TE 53 MULTI-PURPOSE FRICTION AND WEAR TESTER

Description

A bearing housing carries two parallel shafts. The lower shaft carries a flat profile ring or roller and is connected to an a.c. servo motor. The upper shaft is carried in a spherical bearing at one end that permits rotation about the gear contact line and has a floating bearing at the other end. This allows the shaft to pivot freely in the vertical and horizontal axes.

Horizontal movement in the direction perpendicular to the upper shaft axis and is resisted by a strain gauge transducer. This gives measurements of the tangential force in the contact, which is displayed as friction force on the control unit.
Load is applied through a lever acting in the vertical plane on the front end of the upper shaft, pressing on the outer race of the floating bearing. Load is applied to the other end of the lever by a low friction pneumatic cylinder, which is manually set using a precision regulator. A strain gauge beam force transducer is provided to sense the applied load.

A sealed chamber surrounds the test specimens and incorporates a heater element to maintain the test fluid temperature.

In two roller configuration the upper shaft carries a roller and is driven from the lower shaft through a pair of gears. Seven fixed percentage slip ratio are provided. The upper roller is mounted on a self-aligning bearing to achieve full width line contact between the specimens.

In block on ring configuration the upper shaft carries a holder for the fixed specimen and is restrained from rotating. The specimen may be a ball (ball on cylinder test), a block (block on ring test) or a cylinder (crossed cylinder test). A holder for blocks described in ASTM G77 test is included.
Roller and block specimens can be manufactured easily from a variety of materials including metals, plastics, elastomers and ceramics.

Control and Data Acquisition

Speed set-point control is manual, implemented via a PLC, with inputs via touch-screen. Data is recorded at 1 Hz sampling rate, stored by the PLC and exported on USB stick, for post-processing.