

Tentative Method of Test for

TENSILE ENERGY ABSORPTION OF PAPER¹



ASTM Designation: D 2174 - 63 T

This Tentative Method has been approved by the sponsoring committee and accepted by the Society in accordance with established procedures, for use pending adoption as standard. Suggestions for revisions should be addressed to the Society at 1916 Race St., Philadelphia 3, Pa.

[In accordance with the Society's policy that tentatives should not be continued indefinitely, this tentative will be discontinued in April, 1971 unless the sponsoring committee takes action to adopt it as standard or the Committee on Standards grants a continuance for an additional year.]

Scope

1. This method covers the determination of the tensile energy absorption of paper.

Significance

2. The suitability of paper for many end uses depends upon its ability to absorb energy in tension. This energy-absorbing capacity of paper can best be characterized by the area under its tension load - elongation curve. This area has the units of force times distance and, when it refers to unit area of paper, is referred to as tensile energy absorption.

Apparatus

3. Provide a tension testing instrument (Note 1) with the following features and auxiliary equipment:

NOTE 1.—This method requires a constant rate of elongation of the specimen. Therefore, a pendulum-type tester cannot be used.

¹ Under the standardization procedure of the Society, this method is under the jurisdiction of the ASTM Committee D-6 on Paper and Paper Products. A list of members may be found in the ASTM Year Book.

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(a) Means for straining the specimen at a constant rate of 1.00 ± 0.01 in. per min (2.54 ± 0.02 cm per min).

(b) Capacity for measuring the elongation with an accuracy of ± 2 per cent of the actual value and the load with an accuracy of ± 0.5 per cent.

(c) Means for recording the load - elongation curve and measuring the area under it (area between the load curve and the elongation axis) or for directly measuring the work to rupture with an accuracy of ± 2 per cent. Automatic integrators, planimeters, or other integrating devices may be used so long as the requirement for accuracy is fulfilled. (For the purpose of terminating integration, the specimen will be deemed broken when maximum elongation and maximum tensile load have been reached and the tensile load has dropped no more than 0.25 per cent of full-scale load below the maximum load.)

(d) *Clamping Device.*—Two clamps constructed to provide (1) line contact for gripping the specimen, with the line of contact perpendicular to the direction of the applied load (Note 2), and (2) a means for control and adjustment of the