



# SLOVENSKI STANDARD

## SIST EN 14444:2006

01-januar-2006

---

**Konstruksijska lepila – Kvalitativno ugotavljanje trdnosti lepljenih spojev -  
Preskus pretrganja s klinom (ISO 10354:1992, spremenjen)**

Structural adhesives - Qualitative assessment of durability of bonded assemblies -  
Wedge rupture test (ISO 10354:1992 modified)

Strukturklebstoffe - Qualitative Bestimmung der Beständigkeit geklebter Baugruppen -  
Keilberstprüfung (ISO 10354:1992 modifiziert)

Adhésifs structuraux - Évaluation qualitative de la durabilité des assemblages collés -  
Essai de clivage au coin (ISO 10354:1992 modifiée)

**Ta slovenski standard je istoveten z: EN 14444:2005**

---

**ICS:**

83.180          Lepila                                  Adhesives

**SIST EN 14444:2006                                  en**

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN 14444:2006

<https://standards.iteh.ai/catalog/standards/sist/a533fc80-dd0f-4e7d-b5b6-1d910aa11e8a/sist-en-14444-2006>

EUROPEAN STANDARD

EN 14444

NORME EUROPÉENNE

EUROPÄISCHE NORM

October 2005

ICS 83.180

English Version

## Structural adhesives - Qualitative assessment of durability of bonded assemblies - Wedge rupture test (ISO 10354:1992 modified)

Adhésifs structuraux - Évaluation qualitative de la durabilité des assemblages collés - Essai de clivage au coin (ISO 10354:1992 modifiée)

Strukturklebstoffe - Qualitative Bestimmung der Beständigkeit geklebter Baugruppen - Keilberstprüfung (ISO 10354:1992 modifiziert)

This European Standard was approved by CEN on 13 June 2005.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

<https://standards.iteh.ai/catalog/standards/sist/a533fc80-dd0f-4e7d-b5b6-1d910aa11e8a/sist-en-14444-2006>



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

## Contents

	Page
Foreword .....	3
1 Scope .....	4
2 Normative references .....	4
3 Principle.....	4
4 Safety .....	4
5 Apparatus .....	5
6 Procedure .....	5
6.1 Preparation of specimens .....	5
6.2 Number of specimens.....	6
6.3 Determination.....	6
7 Expression of results.....	7
8 Precision.....	8
9 Test report .....	8

**iTeh STANDARD PREVIEW**  
(standards.iteh.ai)

[SIST EN 14444:2006](https://standards.iteh.ai/catalog/standards/sist/a533fc80-dd0f-4e7d-b5b6-1d910aa11e8a/sist-en-14444-2006)

<https://standards.iteh.ai/catalog/standards/sist/a533fc80-dd0f-4e7d-b5b6-1d910aa11e8a/sist-en-14444-2006>

## Foreword

This document (EN 14444:2005) has been prepared by Technical Committee CEN/TC 193 “Adhesives”, the secretariat of which is held by AENOR.

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 April 2006, and conflicting national standards shall be withdrawn at the latest by April 2006.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

### Endorsement notice

The text of International Standard ISO 10354:1992 was approved by CEN as a European Standard with agreed common modifications as given below:

— the title, scope and precision have been modified.

— A “Safety” clause has been introduced

The common modifications have been inserted in the text of the reference document and indicated by a vertical line in the left margin.

<https://standards.iteh.ai/catalog/standards/sist/a533fc80-dd0f-4e7d-b5b6-1d910aa11e8a/sist-en-14444-2006>

**EN 14444:2005 (E)****1 Scope**

This document simulates in a qualitative manner mechanical forces and important environmental influences on an adhesive-bonded joint at a metal polymer interfaces it can also be used as a method of checking the surface preparation of substrates, with a limited detection level.

The test is applicable at the present time to the bonding of aluminium and titanium alloys using thermosetting structural adhesives and primers.

NOTE This method can also be used for assessing surface preparation of other metals. Considerable caution in the evaluation of comparative results should be exercised in the event that the materials (adhesive plus adherend) and the specimen geometry are varied. Like should be compared with like (only similar adherends bonded with similar adhesives can be compared between themselves).

**2 Normative references**

The following referenced documents are indispensable for the application 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 ISO 9142, *Adhesives – Guide to the selection of standard laboratory ageing conditions for testing bonded joints.* (ISO 9142:2003)

EN ISO 10365, *Adhesives – Designation of main failure patterns.* (ISO 10365:1992)

EN 13887, *Structural adhesives – Guidelines for surface preparation of metals and plastics prior to adhesive bonding.*

SIST EN 14444:2006

[https://standards.iteh.ai/catalog/standards/sist/a533fc80-dd0f-4e7d-b5b6-](https://standards.iteh.ai/catalog/standards/sist/a533fc80-dd0f-4e7d-b5b6-1d910aa11e8a/sist-en-14444-2006)

[1d910aa11e8a/sist-en-14444-2006](https://standards.iteh.ai/catalog/standards/sist/a533fc80-dd0f-4e7d-b5b6-1d910aa11e8a/sist-en-14444-2006)

**3 Principle**

The test consists of the progressive introduction of a wedge between two plates bonded together with the adhesive under test. The length of the crack thus produced is measured, as is any propagation of the crack caused by laboratory ageing tests.

**4 Safety**

Persons using this document shall be familiar with normal laboratory practice.

This document does not purport to address all the safety problems, if any, associated with its use.

It is the responsibility of the user to establish safety and health practices and to ensure compliance with any European or national regulatory conditions.

## 5 Apparatus

**5.1 Wedge**, of a composition which will not interact chemically with the adherends of the specimens being tested (electrolytic corrosion). Stainless-steel wedges have been found to work well many adherends and are very durable and reusable (see Figure 1).

Dimensions in millimetres, except where indicated otherwise

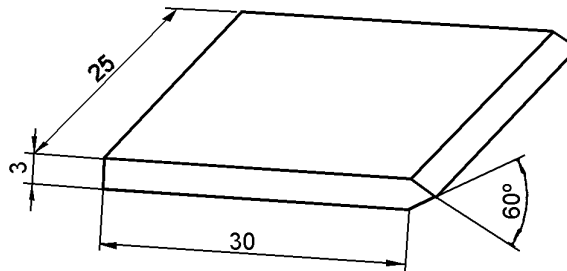


Figure 1 — Dimensions of wedge

**5.2 Device for driving the wedge**, of any suitable design which provides slow and regular penetration (300 mm/min  $\pm$  5 mm/min), but excludes the possibility of oblique penetration or oblique movement of the wedge.

**5.3 Binocular magnifying glass**, with a magnification between x 10 and x 40.

**5.4 Stopwatch**, accurate to the nearest 0,1 s.

**5.5 Thickness-measuring device**, accurate to the nearest 0,01 mm.

## 6 Procedure

### 6.1 Preparation of specimens

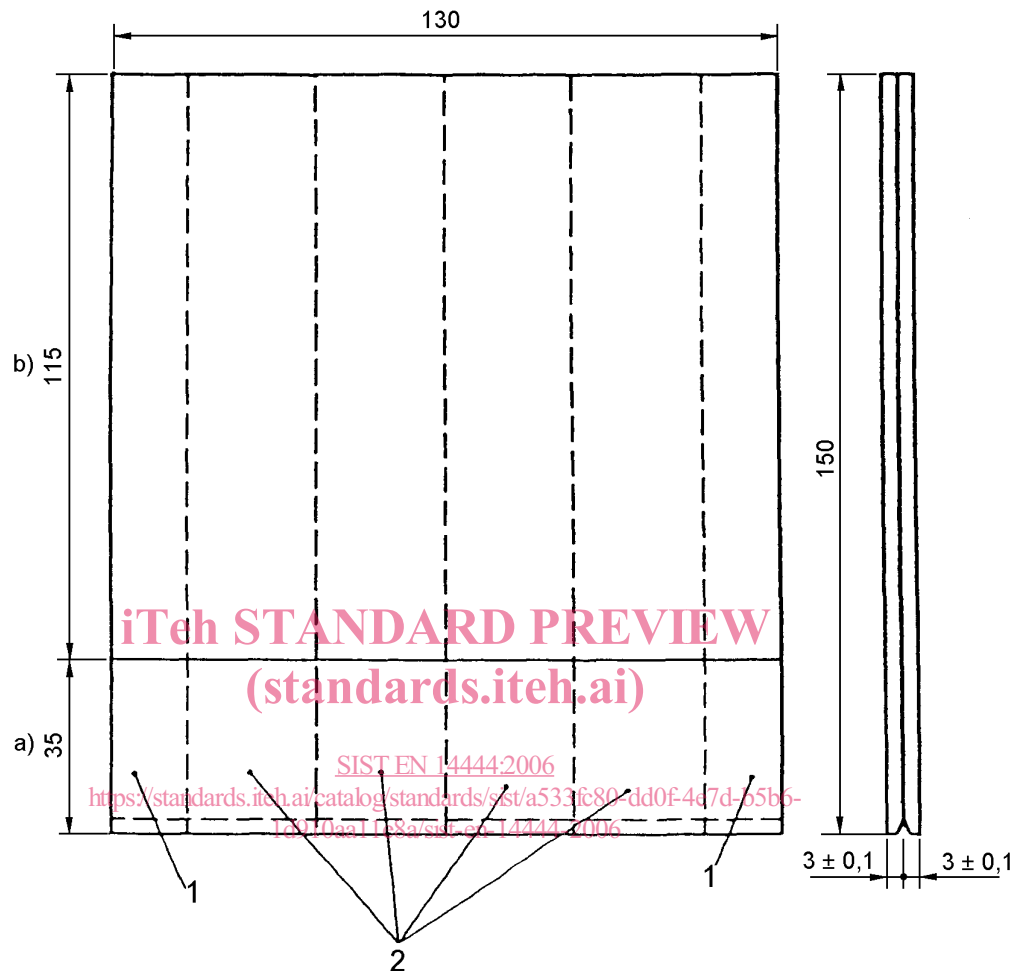
Specimens shall be prepared from two plates, bonded as shown in Figure 2, of dimensions 130 mm x 150 mm x (3  $\pm$  0,1) mm.

Before bonding the plates, apply beyond the end of the zone to be bonded a strip of thin (less than 0,1 mm) anti-adhesive tape (see Figure 2) to prevent any bonding outside the required zone. Polytetrafluoroethylene is generally used as tape material.

Prepare the surface in accordance with EN 13887 and bond the plates as specified by the manufacturer of the adhesive under test. Bring the bonded plates to a temperature of 23 °C  $\pm$  2° C if necessary. Starting from the centreline cut four strips 27 mm in width and 150 mm in length from the bonded plates by sawing. Machine the sawn edges of these strips to give specimens 25 mm  $\pm$  0,1 mm in width. Alternatively, specimens measuring 150 mm x 27 mm x (3  $\pm$  0,1) mm may be prepared individually and machined to a width of 25 mm  $\pm$  0,1 mm after bonding.

Determine, for each specimen, the average thickness of the adhesive layer bonding. To do this, make three measurements, to an accuracy of 0,01 mm, on each specimen and calculate the mean.

Dimensions in millimetres

**Key**

- 1 Discard
- 2 Four 150 x 25 specimens taken after bonding
- a) Zone covered by anti-adhesive tape
- b) Bonded zone

**Figure 2 — Dimensions of bonded plate from which specimens are cut**

**6.2 Number of specimens**

Conduct the test on at least 10 specimens.

**6.3 Determination**

For each specimen, drive the wedge (5.1) fully home with the device (5.2) as shown in Figure 3. To accomplish this, open the end of the specimen that contains the anti-adhesive tape, and insert the wedge. Push the wedge into the joint so as to permit slow and regular penetration at a speed of 30 mm/min  $\pm$  5 mm/min, positioning the wedge so that the end and sides are approximately flush with the sides of the specimen.



Determine the position of the crack on each side of the specimen by examination with the binocular magnifying glass (5.3). Mark this position with a fine, indelible line.

Measure the initial crack length, in millimetres, from the wedge/adherend contact point to the mark, on each edge of the specimen. Note the mean initial crack length  $l_0$ .

Age the specimen under of the sets of conditions specified in EN ISO 9142.

After ageing, allow the specimen to stand for  $60 \text{ min} \pm 10 \text{ min}$  (see 5.4) at ambient conditions to stabilize.

Measure the final length, in millimetres, of the crack on each edge of the specimen. Note the mean final crack length  $l_F$ .

Separate the two halves of the specimens and determine the pattern of failure in accordance with EN ISO 10365.

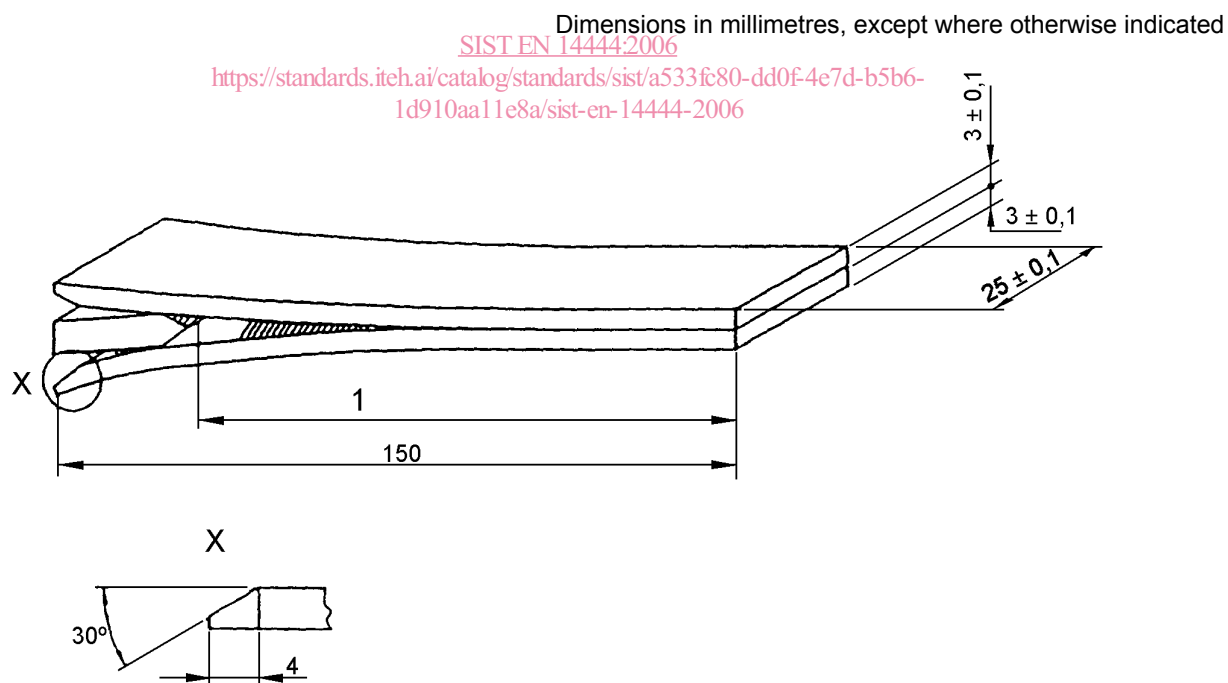
## 7 Expression of results

Determine, for each specimen, the average increase  $\Delta l$  in crack length, in millimetres, as a result of ageing (see Figure 4), using the equation :

$$\Delta l = l_F - l_0$$

Where  $l_F$  and  $l_0$  are as defined in 6.3.

Determine, for each type of failure, the arithmetic mean of  $\Delta l$ .



### Key

1 Bonded zone:115

Figure 3 — Specimen with wedge