



**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
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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).

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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.

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.

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*

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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^[1], 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°	—	Annex A
Adhesion to steel	90°	Annex B	-
Method 2	180°	—	Annex A
Adhesion to backing	90°	Annex B	—
Method 3	180°	—	Annex A
Adhesion of double-sided and transfer tape	90°	Annex B	—
Method 4	180°	—	Annex A
Adhesion of liner	90°	Annex B	-

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.

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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 ± 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 ± 1) °C and (50 ± 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.