International Standard

ISO 7389

Building construction — Jointing products — Determination of elastic recovery

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

First edition — 1982-12-15

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up 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.

International Standard ISO 7389 was developed by Technical Committee ISO/TC 59, *Building construction*, and was circulated to the member bodies in November 1981.

It has been approved by the member bodies of the following countries :

Australia	Germany, F.R.	Portugal
Belgium	Hungary	Romania
Brazil	India	South Africa, Rep. of
Canada	Iraq	Spain
Czechoslovakia	Ireland	Sweden
Egypt, Arab Rep. of	Israel	Thailand
Ethiopia	Japan	United Kingdom
Finland	Korea, Rep. of	USSR
France	Poland	

The member bodies of the following countries expressed disapproval of the document on technical grounds :

Denmark
Italy
Norway

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

Specimens of the sealant to be tested which adhere at two parallel contact surfaces shall be extended to a defined width, maintained under extension and released 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 in contact with 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 Polyethylene sheet.

3.2.5 Glass plate, dusted with talc.

3.2.6 Convection type oven, capable of operating at 70 ± 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

The two U-profiles[1] (3.2.1) and the two spacers (3.2.2) are assembled according to the figure and set up on a polyethylene sheet (3.2.4). The delimited volume is filled with sealant, previously conditioned for 24 h at 23 ± 2 °C.

The following precautions shall be taken :

  a) avoid the formation of air bubbles;

  b) press the sealant on the inner profile surfaces;

  c) trim the sealant surface so that it is flush with the face and the ends of the U-profile.

3.4 Conditioning of test specimens

The test specimens shall be conditioned either according to method A (see 3.4.1) or according to 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 ± 2 °C and 50 ± 5 % relative humidity before testing.

3.4.1 Conditioning method A

The test specimens shall be conditioned for 28 days at 23 ± 2 °C and 50 ± 5 % relative humidity.

---

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.

3.4.2 Conditioning method B

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

a) 3 days in the oven (3.2.6) at 70 ± 2 °C;

b) 1 day in distilled water at 23 ± 2 °C;

c) 2 days in the oven at 70 ± 2 °C;

d) 1 day in distilled water at 23 ± 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 ± 2 °C and 50 ± 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_o, shall be measured at both ends of each test specimen. The test specimens shall than 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_o, l_1, 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

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

where

R_e is the elastic recovery, in percent;

l_o 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;

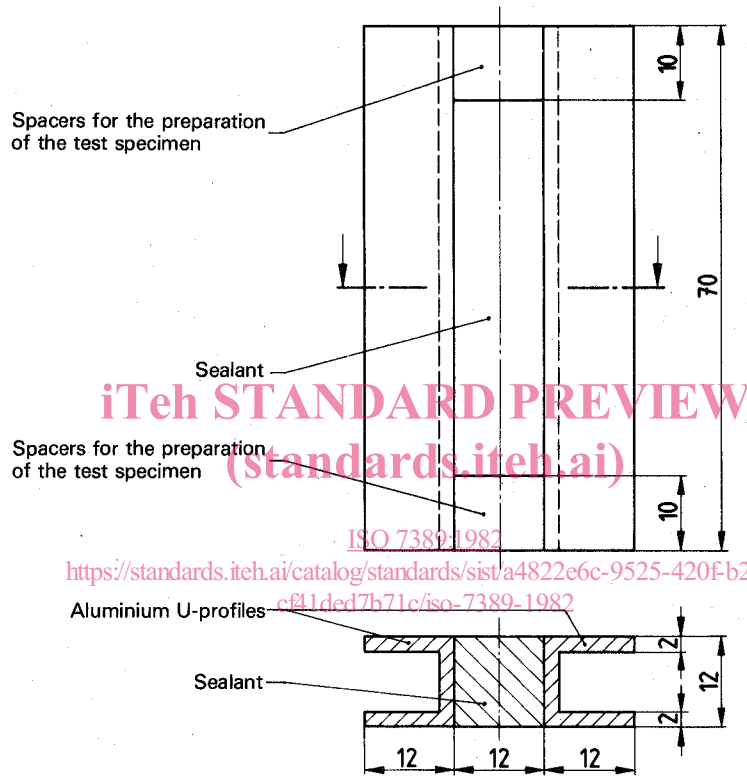l_2 is the width, in millimetres, between the contact surfaces after elastic recovery.

For l_o, 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) 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 or values 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

Spacers for the preparation
of the test specimen

Sealant

Spacers for the preparation
of the test specimen

Aluminium U-profiles

Sealant

10

70

10

2

12

2

12   12   12

Figure — Test specimen