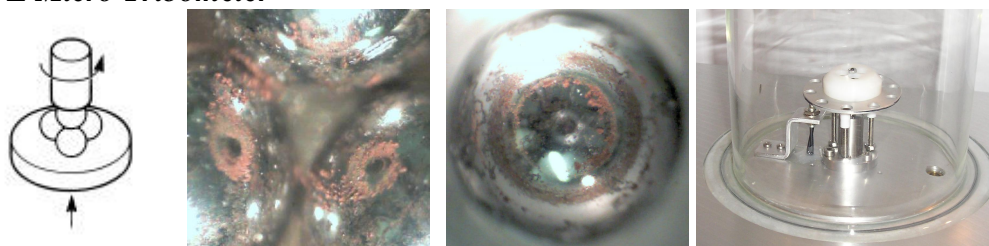


## TRIBOLOGY UPDATE: *ISSUE 20 - October 2007*

This is the latest e-mail issue of our regular **Tribology Update** newsletter. It is about three months later than planned and that is because we have been rather busy during the summer. Further information can be viewed at our web site: <http://www.phoenix-tribology.com>. Alternatively, you may wish to contact us by e-mail at [info@phoenix-tribology.com](mailto:info@phoenix-tribology.com) or by telephone on 44 1635 276064.

### WORK IN PROGRESS:

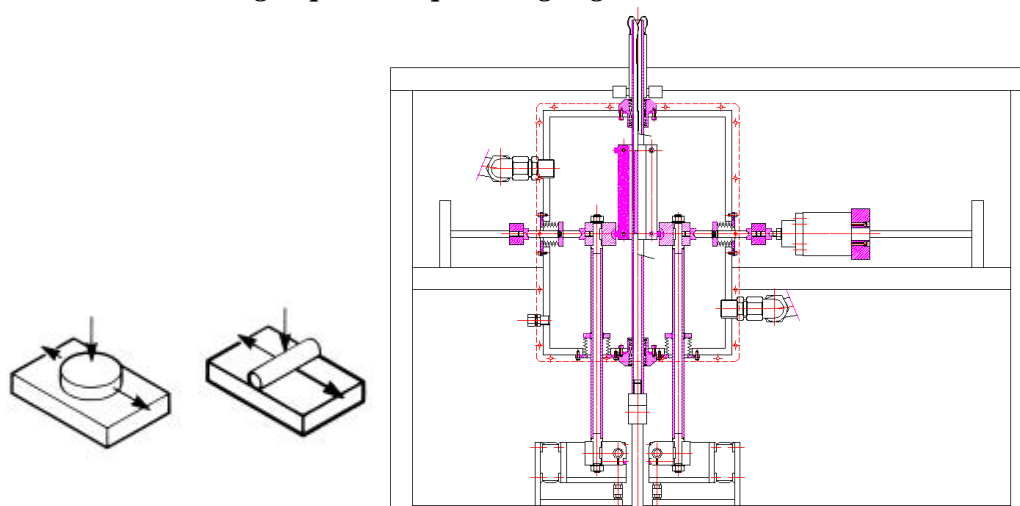
#### *NPL Micro Tribometer*



Four ball test – 2 mm diameter balls – 0.325 N load – 1360 revolutions - in vacuo

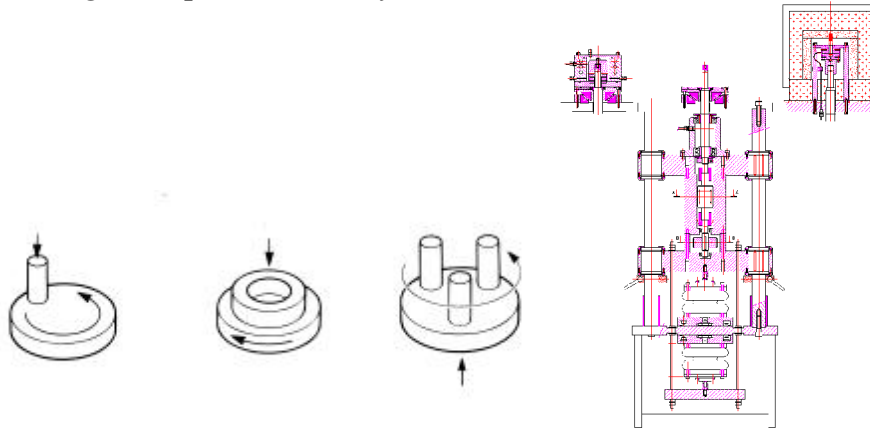
We have completed a prototype micro tribometer for the UK National Physical Laboratory. The device comprises a spinning top running in vacuum, with a tribological contact formed between the top axle and a supporting sample. It is based on a concept developed by Professor John Williams at Cambridge University. Friction is calculated from the deceleration of the top. Initial tests have been with sliding four ball configurations with both 1 mm and 2 mm diameter test balls. Other test configurations are to be investigated, including cone in tube.

#### *Two/Four Station High Speed Reciprocating Rig*



By combining the loading and friction force measuring system from the *DN 55 High Temperature Dry Sliding & Fretting Test Machine* with a long stroke reciprocating mechanism and a gas enclosure, we have produced a design for a multi-station alternative to the *TE 102 High Speed Reciprocating Machine*. The latter was used extensively by Morgan Materials Technology for evaluating filled polymers for reciprocating compressor seal applications.

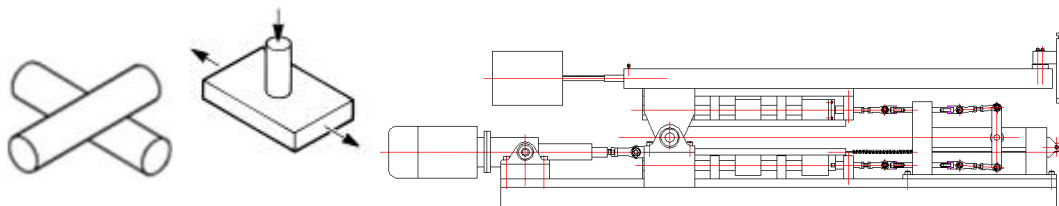
## ***TE 95 High Temperature Rotary Tribometer – Pressurized Seal Testing***



Developments reported in Tribology Update 19 have progressed somewhat and the TE 95 design has now evolved to include bi-directional loading. This allows the device to be used not only as a conventional pin on disc or thrust washer test machine (with temperatures up to 1000°C) but also as a pressurized seal test machine. A range of different test adapters may be fitted to the upper test platform in place of the high temperature furnace assembly.

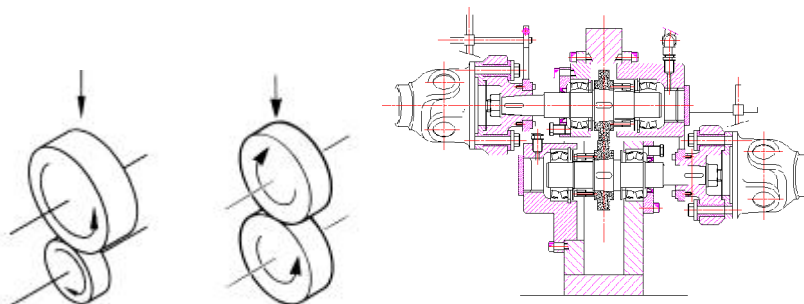
### **IN PRODUCTION:**

#### ***TE 69 Load Scanner***



After a number of years waiting for an order for this most interesting device, the first production TE 69 unit is in hand. The machine, based on a device developed by Professors Sture Hogmark at Uppsala University, has been modified to allow operation as a load scanner, as a conventional Bowden-Leben machine and as a high-load scratch tester.

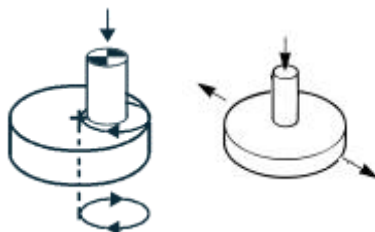
#### ***TE 74 Two Roller Machines***



Having built a range of different versions of the TE 74 Two Roller Machine, with motors ranging from 5.5 kW to 30 kW and rollers of varying sizes, we have now put some effort into rationalizing what we offer as a nominally standard product. We have eliminated the LVDT for displacement measurement (a waste of time) but added electrical insulation to the roller shafts, plus slip rings, to allow electrical contact resistance measurements to be made (more interesting).

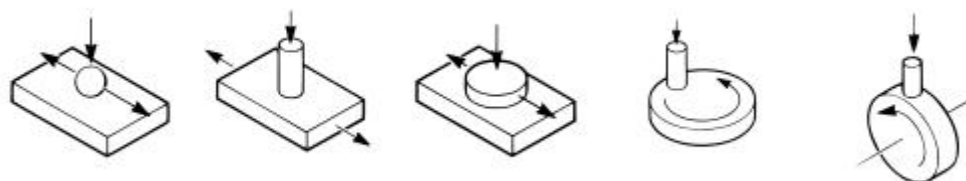
The new TE 74S design has two 5.5 kW motors, shaft centre distance of 40 mm and can accommodate rollers in the range 40 mm on 40 mm diameter to 15 mm on 65 mm diameter. The maximum load is 12 kN. The TE 74H has two 30 kW motors, shaft centre distance of 70 mm and can accommodate rollers in the range 70 mm on 70 mm to 30 mm on 110 mm. The maximum load is 30 kN.

### ***TE 87 Multi-station Circular Translation Pin on Disc Machine***



The first two units of Dr Vesa Saikko's orbital motion pin on disc machine (Tribology Update 19) are currently in production. The original orbital drive system has been replaced by a double scotch yoke mechanism that allows circular orbital, elliptical orbital and pure reciprocating motion, thus enhancing considerably the capabilities of the machine.

### ***TE 88 Multi Station Friction and Wear Test Machine***



We have finally replaced the old spring balance loading arrangement on the TE 88 machine with pneumatic bellows with an in-line force transducer measuring the applied load. A manually adjusted pressure regulator is used to set the load.

### **OTHER NEWS:**

#### ***The Cambridge Tribology Course 2007/8***

The 2007 course was once again fully subscribed, or to be precise, over-subscribed: a total of 42 delegates against a target of 36. In view of the popularity, the course will once again take place, from Wednesday 17<sup>th</sup> to Friday 19<sup>th</sup> September 2008. We understand that 15 provisional bookings have already been received, so book early to avoid disappointment.

#### ***Web Site on CD ROM***

If you would like to view our web site off-line, we can provide you with a copy of the latest web site on CD ROM. If you would like to receive a copy please e-mail [CDROM@phoenix-tribology.com](mailto:CDROM@phoenix-tribology.com).

George Plint and David Harris  
**Phoenix Tribology Ltd**