

**Force Sensor:** During tests, force sensors measure the load applied. A digital load meter shows the real-time force and stores the peak force.

**Displacement indicator:** measures and displays the vertical movement of the loading platform or part of the structure under test.

User can use the force and the dimensions of the part under test to find the applied stress. They also use the vertical displacement to find the strain. User can also use the Universal Testing Machine to test different types of materials, engineering parts and structures taking into account the limitations of the system.

The provided data acquisition software allows quick and reliable tests, that gives accurate real-time data capture, monitoring and display, calculation and charting of all important readings on the PC. This will be provided with a comprehensive user guide for the system.

### **Tests allowed (also depend on the available hardware limitations):**

#### **1. Compression Test Parameters:**

- **Compressive Strength:** It represents the maximum compressive stress a material can withstand without failure. Commonly used in assessing the strength of concrete.
- **Modulus of Elasticity (Young's Modulus) in compression:** This parameter measures the material's stiffness and its ability to deform elastically under compressive stress.
- **Strain at Failure:** It indicates how much the material deforms under the maximum compressive load before failure.

#### **2. Flexural Test Parameters:**

- **Flexural Strength (Modulus of Rupture):** This measures the maximum bending stress a material can withstand before failure. It's crucial for assessing the structural integrity of materials like concrete beams.
- **Flexural Modulus (Modulus of Elasticity in Bending) in compression:** Similar to the modulus of elasticity in compression, this parameter measures the material's stiffness under bending loads.
- **Strain at Failure in Bending:** Indicates the material's deformation under bending stress before failure.

### 3. Bending Test Parameters:

- **Bending Strength:** Similar to flexural strength, this parameter assesses the material's ability to withstand bending stress.
- **Bending Modulus (Flexural Modulus) in compression:** Measures the material's stiffness and resistance to deformation under bending.
- **Strain at Failure in Bending:** Indicates the material's deformation under bending stress before failure.