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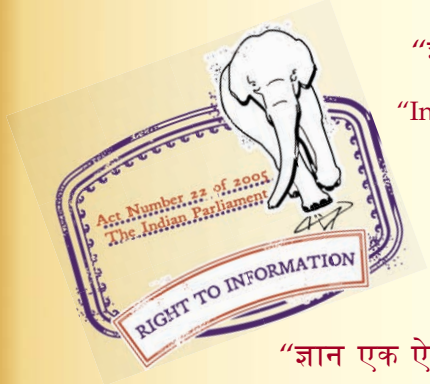

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IS: 525 - 1968
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Indian Standard

SPECIFICATION FOR VARNISH, FINISHING, EXTERIOR AND GENERAL PURPOSES

(First Revision)

Fifth Reprint AUGUST 2007
(Including Amendment No. 1)

UDC 667.633

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Gr 3

May 1968

AMENDMENT NO. 1 APRIL 1979

TO

IS : 525-1968 SPECIFICATION FOR VARNISH, FINISHING, EXTERIOR AND GENERAL PURPOSES

(*First Revision*)

Alterations

(*Page* 3, *clause* **0.3**) —Substitute the following for the existing clause:

'**0.3** The requirements for undercoating varnish were covered in IS:338-1952* but the concerned technical committee responsible for preparation of this standard was of the opinion that instead of using one coat of undercoating varnish conforming to IS : 338-1952* and another coat of finishing varnish conforming to this specification two coats of the latter may be used with improved performance and comparable cost. The Committee, therefore, decided to withdraw IS : 338-1952* and recommended to use two coats of the material conforming to this specification in place of one coat of undercoating and another coat of finishing. IS : 338-1952* was, therefore, withdrawn.

[*Page* 8, *clause* **A-2.2**(c), *lines* 2 *and* 3] — Substitute 'material' for 'varnish, undercoating, exterior, synthetic resin (conforming to IS : 338-1952†)'.

(*Page* 8, *foot-note with* '†' *mark*) — Delete.

Addendum

(*Page* 3, *foot-note*) — Add the following new foot-note at the end:

'*Specification for varnish, undercoating, exterior, natural resin.'

(CDC 8)

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SPECIFICATION FOR VARNISH, FINISHING, EXTERIOR AND GENERAL PURPOSES

(First Revision)

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Indian Standard

SPECIFICATION FOR VARNISH, FINISHING, EXTERIOR AND GENERAL PURPOSES

(First Revision)

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 9 January 1968, after the draft finalized by the Paints and Allied Products Sectional Committee had been approved by the Chemical Division Council.

0.2 This standard was first issued as a tentative standard in 1954 due to non-availability of authentic technical data on durability of this material. It is now being revised on the basis of experimental data and experience gained during these years.

0.2.1 Apart from the above, modifications in evaluating performance tests and their assessments have also beed introduced through this revision. The stripping test has been elaborated by stipulating definite time intervals after which the test is to be performed. Besides, the requirements for volatile matter and viscosity have been modified to suit the material currently manufactured in the country. In the extensive and intensive study for revision, due consideration has been given for alignment of this standard with latest revised standards of this series. This revised standard, it is hoped, will go a long way in assisting the consumers and all those associated with the manufacture, use and testing of material to this standard.

0.3 For good results, it is desirable that both the undercoating and the finishing varnishes are obtained from the same manufacturer. For purposes of testing, the undercoating and finishing varnishes should be from the same source.

0.4 This standard is one of a series of Indian Standards on varnishes (*see* P 10).

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated.

expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the requirements and the methods of sampling and test for varnish, finishing, exterior and general purposes. The material is used in painting systems for protection and decoration.

2. TERMINOLOGY

2.0 For the purpose of this standard, the definitions given in IS : 1303-1963† and the following shall apply.

2.1 Registered Sample — Sample supplied in advance by a prospective supplier and registered by the approved testing authorities after testing it to all the requirements of this standard. A complete record of its performance shall be kept in respect of all tests.

3. REQUIREMENTS

3.1 Composition — The material shall be of such a composition as to satisfy the requirements of this standard. The composition of the bulk supply shall be similar to that of the registered sample.

3.2 Durability

3.2.1 *Registered Sample*

3.2.1.1 When prepared and tested for normal outdoor exposure as prescribed under A-3, a general breakdown of the film prepared from the sample for registration shall not occur in less than 6 months.

3.2.1.2 A film of the material for registration shall be prepared and tested as prescribed under A-4, in an accelerated weathering apparatus for a period of 15 days and a complete record of its performance maintained.

NOTE — As a precaution against inadvertent accidents, the outdoor exposure test (A-3) and the accelerated weathering test (A-4) shall be carried out in duplicate.

3.2.2 *Sample from Bulk Supply* — A film of the material prepared from a representative sample from bulk supply as described in Appendix A and tested in the accelerated weathering apparatus (A-4)

*Rules for rounding off numerical values (*revised*).

†Glossary of terms relating to paints (*revised*).

shall be not materially different in performance as compared with the record of the film of the registered sample. The film shall be examined daily for a period of 15 days.

3.3 The material shall also comply with the requirements given in Table 1.

TABLE 1 REQUIREMENTS FOR VARNISH, FINISHING, EXTERIOR AND GENERAL PURPOSES

SL No.	CHARACTERISTIC	REQUIREMENT	METHOD OF TEST (REF TO CL No. IN IS : 197-1952*)
(1)	(2)	(3)	(4)
i)	Drying time, *Max*		7.2
	a) Surface dry	8 hours	(Method I)
	b) Hard dry	18 hours	
	c) Tack free	48 hours	
ii)	Finish	Smooth and glossy	8
iii)	Colour	Not darker than a combination of 41 yellow units and 10 red units	9
iv)	Scratch hardness	No such scratoh as to show the bare metal	10
v)	Flexibility and adhesion, after 96 hours air-drying	No visible damage or detachment of the film	11 (Method II)
vi)	Stripping test, after 96 hours air-drying	Scratches free from jagged edges	12
vii)	Flash point	Not below 30°C	18
viii)	Volatile matter content, percent by weight, *Max*	60.0	14
ix)	Viscosity at 30°0	1.5 to 3.0 stokes	16
x)	Acid value, *Max*	25.0	17
xi)	Keeping properties	Not less than one year from the date of manufacture	19

†Method of test for varnishes and lacquers.

4. PACKING AND MARKING

4.1 Packing — The material shall be packed as agreed to between the purchaser and the supplier.

4.2 Marking — Each container shall be marked with the following:

a) Name, class, and type of the material;

b) Name of the manufacturer, initials or his trade-mark, if any;

c) Volume of the material; and

d) Month and year of manufacture.

4.2.1 The product may also be marked with Standard Mark.

4.2.2 The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufactures or producers may be obtained from the Bureau of Indian Standards.

4.3 Other details of packing and marking shall be in accordance with the instructions given by the purchaser.

5. SAMPLING

5.1 Preparation of Test Samples

5.1.1 *For Registration* — The sample shall be submitted in three different containers, each containing not less than 500 ml of the material.

5.1.1.1 As testing to the requirements of material covered by this standard involves a period of more than 6 months, the supplier is advised to submit samples for registration sufficiently in advance.

5.1.2 *Tender Sample* — The supplier may dispense with sending a tender sample provided that he declares that the material for which the tender is given is of the same quality as the sample previously registered in his name.

5.13 *Bulk Supply Sample* — Representative samples of the material shall be drawn and treated as prescribed under **3** of IS : 197-1952*.

6. TEST METHODS

6.1 Tests shall be conducted as prescribed in IS : 197-1932* and in Appendix A. References to relevant clauses of IS : 197-1952* are given in col 4 of Table 1 and to the Appendix in **3.2.**

6.2 Quality of Reagents — Unless specified otherwise, pure chemicals and distilled water (*see* IS : 1070-1960†) shall be employed in tests.

NOTE—' Pure chemicals ' shall mean chemicals that do not oontain impurities which affect the results of analysis.

*Methods of test for varnishes and lacquers. (Since revised).
†Specification for water, distilled quality (*revised*).

6.3 Comparison with the performance of the registered sample shall be carried out on the basis of records maintained for the registered sample (*see* **3.2.1.2**).

APPENDIX A
(*Clause* 3.2)
DETERMINATION OF DURABILITY

A-0. GENERAL

A-0.1 Outline of the Method — The durability of the varnish is determined by ascertaining actual behaviour of suitably prepared test panels in normal outdoor exposure test for a specified period and evaluating the results of this exposure by a suitable method of rating for various characteristics of the varnish film. Apart from this, the varnish is also evaluated by an accelerated weathering test wherein a prepared panel is subjected to controlled exposure of heat, light and water in an artificial weathering apparatus.

A-1. TEST PANELS

A-1.1 The panels shall be of seasoned teak wood conforming to the requirements of **5.4.1** of IS : 197-1952*. Panels for outdoor exposure shall be 300 × 150 × 25 mm in size, and for the accelerated weathering test 150 × 75 × 12 mm. The panels shall be bevelled at the edges and shall be smoothened by rubbing, down with fine glass paper, the back being protected with a suitable paint.

A-2. PREPARATION OF TEST PANELS

A-2.1 In the painting procedure outlined under **A-2.2,** the air-drying shall be done at the room temperature as defined under **2.8** of IS : 197-1952* and at relative humidity of not more than 70 percent**.**

A-2.2 The surface of the test panels to be exposed shall be prepared as follows:

a) Apply one coat of liquid, transparent wood filler (conforming to IS : 345-1952†) and remove the excess after it has dried to touch. by rubbing across the grains with jute fibres or hessian cloth, and allow it to air-dry for 24 hours.

*Methods of test for varnishes and lacquers. (Since revised).
†Specification for wood filler transparent, liquid.

b) Rub down with emery paper No. 220/240 and wipe off the dust apply one coat of varnish, gold size (conforming to IS : 198-1952*) and allow to air-dry for 24 hours.

c) Rub down with waterproof emery paper No. 220/240, wash and wipe off water, and when dry, apply one coat of varnish, undercoating, exterior, synthetic resin (conforming to IS : 338-1952†) and allow to air-dry for 24 hours.

d) Rub down with waterproof emery paper No. 320, wash and wipe off water, and when dry, apply one coat of the finishing varnish, and allow to air-dry for 48 hours.

e) Rub down with waterproof emery paper No. 320, wash and wipe off water, and when dry, apply a second coat of the finishing varnish, and allow to air-dry for 7 days.

A-3. NORMAL OUTDOOR EXPOSURE TEST

A-3.0 Subject the sample for. registration and the tender samples, if supplied, to normal outdoor exposure test in the manner described under **A-3.1.**

A-3.1 Expose in the open the test panels, prepared in the manner prescribed under **A-1** and **A-2**, in duplicate, in a vertical position facing south. Commence the exposure not earlier than the last week of January and not later than the first week of March.

A-3.1.1 Examine the condition of the exposed films at monthly intervals for gloss retention and at bimonthly intervals for other characteristics, as given below:

a) Checking, and

b) Blooming and spotting.

A-3.1.2 For the above examinations, clean half the surface of the two test panels with a sponge dipped in water and wipe it dry with a piece of soft cotton cloth or chamois leather (*see* IS : 1017-1964‡) prior to examination. Examine the same half of the test panels at each examination. As an aid to the examination, a magnifying glass may be used, but the evaluation shall be based on an assessment with the unaided eye. At the end of the stipulated period for durability, examine both halves of the test panels and base the evaluation for rating (*see* **A-3.3**) on the condition of the unwiped half of the test panels, which shall be wiped before the final examination.

*Specification for varnish, gold size.

†Specification for varnish, undercoating, exterior, natural resin.

‡Specification for chamois leather. (Since revised).

A-3.2 Method of Rating — The film of an unexposed test panel shall be rated with the following basic values for the respective characteristics

a) Possessing high gloss	40
b) Freedom from checking	45
c) Freedom from blooming and spotting	15
	100

NOTE — The initial rating of film may be 100 or less according to the condition of gloat and colour, the rating for freedom from checking, blooming, and spotting being always the maximum in the case of unexposed films.

A-3.3 Evaluation of Exposed Films — In recording the condition of exposed films at each examination, express the observed relative values of different characteristics in percentages of the basic value allotted to each characteristic under **A-3.2.** The allotment of performance value shall be multiples of 10. For arriving at an assessment, multiply the basic value for each characteristic (*see* **A-3.2**) by the percentage awarded for the performance in the test and divide the product so obtained by 100 to obtain the percentage award for the observed value of each characteristic. Take the sum total of these resulting values as the overall assessment.

A-3.3.1 The following table is intended to serve as an example for the assessment of a varnish film after exposure:

Characteristic	*Basic Value* Percent	*Performance Value* Percent	*Assessment Value* Percent
(1)	(2)	(3)	(4)
a) Possessing high gloss	40	100	40
b) Freedom from checking	45	50	22.5
c) Freedom from blooming and spotting	15	20	3
			65.5

A-3.4 Results of Exposure — Reckon the period for the general breakdown of the exposed film from the date of commencement of exposure to the time when the overall assessment falls below 50 percent or when the performance value of any one characteristic, except for gloss which shall be 50 percent, falls below 25 percent of the basic value adopted for that characteristic. In the example given under **A-3.3.1**, although the overall assessment is 65.5 percent, yet the film is to be regarded as having generally broken down, because the performance value of blooming and spotting has fallen below 25 percent of its basic value.

A-4. ACCELERATED WEATHERING TEST

A-4.1 Accelerated Weathering Apparatus — An artificial weathering apparatus of the carbon arc type for uniform and controlled exposure to the effects of heat, light and water.

A-4.2 Samples for registration shall be tested in duplicate in a suitable accelerated weathering apparatus (*see* **A-4.1**) and samples drawn from bulk supply shall be tested in a similar manner. The test panels shall be prepared as described under **A-2.2.** The requirements of this test shall be taken to have been satisfied if the performance of the film is not materially different as compared with the record of the film of the registered sample.

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