

# INTERNATIONAL STANDARD

ISO  
7389

Second edition  
1987-11-15



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INTERNATIONAL ORGANIZATION FOR STANDARDIZATION  
ORGANISATION INTERNATIONALE DE NORMALISATION  
МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ

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## **Building construction — Jointing products — Determination of elastic recovery**

*Construction immobilière — Produits pour joints — Détermination de la reprise élastique*

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ISO 7389:1987

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Reference number  
ISO 7389:1987 (E)

## 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 7389 was prepared by Technical Committee ISO/TC 59, *Building construction*.

This second edition cancels and replaces the first edition (ISO 7389 : 1982), clauses 3.2.2, 3.2.4 and 3.3 of which have been technically revised. [ISO 7389:1987](#)

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Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

# Building construction — Jointing products — Determination of elastic recovery

## 1 Scope and field of application

This International Standard specifies a conventional method for the determination of the elastic recovery of sealants after extension and applies to sealants used in joints in building construction.

## 2 Reference

ISO 6927, *Building construction — Jointing products — Sealants — Vocabulary*.

## 3 Test method

### 3.1 Principle

Extension of specimens of the sealant to be tested which adhere at two parallel contact surfaces to a defined width, maintaining under extension and releasing under defined conditions. The decrease in extension after releasing is the elastic recovery expressed as a percentage (see clause 4).

### 3.2 Apparatus

**3.2.1 U-profiles of non-anodized aluminium alloy**, with a cross-section of dimensions 12 mm × 12 mm × 2 mm and a length of 70 mm.

**3.2.2 Spacers**, not adherent to the sealant, for the preparation of the test specimens of dimensions 12 mm × 12 mm × 10 mm.

**3.2.3 Spacers** of appropriate dimensions to hold the test specimens extended by 125, 160 or 200 % of the original width (see the table);

**3.2.4 Anti-adherent substrate**, for the preparation of the test specimens, e.g. **polytetrafluoroethylene (PTFE) film** or **vellum paper**, preferably according to the advice of the sealant manufacturer.

**3.2.5 Glass plate**, dusted with talc.

**3.2.6 Convection-type oven**, capable of operating at  $70 \pm 2$  °C.

**3.2.7 Extension machine**, capable of pulling at a rate of 5 to 6 mm/min.

**3.2.8 Vernier inside caliper**, accurate to 0,1 mm.

**3.2.9 Container** for water immersion of the specimen.

### 3.3 Preparation of test specimens

Prepare three test specimens for each extension value to be applied. For each test specimen, assemble two U-profiles<sup>1)</sup> (3.2.1) and two spacers (3.2.2) according to the figure and set them upon the anti-adherent substrate (3.2.4). Fill the hollow space formed by the U-profiles and spacers with sealant which has previously been conditioned for 24 h at  $23 \pm 2$  °C.

The following precautions shall be taken :

- avoid the formation of air bubbles;
- press the sealant to the contact surfaces of the U-profiles;
- trim the sealant surface so that it is flush with the faces of the U-profiles and the spacers.

The test specimens shall be set on edge of one of the supports and the anti-adherent substrate shall be removed as soon as possible. The specimens shall rest in this position to allow curing or optimum drying of the sealant.

The spacers shall be maintained in place during conditioning.

### 3.4 Conditioning of test specimens

The test specimens shall be conditioned either according to method A (see 3.4.1) or method B (see 3.4.2).

After conditioning according to one of these methods, the test specimens shall be stored for a further period of at least 24 h at  $23 \pm 2$  °C and  $(50 \pm 5)$  % relative humidity before testing.

1) The U-profiles shall be first cleaned with methyl ethyl ketone or similar solvent, then cleaned with a detergent solution and finally rinsed with distilled water and air dried.

**3.4.1 Conditioning method A**

The test specimens shall be conditioned for 28 days at  $23 \pm 2$  °C and  $(50 \pm 5)$  % relative humidity.

**3.4.2 Conditioning method B**

The test specimens shall first be conditioned according to method A and subsequently subjected three times to the following storage cycle :

- a) 3 days in the oven (3.2.6) at  $70 \pm 2$  °C;
- b) 1 day in distilled water at  $23 \pm 2$  °C;
- c) 2 days in the oven at  $70 \pm 2$  °C;
- d) 1 day in distilled water at  $23 \pm 2$  °C.

This cycle may be carried out alternatively in the sequence : c) — d) — a) — b).

NOTE — Conditioning method B is a normal conditioning procedure using the influence of heat and water. It is not intended to give information on the durability of the sealant.

**3.5 Procedure**

The test shall be carried out at  $23 \pm 2$  °C and  $(50 \pm 5)$  % relative humidity and all measurements shall be taken with the vernier inside caliper (3.2.8).

The spacers for the preparation of the test specimens shall be removed and the initial width,  $l_0$ , shall be measured at both ends of each test specimen. The test specimens shall then be placed in the extension machine (3.2.7) and extended to 125, 160 or 200 % of the initial width, at a rate of 5 to 6 mm/min.

$l_1$  is the width after extension.

The following table gives the correspondence in millimetres of the extension percentage for a test specimen of 12 mm initial width.

**Table — Correspondence of extension values**

Initial width 12 mm	
Extension percentage %	Width after extension mm
125	15
160	19,2
200	24

The extension shall be maintained for 24 h using the appropriate spacers. After this time the spacers shall be removed and the test specimens shall be placed on the talc-dusted glass

plate (3.2.5). After 1 h, the width after elastic recovery  $l_2$  shall be measured at both ends of each test specimen.

For  $l_0$ ,  $l_1$  and  $l_2$ , calculate the arithmetic mean of the respective measurements at both ends of the test specimen.

**4 Expression of results**

Calculate the elastic recovery of each test specimen, by the equation

$$R_e = \frac{l_1 - l_2}{l_1 - l_0} \times 100$$

where

$R_e$  is the elastic recovery, in percent;

$l_0$  is the initial width, in millimetres, between the contact surfaces after conditioning;

$l_1$  is the width, in millimetres, between the contact surfaces under extension;

$l_2$  is the width, in millimetres, between the contact surfaces after elastic recovery.

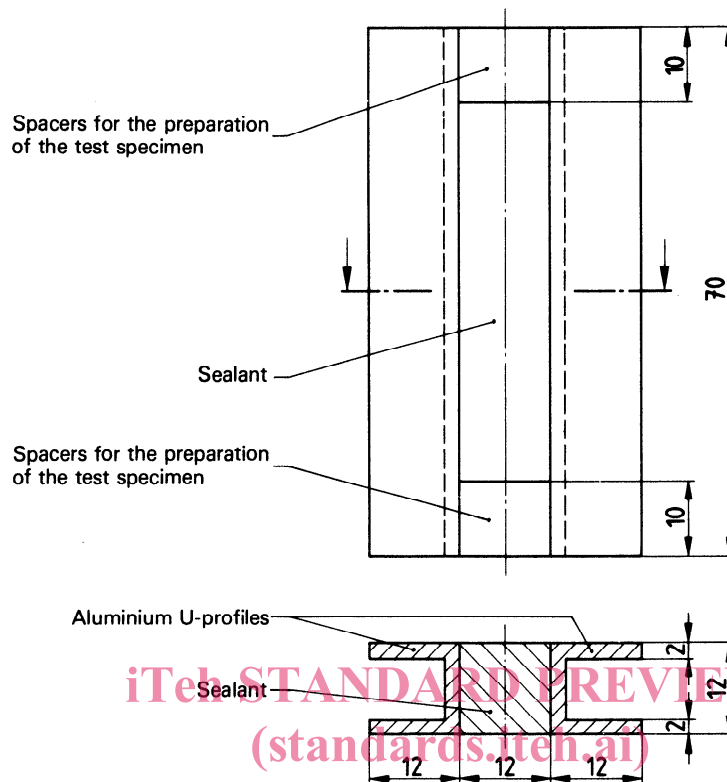
For  $l_0$ ,  $l_1$  and  $l_2$ , the mean elastic recovery is the arithmetic mean of the elastic recovery of each test specimen.

**5 Test report**

The test report shall contain the following information :

- a) a reference to this International Standard;
- b) name and type of sealant;
- c) batch of sealant from which the test specimens were produced, if possible;
- d) the primer used, if applicable;
- e) the method of conditioning (see 3.4);
- f) the applied value(s) of extension in percent (see 3.5);
- g) the elastic recovery of each test specimen, in percent rounded to the nearest 1 % (see clause 4);
- h) values of the mean elastic recovery for each extension value;
- j) any operations not specified in this International Standard which might have affected the results.

Dimensions in millimetres



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**Figure — Test specimen**

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**UDC 624.078.3 : 620.172 : 539.389.3**

**Descriptors** : buildings, joints, sealing materials, putty, tests, determination, elastic properties.

Price based on 3 pages

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