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CORRUGATED BOX MANUFACTURERS' PRACTICAL STANDARDS

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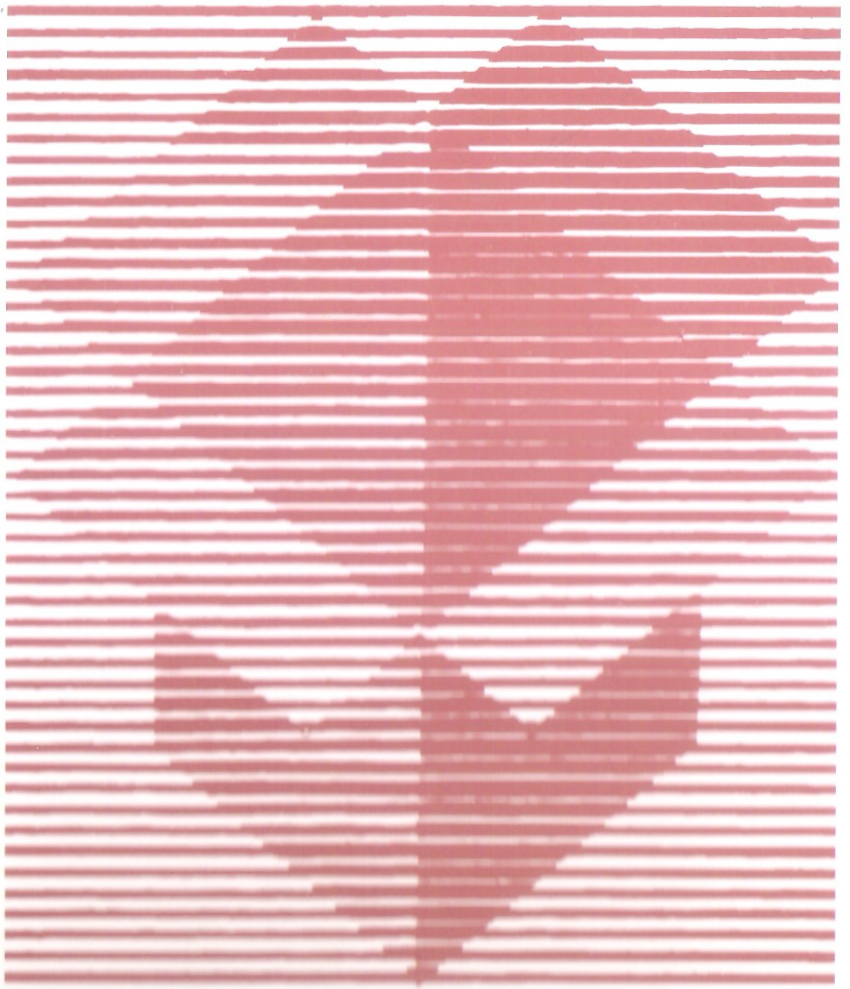
Standard Test Method for Grammage of Kraft Paper and Corrugated Fibreboard



FEDERATION OF CORRUGATED BOX MANUFACTURERS OF INDIA

Standardising Test Methods and Measurement of Properties is an essential requirement for quality control. Recognising this need for establishing uniform test procedures, the R&D Committee-of Federation had taken up the task of publishing Practical Standards Booklets on Test Methods.

These booklets have received appreciation from the corrugated box manufacturers as well as others connected with industry.

The fact that this booklet is being reprinted after just 2 years of its publication speaks for the demand for such publications which help in establishing uniform standards for test procedures.

I congratulate the R&D Committee on its efforts.

Capt. N. K. Davar
President

Federation of Corrugated Box Mfrs. of India
1.9.95

STANDARD TEST METHOD FOR GRAMMAGE OF KRAFT PAPER AND CORRUGATED FIBREBOARD

PART A: KRAFT PAPER

A.1. SCOPE

This test is applicable to all types of kraft paper, kraft liner, kraft paperboard, kraft linerboard and all other varieties of paper/ paperboard used in the manufacture of corrugated fibreboard.

A.2. DEFINITION

The grammage or substance is defined as the weight of one square metre of paper or paperboard under standard test conditions and expressed as grams per square metre.

A3. PRINCIPLE

Test specimen of given area, taken from a representative sample of paper or paperboard, are brought into equilibrium with standard atmosphere and are then weighed on a suitable accurate balance.

Test results (grammage) are expressed in gsm or g/m^2.

A.4. APPARATUS

A.4.1. A balance with sensitivity of 0.01 gram, or better, over the entire measuring range, shall be used to make the - determinations.

OR

A.4.2. A direct reading grammage indicator showing instantly and accurately the grammage of the sample with 1.0 gsm or better calibration shall be used to make the determinations.

A.5. TEST SPECIMEN

Representative samples to be tested shall be large enough to permit the cutting of test specimens of 500 square cm. area (200 mm x 250 mm ±0.5 mm). A suitable template may be used for cutting the samples, provided the accuracy of the dimensions is maintained within ± 0.5 mm.

Test specimens shall be free from machine marks and other irregularities, the surfaces must be free from printing or other treatments which may affect the weight; and the edges must be cut clean and square.

A.6. CONDITIONING

A.6.1. Standard Atmospheric Conditions

A relative humidity of 65% ± 2% and temperature of 27°C ± 2 will be taken as the standard atmospheric condition for the purpose of testing.

A.6.2. Conditioning

A suitable room or chamber is required for conditioning samples. Specific temperature and relative humidity, as specified in A.6.1 above, should be uniformly maintained throughout the chamber. Samples should preferably be suspended so that the conditioning atmosphere has free access to all its surfaces. The samples will be deemed to be conditioned when the results of two weighings, at an interval of not less than one hour, do not differ by more than 0.25 per cent of the total weight.

After the samples are so conditioned, they shall be touched and/ or handled as little as possible and tested immediately.

A.7. PROCEDURE

A.7.1. Individual Tests

Each test specimen will be separately weighed and the weight recorded to the nearest 0.01 gram or 1 gsm depending on the apparatus used.

If the apparatus as per A.4.1 above is used, record the length and the width of the sample.

A.7.2. Number of Tests

Unless otherwise stipulated, at least five determinations will be made.

A.7.3. Calculation of Grammage

A.7.3.1. If apparatus as per A.4.1 above is used, the grammage will be calculated by the formula:

$$G = \frac{(g \times 10^6)}{(a \times b)}$$

Where:

G = Grammage in gsm or g/m2.

g = Weight of test. specimen in grams.

a = Length of test specimen in mm.

b = Width of test specimen in mm.

A.7.3.2. In case the direct reading grammage indicator (as perA.4.2 above) is used, the gsm readings directly from the quadrant scale are recorded.

A.8. TOLERANCE

A.8.1. The average of test results shall not differ from the nominal grammage by more than ± 5%.

A.8.2. The individual readings shall not differ from the nominal grammageby±1O%.

In both the above cases, reading as per A.9.4 will be ignored.

A.9. TEST REPORT

The test report will contain the following details:

A.9.1. Date and place of testing.

A.9.2. Description and identification of the product tested.

A.9.3. Number of readings taken and their values to the nearest 1 gsm or g/m2.

A.9.4. The highest and the lowest readings will be ignored.

A.9.5. Arithmetic average of the remaining readings shown to the nearest 1 gsm or g/m2.

A.9.6. Details of any deviation from this testing method.

A.9.7. Any other information which may assist in the interpretation of the test results.

PART B: CORRUGATED FIBREBOARD

B.1. SCOPE

This test is applicable to all types of corrugated fibreboards

B.2. DEFINITION

The grammage or substance is defined as the weight of one square metre of corrugated fibreboard under standard test conditions and expressed as grams per square metre.

B.3. PRINCIPLE

Test specimens of given area, taken from a representative sample of corrugated fibreboard, are brought into equilibrium with standard atmosphere and are then weighed on a suitable accurate balance.

Test results (grammage) are expressed in gsm or g/m2

B.4. APPARATUS

A balance with sensitivity of 0.01 gram, or better, over the entire measuring range, shall be used to make the determinations.

B.5. TEST SPECIMEN

Representative samples to be tested shall be large enough to permit the cutting of test specimens of 500 square cm area (200 mm x 250 mm ± 0.5 mm). A suitable template may be used for cutting the samples provided the accuracy of the dimensions is maintained within ± 0.5 mm.

Test specimens shall be free from machine marks and other irregularities, the surfaces must be free from printing or other treatments which may affect the weight; and the edges must be cut clean and square.

B.7.3. CALCULATION OF GRAMMAGE

The grammage weight will be calculated by the formula:

$$G = \frac{(g \times 10^6)}{(a \times b)}$$

Where:

G = Grammage is gsm or g/m2.

g = Weight of test specimen in grams.

a = Length of test specimen in mm.

b = Width of test specimen in mm.

B.8. TOLERANCE

B.8.1. The average of test results shall not differ from the nominal grammage by more than ±5%.

B.8.2. The individual reading shall not differ from the nominal grammage by ±10%.

In both the above cases, readings as per B.9.4 will be ignored.

B.9. TEST REPORT

The test report will contain the following details:

B.9.1. Data and place of testing.

B.9.2. Description and identification of the product tested.

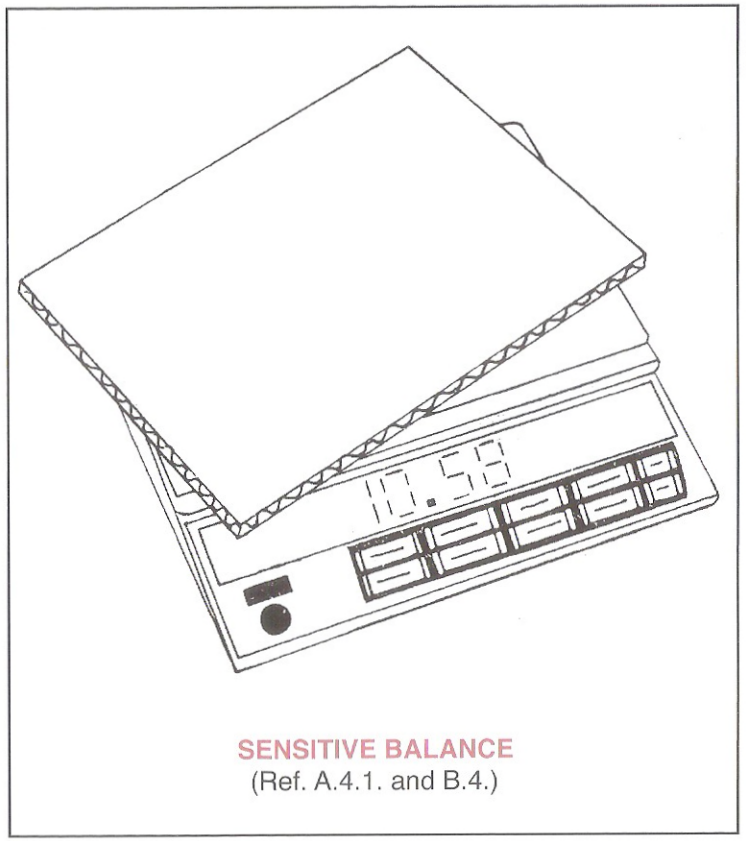
B.9.3. Number of readings taken and their values to the nearest 1 gsm or g/m2.

B.9.4. The highest and the lowest readings will be ignored.

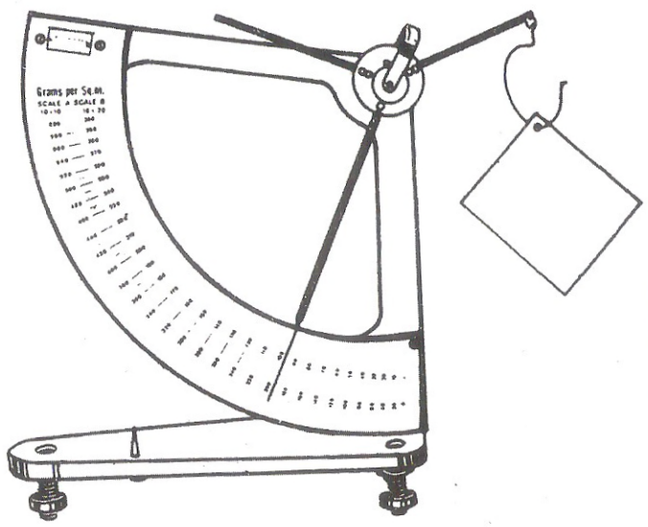
B.9.5. Arithmetic average of the 'remaining readings shown to the nearest I gsm or g/m2.

B.9.6. Details of any deviation from this testing method.

B.9.7. Any other information which may assist in the interpretation of the test results.



SENSITIVE BALANCE
(Ref. A.4.1. and B.4.)



DIRECT READING GRAMMAGE INDICATOR

(Ref. A.4.2)