

Determination of the bursting strength of corrugated fibreboard

1 Scope

To define the apparatus and test procedure used to determine the bursting strength of corrugated fibreboard. The test is applicable to all kinds of corrugated fibreboard.

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

The test specimen of corrugated fibreboard is firmly clamped between annular surfaces and uniformly increasing pressure is applied to one side, by pumping liquid under a flexible diaphragm, over a circular free testing area, until the specimen bursts.

The maximum pressure sustained by the specimen is recorded.

4 Apparatus

4.1. Type of Burst Tester

A hydraulic motor-driven burst tester shall be used.

4.2. Clamping Device

The burst tester must be fitted with a clamping device in which test specimens can be held without damage, other than crushing of the flutes, and without slippage, whilst the test is carried out. The clamping pressure shall be measurable.

4.3. Clamping Rings

The internal diameter of the upper and lower clamping rings shall be 31.5 mm ± 0.1. mm.

The edges of the clamping surfaces shall be slightly rounded. The rings shall be strong enough to withstand the clamping stresses without deformation.

The internal edge at the lower face of the lower clamping ring shall be rounded, to prevent damage to the diaphragm.

The clamping surfaces must be flat and should have circular or spiral grooves 0,2 mm to 0,5 mm deep to increase clamping efficiency.

The clamping rings must be mounted parallel, and accurately centred.

4.4. Diaphragm

The diaphragm shall be made of highly elastic material, should be clamped securely with its upper surface about 5.5 mm below the top plane of the lower clamping plate and have the following distension / load properties :

Bulge height	Pressure range
10 mm	170 to 220 kPa
18 mm	250 to 350 kPa

4.5. Pumping rate

The pressure under the diaphragm shall be produced by an electro-hydraulic pump delivering technically pure, air-free glycerine, or other suitable liquid with analogous properties, at a rate of 170 ± 15 ml per minute.

4.6. Pressure measurement

The total measuring capacity shall extend from 0 to 5000 kPa.

Pressure measuring devices shall be fitted with the means to record maximum value.

Those devices shall be calibrated

5 Sampling

Sample in accordance with FEFCO Testing Method N° 1.

6 Conditioning

The 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

A sufficient number of representative samples of the corrugated fibreboard to be tested shall be available to permit the stipulated number of replicate tests to be carried out without overlap of the clamped areas. For convenience of handling, the board may be cut into specimens 150 mm x 250 mm ; this will allow one test from each side of each specimen.

The testing shall be carried out in the standard atmosphere defined in clause 6.

The specimen is placed in the clamping device and clamped with a pressure not less than 700 kPa.

The maximum reading device is set to zero and the tester operated until the specimen bursts.

Test results should be recorded to 3 significant figures.

Unless otherwise stipulated, 10 tests are to be made from each side of the corrugated fibreboard.

The test report should contain at least the following points :

- a** *Date and place of testing*
- b** *Reference to this FEFCO testing method*
- c** *Description and identification of the product tested*
- d** *Value of each test*
- e** *Arithmetic mean and standard deviation of all replicate test results*
- f** *Clamping pressure in kilopascal*
- g** *Details of any deviation from this testing method*
- h** *Any other information which may help in the interpretation of the test results*
- i** *Name and signature of the operator.*