INTERNATIONAL STANDARD 55

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Seedlac — Specification

Gomme laque en grains — Spécification

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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 55 was developed by Technical Committee ISO/TC 50, *Lac,* and was circulated to the member bodies in February 1976.

It has been approved by the member bodies of the following countries :

Austria	Mexico	Thailand
Czechoslovakia	Netherlands	Turkey
Egypt, Arab Rep. of	Romania	United Kingdom
India	Sweden	

No member body expressed disapproval of the document.

This International Standard cancels and replaces ISO Recommendation R 55-1957, of which it constitutes a technical revision.

Acknowledgement is due for the assistance that has been derived from the specifications and publications of the American Society for Testing and Materials, the American Bleached Shellac Manufacturer's Association, the United States Shellac Importer's Association, the British Standards Institution, the Agricultural Marketing Adviser to the Government of India, Messrs. Angelo Brothers, Ltd., Calcutta, and the Indian Lac Research Institute. Considerable assistance has been derived also from *A Handbook of Shellac Analysis,* by M. Rangaswami and H. K. Sen, issued by the Indian Lac Research Institute.

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Seedlac — Specification

0 INTRODUCTION

0.1 The usual trade descriptions of seedlac are based on the Indian names of the host trees, the season of cropping the sticklac, visual differences or a combination of any of these. The use of these grade designations led to confusion and some marketing difficulties. When ISO/R 55 was prepared in 1957, it was decided to adopt only seven grades which were independent of the names of host trees or seasons. However, the expectation that the ISO grades for seedlac would be increasingly adopted in trade and ultimately replace the traditional grade designations has not come about. A new system has therefore been adopted in this International Standard so that seedlac can now be completely identified by a combination of the ISO grade and the trade grade. In this revision, it has been found possible to reduce the number of ISO grades from seven to five.

0.2 For matter insoluble in hot alcohol, two limits are prescribed, in line with trade practice : a basic limit and a relaxed limit. The relaxed limit shall be the limit for rejection.

0.3 The requirement for non-volatile matter soluble in cold alcohol has not been retained as this requirement is applied in practice to waste products of lac only.

0.4 One of the requirements for seedlac, namely that for matter insoluble in hot alcohol, is included in this International Standard as an essential clause. The remainder, namely those for volatile matter (moisture), colour, bleach index and bleachability, matter soluble in water, wax and ash, are optional.

0.5 For determination of bleach index and bleachability, two methods are practised. One has been developed in India and the other in the U.S.A. The method to be followed for the determination of bleach index and bleachability shall be subject to agreement between the purchaser and the supplier.

0.6 For the purpose of deciding whether a particular requirement of this International Standard is complied with, it is necessary for the final value, observed or calculated, expressing the result of test or analysis to be rounded off to the same number of places as that in the specified value, it being always understood that the analyst will carry out his determination to at least one place more than in the specified value.

1 SCOPE AND FIELD OF APPLICATION

1.1 This International Standard specifies requirements and methods of test for seedlac.

1.2 This International Standard is intended chiefly to cover the technical provisions for guiding the purchase of the material, but does not include all the necessary provisions of a contract.

1.3 The limits specified in this International Standard are limits for rejection (see 0.2).

2 DEFINITIONS

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

2.1 sticklac : The natural product of lac insects.

2.2 seedlac : The product obtained by washing crushed sticklac.

2.3 approved sample : The sample agreed upon between the purchaser and the vendor as the standard for colour and appearance.

3 FORM AND CONDITION

The form and condition of seedlac are subject to agreement between the purchaser and the supplier.

4 GRADES

Five grades of seedlac, namely Special, A, B, C and D are specified. Further, if required by the purchaser, the names of the grades as prevalent in trade shall be indicated in addition, in parentheses, as shown below :

— Grade Special (Golden Kusmi);

— Grade B (Kusmi No. 2).

The correspondence between ISO grades and trade grades is shown in table 1.

TABLE 1

ISO grade	Trade grade
Special	i) Golden Kusmi ii) Golden Bysacki iii) Grade I, Class A
A	i) Kusmi No. 1 ii) Grade II, Class A
B	i) Kusmi No. 2 ii) Manbhum Fine Bysacki iii) Grade I, Class B
C	i) Fine Bysacki ii) Grade II, Class B
D	i) Ordinary Bysacki

5 MANDATORY REQUIREMENT

Matter insoluble in hot alcohol

Seedlac shall not contain more than the basic limits of matter insoluble in hot alcohol specified in table 2, when determined by either of the methods described in annex A, as agreed between the purchaser and the supplier. 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 as shown in table 2.

TABLE 2

Grade	Basic limit % (*m*/*m*)	Relaxed limit % (*m*/*m*)
Special	2,0	3,0
A	3,0	4,0
B	3,0	4,0
C	3,0	5,0
D	5,0	7,0

6 OPTIONAL REQUIREMENTS

6.1 Volatile matter (moisture)

Seedlac shall not contain more than 2,5 % (*m*/*m*) of volatile matter (moisture) as determined by the method described in annex B.

6.2 Colour index

The colour index of seedlac, as determined by the method described in annex C, shall not exceed the limits given in table 3.

TABLE 3

Grade	Colour index (maximum)
Special	8
A	10
B	12
C	18
D	30

Alternatively, the appearance and colour of seedlac shall not be inferior to those of an approved sample when judged by visual examination.

6.3 Bleach index and bleachability

The bleach index of seedlac shall be determined or the bleachability test for seedlac shall be carried out, if either is agreed between the purchaser and the supplier, in accordance with such methods as may be agreed between them (see 0.5).

6.4 Matter soluble in water

Seedlac shall not contain more than 1 % (*m*/*m*) of matter soluble in water, and the aqueous extract shall be neutral to methyl red. Matter soluble in water shall be determined by the method described in annex D.

6.5 Ash

The limits and methods of test for ash content of seedlac shall be subject to agreement between the purchaser and the supplier.

6.6 Wax

Seedlac shall not contain more than 5,5 % (*m*/*m*) of wax when determined by the method described in annex E.

7 SAMPLING

Samples shall be taken in the manner described in annex F.

ANNEX A
(See clause 5)

DETERMINATION OF MATTER INSOLUBLE IN HOT ALCOHOL

A.1 PRINCIPLE

The matter insoluble in hot alcohol is determined by extracting a known mass of seedlac with 95 % (*V*/*V*) ethanol and determining the percentage of the undissolved residue by either of the two methods described below, as may be agreed.

A.2 METHOD I

A.2.1 Reagent

Alcohol : 95 % (*V*/*V*) ethanol, or 95 % (*V*/*V*) denatured spirit.

A.2.2 Apparatus

A.2.2.1 Condenser, all glass, of the type and dimensions shown in figure 1, with the tip cut at an angle of 45°. The condenser shall have two holes in its tip to hold the siphon tube (A.2.2.2).

A.2.2.2 Siphon tube, of glass, of the type and dimensions shown in figure 1. The siphon tube shall have two holes near the top for a wire to be fastened to the condenser tip, leaving about 6 mm space between the top of the tube and the condenser tip.

Dimensions in millimetres
All dimensions are approximate

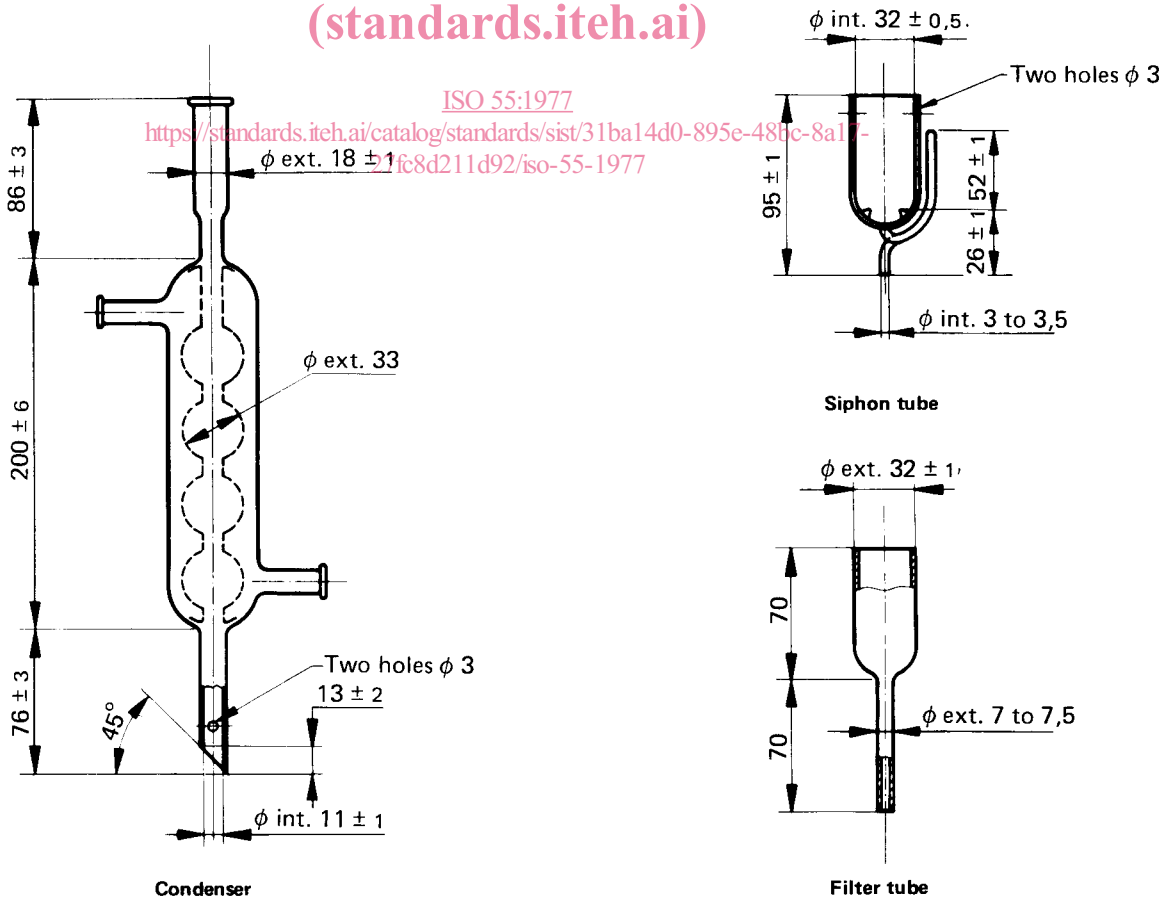

FIGURE 1 — **Extraction apparatus for determining matter insoluble in hot alcohol — Method I**

A.2.2.3 **Conical flask,** heat-resistant, wide-mouthed, preferably of borosilicate glass, approximately 175 mm in height and approximately 50 mm in inside diameter at the top.

The flask shall be fitted with a tight-fitting cork 25 mm in depth and bored to fit the stem of the condenser. The bottom of the cork shall be just above the holes for the wire in the condenser. To support the flask, a suitable ring support with iron clamp and nickel-chromium or iron gauze shall be used. The gauze shall not have asbestos covering.

A.2.2.4 **Carbon filter tube,** of the type and dimensions shown in figure 1, with a light spiral spring at the bottom to hold up the extraction cartridge. The stem of the filter tube shall be fitted with a rubber stopper and shall be firmly supported in a hot water bath.

A.2.2.5 **Extraction cartridges,** of fat-free paper, approximately 25 mm in diameter and approximately 60 mm in height.

A.2.2.6 **Weighing bottle,** glass-stoppered, approximately 80 mm in height and approximately 40 mm in diameter.

A.2.2.7 **Hot water bath,** made of about 0,9 mm thick copper or stainless steel, having a width of approximately 100 mm and other dimensions as given in figure 2.

The cover shall have a flanged hole, 57 ± 1 mm in diameter, for a 200 ml beaker, and also a hole 35 ± 1 mm in diameter through which the top of the filter tube projects. Directly below this hole, in the bottom of the bath, there shall be a flanged hole, 25 ± 1 mm in diameter, to hold the rubber stopper, through which the stem of the filter tube extends, to discharge into the bottle or flask. The hot water bath shall be mounted on a low tripod or stand.

Dimensions in millimetres
All dimensions are approximate

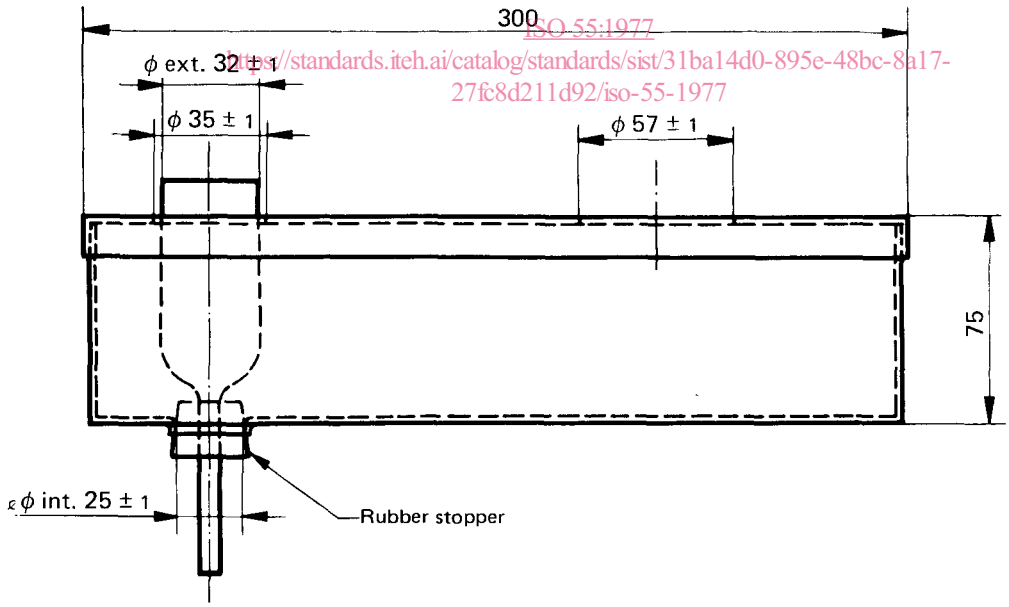

FIGURE 2 – **Hot water bath for insoluble matter test – Method I**

A.2.2.8 Beaker, tall-form, 200 ml capacity.

A.2.2.9 Desiccator, containing sulphuric acid, ρ 1,84 g/ml, as desiccant.

A.2.2.10 Drying oven, maintained at 100 ± 2 °C.

A.2.2.11 Weighing balance, accurate to 0,1 mg.

A.2.2.12 Gas burner, low form, adjustable, Bunsen type, carrying a draught shield, or any other suitable heating device.

A.2.3 Preparation of extraction cartridge

A.2.3.1 Place 125 ml of the alcohol (A.2.1) in the flask (A.2.2.3) and a new cartridge (A.2.2.5) in the siphon tube (A.2.2.2). Introduce the siphon tube into the flask and connect it to the condenser (A.2.2.1), making sure that there is ample flow of cold water through the condenser. Adjust the rate of heating so as to give a cycle of filling and emptying in the siphon tube every 2 min and extract for 30 min. Dry the cartridge in the oven (A.2.2.10) at 100 ± 2 °C. At the end of 2 h, weigh it in a tared weighing bottle (A.2.2.6), which has been kept in the desiccator over sulphuric acid (A.2.2.9), lifting the stopper of the bottle momentarily before weighing. Repeat the operations of drying, for periods of 1 h, and weighing, until the loss in mass between two successive weighings does not exceed 2 mg.

A.2.3.2 Use only new cartridges. A number of cartridges may be extracted, dried, weighed and kept in weighing bottles in a desiccator until needed for use.

A.2.4 Procedure

A.2.4.1 Before analysis, thoroughly mix the test sample (see F.3.1) by rolling on paper, at least ten times, to ensure uniformity of the test sample. Weigh, directly from the paper, 4,5 to 5,5 g of the sample, to an accuracy of 0,01 g, place in the beaker (A.2.2.8), add 125 ml of the alcohol (A.2.1), cover with a watch-glass and place on the hot water bath (A.2.2.7) (see figure 2). Boil the solution vigorously for 30 min to ensure complete solution of the seedlac and dispersion of wax. Keep the volume of alcohol constant by adding hot alcohol from a wash bottle, washing down the sides of the beaker.

A.2.4.2 Meanwhile, place an extracted and weighed cartridge in the filter tube. Maintain the hot water around the tube at not less than 90 °C. Wet the cartridge with hot alcohol and decant the boiling solution into the heated cartridge until the beaker is nearly empty.

A.2.4.3 Wash the remaining solution and the insoluble matter into the cartridge, using a "policeman", if necessary, with successive portions of hot alcohol contained in a wash-bottle kept hot on the water bath. Finally, wash the cartridge from the top downwards with a fine stream of hot alcohol. A complete washing and transfer from the original beaker will require at least 75 ml of hot alcohol.

A.2.4.4 Transfer the cartridge containing the insoluble matter to the extraction apparatus, place 125 ml of alcohol in the extraction flask and connect up the apparatus. Start the water flowing through the condenser, making sure that there is an adequate supply for efficient condensation. Light the burner and time the extraction from the first emptying of the siphon, running the extraction for exactly 1 h. Adjust the rate of heating so that a complete filling and emptying of the siphon tube takes place every 2 min, as determined by a stop-watch or preferably by a good two-minute sand-glass, one for each extraction apparatus.

A.2.4.4.1 In this way exactly 30 cycles per hour are accomplished. If this cycle rate is not meticulously maintained, neither check results on duplicate samples in the same laboratory nor concordant figures from one laboratory to another can be obtained, even when working on the same standard sample. It is also necessary to protect the apparatus from draughts while in operation, otherwise the proper cycle rate cannot be maintained.

A.2.4.4.2 Occasionally, seedlacs are encountered which do not yield the required number of 30 siphonings per hour, due to slow filtration, in these cases, continue the extraction until 30 siphonings have been accomplished or repeat the test with a 2 g test portion and report the sample as abnormal or slow filtering.

A.2.4.5 Remove the cartridge, drain in an upright position on filter paper and dry in the oven at 100 ± 2 °C. After drying for 2 h, place it in the weighing bottle, cool in the desiccator over sulphuric acid and weigh, removing the stopper momentarily just before weighing. Repeat the operations of drying, for periods of 1 h, and weighing, until the loss in mass between two successive weighings does not exceed 2 mg. From the mass of the residue and the mass of the sample, calculate the percentage of insoluble matter. Use the lowest mass in the caiculation.

A.2.5 Calculation

The matter insoluble in hot alcohol, expressed as a percentage by mass, is given by the formula

$$\frac{100\, m_2}{m_1}$$

where

m_1 is the mass, in grams, of the test portion;

m_2 is the mass, in grams, of the residue.