SRI LANKA STANDARD 1256 : PART 33 : 2016

ISO 6270 - 1 : 1998

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METHOD OF TEST FOR
PAINTS AND VARNISHES
PART 33 : DETERMINATION OF RESISTANCE TO HUMIDITY

SRI LANKA STANDARDS INSTITUTION

Sri Lanka Standard

METHOD OF TEST FOR PAINTS AND VARNISHES
PART 33 : DETERMINATION OF RESISTANCE TO HUMIDITY

SLS 1256 Part 33 : 2016
ISO 6270 Part 1 : 1998

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Sri Lanka.

Sri Lanka Standards are subject to periodical revision in order to accommodate the progress made by industry. Suggestions for improvement will be recorded and brought to the notice of the Committees to which the revisions are entrusted.

This standard does not purport to include all the necessary provisions of a contract.

Sri Lanka Standard
METHOD OF TEST FOR PAINTS AND VARNISHES
PART 33 : DETERMINATION OF RESISTANCE TO HUMIDITY

NATIONAL FOREWORD

This Sri Lanka Standard was approved by the Sectoral Committee on Chemical and Polymer Technology and authorized for adoption and publication as a Sri Lanka Standard by the Council of the Sri Lanka Standards Institution on 2016-03-23.

This Standard is identical with ISO 6270-1: 1998 Paints and varnishes – Determination of resistance to humidity Part 1- Continuous condensation published by the International Organization for Standardization (ISO).

TERMINOLOGY AND CONVENTIONS

The text of the International Standard has been accepted as suitable for publication, without deviation, as a Sri Lanka Standard. However, certain terminology and conventions are not identical with those used in Sri Lanka Standards. Attention is therefore drawn to the following:

a) Wherever the words “International Standard” appear referring to a particular Standards they should be interpreted as “Sri Lanka Standard”.

b) The comma has been used throughout as a decimal marker. In Sri Lanka Standards it is the current practice to use the full point at the base as the decimal marker.

c) Wherever page numbers are quoted, they are ISO page numbers.

Cross References

International Standard	Corresponding Sri Lanka Standard
ISO 1512:1991, Paints and varnishes - Sampling of products in liquid or paste form	No corresponding Sri Lanka Standard
ISO 1513:1992, Paints and varnishes -Examination and preparation of samples for testing	SLS 1256 Method of test for paints and varnishes Part 1 Examination and preparation of samples for testing
ISO 1514:1993, Paints and varnishes - Standard panels for testing.	No corresponding Sri Lanka Standard
ISO 2808:1997, Paints and varnishes -Determination of film thickness	SLS 1256 Method of test for paints and varnishes Part 15 Determination of film thickness
ISO 3270:1984, Paints and varnishes and their raw materials - Temperatures and humidities for conditioning and testing	No corresponding Sri Lanka Standard
ISO 3696:1987, Water for analytical laboratory use - Specification and test methods	No corresponding Sri Lanka Standard
ISO 4628-1:1982, Paints and varnishes - Evaluation of degradation of paint coatings - Designation of intensity, quantity and size of common types of defect - Part 1: General principles and rating schemes	No corresponding Sri Lanka Standard
ISO 4628-2:1982, Paints and varnishes - Evaluation of degradation of paint coatings –Designation of intensity, quantity and size of common types of defect - Part 2: Designation of degree of blistering	No corresponding Sri Lanka Standard
ISO 4628-3:1982, Paints and varnishes - Evaluation of degradation of paint coatings - Designation of intensity, quantity and size of common types of defect - Part 3: Designation of degree of rusting	No corresponding Sri Lanka Standard
ISO 4628-4:1982, Paints and varnishes - Evaluation of degradation of paint coatings - Designation of intensity, quantity and size of common types of defect - Part 4: Designation of degree of cracking	No corresponding Sri Lanka Standard
ISO 4628-5:1982, Paints and varnishes - Evaluation of degradation of paint coatings - Designation of intensity, quantity and size of common types of defect - Part 5: Designation of degree of flaking	No corresponding Sri Lanka Standard

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INTERNATIONAL STANDARD

ISO 6270-1

First edition
1998-04-01

Paints and varnishes — Determination of resistance to humidity —

Part 1:
Continuous condensation

Peintures et vernis — Détermination de la résistance à l'humidité —

Partie 1: Condensation continue

Reference number
ISO 6270-1:1998(E)

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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.

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.

International Standard ISO 6270-1 was prepared by Technical Committee ISO/TC 35, *Paints and varnishes,* Subcommittee 9, *General test methods for paints and varnishes*.

It cancels and replaces ISO 6270:1980, of which it constitutes a minor technical revision.

It differs from ISO 6270:1980 in that the angle of the panels to the horizontal has been changed from $(15 \pm 5)°$ to $(60 \pm 5)°$ and the temperature of the air below the panels is maintained at (38 ± 2) °C rather than at that of the water itself. Work has shown that the results do not differ substantially between the two sets of conditions.

At the date of publication, ISO 6270 consisted of only one part, under the general title *Paints and varnishes – Determination of resistance to humidity:*

– Part 1: Continuous condensation

Other parts will be added at a later date. One of these parts will be ISO 11503:1995, *Paints and varnishes – Determination of resistance to humidity (intermittent condensation),* which will be renumbered into this series.

Annex A forms an integral part of this part of ISO 6270.

INTERNATIONAL STANDARD © ISO **ISO 6270-1:1998(E)**

Paints and varnishes — Determination of resistance to humidity — Part 1: Continuous condensation

1 Scope

This part of ISO 6270 is one of a series of standards dealing with the sampling and testing of paints, varnishes and related products.

It specifies a method for determining the resistance of paint films, paints systems and related products to conditions of high humidity in accordance with the requirements of coating or product specifications.

The method is applicable to coatings both on porous substrates such as wood, plaster and plasterboard and on non-porous substrates such as metal. It provides an indication of the performance likely to be obtained under severe conditions of exposure where continuous condensation occurs on the surface.

The procedure may reveal failures of the coating (including blistering, staining, softening, wrinkling and embrittlement) and deterioration of the substrate.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 6270. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 6270 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 1512:1991, *Paints and varnishes – Sampling of products in liquid or paste form.*

ISO 1513:1992, *Paints and varnishes – Examination and preparation of samples for testing.*

ISO 1514:1993, *Paints and varnishes – Standard panels for testing.*

ISO 2808:1997, *Paints and varnishes – Determination of film thickness.*

ISO 3270:1984, *Paints and varnishes and their raw materials – Temperatures and humidities for conditioning and testing.*

ISO 3696:1987, *Water for analytical laboratory use – Specification and test methods.*

ISO 4628-1:1982, *Paints and varnishes – Evaluation of degradation of paint coatings – Designation of intensity, quantity and size of common types of defect – Part 1: General principles and rating schemes.*

ISO 4628-2:1982, *Paints and varnishes – Evaluation of degradation of paint coatings – Designation of intensity, quantity and size of common types of defect – Part 2: Designation of degree of blistering.*

ISO 4628-3:1982, *Paints and varnishes – Evaluation of degradation of paint coatings – Designation of intensity, quantity and size of common types of defect – Part 3: Designation of degree of rusting.*

ISO 4628-4:1982, *Paints and varnishes - Evaluation of degradation of paint coatings – Designation of intensity, quantity and size of common types of defect – Part 4: Designation of degree of cracking.*

ISO 4628-5:1982, *Paints and varnishes - Evaluation of degradation of paint coatings – Designation of intensity, quantity and size of common types of defect – Part 5: Designation of degree of flaking.*

3 Principle

A coated test panel is exposed to continuous condensation and the effects of the exposure are evaluated by criteria agreed in advance between the interested parties, these criteria usually being of a subjective nature.

4 Required supplementary information

For any particular application, the test method specified in this part of ISO 6270 needs to be completed by supplementary information. The items of supplementary information are given in annex A.

5 Apparatus

5.1 The apparatus shall be constructed of chemically resistant materials and consist essentially of an electrically heated water bath, designed so that the cover is formed by the blanking panels (see 5.5) or test panels, the upper faces of which are exposed to the environment (see 5.2). It is preferable for the apparatus to be designed so that it will accommodate test panels of size 150 mm x 100 mm.

5.2 The sides of the water bath shall be suitably insulated to ensure that the temperature in the air space above the water when measured approximately 25 mm below the test panels is maintained at a uniform temperature of (38 ± 2) °C unless otherwise specified (see annex A, item e).

NOTE – Temperatures of 49 °C and 60 °C are recommended if 38 °C is too low.

5.3 The apparatus shall be operated in a draught-free environment maintained at (23 ± 2) °C.

NOTE – This test method will not work if the ambient temperature is higher than the test temperature, as no condensation will be formed on the test panels.

5.4 The top of the bath shall be designed so that the test panels are held at the preferred angle of (60 ± 5)° to the horizontal to permit drainage of condensed water, and shall be such that water draining from one panel does not come into contact with another. An angle of (15 ± 5)° may be used on old equipment if specified (see the foreword).

5.5 Suitable inert blanking panels shall be provided for use in setting up the apparatus and if the number of test panels is insufficient to form a complete cover.

5.6 The water used should preferably be of at least grade 3 purity as defined in ISO 3696. Water of lower quality may be used, but problems may arise with build-up of insoluble matter in the water bath, which will require regular cleaning.

5.7 The water shall be maintained at a constant level by means of an automatic control device.

6 Sampling

Take a representative sample of the product to be tested (or of each product in the case of a multicoat system), as specified in ISO 1512.

Examine and prepare the sample for testing, as specified in ISO 1513.

7 Test panels

7.1 Material and dimensions

Unless otherwise specified or agreed, the test panels shall be of burnished steel complying with ISO 1514, and of minimum dimensions 70 mm x 100 mm x 0,3 mm.

NOTE – As the results can be significantly affected by the thickness of the substrate, it is important to ensure that the dimensions of the panels are appropriate to the end use for which the coating is being tested.

7.2 Preparation and coating

Unless otherwise specified, prepare each test panel in accordance with ISO 1514 and then coat it by the specified method with the product or system under test.

For many purposes, it is sufficient to coat only one face of the test panel. However, it is necessary to specify whether the back and/or edges of the panel are to be sealed and, if so, whether it should be with the product or system under test or with a suitable sealant (see annex A, item b).

7.3 Drying and conditioning

Dry (or stove) and age (if applicable) each coated test panel for the specified time under the specified conditions, and, unless otherwise specified, condition them in a standard atmosphere in accordance with ISO 3270 for at least 16 h, with free circulation of air and without exposing them to direct sunlight. The test procedure shall then be carried out as soon as possible.

7.4 Thickness of coating

Determine the thickness, in micrometres, of the dry coating using one of the non-destructive procedures described in ISO 2808.

8 Method of exposure of test panels

Carry out the determination in duplicate, unless otherwise specified.

8.1 Set up the apparatus with blanking panels in position and allow the apparatus to come to equilibrium. When the conditions specified in 5.2 are attained, swiftly replace the blanking panels with the test panels so that the test surface faces the water.

NOTE – It is recommended that a control specimen of a paint with known durability be included with each series of test panels.

In order to prevent a galvanic couple, the test panels shall not be allowed to come into contact with each other or with other metallic material. If the panels have not been edged (see 7.2) then non-metallic filler strips shall be used between the panels.

8.2 Run the apparatus continuously throughout the prescribed test period, maintaining the conditions specified in clause 5.2 except for a short daily interruption (see annex A, item f) to inspect, re-arrange or remove test panels or to check and, if not performed automatically, adjust the level of the water.

9 Examination of test panels

9.1 Make a periodic examination of the panels as quickly as possible, taking care not to damage the surfaces under test. Do not remove the panels for more than 30 min in any 24 h period. Immediately replace panels which have been removed by blanking panels. Panels may be blotted with absorbent paper to examine them more clearly, but shall then be immediately returned to the apparatus. They shall not be allowed to dry fully.

9.2 At the end of the specified test period, immediately examine the test surface for signs of deterioration in accordance with the appropriate part of ISO 4628 (see annex A, item h).

9.3 If required, keep the panels in the standard atmosphere in accordance with ISO 3270 for the specified period and examine the test surfaces for deterioration.

9.4 If it is required to examine the substrate for signs of attack, remove the coating by means of a non-corrosive paint remover unless otherwise specified.

10 Precision

The concept of precision is not applicable to this part of ISO 6270 due to the subjective nature of the assessment (see clause 3). Users of this part of ISO 6270 should be aware that, because of this subjective assessment of the deterioration of the coating, the actual rating will depend upon a number of factors. These include the evaluation method (ISO 4628), the preparation of the test panels, the thickness of the coating, and the drying and conditioning of the test panels.

11 Test report

The test report shall contain at least the following information:

a) all details necessary to identify the product tested;

b) a reference to this part of ISO 6270 (ISO 6270-1);

c) the items of supplementary information referred to in annex A;

d) a reference to the international or national standard, product specification or other document supplying the information referred to in c) above;

e) any deviation, by agreement or otherwise, from the test procedure described;

f) the angle of the panels in the apparatus;

g) the temperature of the test;

h) the results of the test, in terms of the stated requirements;

i) the dates and duration of the test.

Annex A
(normative)

Required supplementary information

A.1 The items of supplementary information listed in this annex shall be supplied as appropriate to enable the method to be carried out.

A.2 The information required should preferably be agreed between the interested parties and may be derived, in part or totally, from an international or national standard or other document related to the product under test.

a) Material, dimensions and surface preparation of substrate (see 7.1).

b) Method of application of test coating and details of sealing of edges and backs of the test panels (if required) (see 7.2).

c) Thickness, in micrometres, of the dry coating, including the method of measurement and whether it is a single coating or a multicoat system (see 7.4).

d) Duration and conditions of drying (or stoving) and ageing (if applicable) of the coated test panels before testing (see 7.3).

e) Test temperature (see 5.2).

f) Duration of test period, including whether the test period is to be interrupted at intervals (for example during weekends) (see 8.2).

g) When inspection of the test coating is to be carried out, including details of recovery period if applicable (see 9.3).

h) How inspection of the test coating is to be carried out, and what characteristics are to be considered in evaluating its resistance properties (see clauses 9 and 10).

i) Method of paint removal if the substrate is to be examined, and how the substrate is to be evaluated (see 9.4).

ICS 87.040

Descriptors: paints, varnishes, coatings, tests, water vapour tests, test equipment.

Price based on 5 pages

SLS CERTIFICATION MARK

The Sri Lanka Standards Institution is the owner of the registered certification mark shown below. Beneath the mark, the number of the Sri Lanka Standard relevant to the product is indicated. This mark may be used only by those who have obtained permits under the SLS certification marks scheme. The presence of this mark on or in relation to a product conveys the assurance that they have been produced to comply with the requirements of the relevant Sri Lanka Standard under a well designed system of quality control inspection and testing operated by the manufacturer and supervised by the SLSI *which includes surveillance inspection of the factory, testing of both factory and market samples.*

Further particulars of the terms and conditions of the permit may be obtained from the Sri *Lanka Standards Institution, 17, Victoria Place, Elvitigala Mawatha, Colombo 08.*

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SRI LANKA STANDARDS INSTITUTION

The Sri Lanka Standards Institution (SLSI) is the National Standards Organization of Sri Lanka established under the Sri Lanka Standards Institution Act No. 6 of 1984 which repealed and replaced the Bureau of Ceylon Standards Act No. 38 of 1964. The Institution functions under the Ministry of Science, Technology and Research.

The Principal objects of the Institution as set out in the Act are to prepare standards and promote their adoption, to provide facilities for examination and testing of products, to operate a Certification Marks Scheme, to certify the quality of products meant for local consumption or exports and to promote Standardization and quality control by educational, consultancy and research and research activity.

The Institution is financed by Government grants, and by the income from the sale of its publications and other services offered for Industry and Business Sector. Financial and Administrative control is vested in a Council appointed in accordance with the provisions of the Act.

The development and formulation of National Standards is carried out by Technical Experts and representatives of other interest groups, assisted by the permanent officers of the Institution. These Technical Committees are appointed under the purview of the Sectoral Committees which in return are appointed by the Council. The Sectoral Committees give the final Technical approval for the Draft National Standards prior to the approval by the Council of the SLSI.

All members of the Technical and Sectoral Committees render their services in an honorary capacity. In this process the Institution Endeavours to ensure adequate representation of all view points.

In the International field the Institution represents Sri Lanka in the International Organization for Standardization (ISO), and participates in such fields of Standardization as are of special interest to Sri Lanka.

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