
**Buildings and civil engineering
works — Sealants — Paintability and
paint compatibility of sealants**

*Bâtiments et ouvrages de génie civil — Mastics — Peignabilité et
compatibilité des mastics avec les peintures*

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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).

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For an explanation on 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 the following URL: 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*.

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Introduction

There are current International Standards to classify sealants for façade, glazing and pedestrian walkways. These International Standards refer to a number of established test methods relating to the performance of the sealants, but until now, no methodology has been developed to evaluate claims regarding paintability and paint compatibility of sealants.

This is a complex subject and generally, although the expert opinion is that ideally it is not recommended that sealants are overpainted, it is recognized internationally that manufacturers are marketing sealants that are actively promoted as being “paintable” in marketing and sales literature and that for many refurbishment projects, sealants will be overpainted or overcoated rather than be removed and fresh sealant reapplied. It is therefore important to review the current state-of-the-art methods and characteristics relating to overpainting sealants, ultimately to at least standardize the test methods used when manufacturers make claims relating to this characteristic in future. This document can then be used in the development of future international standards relating to paintability of sealants, if required.

This document considers ways of defining sealant and coating performance and aesthetics in order to be able to suggest the aspects that are relevant when referring to a sealant as “overpaintable”. There is also guidance over the form that reporting of the results should take.

The intention is that, if required, this document can be followed with the publication of a set of standard test methods leading to the possible drafting of a technical specification if necessary.

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Buildings and civil engineering works — Sealants — Paintability and paint compatibility of sealants

1 Scope

This document reviews and evaluates the methodology that can be employed to assess the paintability of or paint compatibility with sealants used in building and construction. The term “paintability” is used throughout this document and is a generic term to refer to the application of paint or a coating to a sealant.

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, *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.

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

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

4 Evaluation of paintability of a sealant

A number of characteristics can be part of an evaluation to determine the overall compatibility of any sealant with a specified paint or coating applied to the sealant.

Any claims of paintability will only relate to a combination of a specific paint and a specific sealant when tested together, as the coatings themselves may be subject to frequent changes in formulation. Also, the sealants may be subject to reformulation, thus necessitating regular rechecks regarding continued paintability performance. Generic claims regarding paintability are unlikely to be substantiated unless it can be guaranteed that no formulation changes have occurred since the initial evaluation.

The performance is usually evaluated as a broad assessment of overpaintability, focusing on certain aspects; see [Figure 1](#).

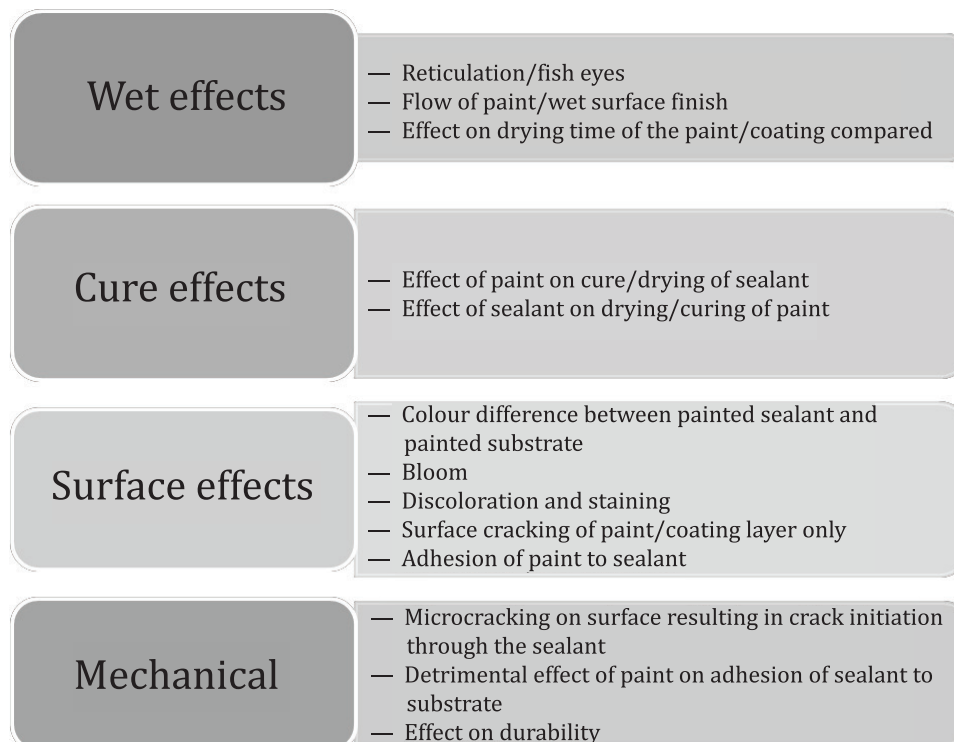


Figure 1 — Characteristics of overpaintability
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These characteristics are evaluated and the overall results are used to make an assessment of paintability. Not all characteristics are used by all sealant manufacturers, but to standardize any claims, it would be important to establish a suitable overall assessment schedule that could be used if sealants carry claims that they can be overpainted/coated. It is unlikely that this will be a blanket claim for all paints, and would need to be specific to a paint or coating and sealant combination, so it is important to consider this aspect when deciding the test protocol to avoid excessive testing.

It would be desirable to combine the characteristics so that they can be evaluated on a reduced number of test pieces if possible.

There are no comprehensive specifications available that define paintability of sealants; however, there are a variety of standards available internationally that cover various aspects of paintability and compatibility.

There are also manufacturers' test methods that have been developed to allow them to substantiate their own claims and to verify any recommendations they make to their customers.

In terms of reporting results, the following should be included in any test report in addition to any specific requirements listed in each individual test:

- a) specific sealant details including manufacturer, type of product, product name, batch number or date of manufacturing;
- b) specific coating or paint: manufacturer, type of product, colour of product system/specification of product, name of product, batch number or date of manufacturing;
- c) barrier primer (if applied): manufacturer, type of product, system/specification of product, name of product, batch number or date of manufacturing;
- d) length of time between application of wet/uncured sealant and any paint or coating;
- e) details of substrate that sealant is applied onto including specific details of the test pieces used;

- f) information regarding how paint or coating was applied including coat weight or thickness applied;
- g) time after coating before test evaluation is carried out.

5 Methods for assessment of initial coating application

5.1 General

Assessment of the actual application of the paint/coating to the sealant is unlikely to be made when the sealant will be fully dry or cured and therefore the application time before overcoating is recommended and will be specified by the manufacturer. Typical claims are “overpaintable 1 h after sealant application” and so the first aspect that needs to be specified in any testing is how long after sealant application the coating is applied.

On application of the coating, initially, an assessment of the visual appearance of the freshly applied coating is made in terms of the quality of the applied coating and the appearance of the sealant surface relative to the surrounding substrate.

5.2 Reticulation/fish eyes

5.2.1 Principle

“Fish eyes” are round spots, resembling fish eyes, in a newly applied coating that appear to be pulling away from the sealant surface. Reticulation is a similar effect and is a surface defect that creates a net-like appearance in the coating surface.

5.2.2 Evaluation

This is assessed via a visual inspection after the paint is applied to the sealant at the time claimed by the sealant manufacturer that his sealant will be overpaintable. It might involve brush application of the paint/coating to the sealant at a specified time point after sealant application or it might be a more controlled application method. It is possible that the sealant could be applied to a flat substrate and then after a specified time, the paint/coating is applied over this, overlapping at the sides so that the coating is only applied to the substrate in some areas. An assessment of the appearance of the coated and uncoated sealant areas is then made subjectively, perhaps with photographic record being taken.

5.2.3 Reporting

This is normally in the form of a comment and will either be that faults are observed (reticulation or pin holes or other incomplete coating surfaces observed) or that an even coating with no defects is observed.

5.3 Flow of paint/wet surface finish

5.3.1 Principle

There may be a difference in the coating of the sealant and surrounding substrate. It is possible to carry out a determination of recoatability at the time point claimed by the sealant manufacturer that the sealant is overpaintable.

5.3.2 Evaluation

This involves the application of the coating, by brush, to the newly through-dried film or bead of sealant.

The evaluation would involve applying either a defined layer of sealant or a bead of sealant onto a substrate allowing the sealant to dry or cure for the time recommended by the sealant manufacturer

regarding overpaintability and then applying the paint or coating under evaluation using a paint brush or roller.

5.3.3 Reporting

Any drag on the brush experienced while applying the coating is noted.

5.4 Effect of sealant on curing/drying time of paint/coating

5.4.1 Principle

Once an even coating is applied, the next stage is to examine the effect that the sealant may have on the drying/curing of the coating due to any chemical incompatibility or migration of substances that might interfere with the drying, film formation or curing of the coating. The coating itself may also retard any drying or curing of the sealant for the same reasons.

5.4.2 Evaluation

The evaluation would involve applying either a defined layer of sealant or a bead of sealant onto a substrate allowing the sealant to dry or cure for the time recommended by the sealant manufacturer regarding overpaintability and then applying the paint or coating under evaluation using a paint brush or roller. The paint would be applied so that it overlapped the sealant, thus allowing both the coated substrate and coated sealant to be assessed at the same time.

Assessment of the overpainted sealant is made and compared with the painted substrate for properties like tack/drying time/cure time. There are defined methods for measuring surface tack; however, a subjective assessment is sufficient for evaluation purposes.

5.4.3 Reporting

Any differences between the coating applied to the sealant and the coating applied only to the substrate are noted. The drying time of the coated neutral substrate and the coated sealant should be mentioned in the test report.

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6 Test methods for assessment relating to cure effects

6.1 Principle

Once an even coating is applied, the next stage is to examine the effect that the coating may have on the drying/curing of the sealant due to any chemical incompatibility or migration of substances that might interfere with the drying or curing of the sealant. The application of the paint at an early stage in the drying/curing of the sealant can have a detrimental effect on the final performance of the sealant. This can result in adhesion failure or retarded cure, which could mean that the performance of the sealant does not meet any claims made.

6.2 Evaluation

Assessment of the effect of the paint on the curing of the sealant is more complex and is likely to involve a mechanical test of the painted sealant at time intervals to determine if any retarded cure behaviour is observed as a result of the overpainting.

As the surface of the sealant is no longer available because of the coating, the traditional hardness determination methods common when cure behaviour is investigated cannot be used. It may be necessary to measure the modulus of the sealant after overpainting.

The measurement of modulus is already assessed as part of the ISO 11600 classification system using ISO 8339. This method can therefore be used to measure the modulus at the standard time point, but

also at interim intervals, typically using Method A conditioning. For water-based sealants, interim measurements may not be appropriate, but curing sealants could be evaluated at 7 days, 14 days and 28 days conditioning.

6.3 Reporting

The modulus values should be reported for both the uncoated and coated tested sealants

7 Test methods to assess surface appearance of dried coating

7.1 General

Once the wet and cure aspects are considered, the next important criterion for a sealant to be overpaintable is the appearance of the dry/cured coating.

7.2 Colour difference between painted sealant and painted substrate

7.2.1 Overview

This colour difference can be due to absorption differences or due to some form of chemical incompatibility. It can also be a result of migration of substances from the sealant into the paint and this migration can result in only a surface sheen or can be more substantial staining.

7.2.2 Principle

There are test methods available for paints and varnishes. Visual assessment is possible using typical substrates and painting the sealant and substrate and making a subjective assessment.

7.2.3 Evaluation

An existing paint assessment method is available (see ISO 3668). Alternatively, a simple subjective visual assessment can be made once the paint or coating is cured or dried and is normally sufficient. See [Table 1](#).

Table 1 — Colour between painted sealant and painted substrate

Surface change compared with surrounding painted substrate	Change description (painted sealant compared with painted substrate)
None	No change from surroundings
Very, very slight	Change so slight that it is barely perceptible
Very slight	Faint colour shade difference between painted sealant and surrounding painted substrate
Slight	Slight colour shade difference between painted sealant and surrounding painted substrate
Severe	Distinct colour shade difference between painted sealant and surrounding painted substrate
Very severe	Colour of painted sealant is completely different from the painted surrounding substrate

7.2.4 Reporting

Indicate in the report any ageing conditions used but care should be taken not to induce any effects using artificial ageing that would not be seen in normal use.