T 538 om-01

PROVISIONAL METHOD – 1982
OFFICIAL TEST METHOD – 1988
REVISED – 1996
REVISED – 2001

CAUTION:
This Test Method may include safety precautions which are believed to be appropriate at the time of publication of the method. The intent of these is to alert the user of the method to safety issues related to such use. The user is responsible for determining that the safety precautions are complete and are appropriate to their use of the method, and for ensuring that suitable safety practices have not changed since publication of the method. This method may require the use, disposal, or both, of chemicals which may present serious health hazards to humans. Procedures for the handling of such substances are set forth on Material Safety Data Sheets which must be developed by all manufacturers and importers of potentially hazardous chemicals and maintained by all distributors of potentially hazardous chemicals. Prior to the use of this method, the user must determine whether any of the chemicals to be used or disposed of are potentially hazardous and, if so, must follow strictly the procedures specified by both the manufacturer, as well as local, state, and federal authorities for safe use and disposal of these chemicals.

Roughness of paper and paperboard (Sheffield method)

1. Scope

This method is a measurement of the air flow between the specimen (backed by flat glass on the bottom side) and two pressurized, concentric annular lands that are impressed into the sample from the top side. The rate of air flow is related to the surface roughness of paper or paperboard.

2. Summary

The measuring head, which has concentric annular lands, is dead-weight loaded against the specimen, which is supported by a flat glass surface. Air pressure is supplied to the zone between the annular rings that form the lands, and the flow rate of air that leaks between the surface of the paper and the metal lands in contact with the specimen is measured. The purpose of this test is to measure the extent to which the surface of a specimen deviates from a plane, as affected by the depth, width and number of departures from that plane. The measured flow rate of the leakage of air is an indirect measurement of surface roughness. This method does not read absolute roughness, but indicates the degree of roughness for comparison. The effective measuring range of this method is from 0 to approximately 445 Sheffield units.

3. Significance

3.1 Surface roughness has an important influence on the printing quality, as uniform ink coverage of the paper can be achieved only when the deepest depressions of the paper surface under impression are separated from the printing plate by not more than ink film thickness on the plate. Roughness also affects properties such as the coefficient of friction, gloss, and coating absorption.

3.2 This method describes a procedure for obtaining surface roughness data quickly, using a measuring head with air passages that can easily be inspected for blockage, and easily cleaned.

3.3 In addition to the air that leaks between the lands and the surface of the specimen, there is some leakage through the specimen due to its porosity and also to the roughness of the underside of the sheet. The degree to which the test results are affected is related to the air permeance and compressibility properties of the specimen.

Approved by the Standard Specific Interest Group for this Test Method
TAPPI