

# Determination of the flat crush resistance of corrugated fibreboard

## 1 Scope

To define the apparatus and test procedure used to determine the flat crush resistance of corrugated fibreboard used for packing cases bearing the manufacturer's certificate.

The test may be carried out on single face and double face (single wall) corrugated fibreboard. It is not suitable for testing the flat crush resistance of double-double face (double wall) board.

## 2 References

FEFCO testing method n° 1 : sampling procedure

EN 20 187 : paper, board and pulps - Standard atmosphere for conditioning and testing and procedure for monitoring the atmosphere and conditioning of samples.

## 3 Principle

A test specimen of corrugated fibreboard is subjected to a uniformity increasing force applied perpendicularly to the surface by a compression tester having two flat and parallel platens, until the fluting collapses.

The maximum force sustained by the specimen is recorded.

## 4 Apparatus

### 4.1. Type of flat crush tester

A motor-driven type compression tester shall be used.

If the tester operates on the principle of beam deflection the beam shall be such that the test results will occur within 20 % to 80 % of the normal range of deflection.

### 4.2. Platens

The platens must meet the following conditions :

- deviation from parallel not greater than 1:1000
- lateral play not exceeding 0.05 mm
- size : 120 mm x120 mm to take 100 cm<sup>2</sup> or 50 cm<sup>2</sup> specimens.

Note : the preferable size for beam tester is 50 cm<sup>2</sup>.

### 4.3. Relative speed and force

The relative speed between the two platens shall be 12.5 mm ± 2.5 mm per minute (with testers operating on the principle of beam deflection this is equivalent to an increment of force of 67 ± 23 N per second when the platens are in contact with each other).

### 4.4. Cutting instrument

An instrument having a circularly guided knife to cut specimens with area of 100 cm<sup>2</sup> (diameter 112.8 ± 0.5 mm), or an area of 50 cm<sup>2</sup> (diameter 79.80 ± 0.5 mm) shall be used. The cut edges must be clean and perpendicular to the facings of the board.

## 5 Sampling

Sample in accordance with FEFCO Testing Method N° 1.

## 6 Conditioning

Samples shall be conditioned in accordance with EN 20 187 (i.e. 23°C ± 1°C, 50 % ± 2 % r.h.).

## 7 Preparation of test pieces

Unless otherwise stipulated, at least ten specimens of the board shall be tested. They shall be free from converting machine marks, printing, or damage.

## 8 Procedure

The testing shall be carried out in the standard atmosphere defined above in clause 6 unless otherwise stipulated.

The test specimen shall be placed centrally on the lower platen, and the tester operated until the fluting collapses.

The maximum pressure sustained by the specimen before collapse of the fluting will be recorded to the nearest 10 kPa (kN/m<sup>2</sup>).

## 9 Test report

The test report will contain the following details :

- a) Date and place of testing
- b) Description and identification of the product tested
- c) Results of individual tests to the nearest 10 kPa (kN/m<sup>2</sup>)
- d) Arithmetic mean and standard deviation of all the replicate test results
- e) Number of specimens with leaning flutes
- f) Details of any deviation from this testing method
- g) Any other information which may assist in the interpretation of the test results.