



FEFCO RECOMMENDATION N° 102
(September 2002)

This FEFCO recommendation is one of a series numbered from 101 upwards, which gives guidance to FEFCO Members appropriate to the title, in practical matters dealing with production, or customer-related problems. It is hoped that it will provide a uniform means of operation, for example in a comparative study of a problem.

The issuing body is the FEFCO Standards Committee working under the auspices of the FEFCO Council.

The FEFCO Recommendations are supplementary to the internationally recognized FEFCO Testing Methods. The latter will continue to be developed for testing corrugated board products.

DETERMINATION OF THE TAKE-UP FACTOR OF THE FLUTING PAPER.

1. **Definition:** The take-up factor is the relation between the length of the fluted paper and the length of the board.
2. **Principle:** Test specimens of corrugated fiberboard are treated so that the individual components can be separated.
The relation between the length of the flattened fluting *test* specimen and the initial board specimen length gives the take-up factor.
3. **Apparatus:**
 - 3.1. See FEFCO test methods N°.10 para. 4.1., 4.2., 4.3.
 - 3.2. A rigid rule graduated in one millimeter increment.
4. **Procedure:**
 - 4.1. Test specimen preparation. Follow the procedure of FEFCO Method N°.10 for separation of component papers, removal of adhesive, drying of separated paper, conditioning.
The corrugated paper is flattened in the wet state

Note: A circular test specimen of board gives an oval flattened fluting specimen.

A square test specimen of board gives a rectangular flattened fluting specimen.

4.2. Measurement of test specimen.

The test *piece* is folded firstly *perpendicular to the line of fluting in the middle of the test piece*, secondly *parallel to the first at a distance of approximately 10mm*. This prevents the *unavoidable curvature resulting from the first fold, due to the retraction of the fluted paper*. Measure the length along the first fold *in mm*.

4.3. Calculation of the take-up factor.

This factor F is calculated as follows: $F = \frac{l}{1}$

l is the measurement made in 4.2.

l is:

- *For a circular test piece; the diameter of the board test piece (a test piece of 100 cm² has a diameter of 113 mm)*
- *For a square test piece: the side dimension of the board test piece (a test piece of 100 cm² has a side length of 100 mm)*

Consequently the following formulas are obtained for a test piece of 100 cm²:

- for circular pieces: $F = \frac{L}{113}$

- for square pieces: $F = \frac{L}{100}$

The take-up factor can be reported to two decimal places.