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Building and civil engineering sealants — Determination of application life

*Mastics pour le bâtiment et le génie civil — Détermination de la durée
pratique d'utilisation*

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Foreword

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This document was prepared by Technical Committee ISO/TC 59, *Buildings and civil engineering works*, Subcommittee SC 8, *Sealants*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Building and civil engineering sealants — Determination of application life

1 Scope

The document specifies a method for the determination of application life of multi-component sealants.

NOTE The application life test method is only applicable to multi-part sealants.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 6927, *Building and civil engineering sealants — Vocabulary*

ISO 8394-2, *Buildings and civil engineering works — Determination of extrudability of sealants — Part 2: Using standardized apparatus*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 6927 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1

application life

maximum amount of time the user has to apply the sealant after the base and curing agent components have been mixed together in accordance with manufacturer's instructions

Note 1 to entry: Application life is the longest time that the mixed sealant retains its minimum extrusion properties.

Note 2 to entry: Application life is also frequently referred to as "pot life" or "working life", although the definitions of these terms and the related test procedures can vary. "Snap time" is an entity related to application life but differs both in the definition of the term and the related test procedure

4 Principle

The application life of a multi-component wet sealant is determined by extruding it under defined conditions from a standardized apparatus at certain time intervals after the onset of the curing process. Once the mass of sealant extruded within 30 s from the standardized apparatus drops below a predetermined limit (specified, for instance, by the sealant supplier), the sealant has reached the end of its application life.

5 Apparatus and materials

5.1 Regulated enclosure

Thermally regulated enclosure capable of automatically controlling the internal temperature of the enclosure to (23 ± 2) °C or any other temperature as agreed upon by the parties concerned.

5.2 Pneumatic standardized apparatus

Standardized apparatus for extrusion testing according to ISO 8394-2 with a test volume of 250 ml or 400 ml and with an orifice diameter from 2 mm to 10 mm, as agreed upon by the parties concerned. The standardized apparatus consists of cylinder, piston, ring, orifice, slide bar, orifice plate, and bottom cap with dimensions documented in ISO 8394-2.

5.3 Compressed air

Compressed air with operating pressure up to 700 kPa supplied via pressure regulator.

5.4 Timer

Stop watch or other suitable timer with a reading precision (resolution) of at least 0,1 s.

5.5 Weighing device

Weighing device (balance or electronic and mechanical industrial weighing equipment) with a suitable weight range up to 1 000 g and a weighing accuracy of 0,1 g.

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6 Conditioning

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Store all components of the multi-part sealant in their original closed containers and minimum seven cylinders of the standardized apparatus at the test temperature in the regulated enclosure (5.1) for a minimum of 16 h before testing. The default conditioning temperature is (23 ± 2) °C.

7 Preparation of the standardized apparatus

Prepare the standardized apparatus in accordance with ISO 8394-2.

8 Test procedure

8.1 Overview

8.1.1 General

Perform all the measurements under the same conditions (same batch number, temperature, volume of cylinder and orifice diameter, same pressure, etc).

Testing shall occur at (23 ± 2) °C (or any other temperature as agreed upon by the parties concerned).

Follow the instructions of the sealant manufacturer concerning the mixing procedure of the sealant. Record the amount (mass) of the parts mixed. Record the time when mixing was completed.

Completely fill all cylinders of the standardized apparatus with the mixed multi-component sealant, avoiding the formation of air pockets.

8.1.2 Indicative value

If no indication of the application life of the sealant is available, perform the extrusion test at 30 min intervals (i.e. after < 5 min, 30 min, 60 min, 90 min, 120 min, 150 min and 180 min after mixing of the sealant).

8.1.3 Precise value

Once an indication of the application life has been obtained, repeat the extrusion tests (using new cylinders) within the 30 min time interval prior to the end of application life with a 5 min period (i.e. after < 5 min, 5 min, 10 min, 15 min, 20 min, 25 min and 30 min after mixing of the sealant).

8.2 Extrusion test

All the following operations shall be carried out within 5 min.

- a) Put the cylinder in the standardized apparatus.
- b) Set the air pressure of the compressed air regulator to (300 ± 10) kPa (or to any other pressure as agreed upon by the parties concerned).
- c) Extrude a sufficient quantity of sealant to remove the air from the orifice.
- d) Immediately afterwards, extrude sealant from the cylinder for 30 s. This time shall be monitored using the timer (5.4). Do not take into account the quantity of sealant coming out of the orifice after the end of test time. The cylinder shall not be empty after testing. Measure the mass of extruded sealant using the weighting device (5.5).

9 Calculation and expression of test result

Plot the mass of sealant extruded within the 30 s intervals from the standardized apparatus against the time that has passed since the mixing of the sealant. Determine the time after which the mass of sealant extruded within the 30 s interval from the standardized apparatus drops below a predetermined limit (specified, for instance, by the sealant supplier). This time represents the application life of the sealant.

If the application life exceeds 180 min in the first screening test, record application life as greater than 180 min.

NOTE The application life strongly depends on the temperature of the sealant during testing.

10 Test report

The test report shall contain the following information:

- a) test laboratory's name and date of test;
- b) reference to this document, i.e. ISO 4781;
- c) name, type (chemical family) and colour of the sealant;
- d) batch of sealant from which the test specimens are produced;
- e) ratio and mass of the various parts of the multi-part sealant mixed;
- f) mass of the mixed sealant;
- g) application life (in minutes) of the sealant and the specified (predetermined) lower limit on extruded mass;
- h) test temperature and pressure (if other than default);

- i) diameter of the orifice;
- j) any other deviations from this document.

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