INTERNATIONAL STANDARD

ISO 2812-3

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Paints and varnishes — Determination of resistance to liquids —

Part 3: **Method using an absorbent medium**

iTeh ST Peintures et vernis — Détermination de la résistance aux liquides —
Partie 3: Méthode utilisant un milieu absorbant
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| Forewordi | | Page |
|-----------|---------------------------|------|
| | | |
| 1 | Scope | 1 |
| 2 | Normative references | 1 |
| 3 | Principle | |
| 4 | Apparatus | 1 |
| 5 | Test substances | 2 |
| 6 | Sampling | |
| 7 | Test panels | 2 |
| 8 | Procedure | |
| 9 | Evaluation | 3 |
| 10 | Precision | 3 |
| 11 | Test report | 4 |
| Annex | Test report | 5 |
| Bibliog | graphy(standards.iteh.ai) | 7 |

ISO 2812-3:2007 https://standards.iteh.ai/catalog/standards/sist/4fc5ab84-125b-4b3d-ab13e405d7175071/iso-2812-3-2007

Contents

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.

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 2812-3 was prepared by Technical Committee ISO/TC 35, Paints and varnishes, Subcommittee SC 9, General test methods for paints and varnishes.

ISO 2812 consists of the following parts, under the general title *Paints and varnishes* — *Determination of* resistance to liquids: (standards.iteh.ai)

Part 1: Immersion in liquids other than water

ISO 2812-3:2007

Part 2: Water immersion method Part 2: Water immersion method

e405d7175071/iso-2812-3-2007

- Part 3: Method using an absorbent medium
- Part 4: Spotting methods
- Part 5: Temperature-gradient oven method

Paints and varnishes — Determination of resistance to liquids —

Part 3:

Method using an absorbent medium

1 Scope

This part of ISO 2812 specifies a method, using an absorbent medium, for determining the resistance of an individual-layer or multi-layer system of coating materials to the effects of liquids or paste-like products.

This method enables the testers to determine the effects of the test substance on the coating and, if necessary, to assess the damage to the substrate.

2 Normative references iTeh STANDARD PREVIEW

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 1513, Paints and varnishes - Examination and preparation of samples for testing

ISO 1514, Paints and varnishes — Standard panels for testing

ISO 2808, Paints and varnishes — Determination of film thickness

ISO 3270, Paints and varnishes and their raw materials — Temperatures and humidities for conditioning and testing

ISO 4628-1, Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 1: General introduction and designation system

ISO 4628-2, Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 2: Assessment of degree of blistering

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

3 Principle

A coated test panel is exposed to a test substance by using an absorbent medium. The effects of the exposures are assessed in accordance with agreed criteria.

4 Apparatus

Ordinary laboratory equipment and the following apparatus.

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4.1 Heating cabinet, with artificial ventilation, for carrying out the test at higher temperatures up to 40 $^{\circ}$ C and capable of maintaining the temperature to within \pm 3 $^{\circ}$ C.

WARNING — To protect against explosion or fire, products containing volatile flammable substances should be handled with care. National regulations should be followed.

- **4.2 Watch glasses**, with a diameter of approximately 40 mm, curved in such a way that the filter layers will not be touched.
- **4.3 Petri dishes**, with 60 mm diameter and 20 mm rim.
- **4.4** Filter paper, of a type that will not be affected by the test substance used; with a diameter of approximately 25 mm.
- **4.5 Cotton wool**, lint-free and of a type that will not be affected by the test substance used. Cotton wool may be used instead of filter paper and for cleaning the test panel later.

5 Test substances

One or more test substances, as agreed between interested parties, shall be used. Examples of test substances are given in Annex A.

6 Sampling iTeh STANDARD PREVIEW

Take a representative sample of the coating material to be tested, in accordance with ISO 15528.

Pretest each sample in accordance with ISO 1513 and prepare it for further testing.

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7 Test panels

7.1 Substrate

Unless otherwise agreed, use test panels conforming to the requirements of ISO 1514, with dimensions of approximately $150 \text{ mm} \times 100 \text{ mm}$ and a thickness of 0.7 mm to 1.0 mm.

e405d7175071/iso-2812-3-2007

7.2 Preparation and coating

Prepare each test panel as described in ISO 1514 and then coat it by the agreed application method with the product or system under test. Dry (or stove) and age (if applicable) each coated test panel for the specified time under specified conditions.

7.3 Coating thickness

Determine the dry film thickness of the coating, in micrometres, using one of the non-destructive methods specified in ISO 2808.

8 Procedure

8.1 Conditioning of the test panels

Immediately before testing, condition the test panels for at least 16 h under standard conditions as specified in ISO 3270, i.e. (23 ± 2) °C and (50 ± 5) % relative humidity.

8.2 Test conditions

Carry out the test at the standard temperature specified in ISO 3270, i.e. (23 ± 2) °C.

8.3 Determination

Perform the test in duplicate.

Place the test panel horizontally. When using liquid test substances, dip the filter papers and/or cotton wool in the test liquid and wait until the medium is thoroughly impregnated with the substance. Take the medium out of the substance and let excess liquid run off. Place the filter papers and/or cotton wool swabs on the test panel, making sure that they do not touch one another and that the distance between soaked filter papers and/or cotton wool swabs and the edges of the panel is at least 10 mm. Then immediately cover the test areas with the watch glasses or Petri dishes.

When using highly viscous or paste-like test substances, apply about 0,5 cm³ of each substance to the test panel, place absorbent medium over the substance and cover the areas with Petri dishes.

The test duration shall be agreed between the interested parties and should reflect the end use of the coating.

When the test has to be performed at elevated temperatures, apply the agreed test substances and place the test panel in a heating cabinet for the agreed test period.

9 Evaluation iTeh STANDARD PREVIEW

After the test period has expired, emove the filter papers and/or cotton wool swabs and wipe the test panel with dry cotton wool. Clean off any dried residue of aqueous test substances under running water, and clean off the dried residue of any other test substances with a solvent that does not attack the coating.

Evaluate only the area which has been in direct contact with the test substance.

Immediately assess the test panel for blistering as specified in ISO 4628-2, and in comparison with the non-exposed areas of the panel. Rate any visible alterations as specified in ISO 4628-1.

Unless otherwise agreed, reassess the exposed areas after 24 h.

Further tests on the exposed and non-exposed areas of the test panel may be performed (e.g., cross-cut test, hardness test, etc.) to determine the changes resulting from the effects of the test substances.

If the substrate of the test panel is to be examined for visible alterations, remove the coating in conformity with the specified procedure.

If the results of the evaluation of the duplicate determinations differ significantly, repeat the determination, again in duplicate.

Report the results of all determinations, including any repeat determinations.

10 Precision

No details are currently available for the repeatability limit (r) and reproducibility limit (R).

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11 Test report

The test report shall contain at least the following information:

- a) all information necessary for identification of the sample tested, including the manufacturer, trade name, batch number, etc.;
- a reference to this International Standard (ISO 2812-3:2006);
- c) details of the test panels, including:
 - 1) the material (including thickness) and surface pretreatment of the substrate;
 - 2) the application method for applying the sample coating to the substrate, including the drying time and drying conditions for all layers; where applicable, ageing conditions before the test;
 - 3) the dry film thickness of the coating, in micrometres, including the measuring method chosen in ISO 2808;
- d) details of the method used, including:
 - 1) the specification of the test substances;
 - 2) the duration of the test;
 - 3) the temperature; iTeh STANDARD PREVIEW
- e) the result(s) of the test as specified in clause dards.iteh.ai)
- f) the name of the person who conducted the testSO 2812-3:2007

https://standards.iteh.ai/catalog/standards/sist/4fc5ab84-125b-4b3d-ab13-

- g) any deviations from the procedure specified 3d7175071/iso-2812-3-2007
- h) any unusual features (anomalies) observed during the test;
- i) the date of the test.

Annex A

(informative)

Examples of test substances

A.1 General

A range of fuels and chemicals that are typically used as test substances for automotive coatings is given in A.2, A.3 and A.4. Other test liquids may be used for testing both automotive and other coatings.

Use only analytical-grade chemicals.

A.2 Fuels and operating fluids for the automotive industry

- **A.2.1 FAM test substance**, conforming to the requirements of DIN 51604-1, DIN 51604-2 or DIN 51604-3.
- **A.2.2 Diesel fuel**, conforming to the requirements of EN 590.
- **A.2.3** Premium gasoline, conforming to the requirements of EN 228.
- A.2.4 Bio-diesel, conforming to the requirements of EN 14214EVIEW
- A.2.5 Engine oil. (standards.iteh.ai)
- A.2.6 Hypoid gearbox oil. ISO 2812-3:2007
 - https://standards.iteh.ai/catalog/standards/sist/4fc5ab84-125b-4b3d-ab13-
- **A.2.7 Hydraulic oil.** e405d7175071/iso-2812-3-2007
- A.2.8 Automatic transmission oil.
- A.2.9 Brake fluid.
- A.2.10 Radiator anti-freeze.
- A.2.11 Body sealing compound.
- A.2.12 Cavity sealing compound.
- A.2.13 Windscreen-washer fluid.
- A.2.14 Cold cleaner.

A.3 Laboratory chemicals

- A.3.1 Ethanol.
- A.3.2 Isopropanol.
- **A.3.3** Sodium hydroxide solution, with a mass fraction of 5 % sodium hydroxide.
- **A.3.4 Hydrochloric acid solution**, with a mass fraction of 10 % hydrochloric acid.