SLOVENSKI STANDARD
SIST EN ISO 536:2000

01-april-2000

Papir, karton in lepenka - Določevanje gramature (ISO 536:1995)

Paper and board - Determination of grammage (ISO 536:1995)

Papier und Pappe - Bestimmung der flächenbezogenen Masse (ISO 536:1995)

Papier et carton - Détermination du grammage (ISO 536:1995)

Ta slovenski standard je istoveten z: **EN ISO 536:1996**

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85.060 Papir, karton in lepenka Paper and board

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EUROPEAN STANDARD

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English version

Paper and board - Determination of grammage (ISO 536:1995)

Papier et carton - Détermination du grammage (ISO 536:1995)

Papier und Pappe - Bestimmung der flächenbezogenen Masse (ISO 536:1995)

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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart,36 B-1050 Brussels

Foreword

The text of the International Standard form Technical Committee ISO/TC 6 "Paper, board and pulp" of the International Organization for Standardization (ISO) has been taken over as a European Standard by the Technical Committee CEN/TC 172 "Pulp, paper and board", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by December 1996, and conflicting national standards shall be withdrawn at the latest by December 1996.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Endorsement Notice

The text of the International Standard ISO 536:1995 has been approved by CEN as a European Standard without any modification.

1 Scope

This International Standard specifies a method of determining the grammage of paper and board

2 Normative references

The following standards contain provisions which, through reference in this text, cornstitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

prEN ISO 186
Paper and board – Sampling to determine average quality

EN 20187
Paper, board and pulps – Standard atmosphere for conditioning and testing and procedure for monitoring the atmosphere and conditioning of samples

EN 20287
Paper and board – Determination of moisture content – Oven dry method

3 Definition

For the purposes of this International Standard, the following definition applies.

3.1 grammage: Mass of a unit area of paper or board determined by a specific method of test.

Grammage is expressed in grams per square metre.

4 Principle

The area of the test pieces and their masses are determined and the grammage is calculated.

5 Apparatus

5.1 Cutting device, capable of repeatedly cleanly cutting test pieces of the same nominal size whose area falls within ± 1% of a known area. This shall be checked frequently by measurement and, provided that the above accuracy is attained, the mean area obtained in these checks shall be used for calculating grammage.

With certain types of paper and board it will be found, after carrying out this determination of area, that test pieces cannot be cut with the accuracy just defined; in such instances the area of every test piece shall be determined individually.

5.2 Balance, 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 sensitive enough to detect a change of ± 0,2 % in the mass to be weighed and, if the balance is of the direct-reading type, it shall be graduated so that readings may be taken to this degree of accuracy.

Special sheet-weighing balances, designed to weigh test pieces of a given size and which indicate grammage directly, may be used provided that the above conditions are fulfilled and that the area of each test piece on a single weighing is not less than 500 cm² and not more than 1000 cm² (see clause 8 and 9.2).

When in use, the balance shall be shielded from air currents.

6 Sampling

The selection of units and sheets and the taking of specimens shall be carried out in accordance with prEN ISO 186. The number of specimens taken (at least five) shall be sufficient for at least 20 test pieces.

7 Conditioning

For determination of conditioned grammage, the specimens shall be conditioned in accordance with EN 20187.

If a determination is made in the "oven-dry" or "as-taken" condition (see annex A), or if any other conditioning atmosphere is used, the reported results shall be qualified by a statement indicating the condition of the test pieces at the time of weighing.

8 Procedure

For determination of conditioned grammage, prepare and weigh the test pieces in the same atmospheric conditions used to condition the specimens.

Using the cutting device (5.1), cut at least 20 test pieces in total from at least five specimens, if possible taking the same number from each specimen.

Whenever possible, each test piece shall have an area of not less than 500 cm² (preferably 200 mm x 250 mm) and not more than 1000 cm²; it may, if necessary, be composed of several smaller pieces.

Determine the area of each test piece by calculation from measurements taken to the nearest 0,5 mm.

Weigh each test piece on the balance (5.2) and express its mass to three significant figures.

NOTE 1: It is recommended, especially when dealing with srmall pieces, that contact of the test piece with bare hands be avoided.

9 Expression of results

9.1 If the procedure in clause 8 is followed, calculate the grammage g, expressed in grams per square metre, of each test piece, using the equation

$$g = \frac{m}{A} \cdot 10000 \qquad (1)$$

where

m is the mass, in grams, of the test piece;
A is the area, in square centimetres, of the test piece.

Alternatively, the grammage may be calculated using the equation

$$g = \frac{\overline{m}}{\overline{A}} \cdot 10000 \qquad (2)$$

where

m is the average mass, in grams, of the test pieces;
A is the average area, in square centimetres, of the test pieces.

9.2 If a special sheet-weighing balance as described in 5.2 is used, calculate the grammage g, expressed in grams per square metre, using the equation

$$g = \frac{A_1}{A} \cdot g_1 \qquad (3)$$

where

g_1 is the indicated grammage, in grams per square metre, of the test piece;
A_1 is the area, in square centimetres, of the test piece for which the balance is calibrated;
A is the area, in square centimetres, of the weighed test piece.

9.3 Calculate the mean of the results and the standard deviation and express them to three significant figures.

10 Test report

The test report shall include the following information:

a) reference to this International Standard;

b) date and place of testing;

c) conditioning atmosphere used;

d) all information necessary for identification of the sample;

e) area of test piece used;

f) number of replicate tests;

g) mean and standard deviation of the results;

h) if specimens have been taken from more than one position across a reel or sheet and information on grammage variation is required, the details listed in c), d), e) and f) shall be reported for each position separately;

i) any departure from the procedure specified in this International Standard and any circumstances that may have influenced the results.

Annex A (normative)

Determination of grammage on "oven-dry" and "as-taken" bases

A.1 Determination of grammage on an "oven-dry" basis

Determine the area of each test piece after conditioning in accordance with clause 7. Dry the test pieces in accordance withEN 20287 and determine their mass. Calculate the grammage according to 9.1.

A.2 Determination of grammage "as-taken"

This is based on the material in the condition pertaining at the time of sampling. Select specimens and cut and weigh test pieces from them as quickly as the need for accuracy will allow. When taking specimens from a roll, cut them out from such a depth that their moisture content has remained unaffected by the ambient atmosphere.