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Mazdoor Kisan Shakti Sangathan
"The Right to Information, The Right to Live"

"पुराने को छोड़ नये के तरफ"
Jawaharlal Nehru
"Step Out From the Old to the New"

Indian Standard

SHELLAC JOINTING COMPOUND — SPECIFICATION

( First Revision )

UDC 665.944.731
AMENDMENT NO. 1 FEBRUARY 2000
TO
IS 3447:1993 SHELLAC JOINTING COMPOUND — SPECIFICATION
(First Revision)


(Page 1, clause 4.1) — Substitute the following for the existing:
'The material shall be a viscous homogeneous solution of shellac [see IS 16 (Part 1):1991] in denatured spirit [see IS 324] together with some additives and shall be free from dust, grit and other visible impurities.'

(Page 1, clause 4.3) — Substitute the following for the existing:
'The total solids in the material shall be between 50 to 58 percent when determined by the method prescribed in Annex A.'

(Page 1, clause 4.5, line 2) — Substitute '52' for '50'.

(Page 1) — Insert the following new clause after 4.5:

4.6 Resistance to Motor Gasoline-Toluene Mixture
The film of the material shall not become soft or develop any cracks when tested as prescribed in Annex D.'

(Page 2, clause 6.1, line 2) — Substitute 'Annex E' for 'Annex D'.

(Page 3) — Insert the following new 'Annex D' after 'Annex C' and renumber the subsequent Annex:

1
ANNEX D
(Clause 4.6)
DETERMINATION OF RESISTANCE TO MOTOR GASOLINE AND TOLUENE MIXTURE

D-1 PRINCIPLE

D-1.1 The resistance to motor gasoline-toluene mixture is determined by dipping the dried film of the material, applied on the aluminium panel, in motor gasoline-toluene mixture for 24 h and examining the film for any softening or cracks.

D-2 APPARATUS

D-2.1 Aluminium Panel

D-3 REAGENTS

D-3.1 Motor Gasoline (see IS 2796) and Toluene (see IS 1839) Mixture — 3:1 (v/v).

D-3.2 Trichloroethylene (see IS 245).

D-4 PROCEDURE

D-4.1 Clean the aluminium panel with trichloroethylene by rubbing with a clean dry cloth and allow it to dry. Apply a uniform coating of the material with a brush on the panel and allow it to dry in air in a horizontal position for 48 h at room temperature. Immerse this panel in a stoppered container containing motor gasoline-toluene mixture and close it with the stopper. Remove the panel after 24 h and examine the film immediately for any softening or cracks.

D-4.2 Allow this panel to dry at room temperature for 24 h and examine again for any cracks developed on the film.

(PCD 12)
FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Adhesives Sectional Committee had been approved by the Petroleum, Coal and Related Products Division Council.

Shellac jointing compound is a solution of shellac in denatured spirit with some additives. The compound was earlier used as an adhesive to fix and keep in position gaskets in between two metallic parts of internal combustion engines such as automobile engines and stationery engines. It was also used as a sealing compound for joints against leakage of oil hence was extensively used in manufacture, repair and maintenance of automobile engines.

With the availability of sophisticated jointing compounds like anaerobics, RTV silicone rubber based jointing compounds and sealants such as anaerobic sealants, mastic sealants, PVC plastisols, rubber based, etc. which are much superior to shellac based jointing compounds, the shellac jointing compound are now used only for temporary retaining of metallic parts of automobile jointing materials. Alternatively these shellac jointing compounds are used on those areas which are not exposed to heat applications.

With the change in nature of usage of this material, in this revision, requirement for determination of total solids is being amended. The temperature of conducting test for determination of solids is changed from 105°C to 80°C in this revision as shellac based jointing compounds cannot withstand temperature higher than 80°C and material is no longer used for high temperature applications like internal combustion engines.

Requirement for resistance to motor gasoline and resistance to lubricating oils are deleted as these are found to be redundant, in the present context.

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 JOINTING COMPOUND —
SPECIFICATION
(First Revision)

1 SCOPE

This standard prescribes the requirements and the methods of sampling and test for shellac jointing or gasket compound, used for temporary retaining of the parts.

2 REFERENCES

The following Indian Standards are necessary adjuncts to this standard:

<table>
<thead>
<tr>
<th>IS No.</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>196:1966</td>
<td>Atmospheric conditions for testing (revised)</td>
</tr>
<tr>
<td>245:1988</td>
<td>Trichloroethylene, technical (third revision)</td>
</tr>
<tr>
<td>324:1959</td>
<td>Ordinary denatured spirit (revised)</td>
</tr>
<tr>
<td>3434:1984</td>
<td>Glossary of terms for adhesives and pressure sensitive adhesive tapes (first revision)</td>
</tr>
<tr>
<td>4905:1968</td>
<td>Methods for random sampling</td>
</tr>
</tbody>
</table>

The above mentioned standards 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 above.

3 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 3434:1984 shall apply.

4 REQUIREMENTS

4.1 Description

The material shall be a viscous homogeneous solution of shellac (conforming to IS 16:1956) in denatured industrial spirit (see IS 324:1959) and shall be free from dust, grit and other visible impurities.

4.2 Spreadability

The spreadability of the material shall be such that it is possible to brush it easily to a thin, smooth and uniform film on a metal surface with a brush.

4.3 Total Solids

The total solids in the material shall be not less than 60 percent when determined by the method prescribed in Annex A.

4.4 Drying Time

The coating of the material shall become tacky in not more than 5 minutes. It shall remain tacky for at least 10 minutes after application and shall be tackfree dry within 20 minutes when tested as prescribed in Annex B.

4.5 Acid Value

The acid value of the material shall not be more than 50 when determined by the method prescribed in Annex C.

5 PACKING AND MARKING

5.1 Packing

5.1.1 The material shall be suitably packed in well-closed containers. The packing shall be as agreed to between the purchaser and the supplier and subject to the provisions of law in force in the country at the time of packing.

5.1.2 All containers in which the material is stored shall be clean, dry and leak-proof. The containers shall be protected from light and stored in a cool place. If the containers are closed with corks, those shall be protected with metal foils.

5.2 Marking

5.2.1 Each container shall be marked with the following:

a) Name of the material:
5.2.2 Each container shall have a caution label ‘HIGHLY INFLAMMABLE’ together with the corresponding symbol for labelling of dangerous goods [see IS 1260 (Part 1) : 1973.]

5.2.3 The containers may also be marked with Standard Mark.

6 SAMPLING

6.1 Preparation of Test Samples

Representative sample of the material shall be prepared as prescribed in Annex D.

6.2 Number of Tests

Tests for determination of all the requirements of the standard given under 4 shall be performed on each of the individual samples separately.

6.3 Criteria for Conformity

A lot shall be declared as conforming to the requirements of the specification if all the test results, as obtained under 6.2, meet the requirements given in the standard.

ANNEX A

( Clause 4,3 )

DETERMINATION OF TOTAL SOLIDS

A-1 PROCEDURE

A-1.1 Weigh 0.5 to 0.6 g of the material, to an accuracy of 0.000 1 g, in a flat bottomed nickel dish, 70 to 80 mm in diameter and 15 to 25 mm in height, which has been previously dried in an oven at a temperature 80 ± 2°C and cooled and weighed to an accuracy of 0.000 1 g. Remove the alcohol from the solution by cautious evaporation in an oven at 80 ± 2°C, when the alcohol has almost disappeared, add 5 ml of acetone and evaporate in oven at 80 ± 2°C in order to obtain the residue in the form of thin even layer on the bottom of the dish. Continue to heat the dish with its contents for a period of four hours at the same temperature in the oven. Cool in a desiccator and weigh to an accuracy of 0.000 1 g.

A-2 CALCULATION

A-2.1 Total solids, percent by mass = \( \frac{100m}{M} \)

where

\[ m = \text{mass in g of the residue obtained after evaporation, and} \]

\[ M = \text{mass in g of the material taken for the test.} \]

ANNEX B

( Clause 4,4 )

DETERMINATION OF DRYING TIME

B-0 PRINCIPLE

B-0.1 The drying time is determined by examining a film of the material on aluminium panel at appropriate intervals by digital pressure.

B-1 APPARATUS

B-1.1 Aluminium Panel — 0.315 mm (or 30 SWG) in thickness and of 150 mm x 50 mm in size.

B-2 REAGENTS


B-3 PROCEDURE

B-3.1 Carry out the test at a temperature of 27 ± 2°C and 65 ± 5 percent relative humidity [see IS 196 : 1966]. Clean the aluminium panel with trichloroethylene by rubbing with a clean dry cloth and allow it to dry. Apply a uniform coating of the material with a brush on the aluminium panel and keep it in horizontal position. Examine the film at appropriate intervals by pressing with a finger for tackiness and note the time when the film has dried up.
ANNEX C  
( Clause 4.5 )

DETERMINATION OF ACID VALUE

C-0 PRINCIPLE
The acid value is determined by titrating the material with standard alcoholic potassium hydroxide solution.

C-1 REAGENTS

C-1.1 Rectified Spirit Neutral
Treat rectified spirit with silver nitrate crystals (0.5 g for 5 litres). Allow to settle overnight, filter and distil.

C-1.2 Thymol Blue Indicator
Dissolve 0.04 g of thymol blue in 100 ml of 50 percent rectified spirit.

C-1.3 Standard Alcoholic Potassium Hydroxide — 0.1 N. Dissolve about 7 g of potassium hydroxide in one litre of neutral rectified spirit and store in a glass-stoppered bottle for 24 hours. Decant off the clear solution. Standardize in the usual manner using thymol blue indicator.

C-2 PROCEDURE
Weigh by difference from a weighing bottle about 2 g of the material in a conical flask. Dissolve it in 50 ml of neutral rectified spirit. Titrate with alcoholic potassium hydroxide solution using thymol blue as an external indicator till the colour changes from yellow to greenish blue.

C-3 CALCULATION
\[
\text{Acid value} = 56.1 \frac{V N}{M}
\]
where
- \( V \) = volume in ml of standard potassium hydroxide solution used,
- \( N \) = normality of standard alcoholic potassium hydroxide solution, and
- \( M \) = mass in g of the material taken for the test.

ANNEX D  
( Clause 6.1 )

SAMPLING OF SHELLAC JOINTING COMPOUNDS

D-1 GENERAL REQUIREMENTS OF SAMPLING

D-1.0 In drawing, preparing, storing and handling test samples, the following precautions and directions shall be observed.

D-1.1 Samples shall not be taken in an exposed place.

D-1.2 The sampling instrument shall be clean and dry.

D-1.3 Precautions shall be taken to protect the samples, the material being sampled, the sampling instrument and containers for samples from adventitious contamination.

D-1.4 The samples shall be placed in clean and dry glass containers.

D-1.5 After filling, the sample containers shall be closed tightly with a stopper, sealed air tight and marked with full identification particulars, such as sample number, the date of sampling, the batch of manufacture of material, indication of source of manufacture and other important particulars of the consignment.

D-1.6 Samples shall be stored in such a manner that the conditions of storage especially pertaining to heat and light do not unduly affect the quality of the material.

D-2 SCALE OF SAMPLING

D-2.1 Lot
All the containers of the same size in a single consignment of the material, drawn from a single batch of manufacture shall constitute a lot. If a consignment is declared or known to consist of different batches of manufacture, or of different sizes of containers, the containers belonging to the same batch and of the same size shall be grouped together and each such group shall constitute a separate lot.

D-2.1.1 Samples shall be tested for each lot for ascertaining the conformity of the material to the requirements of the specification.

D-2.2 The number of containers (\( n \)) to be selected from a lot shall depend on the size of the lot (\( N \)) and shall be in accordance with Table 1.
Table 1  Number of Containers to be Selected for Sampling

<table>
<thead>
<tr>
<th>Lot Size</th>
<th>No. of Containers to be Selected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 25</td>
<td>3</td>
</tr>
<tr>
<td>26 to 50</td>
<td>4</td>
</tr>
<tr>
<td>51 to 100</td>
<td>5</td>
</tr>
<tr>
<td>101 to 150</td>
<td>6</td>
</tr>
<tr>
<td>151 to 300</td>
<td>8</td>
</tr>
<tr>
<td>301 and above</td>
<td>10</td>
</tr>
</tbody>
</table>

NOTE — In the case of very small lots where the selection of three containers may be uneconomical, the number of containers to be selected and the criterion for judging the conformity of the lot to the specification shall be as agreed between the purchaser and the supplier.

D-2.3 The containers shall be selected at random and in order to ensure the randomness of selection, a random number table shall be used. In case such a table is not available, the following procedure may be adopted:

Starting from any container, count them in one order as 1, 2, 3, ...., up to r and so on, where r is the integral part of \( N/n \) ( \( N \) being the lot size and \( n \) being the number of containers to be selected). Every \( r \)th container thus counted shall be withdrawn to give sample for test.

D-3 PREPARATION OF TEST SAMPLE AND REFEREE SAMPLE

D-3.1 To ensure that the sample taken from each container is representative of the contents, the contents shall be mixed thoroughly by shaking or by stirring or both.

D-3.2 After the contents are thoroughly mixed, a small representative portion of the material shall be taken with the help of a suitable sampling instrument from each of the containers selected according to D-2.3 (The approximate quantity of the material to be taken from each container shall be about one kilogram).

D-3.3 In case it is not possible to attain a thorough mixing by shaking or stirring, small representative portions of the materials shall be taken from different parts of the container with the help of a suitable sampling instrument so as to give representative sample for the container.

D-3.4 The material taken from each container shall be divided into three equal parts, each forming an individual sample. One set of the individual sample shall be marked for the purchaser, the second for the supplier and the third to be used as a referee sample.

D-3.5 All the samples shall be transferred to separate containers. These containers shall then be sealed air-tight and labelled with fully identification particulars given in D-1.5.

D-3.6 The referee samples consisting of a test of \( n \) individual samples representing \( n \) containers selected shall bear the seals of the both purchaser and the supplier. It shall be kept at a place agreed to between the purchaser and the supplier and shall be used in case of any dispute between the two.
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