

T 546 om-01

PROVISIONAL METHOD – 1988
OFFICIAL METHOD – 1994
REVISED – 2001
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Machine direction grammage variation measurement (gravimetric method)

1. Scope

1.1 This method describes a procedure which can be applied to determine the short term machine direction variation in mass per unit area. These variations can be caused by defects in the stock approach system, headbox, or consistency control. This test method is not intended to identify the source of the variations, but rather to quantify them. The method has particular application to acceptance testing of both the papermaking process and the product.

1.2 This test is laborious, but it is reliable and accurate. It requires cutting out samples, weighing samples, and data evaluation.

1.3 The general procedures outlined in TAPPI T 410 “Grammage of Paper and Paperboard (Weight per Unit Area)” and in TAPPI T 402 “Standard Conditioning and Testing Atmospheres for Paper, Board, Pulp Handsheets, and Related Products,” are used as basic references for this method. TAPPI T 545 “Cross-Machine Grammage Profile Measurement (Gravimetric Method)” is the counterpart to this method for the cross-machine evaluation.

2. Summary

The machine direction grammage (basis weight) variation is determined by the following steps: sampling a machine direction strip from the outer layers of a parent roll; preconditioning the sample; cutting and trimming the sample into a series of rectangular sheets 300 mm CD x 200 mm MD; discarding those sheets with obvious defects; conditioning the sheets; weighing the sheets. The sheet weights are then analyzed using analysis of variance to determine MD standard deviation and coefficient of variance.

3. Significance

Evaluation of grammage variation from measurements on a machine direction strip is a useful way to analyze performance of the wet end of a paper machine. This method provides significant accuracy and repeatability to be used for acceptance testing of papermaking equipment and for product specification.

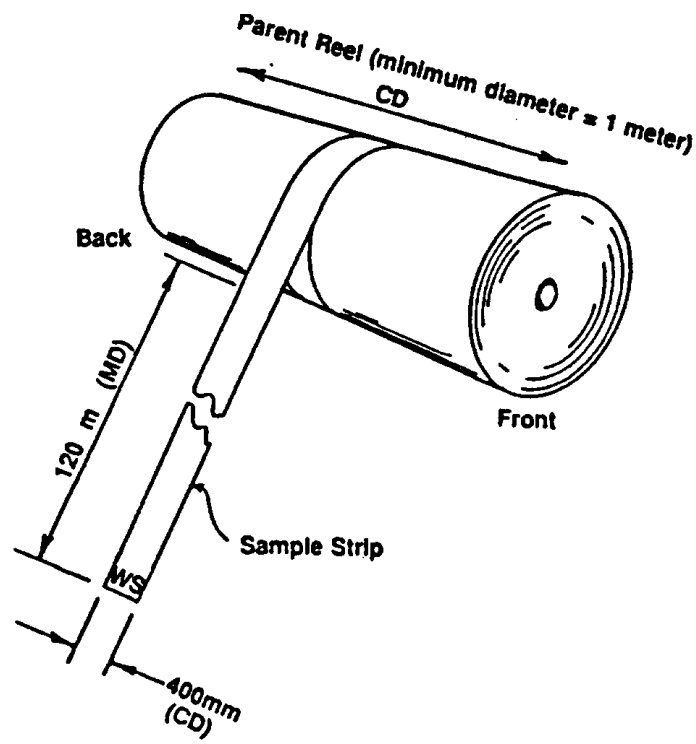


Figure 1

- 6.3 This strip must be free from creases, wrinkles, folds, and tears.
- 6.4 Note the date, time, reel number, and machine number. Mark the wire or bottom side of the strip with “BS.”
- 6.5 Carefully transfer the sample to a climate-controlled conditioning room. Avoid putting creases, wrinkles, or corrugations in the paper.
- 6.6 Depending on the purpose of the testing, it may be useful to note any abnormal conditions which occurred while this strip was being produced.

7. Test specimens

- 7.1 Precondition the test sample strip on the dry side in atmospheres in accordance with TAPPI T 402. Initial drying can be accelerated using an oven.
- 7.2 Unroll the strip on a long, flat surface. Discard the ends of the strip if they are wrinkled or creased. The discarded portions should be no more than 10 m in length.
- 7.3 Beginning at one end, cut (100) rectangular sheets approximately 400 mm (CD) x 300 mm (MD) from the strip.
- 7.4 Sheets will be taken every 1 m so that the MD distance between sheet edges will be 700 mm, as shown in Fig. 2.