

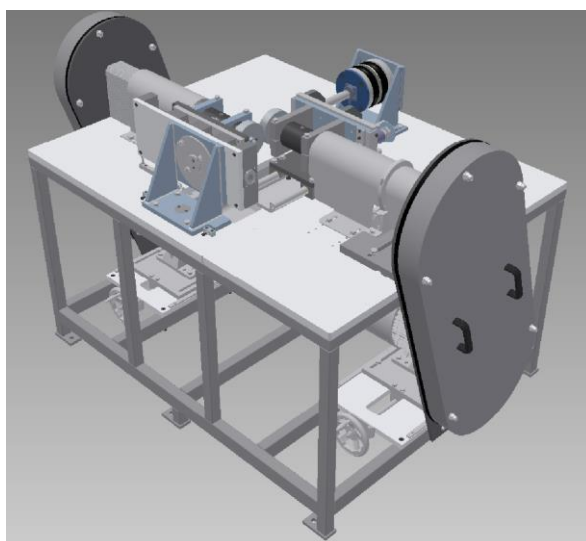
TRIBOLOGY UPDATE: *ISSUE 30 – JANUARY 2015*

This is the latest issue of our **Tribology Update** newsletter. The last nine months have been exceptionally busy for us, so we have a lot to report. For further information, we can be contacted by e-mail at info@phoenix-tribology.com.

WORK IN PROGRESS – IN PRODUCTION:

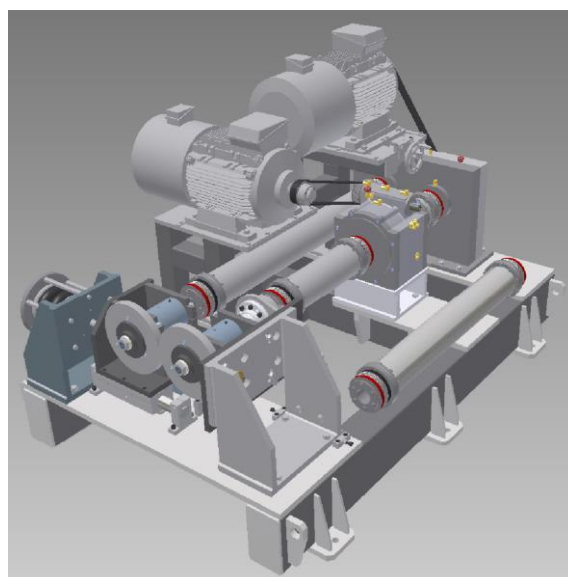
TE 72S Two Roller Machine – 4 kW Transmitted Power

The power capacity of the TE 72S re-circulating power machine has been increased from 2 x 1.5 kW to 2 x 4 kW a.c. vector motors. We are also in the process of adding a reciprocating block on ring option.



TE 73HTwo Roller Machine – 225 kW Transmitted Power

We are currently producing an updated version of the TE 73 re-circulating torque (back-to-back or four-square type) two roller machine, designed for tests on rollers at 300 mm shaft centre distance.



At speeds up to 1780 rpm (a surface speed of 100 kph) the machine operates with a fixed slide-roll ratio, set by a gear pair in a parallel shaft gear-box. Gear-boxes with ratios from 100:100 to 100:90 are available.

At lower speeds, up to a maximum of 500 rpm, a speed modulating, two-stage, epicyclic gear-box is included in the torque loop. By driving the ring gear on the output stage of the gear-box, the output speed can be adjusted by +/-22 rpm, hence, for an input speed of, say, 100 rpm, the output speed can be adjusted to 100 +/-22 rpm and 500 rpm to 500 +/-22 rpm.

WORK IN PROGRESS – PRODUCT DEVELOPMENT:

TE 91 & TE 92 Back-to-back Gear Adapter



We have designed a prototype back-to-back gear test adapter for use with axially loaded tribometers such as the *TE 91 Rotary Vacuum Tribometer* and *TE 92 Rotary Tribometer*. A high helix lead screw is used to translate an axially applied load into wound in torque, thus allowing control of the circulating torque, while in motion, by control of axial load. Gear samples can be manufactured from readily available, standard, spur gears.

WORK COMPLETED:

TE 77 High Frequency Friction Machine

We have been engaged in a significant number of small developments and at the same time have completed a series of *demonstration experiments*, which are now available on the web site. They are designed to provide guidance on how to use the machine effectively and how to design experiments.

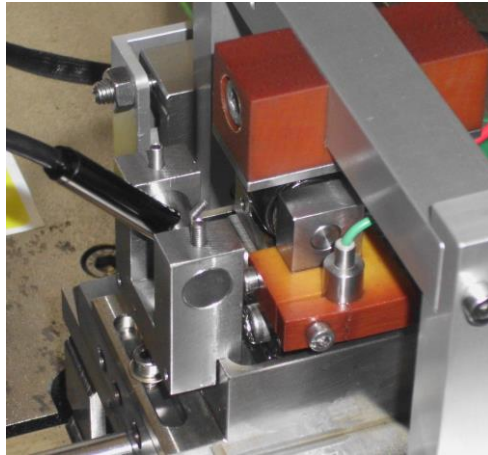
TE 77 LVDT & HSD

Because most machines are currently ordered with the LVDT stroke measurement and high speed data acquisition options, we have decided to incorporate these as standard features on all future machines. Further details on their use can be found in the *demonstration experiments*.

TE 77 Friction Noise

We have developed a new analogue circuit, which allows continuous monitoring of the disorderliness of the instantaneous friction signal, producing a measurement of what we term “friction noise”. This signal can be used to monitor friction events at localised stroke positions. The friction noise circuit is now fitted as standard to all new machines. Details of its development and use can be found in the [demonstration experiments](#).

TE 77 Wear and Camera



We have carried out experiments using a simple and cheap USB endoscope camera to observe fixed specimen wear scars, as they develop. This does, of course, require experiments to be run at sufficiently long stroke to allow the wear scar to be exposed.

TE 77 Pin on Twin



We have started running experiments with the pin on twin test geometry, as developed by Peter Blau at ORNL. Mounting of twin rod samples is achieved by machining a couple of grooves in the bottom of a standard fixed specimen bath, in conjunction with a pair of simple clamps. Further details on its use, in particular for testing DLC coatings, can be found in the [demonstration experiments](#).

TE 47 Six Station Ring/Liner Tribometer – Three station

Having met the challenge of fitting six samples into a small liner, we have come to the conclusion that if one wishes to fit tiny feed-pipes for lubricant supply to each ring sample, plus embed tiny thermocouples in each sample, the assembled ring sample carousel can become somewhat complicated to handle. We have therefore decided that it is more practical to limit the number of samples on the carousel to three, which now conveniently matches the arrangement adopted for the ***TE 92/12 Three Station Ring-Liner Adapter***.

OTHER NEWS:

Cambridge Tribology Course 2015

The course will take place from 21st to 23rd September 2015.

Wear of Materials 2015

We will be represented at 20th International Conference on Wear of Materials, 12th to 16th April 2015 in Toronto, Canada. In addition, we will be contributing to the ***tutorial session*** that runs from 1330 to 1730 on Sunday 12th.

STLE 70th Annual Meeting & Exhibition

We will once again be attending the STLE Annual Meeting and Exhibition in Dallas, Texas, 17th to 21st May 2015, as both authors and exhibitors.

George Plint and David Harris
Phoenix Tribology Ltd