SRI LANKA STANDARD 538 : 1981

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SPECIFICATION FOR SYNTHETIC EMULSION RESIN BINDERS FOR PAINTS

BUREAU OF CEYLON STANDARDS

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SLS 538 : 1981

Gr. 5

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Sri Lanka.

Sri Lanka Standards are subject to periodical revision in order to accommodate the progress made by industry. Suggestions for improvement will be recorded and brought to the notice of the Committees to which the revisions are entrusted.

This Standard does not purport to include all the necessary provisions of a contract.

SRI LANKA STANDARD
SPECIFICATION FOR SYNTHETIC EMULSION RESIN BINDERS FOR PAINTS

FOREWORD

This Sri Lanka Standard was authorized for adoption and publication by the Council of the Bureau of Ceylon Standards on 1981-11-26, after the draft, finalized by the Drafting Committee on Paints, had been approved by the Chemicals Divisional Committee.

All standard values in this specification are given in SI units.

For the purpose of deciding whether a particular requirement of this specification is complied with, the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with CS 102. The number of significant places retained in the rounded off value should be the same as that of the specified value in this specification.

1 SCOPE

This specification prescribes the requirements and methods of sampling and test for synthetic emulsion resin binders for paints.

2 REFERENCES

CS 102 Presentation of numerical values

SLS 489 Glossary of terms for paints

SLS 523 Methods of sampling paints

SLS 533 Emulsion paints for interior use

SLS 535 Methods of test for paints

3 TERMINOLOGY

For the purpose of this specification, the terms defined in SLS 489 and the following shall apply :

3.1 resin binder: Various synthetic polymer resins in emulsion state, prepared by emulsion polymerization of vinyl and/or other monomers.

4 REQUIREMENTS

4.1 Description

The material shall be a homogeneous milk-white liquid (latex like).

4.2 pH

The pH of the material when tested as prescribed in **7.3** shall be as agreed to between the purchaser and the supplier, but shall not vary by more than ± 0.5 of the agreed value.

4.3 The material shall also comply with the requirements given in Table 1 when tested according to the methods given in Column 4 of the Table.

TABLE 1 - Requirements for synthetic emulsion resin binders

Serial No. (1)	Characteristics (2)	Requirements (3)	Methods of test; reference (4)
1	Film appearance	Clear and dry	Appendix **A**
2	Solids content, per cent by mass, min.	54	Appendix **B**
3	Viscosity at 25 °C, Pa s	0.15 to 0.35	SLS 535
4	Resistance to wet abrasion	To pass the test	Appendix **E** of SLS 533:1981
5	Ash, per cent by mass, max.	0.5	Appendix **C**
6	Residual free monomers, per cent by volume, max.	0.5	Appendix **D**

5 PACKAGING AND MARKING

5.1 Packaging

The material shall be packed in suitably lined metal drums or plastic containers.

5.2 Marking

The containers shall be marked with the following particulars:

a) Name of material;

b) Name and address of the manufacturer and/or registered trade mark;

c) Net mass, in kg, of the material;

d) Batch number.

6 SAMPLING

6.1 Method of sampling

From each of the sample containers prepared as in 7.2.1 of SLS 523, a small but equal quantity of material shall be taken and mixed thoroughly to form a composite sample. The composite sample shall be transferred to a sample container.

6.2 Number of tests

Tests for requirements given in this specification shall be carried out on the composite sample (see 6.1).

7 METHODS OF TEST

7.1 Tests shall be carried out as specified in 7.3, Appendices A to D and the relevant sections of SLS 533 and SLS 535.

7.2 Quality of reagents

Unless specified otherwise, chemicals of analytical grade and distilled water shall be employed in tests.

7.3 Determination of pH value

7.3.1 Take 50 ml of the material in a 100-ml beaker.

7.3.2 Determine the pH with a pH meter using glass calomel electrodes.

8 CRITERIA FOR CONFORMITY

The lot shall be declared to have complied with this specification if the composite sample satisfies all the relevant requirements.

APPENDIX A

DETERMINATION OF FILM APPEARANCE

A.1 APPARATUS

A.1.1 *Glass panels,* 150 mm x 100 mm.

A.1.2 *Panel rack.*

A.2 PROCEDURE

A.2.1 Weigh to the nearest g, about 100 g of the sample into a 250-ml beaker. Add from a measuring cylinder 20 ml of water and mix well. Allow the suspension to stand for 10 minutes to 15 minutes and pour over a horizontally held glass penel. Tilt the panel and allow the surplus to drain. Place the glass panel in a horizontal position on a rack and allow to dry under atmospheric conditions of 65 ± 5 per cent relative humidity and 27 ± 2 °C temperature. The drying should be carried out in dust free conditions.

A.2.2 Examine the test panel after 2 hours. The film shall be dry and clear in at least two thirds of the test surface.

APPENDIX B

DETERMINATION OF SOLIDS CONTENT

B.1 APPARATUS

B.1.1 *Aluminium or glass dishes,* 80-mm to 100-mm in diameter and 5-mm to 10-mm in depth.

B.1.2 *Aluminium or glass covers,* for dishes.

B.2 PROCEDURE

B.2.1 Dry a clean aluminium or glass dish with cover in an air-oven at 110 ± 2 °C. Cool in a desiccator and weigh. Stir the sample with a clean glass rod to ensure that it is homogeneous and weigh to the nearest milligram about 2 g of the sample in the dish, the weighing being done immediately after the dish is covered. Transfer the dish with the cover to the oven and allow to dry for 1 hour at 110 ± 2 °C with cover opened.

B.2.2 Remove the dish and cover from the oven, allow to cool in a desiccator and weigh.

B.2.3 Carry out a duplicate determination.

B.3 CALCULATION

B.3.1 Calculate the solids content using the following formula:

$$\text{Solids content, per cent by mass} = \frac{m_2 - m_1}{m_3 - m_1} \times 100$$

where,

m_1 = mass, in g, of the dish and cover;

m_2 = mass, in g, of the dish, cover and residue; and

m_3 = mass, in g, of the dish, cover and test sample.

B.3.2 Calculate the mean of the results of the duplicate determinations.

APPENDIX C

DETERMINATION OF ASH

C.1 APPARATUS

C.1.1 *Muffle furnace* (thermostatically controlled).

C.1.2 *Silica crucibles,* 25-ml, with lids.

C.2 PROCEDURE

C.2.1 Place the crucible with lid in the muffle furnace at 700 °C for 1 hour. Cool in a desiccator and weigh. Weigh to the nearest milligram about 3 g of the sample into the crucible. Dry in an air-oven, controlled at 110 ± 2 °C for 1 hour and then heat gently over a bunsen burner in a fume cupboard. Place the crucible in the muffle furnace controlled at 700 °C for 2 hours. Keep the crucible lid in place throughout both operations.

C.2.2 Remove the crucible and lid at the end of this period, allow to cool in a desiccator and re-weigh.

C.2.3 Carry out a duplicate determination.

C.3 CALCULATION

C.3.1 Calculate the ash using the following formula:

$$\text{Ash, per cent by mass} = \frac{m_2 - m_1}{m_3 - m_1} \times 100$$

where

m_1 = mass, in g, of the crucible and lid;

m_2 = mass, in g, of the crucible, lid and ash; and

m_3 = mass, in g, of the crucible, lid and test sample.

C.3.2 Calculate the mean of the results of the duplicate determinations.

APPENDIX D

DETERMINATION OF RESIDUAL FREE MONOMERS

D.1 APPARATUS

D.1.1 *Distillation assembly,* modified Dean and Stark apparatus.

D.2 REAGENTS

D.2.1 *Aqueous hydroquinone solution,* 5 per cent (m/v).

D.2.2 *Antifoaming agent,* silicone type.

D.3 PROCEDURE

Dilute 100 ml of the material with an equal amount of water. Add 2 ml aqueous hydroquinone solution and 0.5 ml of antifoaming agent. Transfer to a distilling flask and distil the contents. Collect the distillate in a graduated cylinder, equipped with recirculating provision. Recirculate the lower water layer to distilling flask and continue the distillation until the upper organic layer remains constant (this gives the per cent monomer present in the emulsion). Read off the volume of organic layer in the graduated cylinder.

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