SLOVENSKI STANDARD
SIST EN 1945:1997

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Samolepilni trakovi - Merjenje trenutne oprijemljivosti

Self-adhesive tapes - Measurement of quick stick

Klebebänder - Messung der Anfaßklebkraft

Rubans auto-adhésifs - Mesure du pouvoir d'agrippage

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CEN

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

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Contents

Foreword

This European Standard has been prepared by Technical Committee CEN/TC 253 "Self adhesive tapes" of which the secretariat is held by AFNOR.

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of an identical text or by rendorsement, at the latest by August 1996, and conflicting national standards shall be withdrawn at the latest by August 1996.

According to the CEN/CENELEC International Regulations, 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.

1 Scope

This standard specifies a method to measure the ability of adhesive tape to adhere to a surface, with the application of a very light pressure.

2 Normative reference

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. For undated references the latest edition of the publication referred to applies.

prEN 1939 Self adhesive tapes - Measurement of peel adhesion from stainless steel or from its own backing.

3 Definition

For the purposes of this standard, the following definition applies :

quick stick : The property of an adhesive tape that causes an instant bond, with measurable separation force by the touching of the adhesive and a substrate with little or no externally applied pressure. The surface of the adhesive has an influence on this property.

4 Principle

A length of adhesive tape is applied to a standard metal plate under standard conditions. The quick stick is measured by the force required to peel the adhesive tape continuously from the plate at an approximate angle of 90°.

5 Materials

5.1 Diacetone alcohol.

5.2 Lint free cotton wool, or tissue.

5.3 One of the following solvents :

- methanol ;
- methyl ethyl ketone ;
- acetone ;
- toluene.

Solvents shall be of general purpose chemical grade.

6 Apparatus

6.1 **Tensile testing machine** with the following characteristics :

- the force shall be indicated with a maximum error of 2 % ;

- the speed of the moveable clamp shall be 300 mm/min ± 30 min/min ;

- the scale shall be such that the readings obtained are between 15 % and 85 % of the complete scale ;

- the clamps shall be serrated to prevent slipping or tearing of the adhesive tape ;

- if a pendulum machine is used, ensure that the pendulum can swing freely.

6.2 Stainless steel plates

The plates shall be the same as those used for the measurement of peel adhesion of adhesive tape from stainless steel. (See prEN 1939).

6.3 Horizontal traverse device (see fig. 1)

A simple mechanical device that will ensure that the plate moves horizontally at the rate of traverse of the tensile testing machine throughout the period of peeling the adhesive tape at an angle of approximately 90°.

This device may consist of a metal section containing two grooves in which the plate can move freely in a horizontal plane. This section shall be fixed rigidly to one clamp, the plate being positioned horizontally and centred with respect to the vertical passing through the two clamps.

A convenient way to make the plate move horizontally at the same speed as the moveable clamp is to connect it to a fixture by means of an inextensible wire passing round a pulley attached to the device.

The device is designed to produce a theoretical peel angle of 90°. In practice the angle of peel varies slightly around this figure due to irregularities in the structure of the adhesive mass. The extent of the variation will also depend on the degree of damping of the tensile testing machine.

6.4 Roller for the application of light pressure

This roller will be about 32 mm in diameter and 75 mm long, with a total mass of 25 g ± 0,5 g.

7 Test sample and test pieces

Use rolls of adhesive tape at least 25 mm wide.

Condition the sample roll for 24 hours at 23 °C ± 2 °C and 50 % ± 5 % relative humidity.

Discard the 3 outer turns of adhesive tape from the roll.

Take from each roll 5 test pieces. Each test piece shall be 300 to 375 mm long.

For widths greater than 25 mm, a test piece 25 mm wide shall be cut longitudinally from the adhesive tape.

The cutting must be carried out by means of a razor-blade or any other suitable instrument. It must always be effected so that the adhesive surface never contacts other surfaces before application to the test plate. Cutting shall never be carried out with the adhesive tape already applied to the test plate, so as not to mark the plate for subsequent tests.

8 Procedure

8.1 Standard test conditions

The test shall be carried out at 23 °C ± 2 °C and 50 % ± 5 % relative humidity.

8.2 Preparation of plate

Wipe the test surface of the plate with a fresh piece of cotton wool or tissue saturated with diacetone alcohol. Dry the plate with fresh cotton wool, then wipe the test surface with a fresh piece of cotton wool saturated with one of the solvents given in 5.3. Dry the plate with fresh cotton wool, then repeat for a total of three cleaning operations with this solvent. Maintain the plate at a temperature of 23 °C ± 2°C for at least 5 min before proceeding.

In order to obtain consistent results, a new plate must be cleaned at least ten times before use.

8.3 Application of the adhesive tape to the plate

Place the plate on an inclined plane having a slope of 1/5 (making an angle of 11°19' with the horizontal).

Remove the test piece radially from the roll at an approximate speed of 300 mm/s, then apply it immediately to the plate in its sloping position.

Adhere the end of the test piece to the middle of the upper edge of the stainless steel plate. Then place the roller on the back of the adhesive tape and hold the other end of the adhesive tape in a vertical position so that the roller rests in the loop so formed.

Allow the roller to travel down the sloping plane, thus applying the adhesive tape to the plate, at an approximate speed of 25 mm/s. Take care to ensure that the edges of the adhesive tape are parallel to those of the plate.

8.4 Peeling of the adhesive tape

Place the plate immediately in its horizontal support, which shall have been previously fixed in the clamp of the tensile testing machine in the standard test conditions.

Fold back about 25 mm of free end of the adhesive tape, adhesive to adhesive, and place it in the other clamp of the tensile testing machine.

Attach the plate to the fixture with the connecting wire.

Set the speed at 300 mm/min ± 30 mm/min, and start the tensile testing machine.

The measurement shall be made within one minute of applying the adhesive tape to the plate.

As the device has been constructed so that the plate moves at the same speed as the clamp, it follows that, if assembled correctly, an angle of peel of about 90° will be maintained throughout the entire test, subject to the comments made in 6.3.

Take readings when the line of separation of adhesive tape and plate passes each reference mark on the plate.

9 Expression of results

For each test piece, arrange the 5 readings in ascending order and take the central value (median).

Similarly, arrange these 5 medians in ascending order and take their median.

Express the results in newtons per centimetre width of adhesive tape.

Since the measurements made using different types of tensile testing machines (for example, electronic or pendulum) are not directly comparable, the type of tensile testing machine used will be indicated in the report.

10 Test report

The test report shall include the following information :

a) a reference to this European Standard ;

b) all information necessary to identify the test sample ;

c) the type of tensile testing machine used ;

d) the date of the test ;

e) the results obtained ;

f) any operation not specified in this European Standard which may influence the results.