April 1986 (amended in1985, 1994, March 1997)

Determination of water absorptiveness of corrugated fibreboard (Cobb test)

1 Scope

This testing method specifies the apparatus and the procedure for determining the water absorptiveness of corrugated fibreboard in 30 minutes (1800 sec.). The method is applicable to all types of corrugated fibreboard. For paper the EN 20 535 testing method should be used.

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.

EN 20 535 : paper and board - Determination of water absorptiveness - Cobb Method.

3 Principle

One specified side and a specified area of a corrugated fibreboard test piece is exposed to a defined column of water for 30 minutes.

Its water absorptiveness is deducted from the difference of weightings immediately before and immediately after exposure to water.

4 Reagent and material

Freshly distilled or deionized water at a temperature of 23 °C ± 2°C.

Soft blotting paper 250 g/m² ± 25 g/m² grammage.

5 Apparatus

5.1. Rigid smooth finished cylindrical tank of either 100 cm² or 50 cm² internal cross sectional area, of sufficient depth to provide a head of at least 3 mm of water.

When necessary to form an effective seal, the cylindrical tank, with its base possibly covered by a non-absorbent rubber ring of the same cross sectional area, may be fitted with a means of lightly clamping to the corrugated fibreboard test piece.

5.2. Smooth stainless metal roller, 200 mm wide, 90 mm ± 10 mm diameter, 10 kg ± 0,5 kg mass.

5.3. Analytical balance sensitive to 1 mg.

5.4. Stop watch readable in seconds.

5.5. Glass measuring cylinder to prepare aliquots of water.

6 Sampling

Sample in accordance with FEFCO Testing Method N° 1.

7 Conditioning

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

8 Preparation of test pieces

Prepare the test pieces in the same atmosphere as for conditioning the samples. From representative and undamaged areas of the samples, cut at least 3 test pieces for each specified condition (test on inner liner, or test on outer liner, unprinted or printed areas, etc.) with dimensions 10 mm greater than the external cross sectional area of the cylindrical tank. Avoid contact of bare hands on test pieces.

9 Procedure

Carry out the tests in the same atmosphere as for conditioning the samples.
Ensure before each test that the cylindrical tank is dry.
Weigh the test piece to the nearest 1 mg (m_1).
Apply the tank cylinder to the specified side and the specified area of the test piece.
Pour the specified water in the cylindrical tank to form a head of at least 3 mm of water upon the test area of the test piece and start the stop watch immediately.
After 30 minutes of exposure to water, quickly pour out the water, remove the cylindrical tank, place the blotting paper on the tested area of the test piece, roll the metal roller once forwards and once backwards with its axis parallel to the flutes, and weigh again the test piece to the nearest 1 mg (m^2).
Renew the water and the blotting paper for the subsequent test pieces.

10 Expression of test results

The water absorptiveness value A to the nearest g/m² of each test piece is :

$$A = \frac{m_2 - m_1}{S}$$

where :
m_1 : mass of the test piece before exposure to water in g
m_2 : mass of the test piece after exposure to water in g
S : nominal cross sectional area of the cylindrical tank in m²

For each test condition, calculate the arithmetic mean of the replicate test results to the nearest g/m².

11 Test report

The test report shall contain at least the following informations :

- a *Date and place of the testing*
- b *Reference to this FEFCO testing method*
- c *Complete identification and description of the material tested*
- d *Duration of exposure to water, if not 30 minutes*
- e *Nominal cross sectional area of the cylindrical tank*
- f *Number of replicate test for each test condition*
- g *Replicate test results and arithmetic mean for each test condition*
- h *Details of any deviation from this testing method*
- i *Any information which may assist in the interpretation of the test results*
- j *Name and signature of the operator*