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IS 16-1 (2008): Shellac, Part 1: Hand Made Shellac [CHD 23: Lac, Lac Products and Polishes]



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भाग 1 हाथ का बना शलक लाख  
( चौथा पुनरीक्षण )

*Indian Standard*

SHELLAC — SPECIFICATION

PART 1 HAND-MADE SHELLAC

*( Fourth Revision )*

ICS 87.060.20

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

## FOREWORD

This Indian Standard (Part 1) (Fourth Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Lac, Lac Products and Polishes Sectional Committee had been approved by the Chemical Division Council.

This standard for shellac covering hand-made shellac as well as machine-made shellac was first published in 1949. It served as the basis for initiating work at the level of the International Organization for Standardization (ISO) and culminated in the formulation of ISO/Recommendation R 56 Shellac in 1957. Later on, the Committee reviewed the position in respect of adoption of ISO/R 56 Shellac by member countries of ISO and in the fourth meeting of ISO/TC 50 it was decided that specific proposals for changes in the ISO Recommendation be invited. On the basis of the proposals received it was seen that the adoption of ISO/R 56 was much more satisfactory in respect of machine-made shellac than of hand-made shellac. Since the number of types and grades of machine-made shellac and hand-made shellac, taken together, was far too big and caused confusion in making reference to the standard, this standard was revised for the first time and split in 1973. While Part 1 covered hand-made shellac, machine-made shellac is covered in Part 2.

The second revision was based on the discussions during the fourth meeting of ISO/TC 50 that the position in respect of the adoption of grade designations for hand-made shellac given in ISO/R 56 (in line with IS 16) was not satisfactory. Some proposals were put forth by UK and they led to the submission of detailed counter-proposals by India. It was based on the Indian country-proposals which received substantial degree of agreement at the international level. One significant change was that the grade designations of hand-made shellac included the names of grades prevalent in trade. This step necessitated some changes in the hot alcohol insoluble matter limit and colour index limit for Grades A, B, C, D and E.

During this revision the requirement for non-volatile matter soluble in cold alcohol had been dropped since the requirement is applied in practice to waste products of lac only. The methods for quantitative determination of rosin had also been dropped since this type of adulteration is no longer in evidence. The requirement for colour index is given as essential. Though the colour index had been made an optional requirement in ISO Recommendation, it was decided that colour index should continue as an essential requirement but the purchaser and the supplier may, by agreement, judge colour by visual examination by comparison with an approved sample.

In view of the deterioration in quality of shellac on storage and its usage in food and pharmaceutical industries the third revision was brought out in 1991 to incorporate certain modifications in the standard. This revision is taken up to update the standard to meet the present day challenges by incorporating the requirements of Heavy metal and Lead.

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 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

# Indian Standard

## SHELLAC — SPECIFICATION

### PART 1 HAND-MADE SHELLAC

#### (Fourth Revision)

#### 1 SCOPE

**1.1** This standard (Part 1) prescribes the requirements and the method of sampling and test for hand-made shellac.

**1.2** The limits prescribed in the standard are limits for rejection.

#### 2 REFERENCES

The standards listed below contain provisions, which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	Title
4905 : 1968	Methods for random sampling
4908 : 1968	Glossary of terms used in lac industry
6921 : 1973	Methods of sampling and test for lac and lac products

#### 3 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 4908 and the following shall apply.

**3.1 Approved Sample** — The sample agreed upon between the purchaser and the supplier as the standard for colour and general appearance.

#### 4 FORM AND CONDITION

Shellac shall be in the form of flakes, or sheets, or buttons or any other form agreed to between the purchaser and the supplier. The colour appearance shall be as agreed upon between the purchaser and the supplier.

#### 5 GRADES

**5.1** There shall be six grades of hand-made shellac, namely, Grade Special, and Grades A, B, C, D and E. Further, the names of the grades as prevalent in trade may be indicated in addition in parentheses as shown below:

Grade Special (Kusmi Lemon), and Grade B (Lemon No. 2).

**5.1.1** The correspondence between the standard grades and trade grades is shown below:

Sl No.	Standard Grade	Trade Grade
a)	Grade Special	i) Kusmi buttonlac
		ii) Kusmi lemon shellac
		iii) Superior lemon shellac
b)	Grade A	i) Lemon No.1 shellac
		ii) Pure 1 buttonlac
		iii) Golden shellac
		iv) Light pure buttonlac
c)	Grade B	Lemon No. 2 shellac
d)	Grade C	i) FO superfine shellac
		ii) Standard 1 shellac
		iii) Yellow orange shellac
e)	Grade D	Pure TN shellac
f)	Grade E	ITN shellac

#### 6 MANDATORY REQUIREMENTS

##### 6.1 Matter Insoluble in Hot Alcohol

**6.1.1** Shellac shall not contain more than the following specified basic limits of matter insoluble in hot alcohol, when determined by either of the methods prescribed in 6 of IS 6921. In case of dispute the method prescribed in 6.2 shall be used as referee method. By agreement between the purchaser and the supplier, the basic limit may be relaxed but it shall not in any case exceed the relaxed limit prescribed in Table 1.

**Table 1 Matter Insoluble in Hot Alcohol**

Sl No.	Grade	Matter Insoluble in Hot Alcohol	
		Basic Limit Percent by Mass, Max	Relaxed Limit Percent by Mass, Max
(1)	(2)	(3)	(4)
i)	Special	0.75	1.0
ii)	A	1.0	1.5
iii)	B	1.25	2.0
iv)	C	1.5	2.5
v)	D	2.5	3.5
vi)	E	3.0	5.0

**6.2 Colour Index or Colour and Appearance**

6.2.1 The colour index of shellac, as determined by the method prescribed in 7 of IS 6921, shall be not in excess of the limits given in Table 2.

**Table 2 Colour Index**

SI No.	Grade	Colour Index, Max
(1)	(2)	(3)
i)	Special	6
ii)	A	12
iii)	B	15
iv)	C	18
v)	D	25
vi)	E	30

6.2.2 No colouring matter be added to the material during processing or subsequently. The appearance would be determined by the natural colouring pigments present in lac resin.

**6.3 Rosin**

Shellac shall not contain any rosin, when tested by the method prescribed in 9 of IS 6921.

**6.4 Orpiment and Other Arsenical Impurities**

6.4.1 Shellac shall not contain any orpiment, when tested by the method prescribed in 14 of IS 6921 except when a specified percentage is agreed to between the purchaser and the supplier, in which case the determination shall be carried out as prescribed in 20.1 of IS 6921.

NOTE — Shellac is not expected to contain any orpiment or any other arsenical impurities but to guard against inadvertent contamination, when orpiment free shellac is required, it shall not contain more than  $2 \times 10^{-4}$  percent by mass of orpiment and/or other arsenal impurities.

**7 OPTIONAL REQUIREMENTS**

7.0 The optional requirements given below shall be subject to agreement between the purchaser and the supplier.

**7.1 Volatile Matter**

Shellac shall not contain more than 2.0 percent by mass of volatile matter (moisture), as determined by the method prescribed in 5 of IS 6921.

**7.2 Wax**

Shellac shall not contain wax in excess of 5.5 percent by mass as determined by the method prescribed in 11 of IS 6921.

**7.3 Ash**

Shellac shall not leave, on incineration, ash in excess of the limits given in Table 3, when tested by the method prescribed in 12 of IS 6921.

**Table 3 Ash Content**  
(Clause 7.3)

SI No.	Grade	Ash, Percent by Mass, Max
(1)	(2)	(3)
i)	Special	0.5
ii)	A	0.5
iii)	B	0.8
iv)	C	1.0
v)	D	1.0
vi)	E	1.0

**7.4 Matter Soluble in Water**

Shellac shall contain not more than 0.5 percent by mass of matter soluble in water and the aqueous extract shall not be acidic to methyl red or alkaline to bromothymol blue. The test shall be carried out according to the method prescribed in 13 of IS 6921.

**7.5 Flow Test**

Shellac shall have a flow within the range agreed to between the purchaser and the supplier, when tested by the method prescribed in 21 of IS 6921.

**7.6 Heat Polymerization Test**

Shellac shall satisfy a heat polymerization test within the range of time as agreed to between the purchaser and the supplier. The method shall be that prescribed in 22 of IS 6921 and unless otherwise agreed, the temperature of test shall be 150°C.

**7.7 Acid Value**

The acid value of shellac shall be fixed, if desired, by agreement between the purchaser and the supplier. The acid value of shellac to be used in food industry shall be preferably between 73 and 89 when determined by the method prescribed in 16 of IS 6921.

**7.8 Lead Content**

The limit of lead content shall be subject to agreement between the purchaser and the supplier and the percentage of lead shall be determined by the method prescribed in 16 of IS 6921.

NOTE — Shellac is not expected to contain any lead, but to guard against inadvertent contamination, when lead-free shellac is required, it shall not contain more than 0.03 percent by mass of lead calculated as lead.

**7.9 Grit**

The maximum limit for grit content in shellac shall be as agreed to between the purchaser and the supplier. When required, it shall be determined by the method prescribed in 23 of IS 6921.

**7.10 Iodine Value**

The maximum limit for iodine value of shellac shall be as agreed to between the purchaser and the supplier. When required, it shall be determined by any one of the two methods prescribed in 24 of IS 6921.

## 8 PACKING AND MARKING

### 8.1 Packing

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

**8.1.1** It is recommended that the material be consumed as early as possible after purchase; till the time it is consumed, the containers shall be stored at low temperatures preferably 4 to 5°C.

### 8.2 Marking

**8.2.1** The material shall be marked with the following information:

- Name, standard grade and trade grade (*see* 5.1 and 5.1.1);
- Net weight;
- Indication of the source of manufacture;
- Month and year of manufacture;

e) Lot number or Code number to trace the lot of manufacture; and

f) Best before 12 months from date of manufacturing.

### 8.2.2 BIS Certification Marking

Each package of shellac may also be marked with the Standard Mark.

**8.2.2.1** 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 the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

## 9 SAMPLING

Representative samples of the material shall be drawn and their conformity determined in accordance with the method prescribed in Annex A.

## ANNEX A

(Clause 9)

### SAMPLING OF SHELLAC

#### A-1 SCALE OF SAMPLING

##### A-1.1 Lot

All the packages of the shellac belonging to the same batch of manufacture, in a single consignment and of the same grade shall be grouped together and shall constitute a lot.

**A-1.2** For ascertaining the conformity of the lot to the requirements of this specification, tests shall be carried out on each lot separately.

**A-1.3** The number of packages to be selected ( $n$ ) shall depend on the lot size ( $N$ ) and shall be in accordance with Table 4.

**Table 4** Number of Bags/Containers to be Selected for Sampling

Sl No.	Lot Size	No. of Bags/ Containers to be Selected
	$N$	
(1)	(2)	(3)
i)	Up to 50	5
ii)	51 to 100	10
iii)	101 to 200	20
iv)	201 to 300	30
v)	301 to 400	40
vi)	401 and above	50

**A-1.3.1** These packages shall be selected at random. In order to ensure the randomness of selection, random sampling procedure given in IS 4905 may be adopted.

#### A-2 PREPARATION OF TEST SAMPLE AND NUMBER OF TESTS

**A-2.1** Samples shall be taken in the manner prescribed in 3 of IS 6921.

**A-2.1.1** Samples shall be stored in air-tight containers at temperature not more than 20°C for periods up to three months; if it is intended to keep the samples for longer period, they shall be kept in a refrigerator.

##### A-2.2 Number of Tests

**A-2.2.1** Tests for matter insoluble in hot alcohol, colour index, rosin, orpiment and arsenic shall be done on two independent samples.

**A-2.2.2** Tests for all other characteristics shall be done on a single sample only.

##### A-2.3 Criteria for Conformity

The lot shall be considered as conforming to the specification if no failure occurs in any test.



## Bureau of Indian Standards

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### Amendments Issued Since Publication

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