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Coating powders —

Part 12: Determination of compatibility

Poudres pour revêtement —

Partie 12: Détermination de la compatibilité

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

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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).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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 35, *Paints and varnishes*, Subcommittee SC 9, *General test methods for paints and varnishes*.

This second edition cancels and replaces the first edition (ISO 8130-12:1998), which has been technically revised.

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

— a "Terms and definitions" clause has been added;

— the duplicate determination has been changed to single determination;

— the concentrations in the scale have been numbered and two new concentrations have been added;

— the clause on expression of results has been clarified and in case the initial assessment is not conclusive, a list of test methods has been added;

— an example for a test report has been added;

— the text has been editorially revised and the normative references have been updated.

A list of all the parts in the ISO 8130 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.

Coating powders —

Part 12: Determination of compatibility

1 Scope

This document specifies a visual method to determine the deterioration of surface quality of the final coating when mixing two different coating powders. The surface quality will depend on the following characteristics of the coating powders:

a) the chemical reactivity;

b) the chemical composition;

c) the melt properties.

The onset of the incompatibility in appearance, its nature and its extent will depend greatly on the ratio in which the powders are mixed. The nature of the incompatibility in surface appearance can manifest itself in various ways, described in Clause 8.

This test is useful in predicting the possibility of incompatibility arising from mixing different powders both during the manufacturing process and during the application of the coating powder.

This document concerns only changes in visual aspects of the coating. The mixture series can also be used for testing properties such as mechanical properties, chemical properties, corrosive properties and resistance against UV radiation. Further properties can be agreed between interested parties.

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 1514, *Paints and varnishes — Standard panels for testing*

ISO 2813, *Paints and varnishes — Determination of gloss value at 20°, 60° and 85°*

ISO 8130-14, *Coating powders — Part 14: Vocabulary*

ISO 13076, *Paints and varnishes — Lighting and procedure for visual assessments of coatings*

ISO 15528, *Paints, varnishes and raw materials for paints and varnishes — Sampling*

ISO 18314-1, *Analytical colorimetry — Part 1: Practical colour measurement*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 8130-14 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

The coating powders are mixed together in a range of ratios and each mixture is applied to standard test panels, stoved and the surface inspected for evidence of incompatibility.

5 Apparatus

Ordinary laboratory apparatus, together with the following:

5.1 Clean and degreased steel or aluminium panels, as specified in ISO 1514, with holes drilled at one end for hanging.

5.2 Powder application system, either electrostatic spraying or fluidizing bed.

5.3 Suitable clean container, capable of holding a mass of the powder for processing in the powder application system (5.2).

NOTE Plastic bags have been found to be suitable for non-metallic powders.

5.4 Balance, accurate to 10 mg.

5.5 Oven, capable of stoving the coated test panels.

6 Sampling

Prepare a representative sample of the powder under test, as specified in ISO 15528. The quantity of powder required will depend on the powder application system (5.2).

NOTE A quantity of between 50 g and 200 g is normally suitable for each test.

7 Procedure

7.1 In the absence of agreement between the interested parties, prepare mixtures in the following mass ratios in a quantity required for the test, weighing each component to an accuracy of 10 mg:

	A1	A2	A3	A4	A5	A6	B5	B4	B3	B2	B1
Powder A	100,0	99,99	99,9	99,0	90,0	50,0	10,0	1,0	0,1	0,01	0,0
Powder B	0,0	0,01	0,1	1,0	10,0	50,0	90,0	99,0	99,9	99,99	100,0

NOTE For better accuracy, the mixture ratio of 99,99 : 0,01 and 99,9 : 0,1 can be prepared from the 99,0 : 1,0 mixture.

7.2 Place each of the samples prepared in 7.1 in a clean container (5.3) and agitate for sufficient time to ensure complete homogenization.

NOTE Vigorous shaking by hand of a partially filled container for 15 s to 30 s has proved to be adequate.

7.3 Spray each of the mixed samples onto a test panel (5.1), using the powder application system (5.2), to a thickness appropriate for the end application.

It is extremely important that the powder application system (5.2) is thoroughly cleaned when changing from A6 to B1. The order of application of the samples shall be in increasing order of each minor constituent, thus:

100,0 A : 0,0 B to 50,0 A : 50,0 B (A1 to A6)

and then:

100,0 B : 0,0 A to 90,0 B : 10,0 A. (B1 to B5)

7.4 Place the coated panels in the oven (5.5) and stove in accordance with the prescribed stoving schedule of the slower-reacting component. If no stoving conditions are available, then these shall be agreed between the interested parties.

7.5 Remove the panels from the oven and allow to cool.

7.6 Examine the coated surfaces for pinholes, craters and other imperfections.

NOTE Where appropriate, a quantitative measure of change can be obtained by measuring gloss values according to ISO 2813.

8 Expression of results

A comparative visual description of the coatings (see Clause 1) will be the first assessment for the purposes of this standard method.

In cases the initial assessment is not conclusive then tests listed below can be followed. Depending on necessary requirements, different test methods can be used.

— **Change in gloss level:** gloss measurement as specified in ISO 2813.

— **The presence of pinholes:** further tests using a wet-sponge method with a correct voltage relevant for the coating thickness.

NOTE A suitable method is described in ASTM D5162[1].

— **The appearance of the coating eg orange peel:** visual inspection as specified in ISO 13076 or instrumental based evaluation of changing appearance on a sample in correlation to its reference point. Instrumental evaluation can only be done with the same instrument and may not be comparable between laboratories.

— **The presence of craters:** visual inspection as specified in ISO 13076 or an optical microscope.

— **The presence of graininess:** visual inspection as specified in ISO 13076 or an optical microscope.

— **The presence of contamination:** for contamination with particles use visual inspection with the correct viewing distance; for colour contamination then use a suitable analytical colorimetry as specified in ISO 18314-1.

9 Precision

Precision data are inappropriate for a visual method of inspection.

When using instrumental measurements, refer to the precision information for the instrument or the relevant ISO standard.

10 Test report

The test report shall contain at least the following information:

a) all details necessary to identify the products tested;

b) a reference to this document, i.e. ISO 8130-12:2019;

c) the stoving conditions used in the test (see 7.4);

d) the application system used (see 5.2);

e) the coating thickness;

f) the results of the test as indicated in Clause 8;

g) any deviation from the test method specified;

h) any unusual features (anomalies) observed during the test;

i) the date of the test.

An example for test results is given in Annex A, which should be contained in the test report.

Annex A
(informative)

Test data for compatibility

Table A.1 shows the compatibility of two powders when mixed in different proportions, following procedure Clause 7. The visual observations as well as the measurement of gloss are provided.