SLOVENSKI STANDARD
oSIST prEN ISO 11339:2021

01-december-2021

Lepila - T-preskus luščenja za lepljenje dveh gibkih lepljencev (ISO/FDIS 11339:2021)

Adhesives - T-peel test for flexible-to-flexible bonded assemblies (ISO/FDIS 11339:2021)

Klebstoffe - T-Schälprüfung für geklebte Verbindungen aus flexiblen Fügeteilen (ISO/FDIS 11339:2021)

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Adhésifs - Essai de pelage en T d'assemblages collés flexible sur flexible (ISO/FDIS 11339:2021)

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Ta slovenski standard je istoveten z: prEN ISO 11339

ICS:

83.180	Lepila	Adhesives

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FINAL
DRAFT

INTERNATIONAL
STANDARD

**ISO/FDIS
11339**

ISO/TC **61**/SC **11**

Secretariat: **JISC**

Voting begins on:
2021-10-08

Voting terminates on:
2021-12-31

Adhesives — T-peel test for flexible-to-flexible bonded assemblies

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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 documents 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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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).

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This fourth edition cancels and replaces the third edition (ISO 11339:2010), of which it constitutes a minor revision.

The changes compared to the previous edition are as follows:

a) the term “peel strength” is replaced by the term “peel resistance” in the whole text.

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.

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Adhesives — T-peel test for flexible-to-flexible bonded assemblies

SAFETY STATEMENT — Persons using this document should be familiar with normal laboratory practice, if applicable. This document does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and determine the applicability of any regulatory conditions prior to use.

It is recognized that some of the materials permitted in this document may have a negative environmental impact. As technological advances lead to more acceptable alternatives for such materials, they will be eliminated to the greatest extent possible.

At the end of the test, care should be taken to dispose of all waste in an appropriate manner.

1 Scope

This document specifies a T-peel test for the determination of the peel resistance of an adhesive by measuring the peeling force of a T-shaped bonded assembly of two flexible adherends. This test procedure does not provide design information.

NOTE This method was originally developed for use with metal adherends but other, flexible, adherends can also be used.

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2 Normative references

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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.

ISO 291, *Plastics — Standard atmospheres for conditioning and testing*

ISO 10365, *Adhesives — Designation of main failure patterns*

ISO 17212, *Structural adhesives — Guidelines for the surface preparation of metals and plastics prior to adhesive bonding*

3 Terms and definitions

For the purposes of this document, the following terms and definitions 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 resistance
force per unit width necessary to bring an adhesive joint to the point of failure or to maintain a rate of failure by means of a stress applied in the peeling mode

Note 1 to entry: The peel resistance can be expressed as force per unit peel width.

[SOURCE: ISO 472:2013, 2.683, modified — "peel strength" is replaced by "peel resistance" in the Note.]

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3.2
flexible adherend
adherend having dimensions and physical properties that permit bending through any angle up to 90° without breaking or cracking

4 Principle

For the T-peel test for a flexible-to-flexible assembly, the force is applied to the unbonded ends of the specimen. The angle between the bond line and the direction of the applied force is not fixed.

Adherends are separated at an approximately steady rate from an open edge of a prepared bond so that separation occurs progressively along the bond line.

5 Apparatus

5.1 Tensile-testing machine[1)], capable of maintaining a predetermined constant crosshead rate (preferred rate 100 mm/min). It shall be provided with a suitable self-aligning grip to hold the specimen. Each set of jaws of the grip shall firmly engage the outer 25 mm of the unbonded ends of the flexible adherends. The grip and attachments shall be constructed in such a way that they will move into alignment with the specimen as soon as the force is applied. The machine shall produce a chart that can be read in terms of millimetres of crosshead movement as a function of the applied force.

The machine shall permit the measurement and recording of the applied force with an accuracy of ±2 %. All equipment shall be calibrated regularly. It is recommended that a clamping device with low inertia be used.

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5.2 Device for measuring thickness, with an accuracy of ±0,01 mm, or a means of checking the thickness to that tolerance.

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6 Test specimens

6.1 Test specimens of the dimensions shown in Figure 1 shall be prepared, either individually or cut from bonded laminates. Test specimens shall consist of two flexible adherends properly prepared and bonded together.

6.2 Surface treatment shall be such as to obtain optimum strength in the bonded assembly. The preparation of the surface shall be in accordance with ISO 17212, and details of the preparation shall be stated in the test report.

The adhesive shall be applied in accordance with the manufacturer's instructions to obtain an optimum bond with minimum variation; the procedure used shall be reported in the test report.

NOTE Direct comparison of different adhesives can be made only when specimen construction, adherend materials and dimensions, and test conditions are identical.

6.3 The thickness of the flexible adherends shall be reported.

The preferred thicknesses are 0,5 mm ± 0,02 mm for steel (type XES)[2)] and 0,7 mm ± 0,02 mm or 0,5 mm ± 0,02 mm for aluminium (type 5754, H111)[3)] unless otherwise specified.

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1) See for instance ISO 5893[4].

2) XES = low-carbon steel: composition (in mass %) C = 0,05, Cr < 0,01, Cu = 0,013, Mn = 0,018, Al = 0,064, Ni = 0,02; Young's modulus E = 210 GPa; initial yield stress σ_y = 150 MPa; strain-hardening coefficient η = 0,4.

3) See ISO 209[1] and ISO 2107[3].

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6.4 Test specimens shall be cut from the bonded panels (see Figure 1) by a method that is not deleterious to the bond.

The width shall be either

a) 25 mm (preferred width)

or

b) any other convenient width, provided that the test equipment is suitably adapted and the width is stated in the test report.

NOTE The method of cutting the specimens is dependent upon the adherend and adhesive compositions and the specimen width tolerance specified in Figure 1. Milling and bandsawing are two methods commonly used for this purpose.

6.5 Before the test is carried out, the test specimen shall be bent in a manner that does not affect the bonded joint. The two unbonded ends of the flexible adherends shall be bent in opposite directions until each end is perpendicular to the bonded assembly, to form a T-shaped specimen (see Figure 1) for clamping in the grips of the test machine.

6.6 The number of specimens tested shall be not less than five.

6.7 The specimens shall be conditioned and tested in one of the standard laboratory atmospheres specified in ISO 291, which shall be reported in the test report.

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7 Procedure

On the at least five specimens, using the device described in 5.2, measure with an accuracy of ±0,01 mm the average thickness of the adhesive layer after formation of the bond. Clamp each unbonded end of the T-shaped specimen in the grips of the test machine, taking care that the end is accurately aligned between the grips so that the tension applied is distributed evenly across the width. If one adherend is more flexible than the other, attach the less flexible adherend to the moveable grip.

Set the machine in motion at the selected separation rate and record the force applied versus the distance of grip separation.

NOTE A separation rate of 100 mm/min is generally used for metals and 10 mm/min for other adherends.

Continue the test until at least 150 mm of the bonded length is separated. Note the type of failure in accordance with ISO 10365.

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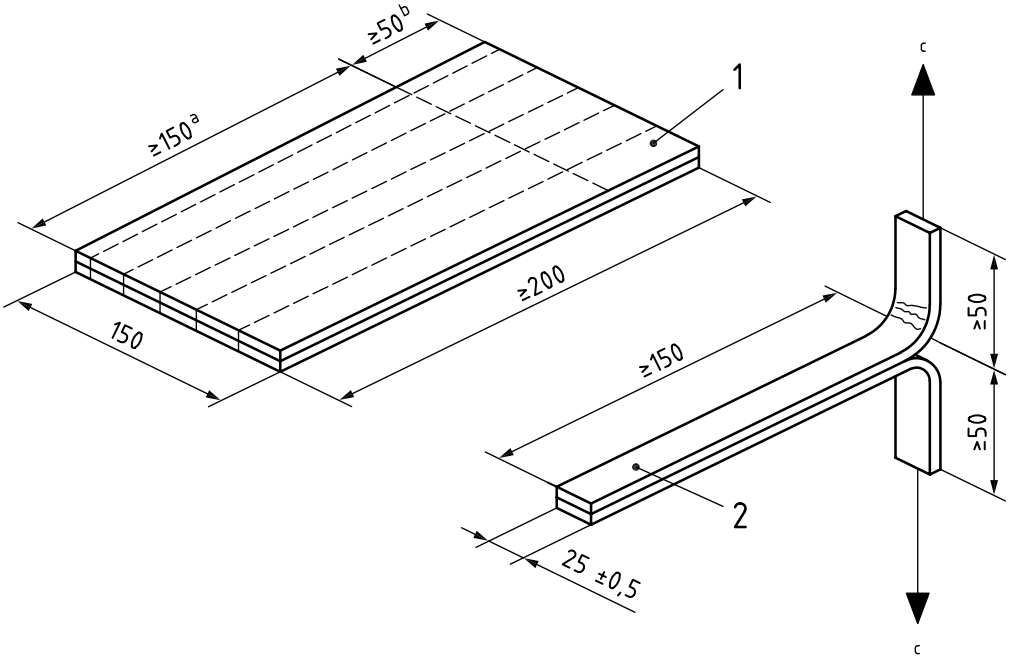
Dimensions in millimetres



Key

1 specimen cut at panel edge
2 specimen
a Bonded.
b Unbonded.
c Direction of pull.

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Figure 1 — Panel before cutting and individual specimen after cutting

8 Expression of results

Determine from the recorded curve, for about 100 mm of peeling (disregarding the first 25 mm and the last 25 mm), the average, maximum and minimum peeling force, in newtons, required to separate the adherends. The average force shall be determined from the curve by drawing the best straight line, or by using other suitable means if a more accurate result is required.

Record the average, maximum and minimum peeling forces for each individual specimen.

From the peeling forces thus recorded, calculate the average, maximum and minimum peel resistance for each individual specimen, in newtons per 100 mm of specimen width.

9 Precision

The precision of this test method is not known because interlaboratory data are not available. When interlaboratory data are obtained, a precision statement will be added at the following revision.

10 Test report

The test report shall include the following information:

a) a reference to this document, i.e. ISO 11339:2021;

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