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**HS 3005 Tensile Strength****1. Purpose**

Tensile strength of bags sample can be characterized in this test method. This test method is suitable for film of less than 1.0 mm in thickness.

**2. Terminology – Nil****3. Apparatus**

3.1 Tensile test machine, a testing machine that is capable to provide a constant rate-of-jaw-separation. The machine shall be equipped with a device for recording the tensile load and the amount of separation of the grips.

3.2 Thickness gauge, a dead-weight dial micrometer, with reading down to 0.0025 mm or less.

**4. Preparation of test specimens and conditioning**

4.1 Cut strips of film of uniform width and thickness from the test sample. The dimension of the test specimen strip may be 15 mm width x 100 mm length or any other recommended dimensions as stated in ASTM D882-97<sup>[1]</sup>.

4.2 Condition the test specimens at  $23\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$  and  $50\% \pm 5\%$  relative humidity for not less than 40 hours prior to the test.

**5. Procedures**

5.1 Perform the test in an environment of  $23\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$  and  $50\% \pm 5\%$  relative humidity.

5.2 Use the thickness gauge (Section 3.2), measure the cross-section area of the specimen at three points along its length.

5.3 Set the initial grip separation of the tensile test machine to 50 mm.

5.4 Set the rate of grip separation of the tensile test machine to 50 mm/min.

5.5 Place the test specimen in the grips of tensile test machine. Tighten the grips evenly and firmly to the degree necessary to minimize slipping of the test specimen during test.

5.6 Start the machine and record the load versus the length of extension.

5.7 Record the maximum load and extension at break of the specimen.

5.8 Repeat the test for five more specimens.

**6. Results**

## 6.1 Tensile strength

It is calculated by dividing the maximum load by the original minimum cross-sectional area of the specimen.

## 6.2 Percentage of elongation at break

It is calculated by dividing the extension at the break point by the original gauge length.

## 6.3 The average tensile strength and % of elongation at break is calculated from the six test specimens for evaluation.

**7. References**

1. ASTM D882-97, Standard Test Methods for Tensile Properties of Thin Plastic Sheeting, ASTM, Philadelphia, PA, USA.