**EXPERIMENT NO. -1**

**Object:** Determination of Tensile Strength and Elongation at break of film sample.

**Equipment:**

* + Tensile testing Machine or UTM
  + Thickness Gauge
  + Vernier caliper**s**

**Significance:** The tensile modulus of elasticity is an index of the stiffness of plastic films and can be used to compare the stiffness of different materials. The tensile energy to break (TEB) is the total energy absorbed per unit volume of the specimen up to the point of rupture and can be considered as a measure of toughness. Ultimate elongation values of several hundred percent are common for polymer films. The rate of strain, specimen parameters, and especially flaws may cause large variations in the results. In that sense, caution is advised in utilizing TEB test results for end-use design applications.

**Procedure:**

* Rectangular sample of dimensions 2.54cm width and 15.24 cm length samples are cut in length wise and cross wise direction of film. 5 samples in each direction are taken.
* Each sample is inspected and with the help of thickness gauge the thickness is measured at various points and average thickness is considered.
* Samples are placed and fixed at upper jaws of tensile machine and movable jaws are moved up to fix the lower end of film
* Initial length L0 of film between the jaws is measured with the help of Vernier caliper**s**
* The stretching speed is fixed on the machine and the movable jaw is moved down at constant speed.
* At the breaking of sample, the reading of load in Kgf noted and final length L1 between the jaws is measured with the help of Vernier calipers.

**Calculations:** The following formulae are used for calculation of tensile strength and %

elongation:-

Tensile Strength ( Kgf/cm2  ) = W / ( b x t )

W = Load in Kgf.

B = Width in cm.

T = Thickness in cm.

% Elongation = [ (L1 - L0)/ L0] x 100.

L0 = Initial length of film between the grips in cm.

L1 =Final length of film between the grips in cm.

**Results:** TheTensile Strength of film sample is ------------- Kgf/cm2  and Elongation at break

of film sample is -----------%