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IS 289 (1963): Aluminium paste for paints [CHD 20: Paints, Varnishes and Related Products]
Indian Standard

SPECIFICATION FOR ALUMINIUM PASTE FOR PAINTS

(Revised)

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(Incorporating Amendment No. 1)

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NEW DELHI 110002

Gr 3

July 1963
Indian Standard

SPECIFICATION FOR

ALUMINIUM PASTE FOR PAINTS

(Revised)

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(Continued on page 2)
AMENDMENT NO. 2  SEPTEMBER 1989
TO
IS : 289 - 1963 SPECIFICATION
FOR ALUMINIUM PASTE FOR PAINTS

( Revised )

( Page 7, clause A-3.1 ) — Insert the following after this clause:

‘or

Petrez SP — 90 Resin’
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Indian Standard

SPECIFICATION FOR ALUMINIUM PASTE FOR PAINTS (Revised)

0. FOREWORD

0.1 This Indian Standard (Revised) was adopted by the Indian Standards Institution on 16 May 1963, 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 in 1952 and was based largely on the interim co-ordinated draft, compiled with the assistance of representatives of manufacturers and of various departments and authorities of the Government of India, by the Co-ordinating Subcommittee of the No. 5 Standing Committee on Specifications for Paints and Allied Stores of the General Headquarters, India (now Army Headquarters). The present revision incorporates important changes in the method of test for determination of leafing value. Besides, a number of other minor changes indicated through the experience of those making use of the standard have been introduced. Opportunity, while revising, has also been taken to substitute metric values for fps ones wherever existing in the original standard.

0.3 For residue on sieve, Indian Standard Sieves [conforming to IS: 460-1962 Specification for Test Sieves (Revised)] are prescribed. Where IS Sieves are not available, other equivalent standard sieves as judged by aperture size may be used.

0.4 Wherever a reference to any Indian Standard appears in this specification, it shall be taken as a reference to the latest version of the standard.

0.5 This standard is one of a series of Indian Standard specifications on aluminium paint and components. Other specifications published so far in the series are:

IS: 642-1963 VARNISH MEDIUM FOR ALUMINIUM PAINT (Revised)

IS: 2339-1963 ALUMINIUM PAINT FOR GENERAL PURPOSES, IN DUAL CONTAINER
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.

This standard is intended chiefly to cover the technical provisions relating to aluminium paste for paints, and it does not include all the necessary provisions of a contract.

1. SCOPE

1.1 This standard prescribes the requirements and the methods of test for the material commercially known as aluminium paste for paints. The material is generally used for making ready mixed paints.

2. TERMINOLOGY

2.1 For the purpose of this standard, the definitions given in IS 1303-1958 Glossary of Terms Relating to Paints and under 2 of IS 85-1950 Methods of Test for Oil Pastes for Paints shall apply.

3. SAMPLING

3.1 The supplier shall submit a tender sample packed in three different containers, each containing not less than 500 g of the material.

3.2 Representative samples of the material shall be drawn as prescribed under 3 of IS 85-1950 Methods of Test for Oil Pastes for Paints.

4. REQUIREMENTS

4.1 Form and Condition — The material shall be supplied in the form of a smooth homogeneous paste and there shall be no separation of the solvent from the paste.

4.2 The material shall be based on aluminium powder being in the form of flakes, which can be ascertained by microscopic examination and a suitable solvent. The paste shall have an aluminium powder content of not less than 64 percent.

4.3 Leafing Value — The leafing value of the material shall be not less than 65.0 percent when determined by the method given in Appendix A.

4.4 The Material shall also comply with the requirements given in Table I.
### TABLE I REQUIREMENTS FOR ALUMINIUM PASTE FOR PAINTS

*Clause 4.4*

<table>
<thead>
<tr>
<th>Sl No.</th>
<th>Characteristic</th>
<th>Requirement</th>
<th>Method of Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ref to Cl No. in IS: 85-1950 Appendix</td>
</tr>
<tr>
<td>(1)</td>
<td></td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>i)</td>
<td>Residue on sieve, percent by weight, <em>Max</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a)</td>
<td>150-micron IS Sieve (using 30 g sample)</td>
<td>15 Nil</td>
<td></td>
</tr>
<tr>
<td>b)</td>
<td>75-micron IS Sieve (using 20 g sample)</td>
<td>8 0·5</td>
<td></td>
</tr>
<tr>
<td>c)</td>
<td>53-micron IS Sieve (using 10 g sample)</td>
<td>5 3·0</td>
<td></td>
</tr>
<tr>
<td>ii)</td>
<td>Grease content, percent by weight, <em>Max</em></td>
<td>3·0</td>
<td>B</td>
</tr>
<tr>
<td>iii)</td>
<td>Settling properties</td>
<td>Shall not settle to an apparent volume of less than 12 ml</td>
<td>C</td>
</tr>
<tr>
<td>iv)</td>
<td>Volatile matter, percent by weight, <em>Max</em></td>
<td>36·0</td>
<td>D</td>
</tr>
<tr>
<td>v)</td>
<td>Keeping properties</td>
<td>Not less than one year from date of manufacture</td>
<td>13</td>
</tr>
</tbody>
</table>

*IS : 85-1950 Methods of Test for Oil Pastes for Paints.*

### 4.5 Total Impurities — The material shall not contain impurities including copper and lead by more than the following limits on the basis of grease-free material:

<table>
<thead>
<tr>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Total impurities including copper and lead</td>
</tr>
<tr>
<td>b) Copper</td>
</tr>
<tr>
<td>c) Lead</td>
</tr>
</tbody>
</table>

4.5.1 The copper content and impurities other than lead may be determined by relevant methods specified in *IS : 504-1954 Methods of Chemical Analysis of Aluminium and Its Alloys.* The lead content shall be determined by the method described under 12 of IS : 85-1950 Methods of Test for Oil Pastes for Paints.

*Since revised.*
4.6 **Optional Requirement** — The water content of the material when determined by the Karl Fischer Method (*see* IS:2362-1963 *Determination of Water by the Karl Fischer Method*) shall not be more than 0.15 percent.

5. **TESTS**

5.1 Tests shall be conducted as prescribed in IS: 85-1950 *Methods of Test for Oil Pastes for Paints,* IS: 504-1954 *Methods of Chemical Analysis of Aluminium and Its Alloys* and IS: 2362-1963 *Determination of Water by the Karl Fischer Method.* References to the relevant clauses of these standards are given in col 4 of Table I and under 4.5.1 and 4.6.

5.2 **Quality of Reagents** — Unless otherwise specified, pure chemicals and distilled water [*see* IS:1070-1960 *Specification for Water, Distilled Quality (Revised)*] shall be employed in tests.

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

6. **PACKING AND MARKING**

6.1 **Packing** — Unless otherwise agreed to between the purchaser and the supplier, the paste shall be packed in metal containers conforming to IS: 1407-1959 *Specification for Round Paint Tins* and IS: 1549-1960 *Specification for Steel Drums and Kegs (Galvanized and Ungalvanized).*

6.2 **Marking** — The containers shall be marked with the name of the material; manufacturer's name and trade-mark, if any; weight of the material; and the month and year of manufacture.

6.2.1 The containers may also be marked with the *Standard Mark*.

Note — 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 Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

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

*Since revised.
†Since withdrawn [*see* IS:2552-1970 *Specification for steel drums (galvanized and ungalvanized) (first revision)*].
A P P E N D I X  A
(Clause 4.3)

DETERMINATION OF LEAFING VALUE

A-1. DEFINITION

A-1.1 Leafed Area — is the completely covered surface free from cracks or breaks, when tested as prescribed under A-5.

A-2. APPARATUS

A-2.1 Spatula — of polished steel which shall be free from taper, with the length of blade not less than 140 mm, width of 13 to 14 mm and the thickness not more than 1.6 mm.

A-2.2 Test-Tube — 150 mm in length, with an internal diameter of 19 mm.

A-2.3 Glass Cylinder — 200 mm in length, with an internal diameter of 40 mm.

A-2.4 Cork — with top diameter 41 mm and bottom diameter 38 mm.

A-3. REAGENTS

A-3.1 Coumarone-Indene — commercially pure resin, with melting point 127° to 137°C; specific gravity 1.07 to 1.09, and acid value not more than 0.5.


A-4. PREPARATION OF LEAF-TESTING VEHICLE

A-4.1 Procedure — Grind the resin finely. Prepare a solution by dissolving 30 g of the resin in 100 ml of petroleum hydrocarbon solvent with gentle heating. Adjust the specific gravity to between 0.867 to 0.874 at 27°C. Allow it to stand for 36 hours, decant and retain the clear portion in a stoppered glass bottle for use.

A-5. PROCEDURE

A-5.1 The test shall be carried out at a temperature between 21° and 38°C.

A-5.2 Transfer 25 ml of the vehicle to a clean container. Accurately weigh 3.5 g of the aluminium paste in a small dish. Add about 4 ml out of the 25 ml quantity of the vehicle and mix to a stiff paste with a spatula or a small stiff brush. Add approximately 5 ml more of the vehicle and stir to

*Since revised.
a smooth mixture, then add the remainder of the vehicle and continue stirring to obtain complete dispersion. Immediately transfer enough of the mixture to the test-tube to give a depth of about 110 mm with the spatula immersed. Remove any bubble on the surface of the liquid by dipping and withdrawing the end of the spatula. Dip the spatula to the bottom of the mixture and rotate it gently through an arc of about 90° for 10 seconds, reversing the direction of rotation once a second. Avoid the formation of bubbles and excessive splashing. Withdraw the spatula at a uniform rate in a total time of 6 ± 1 seconds, without touching the sides of the test-tube, and suspend it vertically in the closed glass cylinder containing 5 ml of the leafing liquid. If the spatula is withdrawn at this rate, not more than three drops of the mixture will drain from it. At the end of 6 minutes, after which time the leafing comes to rest, measure the length of the leafed area on both sides of the spatula. Clean the spatula by rinsing it in benzene (see IS: 1840-1961 Specification for Benzene, Reagent Grade) and wipe dry with a clean cloth. Stir the mixture in the test-tube and repeat the determination.

A-5.3 The cylinder, when not containing a suspended spatula, shall be closed by means of a cover glass or stopper so that the atmosphere within it remains saturated with the vapour from the leafing liquid when the spatula is inserted. A convenient method of suspending the spatula in the closed glass cylinder is to pass the steel handle of the spatula through the centre of the cork used to close the cylinder.

A-6. CALCULATION

A-6.1 Calculate the leafing value from the average of at least five determinations according to the following formula:

\[
\text{Leafing value} = \frac{100 \times A}{L}
\]

where

\( A \) = the average length of the completely leafed area, and

\( L \) = the total immersed length of the spatula.

**Appendix B**

[Table I, Item (ii)]

**DETERMINATION OF GREASE CONTENT**

B-1. PROCEDURE

B-1.1 Take sufficient quantity of the material to contain approximately 10 g of aluminium powder, weigh it accurately and extract in a Soxhlet
extractor with acetone (conforming to *IS: 170-1950 Specification for Acetone) for about three hours, during which period the solvent shall siphon at least eight times per hour. Remove the volatile solvents from the extract in the extraction flask in the usual manner, and weigh.

B-1.2 Remove the acetone from the sample in the thimble. Return the thimble to the Soxhlet extractor and extract with alcohol for about three hours, during which period the solvent shall siphon at least eight times per hour. Remove the volatile solvents from the extract, and weigh.

B-2. CALCULATION

B-2.1 The sum of the two extracts gives the grease content of the sample taken for the test. Express it as percentage of the weight of the material taken for the test.

APPENDIX C

[Table I, Item (iii)]

DETERMINATION OF SETTLING PROPERTIES

C-1. PROCEDURE

C-1.1 Accurately weigh sufficient quantity of the material to contain about 10 g of aluminium powder, and add to about 35 ml of benzene (conforming to IS: 1840-1961 Specification for Benzene, Reagent Grade) contained in a 50-ml stoppered measuring cylinder, the 50-ml graduation mark of which is approximately 13 cm from the zero mark. Shake the mixture thoroughly, make the level of the liquid up to 50 ml with benzene and again shake. Allow the contents of the cylinder to stand undisturbed for 18 hours at a temperature between 21° and 38°C. At the end of this period, note the upper line of separation of the aluminium powder, which indicates the apparent volume of settlement.

APPENDIX D

[Table I, Item (iv)]

DETERMINATION OF VOLATILE MATTER

D-1. DEFINITION

D-1.1 Volatile Matter — is the percentage loss in weight on heating the material to constant weight in an oven at 100° ± 2°C, when determined as described below (see D-2.1).

*Since revised.
D-2. PROCEDURE

D-2.1 Weigh accurately about 2 g of the material in a tared flat-bottom dish about 8 cm in diameter and keep in an oven maintained at 100° ± 2°C for two hours. At the end of this period, transfer the dish to a desiccator containing a suitable desiccating agent, and cool. Remove the dish and weigh. Repeat the heating at half-hour intervals till constant weight is obtained.

D-2.2 Express the loss in weight as percentage of the weight of the material taken for the test.