

T 809 om-11

SUGGESTED METHOD – 1966
OFFICIAL STANDARD – 1971
OFFICIAL TEST METHOD – 1982
REVISED – 1987
REVISED – 1993
REVISED – 1997
REVISED – 1999
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Flat crush of corrugating medium (CMT test)

1. Scope

This method describes a procedure for measuring the crushing resistance of a laboratory fluted strip of corrugating medium, and provides a means of estimating, in the laboratory, the potential flat crush resistance of a corrugated board.

NOTE 1: While the choice of testing instrument does not create significant differences in this test, it should be noted that when the flat crush of the corrugated board is being determined, the rigid support instrument (T 825) gives significantly higher results than the flexible beam instrument (T 808).

2. Significance

Rigidity of the fluted structure is one of the essential characteristics of corrugated board and flat crush resistance (T 825) is necessary to prevent crushing of the flute structure on the corrugator and other converting equipment. The corrugating medium test (CMT) permits the evaluation of the crush resistance of corrugating medium before it is fabricated into combined board, and by consideration of the flat crush of the corrugated board produced may act as a basis for judgment of fabrication efficiency.

3. Apparatus¹ and materials

3.1 *Medium fluter*¹, consisting of a pair of matched “A”-flute type rolls thermostatically controlled to a temperature of $177 \pm 8^\circ\text{C}$ ($350 \pm 15^\circ\text{F}$). The dimensions of the fluting rolls are:

3.1.1 Roll face, 16.0 ± 1.0 mm (0.63 ± 0.04 in.).

¹ Names of suppliers of testing equipment and materials for this method may be found on the Test Equipment Suppliers list in the set of TAPPI Test Methods, or may be available from the TAPPI Quality and Standards Department.

Approved by the Standard Specific Interest Group for this Test Method



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- 3.1.2 Number of teeth, 84.
- 3.1.3 Depth of teeth, 4.75 ± 0.05 mm (0.2 ± 0.002 in.).
- 3.1.4 Roll diameter tip to tip, 228.5 ± 0.5 mm (9 ± 0.02 in.).
- 3.1.5 Radius of teeth at peak, 1.5 ± 0.1 mm (0.06 ± 0.004 in.).
- 3.1.6 Radius of teeth at base, 2.0 ± 0.1 mm (0.08 ± 0.004 in.).
- 3.1.7 The force between the rolls is set at 100 ± 10 N (22.5 ± 2.25 lbf.).
- 3.1.8 The speed of the fluting rolls is permanently set at 4.5 r/min ± 1.0 r/min.
- 3.2 Rack and comb, (see figure 1) having the following characteristics:

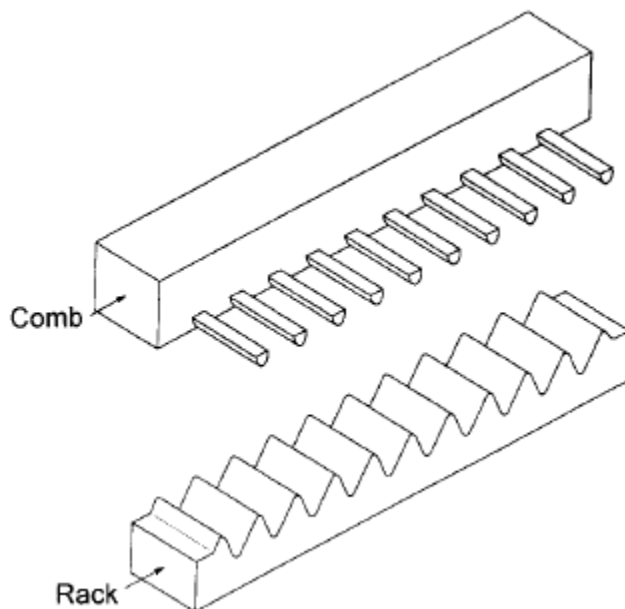


Fig. 1. Drawing of rack and comb.

- 3.2.1 Rack, 11 teeth, 10 valleys.
 - 3.2.1.1 Height of teeth, 4.75 ± 0.05 mm (0.2 ± 0.002 in.).
 - 3.2.1.2 Tooth spacing is 8.50 ± 0.05 mm (0.335 ± 0.002 in.).
 - 3.2.1.3 Width, $19.00 - 0.0$ mm ($0.75 - 0.0$ in.).
- 3.2.2 Comb, number of prongs, 10.
 - 3.2.2.1 Prong length, at least 19 mm (0.75 in.) wide.
 - 3.2.2.2 Max. prong thickness, 3.4 ± 0.1 mm (0.13 ± 0.004 in.).
- 3.3 Pressure sensitive tape, at least 15 mm (0.6 in.) width. While no standard tape can be specified in this method at this time, some laboratories report an impact of the tape used on test results.
- 3.4 Specimen cutter, a hand lever operated diecutter. The female portion is 12.7 ± 0.1 mm (0.5 ± 0.004 in.) $\times$ 150 to 160 mm (6 to 6.3 in.). The male die is machined to fit the female. The cutting assembly is provided with a specimen delivery slot. The whole is enclosed in a frame to keep out dust.
- 3.5 Flexible beam compression or rigid-platen testing machine, in accordance with TAPPI T 811 "Edgewise Compressive Strength of Corrugated Fiberboard (Short Column Test)."
- 3.5.1 The surface of the platens shall be provided with some means to prevent slippage of the test piece during compression, for example, by means of a matt finish or being faced with crocus cloth or its equivalent, adhered free of ridges and maintaining parallel surfaces.

4. Test specimens

From each test unit accurately cut at least 10 specimens. Cut the test specimens 12.7 ± 0.1 mm (0.5 ± 0.004 in.) $\times$ 150 to 160 mm (6 to 6.3 in.) on the die cutter. Assure that the longer dimension is in the machine direction of the medium.

5. Conditioning

Condition the specimen strips prior to testing in an atmosphere in accordance with TAPPI T 402 "Standard Conditioning and Testing Atmospheres for Paper, Board, Pulp Handsheets and Related Products."



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