SRI LANKA STANDARD 1256 : Part 14 : 2005
ISO 3678 : 1976

METHODS OF TEST FOR
PAINTS AND VARNISHES
PART 14 : PRINT – FREE TEST

SRI LANKA STANDARDS INSTITUTION

METHODS OF TEST FOR PAINTS AND VARNISHES
PART 14 : PRINT – FREE TEST

SLS 1256 : Part 14 : 2005
ISO 3678 : 1976
(Superseding SLS 535 : Part 3 : Section 3.6 : 1981)

Gr. A

SRI LANKA STANDARDS INSTITUTION
17, Victoria Place
Elvitigala Mawatha
Colombo - 08
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.

© **SLSI 2005**
All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the SLSI.

SLS 1256 : Part 14 : 2005
ISO 3678 : 1976
(Superseding SLS 535 : Part 3 : Section 3.6 : 1981)

SRI LANKA STANDARD
METHODS OF TEST FOR PAINTS AND VARNISHES
PART 14 : PRINT – FREE TEST

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 2005-02-10

This standard was published in 1981 which superseded **CS 70 : 1969**. In this revision each test method is given as a separate part in order to facilitate updating. This standard supersedes **SLS 535** : Methods of test for paints Part 3 : Tests associated with paint-film formation. Section 3.6 1981 Paints and varnishes – Print-free test.

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

TERMINOLOGY AND CONVENTIONS

a) Wherever the words "International Standard" appear referring to a particular standard, 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/IEC page numbers.

The test temperature adopted in Sri Lanka 27 ° ± 2 ^{o}C . Relative humidity 65 ± 5 per cent is recommended.

CROSS REFERENCES

International Standard	Corresponding Sri Lanka Standard
ISO 48 Vulcanized rubber-Determination Of hardness (between 30 and 85 IRHD)	SLS 297 : Part 4 : Vulcanized rubber Determination of hardness
ISO 1513 Paints and varnishes- Examination and preparation of samples for testing	SLS 1256: Part 1 Methods of test for paints and varnishes- Examination and preparation of samples for testing
ISO 1514 Paints and varnishes- Standards Panels for testing	SLS 1256: Part 11 Methods of test for paints and varnishes- Standards Panels for testing
ISO 2808 Paints and varnishes – Determination of film thickness	SLS 1256. : Part 15 Methods of test for Paints and varnishes - Determination of film thickness
ISO 3270 Paints and varnishes – and their raw Materials - Atmospheres for conditioning and testing	SLS 374. Standard atmospheric conditions for conditioning and testing
ISO 15528 Paints and varnishes – Sampling	SLS 523 Methods of sampling paints

INTERNATIONAL STANDARD ISO 3678

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Paints and varnishes — Print-free test

Peintures et vernis — Essai de séchage «apparent complet»

First edition — 1976-07-01

UDC 667.613 : 620.178.6

Ref. No. ISO 3678-1976 (E)

Descriptors : paints, varnishes, tests, drying.

Price based on 2 pages

FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up 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.

Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 3678 was drawn up by Technical Committee ISO/TC 35, *Paints and varnishes,* and was circulated to the Member Bodies in December 1974.

It has been approved by the Member Bodies of the following countries :

Australia	Iran	Spain
Austria	Ireland	Sweden
Brazil	Israel	Switzerland
Bulgaria	Netherlands	Turkey
Denmark	New Zealand	United Kingdom
Egypt, Arab Rep. of	Portugal	Yugoslavia
France	Romania	
Germany	South Africa, Rep. of	

The Member Body of the following country expressed disapproval of the document on technical grounds :

Canada

© **International Organization for Standardization, 1976** •

Printed in Switzerland

INTERNATIONAL STANDARD ISO 3678-1976 (E)

Paints and varnishes — Print-free test

0 INTRODUCTION

This International Standard is one of a series of standards dealing with the sampling and testing of paints, varnishes and related products. It should be read in conjunction with ISO 1512, ISO 1513, ISO 1514, ISO 2808 and ISO 3270.

This International Standard specifies an empirical test procedure for assessing the performance of a coating of paint, varnish or related product in relation to a stage of drying which is described as "print-free".

The method of test described below requires to be completed, for any particular application, by the following supplementary information. This information should be derived from the national standard or other document relating to the product under test or, where appropriate, should be the subject of agreement between the interested parties.

a) Material and surface preparation of the substrate.

b) Method of application of the test coating to the substrate.

c) Thickness, in micrometres, of the dry coating and method of measurement in accordance with ISO 2808, and whether it is a single coating or a multicoat system.

d) Duration and conditions of drying the coated panel (or conditions of stoving and ageing, if applicable) before testing.

e) Intervals between tests where print-free time is required.

f) Details of the grade of nylon gauze used and the force applied in carrying out the test.

NOTE — The results of tests may only be compared if the test conditions are the same for each test.

1 SCOPE AND FIELD OF APPLICATION

1.1 This International Standard specifies a method for assessing, by means of a simple empirical test, the resistance of a coat of paint, varnish or related product to imprinting by a nylon gauze under a specified force applied for a specified time.

1.2 The method may be carried out

either as a "pass/fail" test by determining whether the print-free state has been reached after a specified period of drying or, in the case of stoving coatings, after stoving and ageing under specified conditions,

or by repeating the print-free test at suitable intervals until the print-free time is obtained.

2 REFERENCES

ISO 48, *Vulcanized rubber — Determination of hardness (hardness between 30 and 85 IRHD).*

ISO 1512, *Paints and varnishes — Sampling.*

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 — Atmospheres for conditioning and testing.*

3 DEFINITIONS

For the purposes of this International Standard, the following definitions apply.

3.1 print-free : The state of a coating of paint or varnish when gauze of a specified grade under a specified force during a specified time does not leave on the surface an imprint, visible under normal corrected vision.

3.2 print-free state : A general term describing the state of the surface of a coating, i.e. whether "print-free" or not.

3.3 print-free time : The period of time elapsing between the moment at which a coating is applied to a prepared test panel and that at which the coating is assessed as just print-free, using the test procedure specified.

4 APPARATUS AND MATERIALS

4.1 Squares of woven monofilament polyamide gauze, minimum size 25 mm × 25 mm.

Unless otherwise specified, the gauze shall be of 0,120 mm thread diameter and of approximately 0,2 mm aperture.[1] Depending upon the type of coating under test, other grades of similar construction may be used if necessary, subject to agreement between the interested parties.

1) A suitable grade of gauze is obtainable commercially. Details may be obtained from the Secretariat of ISO/TC 35 or from the ISO Central Secretariat.

4.2 Rubber disks, of diameter 22 mm, thickness 5 mm and hardness 50 ± 3 IRHD.[1)]

4.3 Cylindrical weights, of mass 200 g, 500 g and 1 000 g and diameter not less than 22 mm.

NOTE — The diameter of the rubber disks and the mass of the weights may vary slightly from those specified in 4.2 and 4.3. The pressures on the coatings, however, shall be equal to those obtained using disks and weights of the dimensions specified in 4.2 and 4.3, i.e. 5,2 kPa (200 g), 13,15 kPa (500 g) and 26,3 kPa (1 000 g).

4.4 Stopwatch or **stopclock.**

5 SAMPLING

A representative sample of the product to be tested (or of each product in the case of a multicoat system) shall be taken as described in ISO 1512.

The samples shall then be prepared for testing as described in ISO 1513.

6 TEST PANELS

6.1 Material

Unless otherwise specified or agreed, the test panels shall be of glass, burnished steel, burnished tinplate or burnished aluminium, complying with the requirements of ISO 1514.

6.2 Preparation and coating of the panels

Prepare the panels in accordance with ISO 1514, unless otherwise required. The test panel shall be coated by the specified method with the appropriate primer and/or undercoat and allowed to dry for the specified period. In the case of multicoat stoving products, the primer and/or undercoat shall be stoved under the agreed stoving conditions, before applying the product under test by the specified method.

6.3 Thickness of coating

Determine the thickness, in micrometres, of the dry coating by the method specified, using one of the procedures specified in ISO 2808.

7 PROCEDURE

7.1 Drying the test panel

Allow the coated panel to dry in a vertical position in the standard atmosphere in accordance with ISO 3270 (23 ± 2 °C and relative humidity of 50 ± 5 %), unless otherwise agreed. The panel shall be dried with free circulation of air but shielded from draughts and direct sunlight.

Stoving products shall be stoved and aged under the specified or agreed conditions.

7.2 Assessment of print-free state

7.2.1 After the completion of the specified drying time, place the test panel in a horizontal position.

7.2.2 Place a square of polyamide gauze (4.1) on the surface of the coating and place a rubber disk (4.2) centrally on the square.

Place the appropriate weight (4.3) carefully on the disk so that the axes of the disk and weight are coincident and start the stopwatch or stopclock (4.4).

7.2.3 Unless otherwise specified or agreed, remove the weight, rubber disk and gauze square after 10 min.

7.2.4 Examine the surface of the coating immediately in the test area, using normal corrected vision.

The surface is"print-free" if no imprint can be seen. Record the result as "print-free" or "not print-free".

7.3 Determination of print-free time

Take a number of coated test panels. At appropriate intervals, starting shortly before the coating is expected to be print-free and using an untouched area of the same panel for each test (or a different panel as necessary), carry out the test as specified in 7.2, until the test shows the coating to be print-free.

Record the time taken for the coating to become just print-free.

8 TEST REPORT

The test report shall include at least the following information :

a) a reference to this International Standard or to a corresponding national standard;

b) the type and identification of the product tested;

c) the items of supplementary information referred to in the introduction to this International Standard;

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

e) the result of the test as required :

either whether or not the coating was print-free after the specified time (pass/fail test)

or the print-free time and the load applied;

f) any deviation, by agreement or otherwise, from the procedure specified, such as duration of application of the gauze;

g) the date of the test.

---

1) See ISO 48.

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.

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 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 turn 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.

Printed at the Sri Lanka Standards Institution, 17, Victoria Place, Elvitigala Mawatha, Colombo 08.

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.*

Printed at SLSI (Printing Unit)