
**Building construction — Jointing
products —**

Part 1:

Determination of extrudability of sealants

Construction immobilière — Produits pour joints —

Partie 1: Détermination de l'extrudabilité des mastics

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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 8394-1 was prepared by Technical Committee ISO/TC 59, *Building construction*, Subcommittee SC 8, *Jointing products*.

ISO 8394 consists of the following parts, under the general title *Building construction — Jointing products*

- *Part 1: Determination of extrudability of sealants*
- *Part 2: Determination of extrudability of sealants using standardized apparatus*

This first edition of ISO 8394-1, together with ISO 8394-2, cancels and replaces ISO 8394:1988, which has been technically revised.

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Building construction — Jointing products —

Part 1: Determination of extrudability of sealants

1 Scope

This part of ISO 8394 specifies a method for determining the extrudability of sealants.

The method is for use in testing the extrudability of a sealant. It is not applicable to the classification of sealants.

2 Normative references

The following referenced documents are indispensable for the application 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 construction — Jointing products — Sealants — Vocabulary*

3 Terms and definitions

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

4 Principle

A sealant is extruded from its package, under defined conditions. The mass of the extruded sealant is determined.

This part of ISO 8394 indicates reference test conditions, such as temperature, pressure, extrusion time, geometry of nozzle. Deviation from these conditions is possible. Deviation modifies the final result; therefore, any deviation shall be described in the test report. The comparison of results is possible, only if all the test conditions are the same.

5 Apparatus

5.1 Enclosure, regulated to (5 ± 2) °C, (23 ± 2) °C, (35 ± 2) °C or a temperature agreed on by the parties concerned.

5.2 Nozzle, as specified in this subclause, shall be used in conjunction with the package. The dimensions and nature of the nozzle shall be determined by the parties concerned.

The nozzle shall be either

- metallic (see Figures 1 and 2 for the dimensions of two different metallic nozzles), or
- plastic. The plastic nozzle shall be cut at internal diameter of between 3 mm and 6 mm. The default internal diameter shall be 6 mm. Acceptable tolerances of the internal diameter shall be $\pm 5\%$.

5.3 Pneumatically operated extrusion gun, supplied with compressed air up to 700 kPa.

5.4 Stopwatch, accurate to 0,1 s.

5.5 Balance, accurate to 0,1 g.

6 General

For each tested sealant, perform three extrusion tests.

For each extrusion test, use one package.

Perform the three measurements under the same conditions (same batch number, temperature, nozzle and diameter, same pressure, etc.).

7 Conditioning

Condition the three packages containing the tested sealant, at the testing temperature in the regulated enclosure (5.1) for a minimum of 12 h, before testing.

The default conditioning temperature is $(23 \pm 2)^\circ\text{C}$.

This conditioning temperature may be at $(5 \pm 2)^\circ\text{C}$, $(23 \pm 2)^\circ\text{C}$ or $(35 \pm 2)^\circ\text{C}$, or a temperature agreed on by the parties concerned.

8 Test procedure

The measurements may be carried out at usual laboratory room temperature. All the following operations shall be carried out within 5 min.

Prepare the packages, removing all elements which can prevent the extrusion of the sealant during testing (i.e. screw, setting, internal membrane between the nozzle and the cartridge).

Attach the nozzle (5.2), at the end of the package. This test of extrudability may be also performed with any other metallic or plastic nozzles, as agreed on by the parties concerned.

Insert the package in the pneumatic gun (5.3).

Extrude sufficient sealant to remove the air from the nozzle.

Set the air pressure of the compressor to (300 ± 10) kPa, or a pressure agreed on by the parties concerned.

Extrude the sealant out of the package for 30 s. Measure this time with the stopwatch (5.4). Do not take into account the quantity of sealant coming out of the nozzle after the end of test time.

The package shall not be empty after testing.

NOTE In the case of a low viscosity sealant, the extrusion time can be lower. In the case of a high viscosity sealant, the extrusion time can be higher.

After the pneumatic extrusion, weigh the quantity of extruded sealant, with the balance (5.5).

9 Expression of results

9.1 Extrusion rate, expressed as mass per minute

The result of each measurement, expressed in grams of extruded sealant per minute, is rounded to the nearest gram, using Equation (1):

$$E_m = \frac{m \times 60}{t} \quad (1)$$

where

E_m is the extrusion rate of the sealant, expressed in grams per minute;

m is the mass of the extruded sealant, expressed in grams;

t is the time of extrusion, expressed in seconds.

Calculate the mean value of the three measurements, rounded to the nearest gram per minute.

9.2 Extrusion rate, expressed as volume per minute

If needed, the result can be expressed in millilitres of extruded sealant per minute, rounded to the nearest millilitre, using Equation (2):

$$E_v = \frac{E_m}{D} \quad (2)$$

where

E_v is the extrusion rate of the sealant, expressed in millilitres per minute;

E_m is the extrusion rate of the sealant, expressed in grams per minute;

D is the density of the sealant, expressed to 2 decimal places, at the test temperature of the sealant.

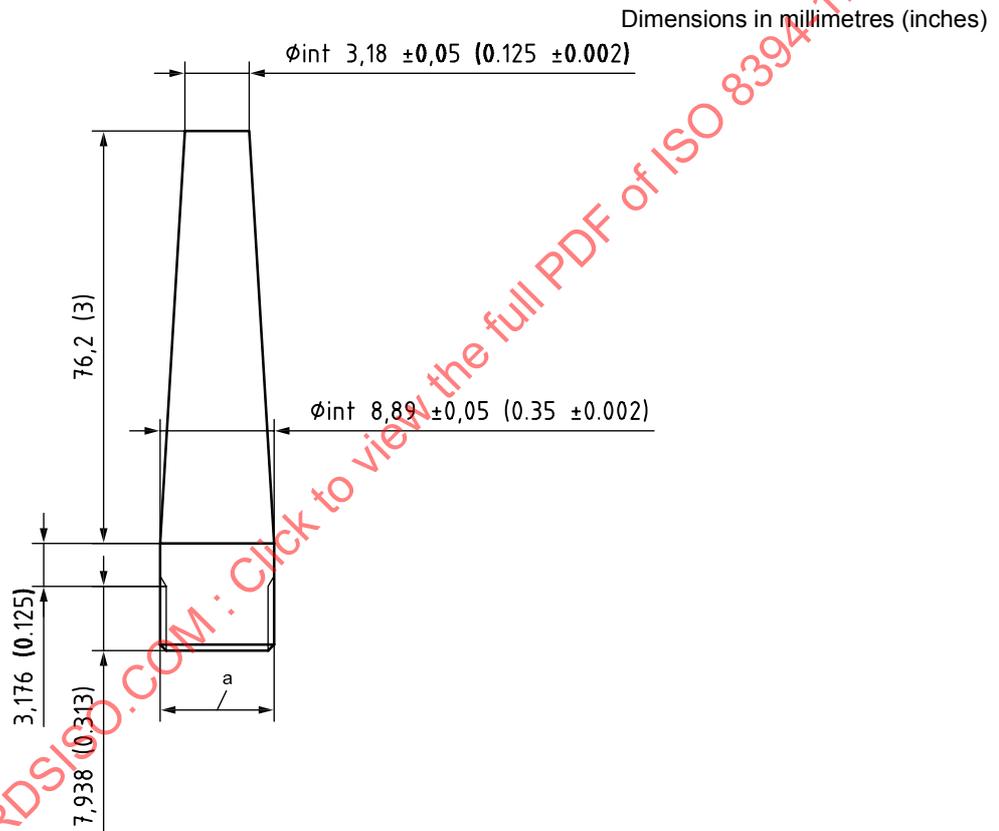
Calculate the mean value of the three values of E_v , rounded to the nearest millilitre per minute.

10 Test report

The test report shall contain the following information:

- a reference to this part of ISO 8394, i.e. ISO 8394-1:2010;
- the name of the test laboratory and the date of test;
- the name, type (chemical family) and colour of sealant;
- the batch number of the sealant;

- e) the conditioning temperature;
- f) the extrusion pressure;
- g) the extrusion time;
- h) the type of nozzle. If another nozzle is used, the nature (plastic or metallic), the geometry, commercial reference and diameter of the nozzle shall be indicated;
- i) the result of each extrusion rate, in grams per minute, and the mean value;
- j) the result of the extrusion rate, in millilitres per minute, the mean value and the density, if necessary;
- k) any deviation from this part of ISO 8394.



a $\frac{1}{4}$ in NPT threads

Figure 1 — First metallic nozzle scheme