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# INTERNATIONAL STANDARD



# 5638

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INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

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## Solid fibreboard — Determination of grammage of single layers

*Carton compact — Détermination du grammage des couches élémentaires*

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[ISO 5638:1978](#)

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**Descriptors** : paperboards, box boards, physical tests, determination, specific surface.

## FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 5638 was developed by Technical Committee ISO/TC 6, *Paper, board and pulps*, and was circulated to the member bodies in December 1976.

It has been approved by the member bodies of the following countries :

Australia	France	Norway
Austria	Germany	Romania
Belgium	Hungary	South Africa, Rep. of
Brazil	India	Spain
Bulgaria	Iran	Sweden
Canada	Ireland	Switzerland
Czechoslovakia	Italy	Turkey
Egypt, Arab Rep. of	Mexico	United Kingdom
Finland	New Zealand	U.S.A.

No member body expressed disapproval of the document.

# Solid fibreboard – Determination of grammage of single layers

## 1 SCOPE

This International Standard specifies a method for determining the grammage of single layers of glued and laminated solid fibreboard.

## 2 FIELD OF APPLICATION

This method is applicable to all types of solid fibreboard (as defined in ISO 4046), provided that the adhesive dissolves under the conditions specified for the test.

## 3 REFERENCES

ISO 186, *Paper and board – Sampling for testing*. ISO 5638:1978

ISO 187, *Paper and board – Conditioning of test samples*.

ISO 4046, *Paper, board, pulp and related terms – Vocabulary*.

## 4 APPARATUS

**4.1 Cutting device**, capable of repeatedly cutting out test pieces 95 % of which have an area within 1 % of a known area. When this cutting accuracy has been confirmed (see 4.5.1), use the mean area for calculation of the grammage in subsequent tests on the same type of board. Check the accuracy of the cutting device frequently – and always when the type of board tested is changed. If the cutting accuracy specified above cannot be achieved (as is likely with certain types of board), it is essential that the area of every test piece be determined individually, by linear measurement accurate to 0,2 %.

**4.2 Weighing device**, sufficiently accurate over the range of mass for which it is used, to measure to within 0,5 % of the actual mass. It shall be able to detect a change of  $\pm 0,2$  % of the mass to be weighed and, if the device is of the direct-reading type, it shall be graduated so that readings may be taken to this degree of accuracy. For checking of the weighing device, see 4.5.2.

**4.3 Submersion tank**, large enough to hold 10 test pieces 250 mm  $\times$  250 mm submerged vertically in a rack for wetting.

**4.4 Drying chamber**, having natural or forced air circulation for an air temperature of  $105 \pm 2$  °C.

## 4.5 Calibration of apparatus

### 4.5.1 Checking of cutting device

Measure 20 test pieces and calculate their areas. The cutting accuracy specified in 4.1. is attained when the standard deviation of the individual areas is less than 0,5 % of the mean area.

### 4.5.2 Checking of weighing device

Check the weighing device frequently by applying accurately measured masses with both increasing and decreasing loads.

## 5 REAGENT

**Distilled or deionized water**, normally at the temperature of the test room. The pH value of the water at the beginning of each test shall be  $7 \pm 1$  at a temperature in accordance with ISO 187.

## 6 SAMPLING

Select specimens in accordance with ISO 186.

## 7 PROCEDURE

### 7.1 Conditioning before cutting

Condition the specimens in accordance with ISO 187.

### 7.2 Preparation of test pieces

From the conditioned specimens cut at least 10 test pieces, normally 250 mm  $\times$  250 mm, to the precision specified in 4.1.

NOTE – If necessary, smaller test pieces may be used, down to a minimum dimension of 100 mm in the cross direction and a minimum area of 0,01 m<sup>2</sup> (but maintaining the specified precision of cutting and weighing). If the area of each test piece is less than 0,05 m<sup>2</sup>, report the test piece dimensions.

If the grammage of the board is to be determined, weigh the test pieces before delamination.

### 7.3 Delamination

Immerse the test pieces in water (see clause 5) until the layers can be separated from one another without fibres being torn.

NOTE — If the board is water-resistant, it may be necessary to heat the water (after checking its pH value) to about 80 °C.

### 7.4 Removal of adhesive

Adhesive showing on the surface of a layer and not absorbed into the layer should be removed by careful washing with distilled or deionized water (see clause 5).

NOTE — Complete removal of the absorbed adhesive cannot be expected. Removal of fibre from the layer is to be avoided.

### 7.5 Drying of delaminated board

Dry the individual layers at 105 ± 2 °C, to constant mass (i.e. when two weighings, at least 2 h apart, do not differ by more than 0,5 %).

### 7.6 Conditioning of delaminated board

Condition the individual layers after drying, in accordance with ISO 187.

### 7.7 Weighing of delaminated board

After conditioning, weigh each layer of each test piece individually.

## 8 EXPRESSION OF RESULTS

Calculate the grammage, in grams per square metre, of a single layer using the formula :

$$\frac{m}{A}$$

where

$m$  is the mean mass, in grams, of the conditioned layer of a test piece;

$A$  is the mean area of the test pieces, in square metres.

## 9 PRECISION

No information is at present available on the repeatability or reproducibility of this method.

NOTE — Where 10 test pieces of area less than 0,05 m<sup>2</sup> each are used (as permitted in the note to 7.2), the repeatability and reproducibility may be less than those obtained with test pieces of size 250 mm X 250 mm, owing to the variability of grammage within the sample.

## 10 TEST REPORT

The test report shall give the following particulars :

- a) reference to this International Standard;
- b) type and origin of the solid fibreboard;
- c) number of test pieces;
- d) the conditioning atmosphere used;
- e) description of single layers;
- f) grammage of single layers, mean value;
- g) place and date of testing;
- h) details of any operations that are optional or not covered in this International Standard, and any other features that may have affected the results.