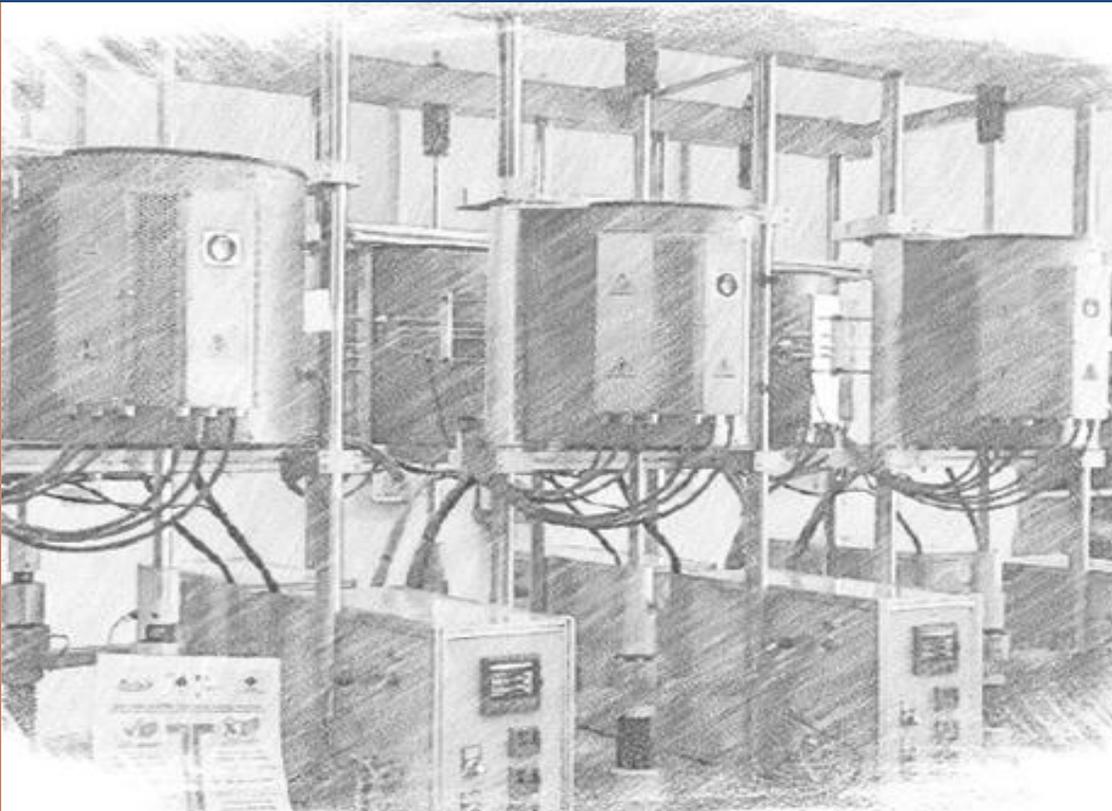


Developing a road for evaluation of materials by technology

Newsletter on Advanced Material Testing



- **IIT Bombay** – High Temperature Electromechanical cum Single-Lever Type Creep Testing Machine
- **IOCL** – 12 nos of Accelerated Stress Rupture Testing Machine
- **Bharat Dynamics Limited**-100 kN Universal Testing Machine
- **Vikram Sarabhai Space Centre** - 50kN UTM for Polymer Testing

Advanced Material Testing

Features

Accelerated Stress Rupture Testing Machine

- 1) The load frame capacity from 10 kN to 100 kN.
- 2) Compact design-multiple machines with a common crosshead can be supplied. Testing temperature from ambient to 1200 °C & above.
- 3) Rigid-column construction with single-screw driven provides precise alignment during testing procedures. Columns are treated and hard chrome plated for extended file and durability.
- 4) Test speed between minimum 0.001 mm/min to 100mm/min.

Universal Testing Machine

- 1) They are dual column floor standing UTM.
- 2) These machines are suitable for performing static and low-frequency cyclic testing. Capacities from 10 kN to 1200 kN are available.
- 3) Can be customized to user requirements.
- 4) High Stiffness and rigid.



Accelerated Stress Rupture Testing Machine

This machine is designed specifically for long term stress rupture test applications that involve maintaining constant loads for extended periods of time. Constant loads are maintained with a high degree of accuracy for long durations by means of an electrochemical powered drive. It has a multiple loading frame system with 6 individual actuators and load cells. Each load spindle is controlled by means of a SCM3000 system and PC's and networked through a central data archiving workstation for data storage and viewing of live and historic data.

A load cell is mounted on each individual load frame in the lower part of the loading train to minimize the heating effects in high temperature tests.



Universal Testing Machine

This machine is very feasible and accurate for performing tests. Under demand machines with higher capabilities can also be designed and manufactured. A wide choice of load cells, extensometers, grips, specimen holders, fixtures and other testing accessories allow the EM2 Series universal testing machines to be used for accurate and repeatable mechanical testing of metals and alloys, plastic, polymers, composites, geo-textiles etc. In this the upper crosshead is actuated by double ball screws and guided by two or four robust guidance columns. The lead ball screws are preloaded for backlash elimination. The precisely-aligned, hard chrome plated guidance columns long with the preloaded ball screws provide superior stiffness and rigidity for these testing machines. This machine is being used by BDL, VSSC, etc.

Advanced Material Testing



High Temperature Electromechanical cum Single-lever type Creep Testing Machine

This machine has a capacity of 50 kN (high capacity available on request). Load is applied to the specimen either electromechanically or through a single-lever arm with a precision lever ratio of 20:1 and with load accuracy better than $\pm 0.5\%$. The central single ball-screw drive of the machine is used for levelling, for weight elevation and for load application when blocking the lever. The system includes measurement of the crosshead position by an internal encoder. The crosshead position is servo-controlled automatically. A manual position control is also possible to allow the manual elevation of the weights or repositioning. The automatic load lever beam levelling device with over travel trips is used to maintain horizontal position of the lever arm.

UTM for Polymer Testing

This machine has been designed and engineered to be suitable for testing a wide range of materials and components in tension, compression, flexure, shear, tear and peel. It is totally pre-calibrated for the scope of testing performance, precision and accuracy and designed for both monotonic and cyclic mechanical testing on a variety of materials and components. Machines are driven by a maintenance free, digitally controlled electromechanical drive system composed of a high-performance servo motor and a high-resolution incremental optical encoder, placed on the motor axis, used for high-precision measurement of the crosshead position and speed.



Features

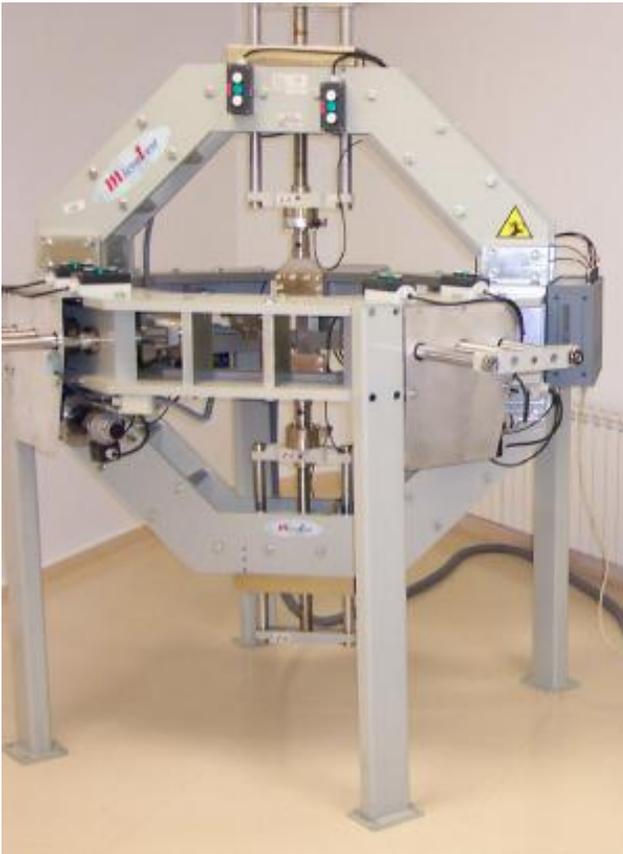
High Temperature Electromechanical cum Single- lever type Creep Testing Machine

- 1) Computer controlled free-standing 10kN to 200kN load frame system to optimize laboratory floor space. Higher capacities available
- 2) Equipped with a three zone furnace to carry out the tests at temperatures in the range 25°C to 1200°C with an accuracy of $\pm 1^\circ\text{C}$ over a length of 200 mm.
- 3) All necessary accessories to facilitate creep testing under tension mode as well as compression mode.
- 4) Adjustable counter-balance arm for nulling load train mass.
- 5) Motorized Draw Head Assembly to maintain lever horizontality with automatic variable speed

UTM for Polymer Testing

- 1) Tabletop/ Floor mounted double column load frame with high stiffness and precise crosshead guidance
- 2) Advanced load cell technology for faster testing and reduction of inertial errors.
- 3) Automatic recognition and calibration of load/strain transducers and other auxiliary equipment.
- 4) This electronic board provides a closed loop control of the machine and analogue to digital conversion for at least 8 channels

Advanced Material Testing



Biaxial & Triaxial Testing Machine

Servo-Controlled Multiaxial (Biaxial and Triaxial) Testing Machines for testing of different type of materials: Steel, Aluminum alloys, fiber reinforced composites such as plastics, Glass Fiber Reinforced Epoxy, Graphite Fiber Reinforced Epoxy etc.

This machine has been designed and engineered to be suitable for testing a wide range of materials and components in Synchronized Tensile /Compressive Loading along perpendicular directions).

This system features a High Stiffness Multi Axis Testing Frame with 4 servo-hydraulic actuators in the case of biaxial testing machines and 6 fatigue rated servo-hydraulic actuators for tri-axial systems. The actuators are working in pairs in two orthogonal axis. The actuators can be individually controlled and programmed for independent or synchronized control load, position or strain.

High rigidity Loading structure floor mounted consisting of two orthogonally intersecting test frames, each with two opposing actuators systems.

The controller unit DMC4000/N is able to control these set of servo actuators and generate high precision states of stress along several axis: XY plane in a biaxial mode or XYZ in a tri axial system. Tension, compression tests can be performed at constant speed, constant load rate static tests, high speed, and high frequency load controlled fatigue tests. The microprocessor control system DMC4000 allows fully automatic test cycle with high-speed closed loop control, data acquisition, function generation, and transducer conditioning for at least 3 channels per test station or actuator for High performance and long term reliability.

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