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Building construction — Sealants — Determination of adhesion/cohesion properties at constant temperature

*Construction immobilière — Mastics — Détermination des propriétés d'adhésivité/cohésion à
température constante*

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Reference number
ISO 9046:1987 (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 9046 was prepared by Technical Committee ISO/TC 59, *Building construction*.

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Building construction — Sealants — Determination of adhesion/cohesion properties at constant temperature

1 Scope

This International Standard specifies a method of determining adhesion/cohesion properties of sealants with predominantly plastic 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 shown 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 extension/compression cycles under defined conditions, test specimens and reference specimens are extended to rupture and the force/strain diagrams recorded.

5 Apparatus

5.1 Concrete and/or aluminium supports, for the preparation of test specimens and reference 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 test specimens and reference specimens (see figures 1 and 2).

NOTE — If spacers are made of material to which the sealant adheres, their surfaces should be made anti-adherent, for example 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 Test machine with recording device, capable of carrying out extension/compression cycles at a rate of 1 mm/min and an extension of 5,5 mm/min ± 0,5 mm/min.

5.5 Ventilated convection-type oven, capable of being controlled at 70 °C ± 2 °C.

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 figures 1 and 2 and set up on the anti-adherent substrate (5.3) which should be wetted by water to which detergents have been added to facilitate subsequent removal from the 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 which has previously been conditioned for 24 h at 23 °C ± 2 °C. The following precautions shall be taken:

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

The test specimens and the reference specimens shall be set on the edge of one of the supports and the anti-adherent substrate shall be removed immediately or whenever possible. The specimens shall rest in this position with the spacers in place for another 48 h to allow reticulation or optimum drying of the sealant.

7 Conditioning

7.1 Preconditioning

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

7.2 Specific conditioning

After preconditioning according to 7.1, test specimens and reference specimens shall be conditioned for 14 days in the oven (5.5) at $70\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$, plus 1 day at $23\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ and $(50 \pm 5)\%$ relative humidity.

8 Procedure

8.1 Extension/compression cycle

Following conditioning according to clause 7, the spacers shall be removed and the test specimens shall be subjected to extension/compression cycles by use of the test machine (5.4). The test temperature shall be $23\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ and the number of cycles shall be 100, to be carried out at a speed of 1 mm/min.

The extension/compression amplitude shall be 25 % ($= \pm 12,5\%$) or 15 % ($= \pm 7,5\%$), as agreed upon.

After cycling, the test specimens shall be left for 1 h to relax retained stresses and shall be inspected for any loss of cohesion or adhesion.

8.2 Extension to break

The test specimens which have been submitted to the cycles and the reference specimens shall be extended to break. The procedure shall be carried out at $23\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$, and at a speed of 5 mm/min to 6 mm/min.

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) the nature of the supports (see 5.1);
- d) the primer used, if applicable;
- e) the amplitude of the extension/compression cycle (see 8.1);
- f) results of visual inspection after cycling (see 8.1);
- g) force/strain diagrams for test specimens and reference specimens, indicating the maximum force in newtons and the modification of force between the mean values obtained for the three test specimens and the three reference specimens, in percentage;
- h) types of break (adhesion or cohesion);
- i) any deviations from the specified test conditions.

Dimensions in millimetres

Dimensions in millimetres

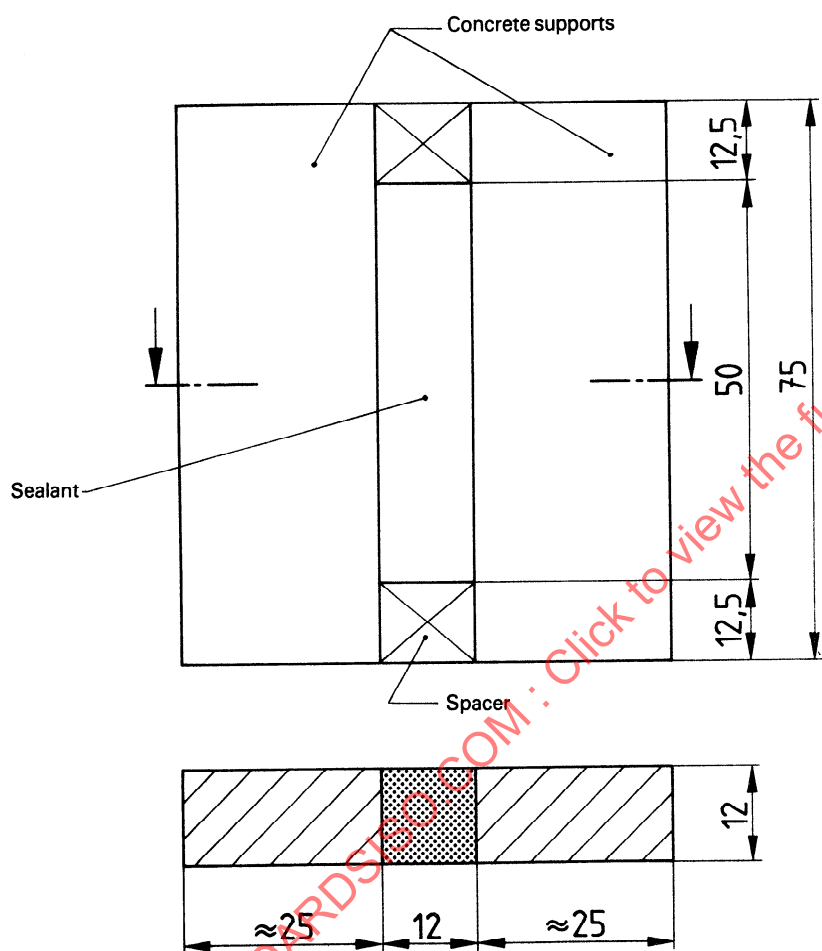


Figure 1 — Test specimen with concrete supports

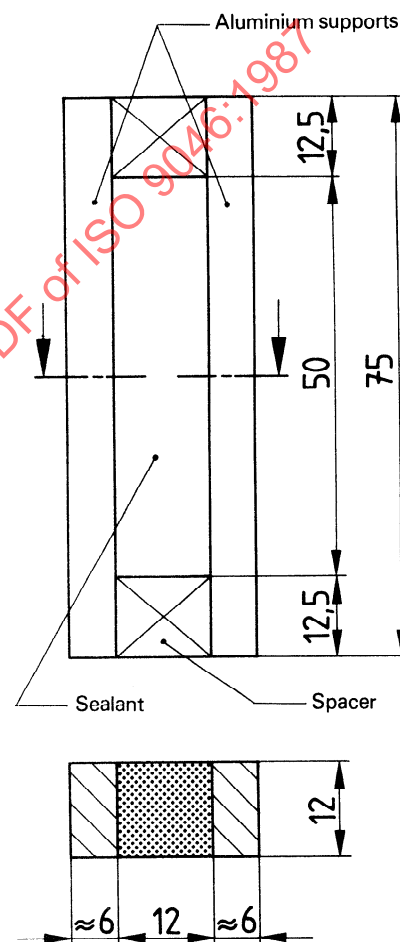


Figure 2 — Test specimen with aluminium supports

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