
**Buildings and civil engineering
works — Determination of the
staining of porous substrates by
sealants used in joints —**

Part 2:

Test without compression

*Bâtiments et ouvrages de génie civil — Détermination du tachage des
supports poreux par les mastics utilisés dans les joints —*

Partie 2: Essai sans compression

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Published in Switzerland

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

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

This second edition cancels and replaces the first edition (ISO 16938-2:2008), which has been technically revised.

The main changes compared to the previous edition are as follows:

- the title of the document has been modified;
- the figures have been modified and notes have been added to provide further explanation;
- Figure 4 has been replaced by [Table 1](#).

A list of all parts in the ISO 16938 series can be found on the ISO website.

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.

Buildings and civil engineering works — Determination of the staining of porous substrates by sealants used in joints —

Part 2: Test without compression

1 Scope

This document specifies a method for determining the staining of porous substrates (e.g. marble, limestone, sandstone, or granite) by sealants used in building construction. The method evaluates the likelihood of a sealant causing an early stain on a porous substrate due to exudation of materials from the sealant. The outcome of the test is specific to the tested sealant and tested substrate and cannot be extrapolated to other sealant formulations or other porous substrates. During this accelerated test, if the sealant does not stain or discolour the substrates, it does not mean that the tested sealant will not stain or discolour the tested porous substrate over a longer time period.

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 4892-1, *Plastics — Methods of exposure to laboratory light sources — Part 1: General guidance*

ISO 4892-2:2013, *Plastics — Methods of exposure to laboratory light sources — Part 2: Xenon-arc lamps*

ISO 4892-3, *Plastics — Methods of exposure to laboratory light sources — Part 3: Fluorescent UV lamps*

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

ISO 11431:2002, *Building construction — Jointing products — Determination of adhesion/cohesion properties of sealants after exposure to heat, water and artificial light through glass*

3 Terms and definitions

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

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

— ISO Online browsing platform: available at <https://www.iso.org/obp>

— IEC Electropedia: available at <http://www.electropedia.org/>

4 Principle

This method measures the visible staining attributed to joint sealants on porous substrates that is a result of the conditioning specified.

A sealant is applied and cured between two pieces of porous substrate. The test specimens are subjected to heat aging and/or cold aging and/or aging in actinic radiation accelerated weathering equipment. After aging, the test specimens are evaluated and visible staining is recorded on the exterior surface

and in the interior of the substrate after visual inspection of changes in surface appearance and measurements of maximum and minimum stain width and stain penetration.

5 Apparatus

5.1 Substrate materials

For the preparation of each test specimen, two substrate pieces of the same material are required with dimensions as shown in [Figure 1](#).

5.2 Spacers

For the preparation of the test specimens, the spacers shall be of a cross-section 12 mm × 12 mm, with a non-adherent surface (see [Figure 1](#)).

If the spacers are made of a material to which the sealant adheres, their surfaces should be made non-adherent, e.g. by a thin wax coating.

5.3 Non-adherent substrate

For the preparation of test specimens, the non-adherent substrate can be, for example, a polyethylene (PE) film or a micro-porous polytetrafluorethylene (PTFE) film, preferably on the advice of the sealant manufacturer.

5.4 Masking tape

The masking tape shall be suitable for covering the tested surface of the substrates (see [Figure 1](#)) to prevent sealant contamination during specimen preparation.

5.5 Ventilated convection-type oven

The ventilated convection-type oven shall be capable of being maintained at $(70 \pm 2) ^\circ\text{C}$.

5.6 Refrigerated enclosure,

The refrigerated enclosure shall be capable of being maintained at $(-20 \pm 2) ^\circ\text{C}$.

5.7 Actinic radiation accelerated aging apparatus

5.7.1 General

A fluorescent ultraviolet radiation/condensation test apparatus or xenon light test apparatus shall be employed as the actinic radiation accelerated aging apparatus.

NOTE Test results can differ between the exposure to fluorescent ultraviolet radiation/condensation and xenon light because of differences in the spectral power distribution of the radiation source and differences in the exposure conditions a) to d) in [8.4](#).

5.7.2 Fluorescent ultraviolet radiation/condensation test apparatus

The apparatus shall provide the ultraviolet radiation with fluorescent UVA-340 lamps having their peak emission at 343 nm, capable of exposing the test specimens to radiation under controlled conditions of temperature and moisture or water, complying with the requirements of ISO 4892-3. Standard practices for operating such accelerated weathering chambers are described in ISO 4892-1. The target value for irradiance at 340 nm shall be $(0,77 \pm 0,02) \text{ W/m}^2$ at $60 ^\circ\text{C}$.