



**International  
Standard**

**ISO 29862**

**Self adhesive tapes —  
Determination of peel adhesion  
properties**

*Rubans auto-adhésifs — Détermination des caractéristiques de la  
force de pelage (pouvoir adhésif linéaire)*

**Third edition  
2024-12**

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 11, *Products*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 193, *Adhesives*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 29862:2018), which has been technically revised.

The main changes are as follows:

- the normative references in [Clause 2](#) have been updated;
- definitions have been added in [Clause 3](#) for “test piece”, “test sample”, “backing” and “carrier”;
- [Clause 4](#) has been modified to improve clarity and precision;
- the list of solvents in [5.2.2](#) has been revised;
- the description of the cutting device in [5.3.1](#) has been amended;
- the description of the procedure for preparing the peel test specimens has been revised, taking into account occupational safety and practicability;
- the light hand roller was added in [5.3.5](#);
- conditioning time of 16 h was added in [5.4.1](#);
- inconsistencies have been removed in [Clause 8](#);
- the text has been editorially revised to comply with the most recent principles and rules for the structure and drafting.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

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# Self adhesive tapes — Determination of peel adhesion properties

## 1 Scope

This document specifies a series of methods for the determination of peel adhesion properties of self adhesives tapes.

This document specifies:

- Method 1: Self adhesive tapes – Measurement of peel adhesion from stainless steel at an angle of 180°;
- Method 2: Self adhesive tapes – Measurement of peel adhesion from its own backing at an angle of 180°;
- Method 3: Self adhesive tapes – Measurement of peel adhesion of double-sided and transfer tapes at an angle 180°;
- Method 4: Self adhesive tapes – Measurement of adhesion of the liner to an adhesive tape at an angle of 180°.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 12481, *Self adhesive tapes — Terminology*

EN 10088-2, *Stainless steels — Part 2: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purposes*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 12481 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

### 3.1 peel adhesion

force required to peel a strip of adhesive tape from a specified substrate at a specified angle and speed

### 3.2 open side

<adhesive> surface of the adhesive on a double-sided adhesive tape which is exposed on normal unwinding or separation of the first liner

[SOURCE: EN 12481:2000, 2.1.2.21]

### 3.3

#### **closed side**

<adhesive> surface of the adhesive on a double-sided adhesive tape which remains in contact with the release liner on normal unwinding or separation of the first liner

[SOURCE: EN 12481:2000, 2.1.2.10]

### 3.4

#### **transfer tape**

adhesive tape having two available pressure sensitive surfaces without the need for a carrier and with a release liner separating the adhesive surfaces

Note 1 to entry: The adhesive may contain reinforcing material.

### 3.5

#### **self adhesive tape**

pressure sensitive adhesive adhesive which in a dry state is permanently tacky at room temperature and adheres readily to surfaces under brief and light pressure

### 3.6

#### **liner**

treated sheet to cover the adhesive temporarily to facilitate handling or unrolling

### 3.7

#### **double-sided adhesive tape**

tape where adhesive is applied to both sides of the carrier

### 3.8

#### **test piece**

strip of adhesive tape used for the peel test

### 3.9

#### **test sample**

sample of an adhesive tape, e.g. a roll or a sheet from which the test piece is made

### 3.10

#### **backing**

flexible supporting film, fabric, non-woven, foil or paper to which an adhesive is applied, on one face

### 3.11

#### **carrier**

flexible material, film, fabric, non-woven, foil or paper to which adhesive is applied, to both faces, to produce a double-sided tape

## 4 Significance and use

These test methods are tools for quality control use. Given specific self adhesive tape and a requirement in terms of the minimum or maximum value expected for this tape, the data from the test can be used in conjunction with acceptance criteria.

Test methods 1, 2, 3, and [Annexes A](#) and [B](#) can show the relative bond strength of a given tape to one or more surfaces (material and texture) as compared to the standard stainless steel panel. Substitution of representative samples of materials in question for the standard steel panel would suffice to do this.

Since the distribution of stress in an adhesively bonded joint under peel is not uniform and strongly depends on the thickness and viscoelastic properties of the adhesive and the rigidity of the backing or carrier<sup>[1]</sup>, utmost care shall be taken when drawing conclusions from the results of test methods 1, 2, 3, and [Annexes A](#) and [B](#) even when comparing self adhesive tapes of the same chemical type of adhesive but of different overall product design for their ability to adhere to a surface.

Test method 4 can show the amount of force required to remove a liner that covers the adhesive side of a tape at a specified peel rate. The force will be different at other peel rates.

These test methods cannot provide design information as there is usually no direct relationship between peel adhesion and any functional requirement.

[Annexes A](#) and [B](#) specify further variations in the testing protocol according to specific conditions. A guide to the use of these methods is given in [Table 1](#).

**Table 1 — Methods and annexes**

Method	Angle of peel	Temperature of test	
		23 °C	Low temperature
Method 1	180°	—	<a href="#">Annex A</a>
Adhesion to steel	90°	<a href="#">Annex B</a>	-
Method 2	180°	—	<a href="#">Annex A</a>
Adhesion to backing	90°	<a href="#">Annex B</a>	—
Method 3	180°	—	<a href="#">Annex A</a>
Adhesion of double-sided and transfer tape	90°	<a href="#">Annex B</a>	—
Method 4	180°	—	<a href="#">Annex A</a>
Adhesion of liner	90°	<a href="#">Annex B</a>	-

NOTE 1 These methods provide a means of assessing the uniformity of the adhesion of a given type of self adhesive tape. The assessment can be within a roll of tape, between rolls or between production lots.

NOTE 2 Variations in the tape backing and adhesive affect the response. Therefore, these methods cannot be used to pinpoint the specific cause(s) of non-uniformity.

NOTE 3 These test methods might not be appropriate to test tapes having either relatively stiff backings, stiff liners or backing showing high stretch at low forces. These characteristics will result in a high variability for the test response which is not a true indication of the real nature of the adhesive bond.

## 5 Method 1 — Self adhesive tapes — Measurement of peel adhesion from stainless steel at an angle of 180°

### 5.1 Principle

The method 1 gives a measure of the force required to remove at an angle of 180° an adhesive tape which has been applied to a stainless steel panel.

A length of adhesive tape is applied to a standard panel which is then fixed vertically in one clamp of a tensile testing machine. The other clamp of the machine pulls the free end of the adhesive tape at an angle of 180° to the panel.

The adhesive strength is measured by the force required to peel the adhesive tape continuously from the panel, the line of separation being perpendicular to the direction of the applied force.

### 5.2 Materials

**5.2.1 Absorbent cleaning material**, surgical gauze, cotton wool or tissue. To be suitable, materials shall be lint free during use, absorbent, contain no additives that are soluble in the solvents listed in [5.2.2](#) and made exclusively from virgin materials.

**5.2.2** One or more of the following **solvents**:

- **diacetone alcohol non-residual grade (4-hydroxy-4-methyl-2-pentanone)**;

- isopropanol;
- ethylacetate;
- methyl ethyl ketone;
- acetone;
- *n*-heptane.

Solvents shall be of general purpose chemical grade and held in a suitable dispensing system.

### 5.3 Apparatus

#### 5.3.1 Test piece cutter

An appropriate test piece cutter shall exhibit solid or snap-off blades like those used for utility knives and be suitable to prepare test strips with parallel edges without causing irregular edge damage.

#### 5.3.2 Tensile testing machine

A constant rate of extension (CRE) tension tester shall be used. It is proposed to use an electronic machine taking at least one reading per mm of tape peeled. The tester shall have two clamps with centres in the same plane, parallel with the direction of the motion on the same plane, parallel with the direction of the motion on the stressing clamp and so aligned that they will hold the specimen wholly in the same plane; a means of moving the stressing clamp at a uniform rate of  $(5,0 \pm 0,2)$  mm/s and a device for recording load. The instrument shall be calibrated such that a maximum error of 2 % is allowed on the reading.

#### 5.3.3 Stainless steel panels

These shall be perfectly flat, at least 125 mm long and 50 mm wide and at least 1,1 mm thick, stainless steel type 1,430 1 in accordance with the 2 R quality defined in EN 10088-2, having a bright annealed finish with a surface roughness of  $50 \text{ nm} \pm 25 \text{ nm}$ . Panels showing stains, discoloration or many scratches are not acceptable. New panels shall be cleaned prior to use as described in 5.5.2 except with ten washes of the final solvent. Between uses the panel test surface shall be protected from scratches and contamination and the panels shall be stored in the conditions described in 5.4.1.

#### 5.3.4 Roller mechanically or hand operated

**5.3.4.1** A steel roller ( $85 \pm 2,5$ ) mm in diameter and ( $45 \pm 1,5$ ) mm in width, covered with rubber approximately 6 mm in thickness, having a hardness of  $(80 \pm 5)$  Shore A. The surface shall be a true cylinder, void of any convex or concave deviations. The mass of the roller shall be  $(2,0 \pm 0,1)$  kg.

**5.3.4.2** No part of the apparatus shall increase the mass of the roller during use. The roller shall move either mechanically or by hand at the rate of  $(10,0 \pm 0,5)$  mm/s.

#### 5.3.5 Light hand roller

A light hand roller, having a weight significantly lower than the roller described in 5.3.4.1 and equipped with a rubber roll, to apply the tape gently to the surface of the test panel avoiding entrapped air.

### 5.4 Test samples and test pieces

**5.4.1** Condition the test sample at standard conditions of  $(23 \pm 1)$  °C and  $(50 \pm 5)$  % relative humidity (RH) for at least 16 h. Unless otherwise specified, perform the peel test at the same climatic conditions. If these tolerances cannot be maintained, the closest possible tolerances shall be used and these revised tolerances quoted in the report.

**5.4.2** The test piece shall have a width between 8,5 mm and 34 mm and a length of approximately 300 mm. The exact width (with or without cutting according to [5.3.1](#)) shall be measured and included in the test report. An acceptable rolling pressure should be obtained by using a 1 kg roller on test pieces with a width of 8,5 mm to 17 mm or by using a 2 kg roller on test pieces with a width > 17 mm. Where the width of the specimen is less than 8,5 mm, apply one or more additional strips of the tape to give an equivalent width. Where the width exceeds 34 mm, use a test piece cutter ([5.3.1](#)) to cut a test piece in the desired width between 8,5 mm and 34 mm.

**5.4.3** Discard at least three but no more than six outer wraps of tape from the sample roll (test sample) before taking the test pieces for testing.

**5.4.4** Remove one test piece for each test to be performed. Remove the test piece from a freely rotating roll at the rate of 500 mm/s to 750 mm/s. Where high unwind force makes it impossible to remove the test piece at the prescribed rate, remove it at a rate as close to 500 mm/s as possible.

**5.4.5** Apply the test pieces within 5 min after unwinding, respectively after removing the release liner. In case the test piece is in sheet form, the adhesive layer shall be open for max. 5 min before application.

## 5.5 Procedure

### 5.5.1 Standard test conditions

Standard test conditions shall be the same as [5.4.1](#) for test pieces and test samples conditioning.

### 5.5.2 Preparation of the panel

Dispense one of the solvents listed in [5.2.2](#) onto the panel, wiping it to dryness with fresh absorbent cleaning material. Proceed for a total of three washes with this solvent.

Final wipe shall be with methyl ethyl ketone or acetone. The panel should be allowed to dry for at least 10 min. Panels not used within 10 h should be recleaned.

In order to obtain consistent results, a new panel shall be wiped at least 10 times with final solvent before use.

Discard panels showing stains, discoloration, or many scratches. Avoid contacting panel surface with fingers. During storage panel should, be protected from damage or contamination.

### 5.5.3 Peel adhesion

**5.5.3.1** Remove a 300 mm test piece of the tape to be tested, as described in [5.4.4](#). Fold 12 mm at one end, adhesive to adhesive to form a tab. Touch the other end of the test piece to an end of the test panel. Hold the tab end of the test piece so that it does not make contact with the panel but is positioned loosely above it. First, apply light pressure, preferably by hand with the light hand roller according to [5.3.5](#), causing the roller to gently apply the tape to the panel. This prevents entrapment of air between the adhesive and the panel. If this occurs, discard the test piece. Then, apply the final rolling pressure according to [5.4.2](#) mechanically or by hand twice in each lengthwise direction.

Individually prepare each test piece and test within 1 min.

**NOTE** Longer dwell time will give different results. Peel adhesion increases with dwell time at different rates for various tapes. A longer dwell time can be chosen purposely.

**5.5.3.2** Double back the folded end of the tape at an angle of 180° and peel 25 mm of the tape from the panel. Clamp that end of the panel into one of the jaws of the tensile testing machine and the tape into the other jaw. Operate the tensile testing machine (or CRE tensile tester) at  $(5,0 \pm 0,2)$  mm/s.

After the movable jaw is started in motion disregard the values obtained while the first 25 mm of tape is mechanically peeled. Use the average force obtained during peeling of the next 50 mm of adhesive tape from the panel as the adhesion value.

It should be noted that heat is transferred to the stainless steel test panel during prolonged handling. Therefore, the panel should be touched as little as possible during and after applying the adhesive tape to the test panel.

## 5.6 Expression of results

Express the peel adhesion in newtons per 10 mm, if necessary, first converting the measured force in newtons.

## 5.7 Test report

The test report shall include the following information:

- a) a reference to this document, including its year of publication, i.e. ISO 29862:2024;
- b) a statement that this test method was used and indicating any deviations from the method as written;
- c) identification of each roll of tape tested;
- d) anomalous behaviour during testing (such as adhesive transfer or splitting);
- e) peel adhesion value in newtons per 10 mm to the nearest 0,1 N/10 mm;
- f) the test method used;
- g) dwell time, if less or greater than the standard 1 min;
- h) test piece width, if other than 24 mm;
- i) conditions of test if other than  $(23 \pm 1)$  °C and  $(50 \pm 5)$  % relative humidity;
- j) the date of the test.

## 6 Method 2 — Self adhesive tapes — Measurement of peel adhesion from its own backing at an angle of 180°

### 6.1 Principle

Method 2 gives a measure of the force required to remove an adhesive tape at an angle of 180° which has been applied to the backing of a second piece of the same tape.

A length of adhesive tape is superimposed on a second length of the same adhesive tape which has already been applied to a suitable panel (as described in 5.5.3.1). The panel is then fixed vertically in one clamp of a tensile testing machine. The other clamp of the machine pulls the free end of the adhesive tape at an angle of 180° from the backing of the underlying tape.

The adhesive strength is measured by the force required to peel the adhesive tape continuously from the backing of a second piece of the same tape. The line of separation being perpendicular to the direction of the applied force.

## 6.2 Apparatus

### 6.2.1 Test piece cutter

As [5.3.1](#).

### 6.2.2 Tensile testing machine

As [5.3.2](#).

### 6.2.3 Suitable panels

Any suitable clean rigid panel with dimension 50 mm by not less than 125 mm and not less than 1,1 mm thick.

### 6.2.4 Roller mechanically or hand operated

As [5.3.4](#).

## 6.3 Test samples and test pieces

As [5.4](#) but with the following modifications in [5.4.4](#): “two test pieces shall be taken”.

## 6.4 Procedure

### 6.4.1 Standard test conditions

Standard test conditions shall be the same as [5.4.1](#) for test pieces and test samples conditioning.

### 6.4.2 Preparation

**6.4.2.1** Remove a 300 mm test piece of adhesive tape to be tested as described in [5.4.4](#). Apply this to the rigid panel and roll firmly. Remove a second 300 mm test piece and apply to the backing of the test piece already applied to the panel by touching one end of the second test piece to one end of the test panel. First, apply light pressure, preferably by hand with the light hand roller according to [5.3.5](#), causing the roller to gently apply the tape to the panel. This prevents the entrapment of air between the two test pieces. If this occurs, discard the test piece. Then, apply the final rolling pressure using the roller according to [5.3.4](#) mechanically or by hand twice in each lengthwise direction. Individually prepare each test piece and test within 1 min after the last rolling.

**6.4.2.2** Peel the test piece, as [5.5.3.2](#).

## 6.5 Expression of results

As [5.6](#).

## 6.6 Test report

As [5.7](#).

## 7 Method 3 — Self adhesive tapes — Measurement of peel adhesion of double-sided and transfer tapes at an angle of 180°

### 7.1 Principle

Method 3 gives a measure of the force required to remove either side of a double-sided tape or an adhesive transfer tape which has been applied to a standard metal with the non-tested adhesive surface being covered by a 25 µm polyester film.

A length of double-sided or adhesive transfer tape is applied to a standard panel with the non-tested surface covered by a supporting film. The panel is then fixed vertically in one clamp of a tensile testing machine. The other clamp of the machine pulls the free end of the adhesive tape at an angle of 180° to the panel. The adhesive strength is measured by the force required to peel either face of the double-sided or transfer tape continuously from the panel, the line of separation being perpendicular to the direction of the applied force.

### 7.2 Materials

In addition to the materials listed in 5.2, a supporting PET-film with a thickness of  $(25 \pm 2)$  µm, approximately 3 mm wider than the test piece is required. Different supporting film will have an influence on the test result and shall be included in the test report.

### 7.3 Apparatus

As 5.3.

### 7.4 Test samples and test pieces

As 5.4.

### 7.5 Procedure

#### 7.5.1 Standard test conditions

As 5.4.1.

#### 7.5.2 Preparation of the panel

As 5.5.2.

#### 7.5.3 Procedure for open side of double-sided or adhesive transfer tape

**7.5.3.1** Remove a 300 mm test piece of the tape to be tested as described in 5.4.4. Fold 12 mm at one end, adhesive to adhesive to form a tab. Touch the other end of the specimen to an end of the test panel. Hold the tabbed end of the specimen so that it does not make contact with the panel but is positioned loosely above it. First, apply light pressure, preferably by hand with the light hand roller according to 5.3.5, causing the roller to gently apply the tape to the panel. This prevents entrapment of air between the adhesive and the panel. If this occurs, discard the test piece. Then, apply the final rolling pressure using the roller according to 5.3.4 mechanically or by hand once in each lengthwise direction, causing the roller to apply the tape to the panel.

Remove the liner and superimpose onto the test piece a strip of supporting film (according to 7.2). Apply this film in the manner of applying the double coated test strip to the panel so that the roller makes the actual application of the film to the double coated adhesive tape.

Individually prepare each test piece and test within 1 min.

**NOTE** The two passes of the roller in applying polyester film can be made using the hand roller. The rolling rate can be increased to 50 mm/s.

7.5.3.2 Peel the test piece from the panel, as [5.5.3.2](#).

#### 7.5.4 Procedure for closed side of double-sided or adhesive transfer tape

7.5.4.1 Remove a 300 mm test piece of the tape to be tested as described in [5.4.4](#). Apply this tape to a supporting film (according to [7.2](#)) and roll mechanically or by hand causing the roller to apply the tape to the film. This prevents entrapment of air between the tape and the film. Remove the liner, fold 12 mm at one end adhesive to adhesive to form a tab. Touch the other end of the test piece to an end of the test panel. Hold the tabbed end of the test piece so that it does not make contact with the panel but is positioned loosely above it. First, apply light pressure, preferably by hand with the light hand roller according to [5.3.5](#), causing the roller to gently apply the tape to the panel. This prevents entrapment of air between the adhesive and the panel. If this occurs, discard the test piece. Then, apply the final rolling pressure using the roller according to [5.3.4](#) mechanically or by hand once in each lengthwise direction, causing the roller to apply the tape to the panel.

Individually prepare each test piece and test within 1 min.

7.5.4.2 Peel the test piece from the test panel, as [5.5.3.2](#).

### 7.6 Expression of results

As [5.6](#).

### 7.7 Test report

As [5.7](#), supplemented by:

k) whether open or closed side tested.

## 8 Method 4 — Self adhesive tapes — Measurement of adhesion of the liner to an adhesive tape at an angle of 180°

### 8.1 Principle

#### 8.1.1 Double-sided adhesive tapes

A test piece of double-sided adhesive tape is adhered to a suitable panel. This panel is fixed vertically into one jaw of the tensile testing machine. The other jaw of the machine pulls the free end of the liner away from the adhesive tape at an angle of 180°. The adhesive strength is measured by the force required to peel the liner continuously from the adhesive surface, the line of separation shall be perpendicular to the direction of the applied force.

#### 8.1.2 Single sided adhesive tapes

As [8.1.1](#) except that a double-sided adhesive tape is used to adhere the single sided adhesive tape to the test panel.

### 8.2 Materials

As [5.2](#).

### 8.3 Apparatus

As [5.3](#) except that a suitable panel as in [6.2.3](#) is acceptable.

### 8.4 Test samples and test pieces

As [5.4](#).

## 8.5 Procedure

### 8.5.1 Double-sided tapes

8.5.1.1 Follow [5.5.2](#).

8.5.1.2 Apply 125 mm of one end of the test piece with the adhesive side (face side) down to the panel. Make two passes with the roller in each direction at a rate of  $(10,0 \pm 0,5)$  mm/s. Separate the liner from the tape not attached to the panel and cut away the free (not adhered) end of the tape. Do not disturb the liner adhered to the tape on the panel.

Double back the liner at an angle of  $180^\circ$  and peel 25 mm of the liner from the tape surface. Clamp that end of the panel into one jaw of the tensile testing machine and the free end of the liner into the other jaw. Operate the tensile testing machine at  $(5,0 \pm 0,2)$  mm/s.

After the movable jaw is started in motion, disregard the values obtained while the first 25 mm of liner are mechanically peeled. Use the average force obtained during peeling of the next 50 mm of liner from the adhesive tape.

### 8.5.2 Single sided tape

8.5.2.1 Follow [5.5.2](#).

8.5.2.2 Apply a strip of double-sided tape at least as wide as the test piece, to the full length of the panel. Remove the liner from the double-sided tape. Superimpose 125 mm of one end of the test piece, backing side down onto the double-sided tape on the panel. Make two passes with the roller in each direction at a rate of  $(10,0 \pm 0,5)$  mm/s. Separate the liner from the single sided tape at the free (not adhered) end and cut away the free tape. Do not disturb the liner adhered to the test piece on the panel. Double back the liner at an angle of  $180^\circ$  and peel 25 mm of the liner from the single sided tape. Clamp that end of the panel into one jaw of the tensile testing machine and the free end of the liner into the other jaw. Operate the tensile testing machine at  $(5,0 \pm 0,2)$  mm/s.

After the movable jaw is started in motion disregard the values obtained while the first 25 mm of liner are mechanically peeled. Use the average force obtained during peeling of the next 50 mm of liner from the single sided tape.

## 8.6 Expression of results

As [5.6](#).

## 8.7 Test report

As [5.7](#).

## Annex A (normative)

# Self adhesive tapes — Measurement of peel adhesion from a surface at low temperature

### A.1 Principle

This annex specifies the method to measure at low temperature the force required to remove an adhesive tape which has been applied to a surface in the manner described in any of the methods in this document at the chosen low temperature, and kept at this low temperature for 16 h to 24 h before measuring the adhesion value.

### A.2 Apparatus

The apparatus shall be:

- as in the appropriate test method; and
- an environment or environmental chamber appropriate to the chosen temperature.

### A.3 Test samples and test pieces

**A.3.1** Test samples, test pieces, and panels (after cleaning) shall be conditioned at the chosen low temperature for 2 h.

**A.3.2** Follow the appropriate test method described in [Clauses 5 to 8](#).

### A.4 Procedure

**A.4.1** The entire test shall be carried at the chosen low temperature.

**A.4.2** Apply the test piece in the low temperature environment as described in the appropriate test method.

Allow to condition for 16 h to 24 h before peeling the test piece from the panel as required by the appropriate test method.

### A.5 Test report

As test report for the appropriate test method indicating additionally that this annex has been used, and the testing temperature.