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Buildings and civil engineering works — Sealants — Determination of curing behaviour

Bâtiments et ouvrages de génie civil — Mastics — Détermination du comportement de durcissement

Reference number
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Foreword

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The committee responsible for this document is ISO/TC 59, *Buildings and civil engineering works*, Subcommittee SC 8, *Sealants*.

Buildings and civil engineering works — Sealants — Determination of curing behaviour

1 Scope

This International Standard specifies a method for the determination of the curing behaviour of sealants used in joints in building construction.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 868, *Plastics and ebonite — Determination of indentation hardness by means of a durometer (Shore hardness)*

ISO 6927, *Buildings and civil engineering works — Sealants — Vocabulary*

3 Terms and definitions

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

4 Principle

Test specimens are prepared such that the sealant to be will be subjected to a curing environment. A one part sealant has the time recorded when its cure in depth reaches 2 mm. A multi component sealant has the time recorded to reach 33 % of its ultimate hardness.

5 Test materials

5.1 One part sealants

5.1.1 Plastic or metal cylindrical cups, 35 mm - 75 mm internal diameter, 35 mm – 50 mm deep, wall thickness 1 mm – 3 mm.

5.1.2 Measuring device, scaled to 0,5 mm.

5.2 Multi component sealants

5.2.1 Draw down device, capable of producing a 6 mm minimum constant thickness of the sealant.

5.2.2 Indentation hardness measurement device, capable of measurements on the A scale.

Extremely soft sealants that measure less than 5 on the A scale should be measured on the 00 scale.

6 Preparation of test specimens

6.1 General

The sealant and test materials shall be brought to (23 ± 2) °C over 24 h.

6.2 One part sealants

6.2.1 Fifteen test specimens shall be prepared. For each specimen the cup shall be filled with the sealant and tooled flat.

6.2.2 The following precautions shall be taken:

a) the formation of air bubbles shall be avoided;

b) the sealant shall be pressed on the inner surfaces of the substrates;

c) the sealant surface shall be tooled so that it is flush with the top of the open cup.

6.3 Multi component sealants

6.3.1 A tooled slab of sealant 6 mm minimum thick, 50 mm wide and 300 mm long on a flat non-absorbing surface is required.

6.3.2 The instructions of the sealant manufacturer concerning the mixing procedure for multi-component sealants shall be followed.

7 Conditioning of test specimens

The test specimens shall be extruded, tooled and cured at a temperature of (23 ± 2) °C and relative humidity (RH) of (50 ± 10) %.

8 Test procedure

8.1 One part sealants

The cured skin on top of three cups shall be removed at the following intervals, 16 h, 24 h, 48 h, 72 h, 96 h and 168 h. The cured skin is wiped of uncured sealant. The thickness of each specimen shall be measured and recorded.

8.2 Multi component sealants

The measurement of hardness is performed according to ISO 868. The sealant shall be extruded onto a flat surface and tooled to 6 mm minimum thickness. The hardness of the air side extruded cured slab of sealant shall be measured three times at the following intervals: Once prior to and twice after the manufacturer recommended cure time for 33 % ultimate hardness at (23 ± 2) °C and (50 ± 10)% RH (hardness at 28 days cure). One measurement shall be made 4 h to 8 h prior to the predicted time, one measurement shall be made at the predicted time, and two final measurements shall be taken, rather evenly spaced, over the subsequent 24 h. The test may cease when two subsequent hardness readings are within 3 % of final hardness (generally published on manufacturer's literature).

9 Expression of results

9.1 One part sealants

The raw data and the average of thickness at each time shall be plotted and the time to achieve 2 mm of cure in depth shall be determined through linear interpolation of the two closest data points.

9.2 Multi component sealants

The raw data and the average hardness of the extruded cured slab of sealant at each time shall be plotted. The time to reach 33 % of the sealants hardness at 28 days shall be determined through linear interpolation of the two closest data points.

The lab is not discouraged from taking additional data points to draw a more accurate curve in lieu of the linear interpolations suggested in this method. Additional data taken should be included in the report. Non-linear cure materials may not be able to be tested 4 h to 8 h before the predicted time of 33 % hardness due to their fast cure and should be tested appropriately.

10 Test report

The test report shall include the following information:

a) the name of the test laboratory;

b) the date of the test and test number;

c) the reference to this International Standard, i.e. ISO 19861;

d) the name of the sealant, the type (chemical family), and colour;

e) the batch of sealant from which the test specimens were produced;

f) the type of sealant one part or multi component;

g) the cure in depth at 16 h, 24 h, 48 h, 72 h, 96 h and 168 h for one part sealants;

h) the time to reach 2 mm of cure in depth, for one part sealants;

i) the hardness at the intervals chosen in 8.2 for multi component sealants;

j) the time to reach 33 %, of the ultimate hardness (hardness at 28 days cure) and the scale of hardness used for multicomponent sealants;

k) any deviations from this International Standard.

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