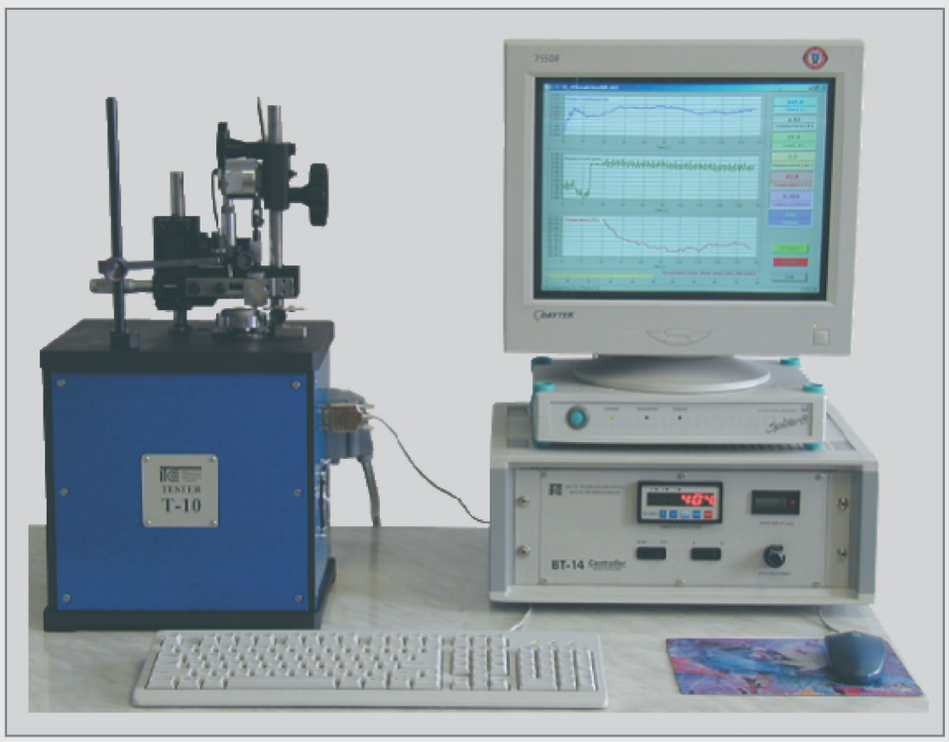
INSTITUTE FOR SUSTAINABLE TECHNOLOGIES
NATIONAL RESEARCH INSTITUTE – RADOM

PW-004 Multi-Year Programme

DEVELOPMENT OF INNOVATIVE SYSTEMS OF MANUFACTURING AND MAINTENANCE 2004–2008

T-10 BALL-ON-DISK TESTING MACHINE FOR EVALUATING FRICTION AND WEAR OF THIN COATINGS



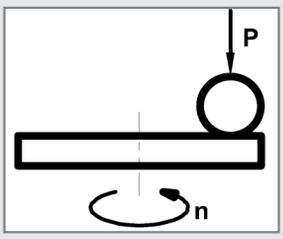
Executor

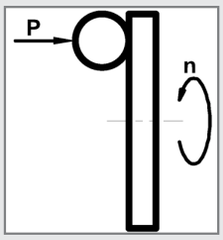
INSTITUTE FOR SUSTAINABLE TECHNOLOGIES – NATIONAL RESEARCH INSTITUTE
ul. K. Pułaskiego 6/10, 26-600 Radom, Poland, tel. 00 48 48 3644241, fax 00 48 48 3644760, e-mail: instytut@itee.radom.pl; http://www.itee.radom.pl

MAIN CHARACTERISTICS

T-10 Testing Machine is intended for the determination of the tribological properties of engineering materials used for sliding joints of machines, particularly thin coatings. T-10 Machine makes it possible to determine the wear resistance and friction coefficient for a pair of materials sliding against each other, depending on sliding velocity, applied load, and other factors.

Experiments can be conducted in accordance with the **ASTM G 99** and **DIN 50324** standards.





The tribosystem consists of a stationary ball pressed at the required load P against the disk rotating at the defined speed n. The disk is made of the tested material. In case of testing of a surface coating, it is deposited on the disk. The tests are generally performed under dry friction conditions.

Two spatial configurations of the tribosystem are possible - vertical rotation and horizontal rotation axis of the disk, which is available after simply changing the load lever system. Optionally, one may use the KS-10 air conditioning chamber for the stabilisation of humidity and temperature in the surroundings of the contact zone. The chamber is mounted directly onto the T-10 tribotester.

As shown during COST 516 Tribology Action programme, the wear debris should be removed from the contact zone by a stream of dry argon, for example, to improve the stability and repeatability of the friction and wear characteristics of the tested pair of materials. The introduction of Ar to the contact zone requires additional equipment (option). T-10 Testing Machine is equipped with a control-measuring system that consists of the following:

- A set of measuring transducers,
- Controller,
- Digital measuring amplifier,
- PC and special software for measurements and data acquisition, and
- Equipment for Ar introduction and the KS-10 air conditioning chamber (options).

During the tests the following quantities are measured:

- Friction force,
- Total linear wear of test specimens,
- Ambient temperature,
- Rotational speed, and
- Time and the number of disk revolutions (sliding distance).

The measured values are displayed on the monitor screen and saved on the computer disk. The motor of the tribotester is automatically stopped when the preset time elapses or when the preset sliding distance (number of disk revolutions) is reached. After test completion, one can print a report presenting the curves of the changes in the particular quantities versus time.

TECHNICAL SPECIFICATIONS

• Type of movement	sliding
• Contact geometry	non-conformal (point)
• Spatial configuration	vertical or horizontal disk rotation axis
• Nominal ball diameter	10 mm
• Nominal disk diameter	42 mm
• Sliding velocity	up to 1 m/s
• Normal load	up to 50 N
• Wear track radius	up to 20 mm
• Tribotester dimensions (W x H x D)	320 x 600 x 260 mm
• Tribotester weight	30 kg
• Power supply	230 V / 50 Hz (optionally 110 V / 60 Hz)
• Max. power consumption	0.6 kW