

INTERNATIONAL STANDARD

**ISO
10590**

First edition
1991-11-01

**Building construction — Sealants —
Determination of adhesion/cohesion properties
at maintained extension after immersion in
water**

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*Construction immobilière — Mastics — Détermination des propriétés
d'adhésivité/cohésion sous traction maintenue après immersion dans
l'eau* [ISO 10590:1991](#)

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Reference number
ISO 10590:1991(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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 10590 was prepared by Technical Committee ISO/TC 59, *Building construction*, Sub-Committee SC 8, *Jointing products*.

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Building construction — Sealants — Determination of adhesion/cohesion properties at maintained extension after immersion in water

1 Scope

This International Standard specifies a method for the determination of the influence of water immersion on adhesion/cohesion properties at maintained extension of sealants used in joints in building construction.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 6927:1981, *Building construction — Jointing products — Sealants — Vocabulary*.

3 Definitions

For the purposes of this International Standard, the definitions given in ISO 6927 apply.

4 Principle

Preparation of test specimens and reference specimens in which the sealant to be tested adheres to two parallel contact surfaces. After submission of the test specimens to water immersion under defined conditions, test specimens and reference specimens are extended to a defined width. After maintenance of the extension for a defined time, any breaks in adhesion or cohesion are noted or measured.

5 Apparatus

5.1 Concrete and/or aluminium and/or flat glass supports, for the preparation of test specimens (two supports are required for each specimen), of dimensions as shown in figures 1 and 2.

5.2 Spacers, of dimensions 12 mm × 12 mm × 12,5 mm, with anti-adherent surface for the preparation of the test specimens (see figures 1 and 2).

NOTE 1 If spacers are made of material to which the sealant adheres, their surfaces should be made anti-adherent, e.g. by a thin wax coating.

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

5.4 Spacers, of appropriate dimensions to hold the test specimens extended to 160 % or 200 % of the original width (see table 1).

5.5 Test machine, capable of extending the test specimens at a rate of 5 mm/min to 6 mm/min.

5.6 Ventilated convection-type oven, capable of being controlled at $70\text{ °C} \pm 2\text{ °C}$.

5.7 Container, for immersing test specimens in water.

6 Preparation of test specimens and reference specimens

Three test specimens and three reference specimens for each support material to be used shall be prepared at the same time.

For each test specimen two supports (5.1) and two spacers (5.2) shall be assembled according to fig-

ures 1 and 2 and set up on the anti-adherent substrate (5.3), which should be wetted by water with addition of detergents to facilitate later removal from the test specimens.

The instructions of the sealant manufacturer, for instance whether a primer is to be used, shall be followed.

The hollow volume formed by supports and spacers shall be filled with sealant previously conditioned for 24 h at $23\text{ °C} \pm 2\text{ °C}$. The following precautions shall be taken:

- a) avoid the formation of air bubbles;
- b) press the sealant on the inner surfaces of the supports;
- c) trim the sealant surface so that it is flush with the faces of the supports and spacers.

The test specimens shall be set on edge on 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.

7 Conditioning

Test specimens and reference specimens shall be conditioned either in accordance with method A (7.1) or method B (7.2), as agreed between the parties concerned.

7.1 Method A

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

7.2 Method B

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

- a) 3 days in the oven (5.6) at $70\text{ °C} \pm 2\text{ °C}$;
- b) 1 day in distilled water of temperature $23\text{ °C} \pm 2\text{ °C}$;

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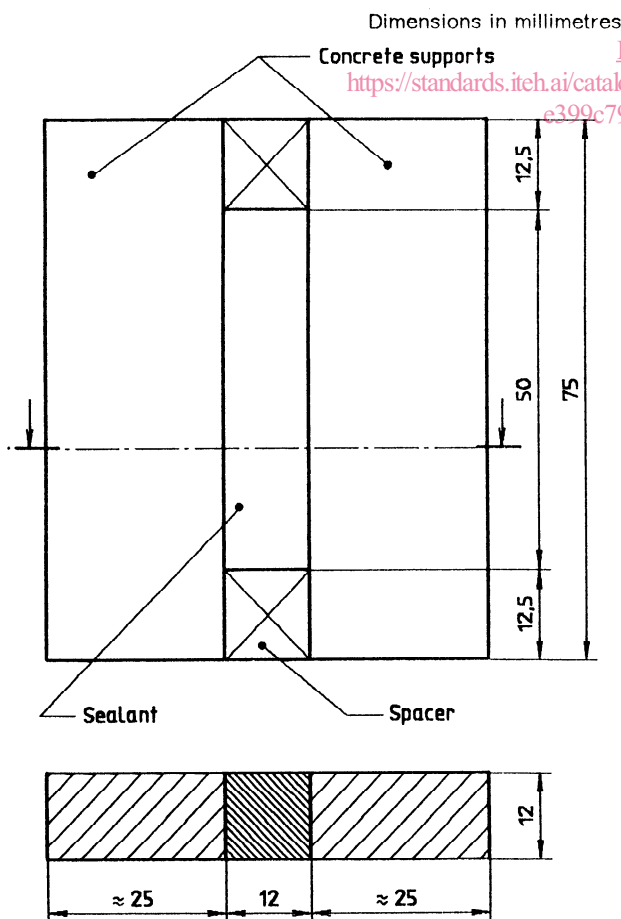


Figure 1 — Test specimen with concrete supports

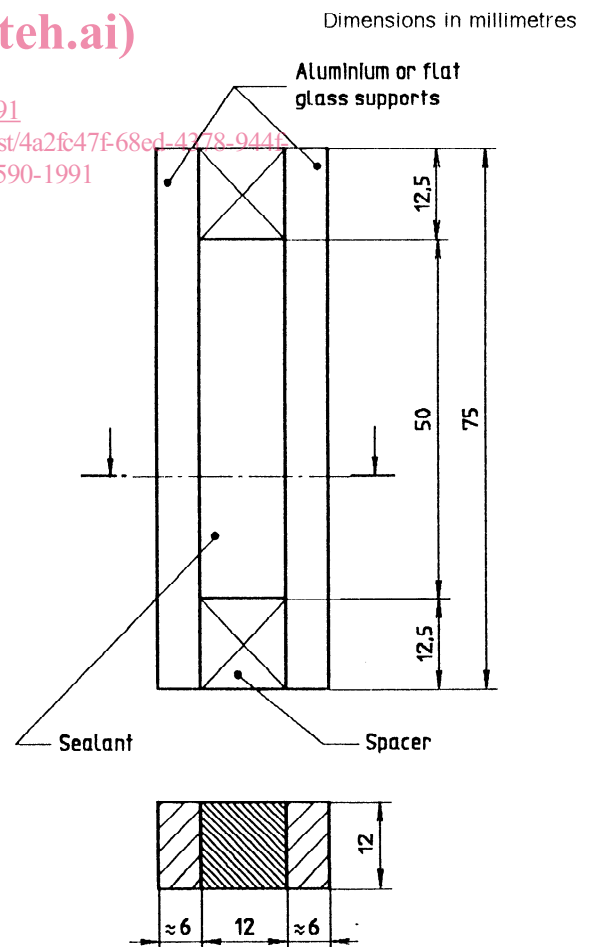


Figure 2 — Test specimen with aluminium or flat glass supports

- c) 2 days in the oven (5.6) at $70\text{ °C} \pm 2\text{ °C}$;
- d) 1 day in distilled water of temperature $23\text{ °C} \pm 2\text{ °C}$;

Alternatively, this cycle may be performed in the order c), d), a) then b).

NOTE 2 Method B is a commonly used conditioning procedure using the influence of heat and water. It is not suitable for giving information on the durability of the sealant.

8 Procedure

8.1 Water immersion

After conditioning, store the test specimens for 4 days in distilled water of temperature $23\text{ °C} \pm 2\text{ °C}$ plus 1 day at $23\text{ °C} \pm 2\text{ °C}$ and $(50 \pm 5)\%$ relative humidity.

8.2 Extension

The extension shall be carried out at a temperature of $23\text{ °C} \pm 2\text{ °C}$.

Remove the spacers (5.2), place the test specimens and the reference specimens in the test machine (5.5) and extend them to 160 % or 200 % of their original width, as agreed between the parties concerned, at a rate of 5 mm/min to 6 mm/min.

Maintain this extension for 24 h using the appropriate spacers (5.4). Measure any breaks in adhesion or cohesion.

Table 1 gives the joint width (l_1), in millimetres, after extension of the test specimens with an initial width (l_0) of 12 mm.

Table 1 — Joint widths after extension

| Ratio of final joint width to initial width, (l_1/l_0) | Final joint width, l_1 | |
|--|--------------------------|------|
| | % | mm |
| 1,6:1 | 160 | 19,2 |
| 2:1 | 200 | 24 |

9 Test report

The test report shall make reference to this International Standard and shall include the following information:

- a) name and type of sealant;
- b) batch of sealant from which the test specimens were produced, if possible;
- c) nature of the supports (see 5.1);
- d) the primer used, if applicable;
- e) the method of conditioning used (see clause 7);
- f) the extension used (see clause 8);
- g) types of rupture (adhesive or cohesive);
- h) any deviations from the specified test conditions.

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