

INTERNATIONAL STANDARD

**ISO
9047**

First edition
1989-10-15

Building construction — Sealants — Determination of adhesion/cohesion properties at variable temperatures

*Construction immobilière — Mastics — Détermination des propriétés
d'adhésivité/cohésion à températures variables*



Reference number
ISO 9047 : 1989 (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 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 9047 was prepared by Technical Committee ISO/TC 59, *Building construction*.

Building construction — Sealants — Determination of adhesion/cohesion properties at variable temperatures

1 Scope

This International Standard specifies a method for determining the adhesion/cohesion properties of sealants with predominantly elastic behaviour which are 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 in which the sealant to be tested adheres to two parallel contact surfaces. After submission of the test specimens to extension/compression cycles under

defined conditions, recording of any breaks in adhesion or cohesion.

5 Apparatus

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

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

5.3 Anti-adherent substrate, for the preparation of test specimens, for example polytetrafluoroethylene (PTFE) film or vellumpaper, preferably according to the indications of the sealant manufacturer.

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

5.5 Refrigerated enclosure, capable of holding the test specimens during extension and capable of operating at $(-20 \pm 2) ^\circ\text{C}$.

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

5.7 Container, for immersing test specimens in water.

6 Preparation of test specimens

Three test specimens for each support material to be used shall be prepared.

For each specimen two supports (5.1) and two spacers (5.2) shall be assembled as shown in figures 1 and 2 and set up on the anti-adherent substrate (5.3).

The instructions of the sealant manufacturer, for instance whether or not a primer is to be used, shall be followed.

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

- avoid the formation of air bubbles;
- press the sealant on the contact surfaces of the supports;
- 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 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.

7 Conditioning

7.1 Preconditioning

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

7.2 Specific conditioning

After preconditioning in accordance with 7.1, the test specimens may be further conditioned by being submitted to the following conditioning cycle:

- 3 days in the oven (5.6) at $(70 \pm 2) ^\circ\text{C}$;
- 1 day in distilled water of $(23 \pm 1) ^\circ\text{C}$;
- 2 days in the oven at $(70 \pm 2) ^\circ\text{C}$;
- 1 day in distilled water of $(23 \pm 1) ^\circ\text{C}$.

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

The cycle shall be carried out three times.

8 Test procedure

The speed of extension and compression used in the test procedure shall be 5 mm/min to 6 mm/min and the amplitude $\pm 12,5 \%$ or $\pm 25 \%$, as required.

After preconditioning and any specific conditioning, the test specimens shall be submitted to the following extension/compression cycle:

First week:

Day 1: 3 h cooling down to $(-20 \pm 2) ^\circ\text{C}$ and subsequent extension,

21 h maintained extension at $(-20 \pm 2) ^\circ\text{C}$;

Day 2: release of extension,

3 h heating up to $(70 \pm 2) ^\circ\text{C}$ and subsequent compression,

21 h maintained compression at $(70 \pm 2) ^\circ\text{C}$;

Day 3: release of compression and procedure of day 1;

Day 4: procedure of day 2;

Days 5 to 7: release of compression,

storing at $(23 \pm 2) ^\circ\text{C}$ and $(50 \pm 5) \%$ relative humidity without application of mechanical force;

Second week: procedure of first week.

After the test procedure, the test specimens shall be examined for any adhesion or cohesion breaks of the sealant.

9 Test report

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

- the name and type of sealant;
- the batch of sealant from which the test specimens were produced, if possible;
- the type or types of support material (see 5.1);
- the primer used, if applicable;
- the methods of conditioning used (see 7.1 and 7.2);
- the amplitude of extension/compression used (see clause 8);
- whether or not breaks of the sealant occurred and, in the affirmative, types of break (adhesion or cohesion);
- any deviations from the specified test conditions.

Dimensions in millimetres

Dimensions in millimetres

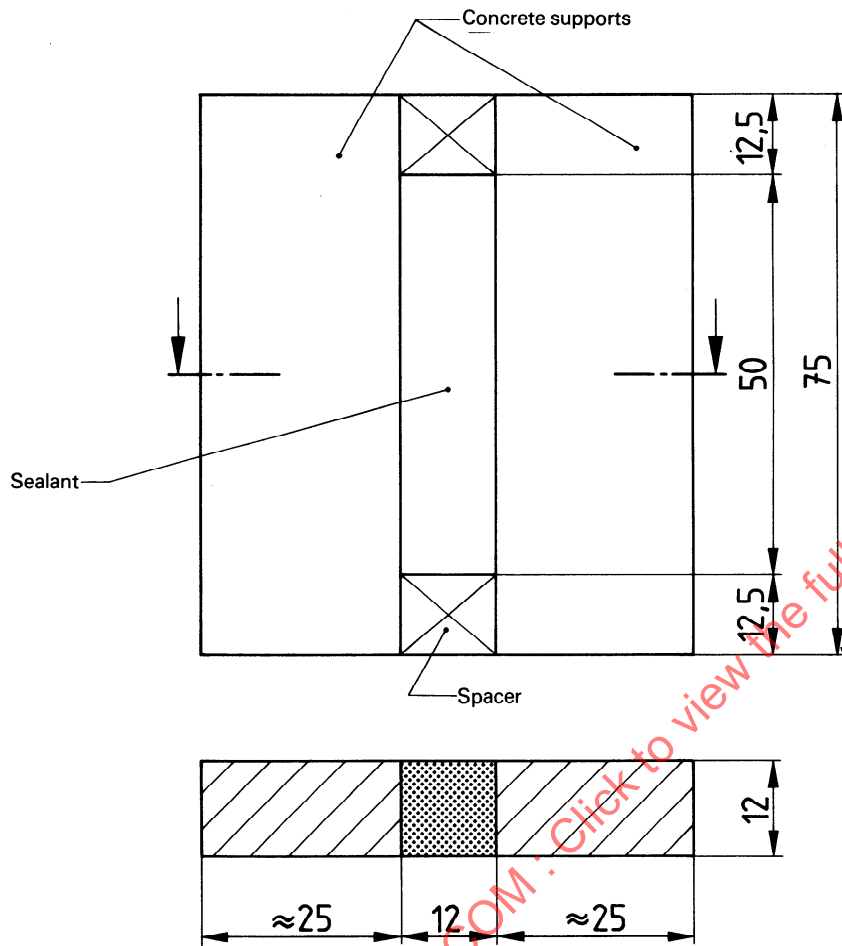


Figure 1 — Test specimen with concrete supports

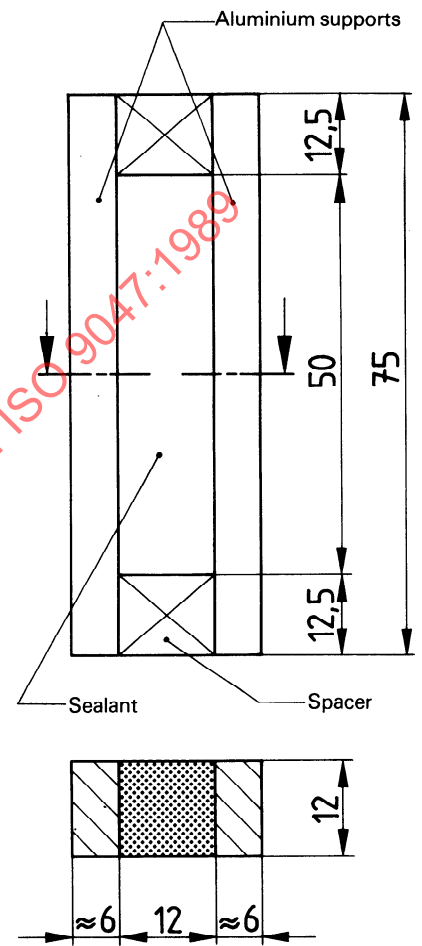


Figure 2 — Test specimen with aluminium supports

This page intentionally left blank

STANDARDSISO.COM : Click to view the full PDF of ISO 9047:1989