



SLOVENSKI STANDARD
SIST EN 12030:1997
01-avgust-1997

Samolepilni trakovi - Merjenje udarne odpornosti

Self-adhesive tapes - Measurement of impact resistance

Klebebänder - Messung des Schlagwiderstands

Rubans auto-adhésifs - Mesure de la résistance à l'impact

Ta slovenski standard je istoveten z: EN 12030:1996

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ICS:

83.180 Lepila Adhesives

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Self adhesive tapes - Measurement of impact resistance

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

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

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Foreword

This European Standard has been prepared by the Technical Committee CEN/TC 253 "Self adhesive tapes", the secretariat of which 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of an identical text or by endorsement, at the latest by November 1996, and conflicting national standards shall be withdrawn at the latest by November 1996.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.

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1 Scope

This standard specifies the method to determine the ability of an adhesive tape to resist impact forces.

An adhesive tape may possess adequate breaking and tear strengths to withstand a steady force, but it may lack sufficient impact strength to withstand the shock forces sometimes experienced in use.

The maximum width of adhesive tape tested by this method is 25 mm. For rolls of adhesive tape of this width or less, the impact resistance measured corresponds to that of adhesive tape as supplied commercially, i.e. with factory-cut edges.

For rolls of adhesive tape wider than 25 mm, this test method provides for the adhesive tape to be cut down to 25 mm with a well-sharpened instrument. In such cases, because of the better cutting of the edges, the results may be higher than would be found on commercially supplied adhesive tape.

2 Definition

For the purpose of this standard the following definition applies :

impact resistance : The ability of a tape to resist sudden shock. For example as may sometimes be encountered by packages in transit.

3 Principle

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The adhesive tape is firmly held horizontally and a given mass is allowed to fall onto its centre from a selected height.

The impact resistance is measured in two ways :

3.1 As the maximum shock force that an adhesive tape can withstand under a single impact.

3.2 As the maximum shock force that an adhesive tape can withstand when a specified number of impacts is repeatedly applied. (In commercial practice there will usually be an agreed minimum shock force for this method between supplier and user. It will suffice to test the adhesive tape at this minimum force only to ensure that it meets this requirement.)

4 Apparatus

4.1 Test equipment (see figure 1)

This shall be a free-falling drop tester or similar equipment capable of giving equivalent results.

The falling spade shall have a rounded striking face of 25 mm radius. The total mass of the spade shall be $2 \text{ kg} \pm 0,05 \text{ kg}$. Additional masses shall be provided to extend the range of the equipment. These masses will be in regular increments of $1 \text{ kg} \pm 0,05 \text{ kg}$.

4.2 A device for measuring the height of the spade

If not built into the frame of the drop tester.

5 Test sample and test pieces

Condition the sample roll for 24 hours at $23\text{ °C} \pm 2\text{ °C}$ and $50\% \pm 5\%$ relative humidity.

Discard the three outer turns of adhesive tape from the roll before taking test pieces. Each test piece shall be 275 mm long and of the same width as the roll of adhesive tape up to a maximum width of 25 mm.

For rolls of width greater than 25 mm, a test piece 25 mm wide shall be cut from the adhesive tape, using a sharp knife to obtain clean-cut edges.

6 Procedure

6.1 Standard test conditions

The test shall be carried out at $23\text{ °C} \pm 2\text{ °C}$ and $50\% \pm 5\%$ relative humidity.

6.2 Remove the test pieces radially from the roll at an approximate speed of 300 mm/s, then condition for a further 2 hours in the standard test conditions in order to remove all strain and distortion due to unrolling.

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6.3 Because of the nature of the equipment, the impact resistance of the adhesive tape must be determined by a "trial and error" approach. The technique is to preselect an impact energy value. The spade is then set at a height above the test piece so that the product of the spade weight and the height of fall equals the preselected impact energy value. This impact energy is then transferred to the test piece by quickly releasing the spade so that it falls and strikes the test piece. It has been found that the minimum fall required with this equipment to obtain reproducible results is 125 mm. Therefore, if reproducible results are to be obtained, the minimum impact resistance that can be measured with this equipment is 2450 Newton millimetre or 2,45 joules ($1\text{ Nm} = 1\text{ J}$).

6.4 Impact resistance to a single shock force

6.4.1 Place the equipment on a solid, level surface so that no noticeable movement of the frame occurs during use.

Apply the test piece to the centre of the cylindrical bars, which are located with centres 150 mm apart, so that the test piece receives the impact centrally with the rounded striking face of the spade when it falls. Take care when applying the test piece to the bars that it is not stretched, is free from sagging and that the ends of the test piece are adhered firmly and smoothly to the cylindrical bars, to prevent any slipping or unpeeling during the test.

6.4.2 Based on the expected value of impact resistance, set the height of fall of the spade required to obtain this value, use additional masses as necessary.

Measure the height of the spade above the test piece from the upper surface of the adhesive tape and the lower end of the rounded striking face of the spade.

6.4.3 Release the spade in such a way that there is no jarring or tilting of the test equipment. Take care that the spade only strikes the test piece once and is not allowed to rest on the adhesive tape.

6.4.4 Repeat the test with the same settings a further 4 times using fresh test pieces unless a failure occurs. Consider that a failure has occurred if the adhesive tape breaks, fractures or partially tears.

6.4.5 Determine, by trial and error, the impact that 5 consecutive test pieces can withstand without failure. Carry out tests at approximately 0,5 joule increments.

This may be achieved by successive 25 mm adjustments to the drop height when using the standard 2 kg spade. For the same drop height adding additional 1 kg masses to the spade will increase the impact force in the ratio of the augmented to original mass.

6.4.6 The impact resistance to a single shock force is the maximum impact value determined in paragraph 6.4.5.

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6.5 Impact resistance to repeated shock forces

6.5.1 Adjust the apparatus so that it produces the minimum shock force agreed between the supplier and user.

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6.5.2 Adopt the same procedure as that described for the determination of the impact resistance to a single shock force with the exception that 25 shocks shall be given to each test piece.

6.5.3 If failure is not obtained after 25 successive impacts, the adhesive tape will be stated to have impact resistance to repeated shock forces which conforms to the required specification.

6.5.4 Repeat the test on a further 4 test pieces of adhesive tape which must all successfully complete the same test.

7 Expression of results

7.1 The impact resistance to a single shock force is the maximum impact withstood without failure, and is expressed in joules for a 25 mm width of adhesive tape.

7.2 The impact resistance to repeated shock forces is the maximum impact withstood by 5 test pieces, 25 consecutive times, without failure. This will be expressed in joules for 25 mm width of adhesive tape.

However, if the procedure in 6.5 is adopted, the results state that the adhesive tape has or has not met the requirements of the test using the shock force specified.

8 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 date of the test ;
- d) the results obtained indicating whether single or repeated impacts were tested ;
- e) the width of the original sample roll if greater than 25 mm ;
- f) any operation not specified in this European Standard, which may influence the results.

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