SLOVENSKI STANDARD
SIST EN 1896:2001

01-junij-2001

Lepila za papir in karton za embalažo in za higienske proizvode za enkratno uporabo - Ugotavljanje natezne trdnosti in raztezka

Adhesives for paper and board, packaging and disposable sanitary products - Determination of tensile strength and elongation

Klebstoffe für Papier, Verpackung und Hygieneprodukte - Bestimmung der Zugfestigkeit und der Dehnung

Adhésifs pour papier et carton, emballage et produits sanitaires jetables - Détermination de la résistance a la traction et de l'allongement

Ta slovenski standard je istoveten z: **EN 1896:2001**

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83.180	Lepila	Adhesives

SIST EN 1896:2001 **en**

EUROPEAN STANDARD
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EN 1896

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ICS 83.180

English version

Adhesives for paper and board, packaging and disposable sanitary products - Determination of tensile strength and elongation

Adhésifs pour papier et carton, emballage et produits sanitaires jetables - Détermination de la résistance à la traction et de l'allongement

Klebstoffe für Papier, Verpackung und Hygieneprodukte - Bestimmung der Zugfestigkeit und der Dehnung

This European Standard was approved by CEN on 6 January 2001.

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 Management Centre 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 Management Centre has the same status as the official versions.

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

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 193 "Adhesives", the secretariat of which is held by AENOR.

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 2001, and conflicting national standards shall be withdrawn at the latest by July 2001.

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.

1 Scope

This European Standard specifies a method of test for the determination of tensile strength and elongation of dry films of hot melt or dispersion adhesives, when these are stretched to breakage at a constant pulling speed.

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 (including amendments).

EN 923	Adhesives –Terms and definitions.
EN 1066	Adhesives – Sampling.
EN 1067	Adhesives – Examination and preparation of samples for testing.
ISO 554	Standard atmospheres for conditioning and/or testing – Specifications.

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 923 and the following definitions apply:

3.1
film tensile strength
maximum force measured during the extension of test specimen, divided by the initial cross-section area of the test specimen. Tensile strength is dependent of pulling speed.

3.2
film elongation at break
increase in length, measured at the moment of break, reported to the initial length expressed in percent.

4 Safety

Persons using this standard shall be familiar with normal laboratory practice.

This standard does not purport to address all the safety problems, if any, associated with its use.

It is the responsibility of the user to establish safety and health practices and to ensure compliance with any European and national regulatory conditions.

5 Apparatus

5.1 Thickness gauge: able to measure 0,01 mm without deforming the film.

5.2 Tensile testing machine: capable of supplying a tensile force with a constant rate of grip separation. The machine shall be equipped with a force-measuring system complete with an indicator and/or a recorder.

The indicated force shall not differ from the true applied force by more than 2%. The response time of the machine shall be short enough not to affect the accuracy with which the force applied at the time of rupture can be measured.

The force of rupture of the specimen shall lie in the range between 20% and 80% of the full-scale reading.

6 Test specimens

6.1 Sampling

Take a sample of the adhesive to be tested in accordance with EN 1066. Examine and prepare it for testing in accordance with EN 1067.

6.2 Preparation of the adhesive film

The initial length(l_o) shall be marked taking care of not damaging the film.

Before testing, the thickness of the test specimen shall be measured at, at least, three points between the marks (l_o), the mean value (t_o) being used as a basis for calculating the cross – sectional area. Variations in the thickness of each individual specimen shall not exceed 4% of the thickness mean.

The width of the test specimen can be assumed to be the same as the cutting width of the die.

6.2.1 Hot melt adhesives. The adhesive film shall be (3,00 ± 1,00) mm thick and can be prepared by any suitable method, for instance putting the adhesives between the hot plates of a press using a metallic spacer to keep the plates separated.

6.2.2 Water based adhesives. A single draw down of adhesive is allowed to dry until it reaches an equilibrium with a standard atmosphere 23/50 according to ISO 554 to obtain a film (0,35 ± 0,05) mm thick.

This equilibrium is considered to be attained when the results of two consecutive weighing at least 1 h apart do not differ by more than 0,25% of the total mass of the test specimen.

6.3 Preparation of test specimens

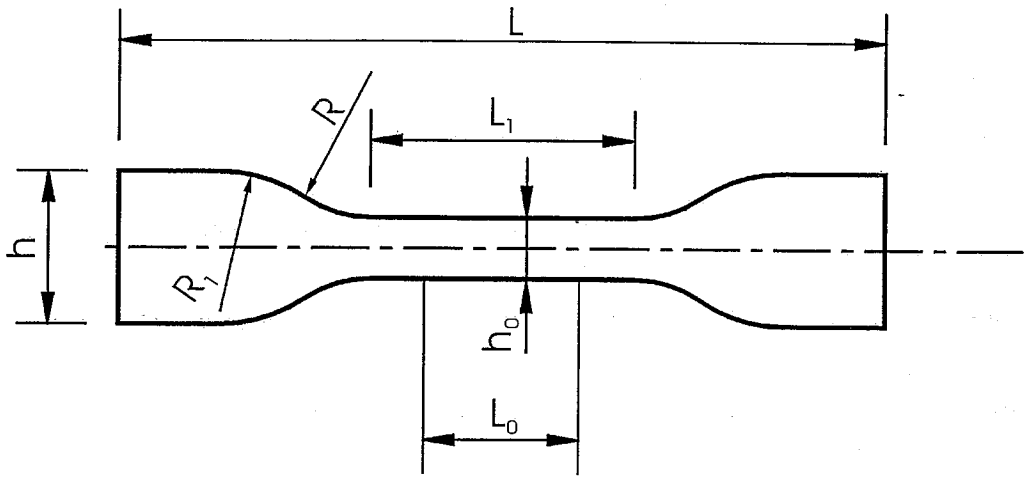
Test specimens shall preferably be cut with a die out of an adhesive film and have a shape as shown in figure 1 and dimensions as indicated in table 1.

Other shapes and dimensions can be used if specified and agreed upon.

Table 1

Dimensions are in millimetres

Type	l_0	l	l_1	h	h_0	R	R_1
1	20 ± 1	115 ± 2	33 ± 2	25 ± 1	6 ± 4	14 ± 1	25 ± 2
2	10 ± 1	50 ± 1	17 ± 1	8,5 ± 1	4 ± 1	7,5 ± 3	10 ± 5



Key

l Overall length

l_1 Length of narrow parallel-sided portion

l_0 Initial marked length

h_0 Initial width of test specimens

h Width at ends

R Small radius

R_1 Large radius

The initial thickness of the test specimen is t_0

Figure 1 – Test specimens shape

7 Test method

7.1 Tensile test procedure

The test shall be carried out in standard atmosphere 23/50 according to ISO 554.

Insert the test specimen in the jaws of the tensile testing machine (5.2), with the longitudinal axis in line with the direction in which the force is applied.

The test specimen shall not be gripped in parts, which are less than "h" wide.

Try to avoid the creation of stress in the samples when clamping it.

When negative stress occurs, do not reset the scale.

If positive stress occurs, reclamp.

The rate of separation of the jaws shall be 300 mm/min. Other rates between 10 mm /min and 1000 mm/min can be agreed upon and have to be recorded in the test report.

Determine the force applied and the elongation of the test specimen until it breaks, preferably by plotting the force/elongation curve.

Ensure that the force recorded lies in the range between 20% and 80% of the full scale.

Test specimens where the break occurs outside the marked length l_0 shall not be evaluated.

Test at least five test specimens, calculate the mean and take this as the result.

8 Expression of results

8.1 Tensile strength

Calculate the tensile strength using the following equation:

$$\sigma = \frac{F}{h_0 t_0}$$

where

σ is the tensile strength, in Newtons per square millimetre

F is the maximum force recorded, in Newtons

t_0 is the initial thickness of test specimens, in millimetres

h_0 is the initial width of test specimen, in millimetres

8.2 Elongation at break

Calculate the elongation at break using the following equation:

$$\varepsilon_B = \frac{l_B - l_0}{l_0} \times 100$$

where:

ε_B is the elongation at break, as percentage

l_B is the marked length at break, in millimetres

l_0 is the initial marked length, in millimetres