SLOVENSKI STANDARD
SIST EN 12625-3:2000

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Tissue papir in proizvodi iz tissue papirja - 3. del: Določ evanje debeline, specifič nega volumna in prostorninske mase

Tissue paper and tissue products - Part 3: Determination of thickness, bulking thickness and apparent bulk density

Tissue-Papier und Tissue-Produkte - Teil 3: Bestimmung der Dicke, der Blattdicke im Stapel und der scheinbaren Stapeldichte

Papier tissue et produits tissues - Partie 3: Détermination de l'épaisseur des feuilles uniques ou des feuilles en liasse et de la masse volumique apparente

Ta slovenski standard je istoveten z: **EN 12625-3:1999**

ICS:

85.080.20	Tissue papir	Tissue paper

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English version

Tissue paper and tissue products - Part 3: Determination of thickness, bulking thickness and apparent bulk density

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This European Standard was approved by CEN on 2 December 1998.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. 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.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Content

Foreword

This European Standard has been prepared by 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of an identical text or by endorsement, at the latest by July 1999, and conflicting national standards shall be withdrawn at the latest by July 1999.

EN 12625 contains the following parts:

- Part 2: Procedures for sampling and conditioning (currently available as ENV)
- Part 3: Determination of thickness, bulking thickness and apparent bulk density
- Part 4: Determination of tensile strength, stretch at break and tensile energy absorption
- Part 5: Determination of wet tensile strength
- Part 6: Determination of grammage

The following Standards of this series are in preparation:

- Part 1: General guidance on terms
- Part ..: Water absorption rate and water absorption capacity (basket method)
- Part ..: Optical properties (whiteness, opacity, colour)

In addition, it is expressly stated, that the detection of impurities and contraries in tissue paper and tissue products should be applied according to the following European Standard:

- prEN ISO 15755 "Paper and board - Estimation of contraries (ISO/FDIS 15755:1998)"

For the determination of moisture content in tissue paper and tissue products, EN 20287 should be applied.

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

Introduction

Thickness is an important property of tissue paper and tissue products. Whilst for a finished article such as, for example, a kitchen towel roll, it may be reasonable to measure properties such as the roll diameter or in another example, the height of a stack of paper towels, there is a need for a consistent measure of thickness that can be applied to tissue products at any stage of manufacture.

Measurement of thickness is very dependent on the pressure applied to the material at the time of measurement. It is recognised that various loading pressures are used in industry. This European Standard has been prepared, harmonising those standards applicable to tissue and tissue products currently in use in Europe and specifies a single loading pressure to be used for all such measurements.

1 Scope

This part of EN 12625 specifies a test method for the determination of thickness, bulking thickness and apparent bulk density of tissue papers and tissue products when under a specified pressure of 2,0 kPa.

NOTE: This European Standard has been developed to provide a consistent test method for the determination of certain properties of tissue paper and tissue products. Corresponding test methods for paper and board in general are covered in EN 20534.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

ENV 12625-2
Tissue paper and tissue products – Part 2: Procedures for sampling and conditioning

EN 12625-6
Tissue paper and tissue products – Part 6: Determination of grammage

3 Definitions

For the purposes of this Standard, the following definitions apply:

3.1 single ply thickness: distance between one surface of a single ply of tissue paper and the other, determined under an applied static load, using the standard method of test.

3.2 single sheet thickness: distance between one surface of a single sheet of tissue paper or tissue product and the other,comprising the number of plies as supplied in the finished product, determined under an applied static load, using the standard method of test.

3.3 bulking thickness: thickness of a single sheet of tissue consisting of a specified number of plies, calculated from the thickness of several superimposed sheets, measured under an applied static load, using the standard method of test.

3.4 apparent bulk density: the mass per unit volume of tissue, expressed in grams per cubic centimetre, calculated from its grammage and bulking thickness.

4 Principle

Measurement of the thickness of a test piece of tissue paper or a tissue product supplied as a finished article as the distance between a fixed reference plate on which the sample rests and a parallel pressure foot that exerts a specified pressure on the area under test.

5 Apparatus

5.1 A precision dead-weight micrometer having two parallel, plane circular faces between which the test piece is placed. The lower face shall be fixed and the upper face moveable in a direction perpendicular to the plane of the fixed face.

The upper face shall have a diameter of (35,7 ± 0,1) mm i.e. a nominal area of 10,0 cm² and be parallel to the lower face within limits defined in annex A.3.

The lower face shall be constructed to support the sample such that it lies flat whilst under test. In practice, a diameter at least 20% larger than the upper face is required.

The pressure between the two faces shall be (2,0 ± 0,1) kPa (see annex B).

The speed at which the pressure foot (upper face) is lowered shall be controlled automatically and set to (2,0 ± 0,2) mm/s.

The scale shall be graduated at least in increments of 0,001 mm.

The maximum opening between the pressure foot and the lower face is by agreement between the instrument supplier and the customer. Where only single sheet (and single ply) measurement is required, a maximum opening of 2 mm to 3 mm is sufficient. Instruments with a maximum opening of 10 mm or 12 mm may be required for bulking thickness measurements.

5.2 Thickness gauges, to be used for calibration corresponding to approximately 10%, 30%, 50%, 70% and 90% full scale reading of the micrometer with each gauge accurate to 0,001 mm.

5.3 A suitable balance and attachments, or calibrated load cell to be used for calibration of the applied load.

6 Sampling

Select samples in accordance with ENV 12625-2.

7 Preparation and conditioning of test pieces

7.0 General

Test pieces shall be free from perforations and faults not normally inherent in the tissue.

Condition the specimens as described in ENV 12625-2 and keep them in the conditioning atmosphere throughout the test procedure. Specimen dimensions are not critical but shall not be less than 80 mm diameter.

At least ten specimens shall be prepared for each type of test required.

7.1 Single ply thickness

Where this measurement is required from multi-ply product, ten specimens shall be prepared from each ply identifying its location in the finished product.

Plies from different positions in the product shall not be assumed to be the same.

7.2 Single sheet thickness

Where this measurement is required, ten specimens shall be prepared.

7.3 Bulking thickness

Where this measurement is required, stacks shall be prepared comprising a number of sheets superimposed with all individual test pieces orientated in the same way.

Multi-ply products shall not be separated into individual plies. Normally stacks will contain twelve plies. Where the stack height using twelve plies is too great for the maximum opening of the instrument in use, a lower number of plies may be used but this should not be less than eight. Report the number of sheets and plies per sheet used.

8 Procedure

8.1 Place the micrometer on a horizontal vibration-free surface within the conditioned atmosphere defined in ENV 12625-2.

8.2 Ensure the working faces of the micrometer are clean and free from dust.

8.3 Verify the calibration of the micrometer as defined in annex A.1.

8.4 Check the zero setting of the micrometer and adjust if necessary.

8.5 Raise the pressure foot and insert the test piece between the lower face and the pressure foot. Allow the pressure foot to move down onto the test piece at controlled speed. After 5 s record the thickness to the maximum precision permitted by the instrument.

8.6 Repeat the measurement on the remaining test pieces until at least ten measurements have been recorded. Between successive readings of two or more samples, ensure the working faces are free from dust.

9 Calculation

9.1 Single ply thickness

Calculate the mean and standard deviation of the ten (or more) readings and report the mean t_p to the nearest 0,01 mm and standard deviation to two significant figures.

9.2 Single sheet thickness

Calculate the mean and standard deviation of the ten (or more) readings and report the mean t_s to the nearest 0,01 mm and standard deviation to two significant figures.

9.3 Bulking thickness

Calculate the mean and standard deviation of the ten (or more) readings. Divide both by the number of sheets (not plies) in each pack and report the result as the bulking thickness t_b to the nearest 0,01 mm and standard deviation to two significant figures.

9.4 Apparent bulk density

If the apparent bulk density of the sample is to be calculated, determine the grammage of the sample by the test method described in EN 12625-6.

Calculate the apparent bulk density, in grams per cubic centimetre from the formula (1):

$$x = \frac{g}{t_b} \qquad (1)$$

where

x is the apparent bulk density in grams per cubic centimetre (g/cm^3);
g is the grammage, in grams per square meter (g/m^2);
t_b is the bulking thickness, in microns (µm).

Report the result to two significant figures.

10 Test report

The test report shall refer to this European Standard and state:

a) the date and place of testing;

b) all details necessary to identify the material, including a statement of the number of plies as received and the location of individual plies if single ply thickness testing has been requested from a multi-ply product. If bulking thickness testing has been requested from a multi-ply product identify the sample (sheet) and state the number of individual plies in each sheet and the number of sheets in each pack;

c) the number of measurements made and the results of the tests;

d) any departure from this European Standard or any other circumstances that may have affected the results.