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PROVISIONAL METHOD – 1992

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Thickness of paper and paperboard (soft platen method)

1. Scope

1.1 This method describes a procedure for measuring the thickness of a single sheet of paper or paperboard using soft synthetic rubber platens against the paper to minimize the effect of surface roughness. This method is not to be confused with nor substituted for TAPPI T 411 “Thickness (Caliper) of Paper and Paperboard and Combined Board.” It is to be used primarily for sheet density calculations and general roughness determination. Because of the relatively high pressure (50 kPa), this method may not be suitable for measurement of tissue or other soft or low density materials, because the structure may collapse at the prescribed pressure of 50 kPa (7.2 psi).

1.2 Other methods which yield similar results are the mercury displacement method and the effective thickness concept (2).

1.3 TAPPI T 411 “Thickness (Caliper) of Paper, Paperboard, and Combined Board” describes a method for measuring thickness using hard platens. This method is affected by surface roughness, and the measured thickness is always higher than that determined by the soft platen method.

2. Summary

This method measures the thickness of a single sheet of paper or paperboard using a micrometer equipped with soft synthetic rubber platens. The calibration and testing procedures are significantly different from methods using hard platen micrometers.

3. Significance

Paper thickness as measured by TAPPI T 411 (hard-platen method) is useful for product control purposes, design of end use products, and for acceptance testing for conformance to specifications. It is known, however, that the test result is affected by the surface roughness and compressibility of the paper being tested. The soft platen method largely eliminates the surface roughness effect and, because the platen closing pressure is more uniformly distributed over the test area, partially eliminates the compressibility effect. Hence, the soft platen method is preferred when the measured thickness is used to calculate sheet density (J). Soft platen thickness gives the same results as effective thickness, which is defined as theoretical thickness obtained from the relationship of extensional stiffness to bending stiffness.