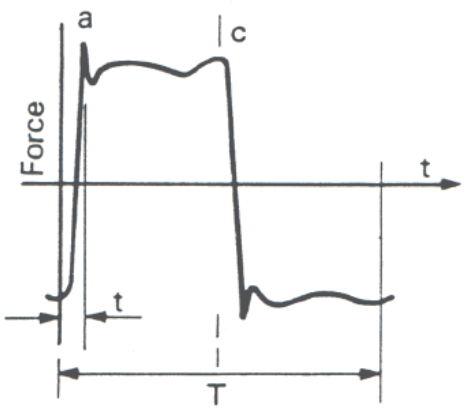
Stick-slip occurs in systems involving a degree of flexibility. At low sliding speeds, stick-slip may occur randomly as the sliding velocities increase or decrease, depending on the contact and lubricant. A more useful measure may be achieved by artificially introducing a compliant element into the driving system. On the TE 77 this is achieved by bonding a layer of rubber to a specially designed area contact specimen.



The stepped moving specimen allows the rubber layer to shear as opposed to acting as a cantilever, thus producing better defined contact conditions.



The stick-slip arrangement is ideally run at low sliding speeds and is thus run using the TE 77/GB20 or TE 77/GB100.

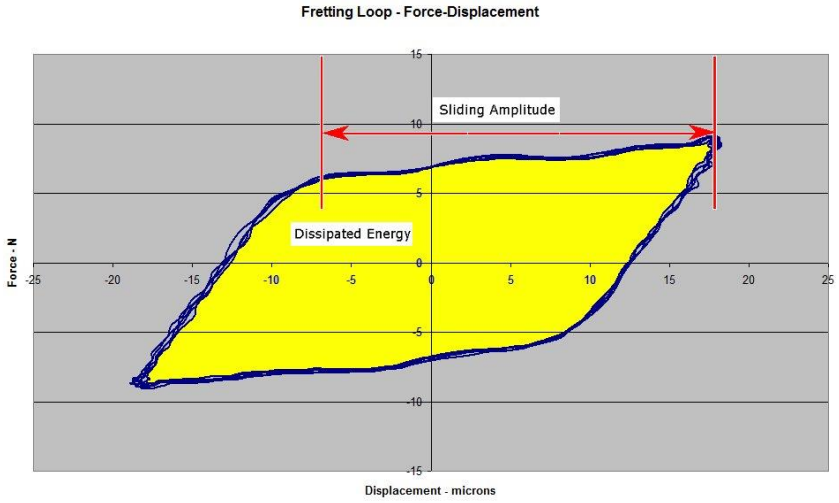


The experimental configuration can be adjusted either to give a single stick-slip event at the beginning of each stroke or tow generate repeated events throughout the stroke.

TE 77/PIEZO

Friction loss hysteresis loops are most commonly associated with fretting stroke lengths. Although they can of course be plotted at much longer strokes, long stroke tests, where there is no obvious variation of friction with velocity, are less interesting. In both cases, it is necessary to record high speed data and to measure displacement. For fretting stroke lengths, a separate capacitance displacement probe is used.

A typical fretting hysteresis loop is as follows:



As the contact progresses from fretting (combined regimes of slip and non-slip) to bulk sliding, the shape of the loop changes.