SRI LANKA STANDARD 920 : 1991

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SPECIFICATION FOR

BRIGHT ALUMINIUM PAINT

SRI LANKA STANDARDS INSTITUTION

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SLS 920:1991

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SRI LANKA STANDARDS INSTITUTION
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This standard does not purport to include all the necessary provisions of a contract.

SRI LANKA STANDARD
SPECIFICATION FOR BRIGHT ALUMINIUM PAINT

FOREWORD

This Sri Lanka Standard was authorized for adoption and publication by the Council of the Sri Lanka Standards Institution on 1991-04-02, after the draft, finalized by the Drafting Committee on Paints and Varnishes, had been approved by the Chemicals Divisional Committee.

Aluminium paint covered by this specification is used for protective and decorative purposes, particularly where a high heat reflecting surface is required.

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 an anlysis shall be rounded off in accordance with CS 102. The number of significant places retained in the rounded off value shall be the same as that of the specified value in this specification.

In the preparation of this specification, the assistance derived from the publications of the International Organization for Standardization, Singapore Institute of Standards and Industrial Research and the American Society for Testing of Materials is gratefully acknowledged.

1 SCOPE

This specification prescribes requirements, methods of sampling and test for bright aluminium finishing paint suitable for both interior and exterior use.

2 REFERENCES

CS 102 Presentation of numerical values.
SLS 428 Random sampling methods.
SLS 489 Glossary of terms for paints.
SLS 523 Methods of sampling paints.
SLS 535 Methods of test for paints.
- Part 1 : Tests on liquid paints (excluding chemical tests)
- Part 2 : Tests involving chemical examination of liquid paints and dried paints films.
- Part 3 : Tests associated with paint film formation.
- Part 4 : Optical tests on paint films.
- Part 5 : Mechanical tests on paint films
- Part 6 : Durability tests on paint films.

SLS 606 Zinc chromate priming paint.

3 DEFINITIONS

For the purpose of this specification, the definitions given in **SLS 489** shall apply together with the following :

Leafing : The process in which the flakes of aluminium pigment migrate to the surface of the paint film and tend to assume positions with their major axes parallel to the surface.

4 REQUIREMENTS

4.1 Composition

4.1.1 *Pigment*

Pigment shall consist solely of leafing aluminium flakes in the paste form. The leafing value of the pigment shall be not less than 65 per cent when tested according to the method given in **Appendix A.**

4.1.2 *Vehicle*

The vehicle shall consist of alkyd resin or oleo-resinous varnish with acid value of not more than 6.

4.1.3 *Thinners, driers and additives*

Suitable thinners, driers and other additives shall be used.

4.2 Condition in the container

The paint shall be free from skin and shall show no excessive settling in a freshly opened can. It shall be easily redispersed to a smooth homogeneous state by stirring with spatula. The paint shall show no curdling, livering, caking, dry sediment and shall be free from lumps, loose skin pieces and foreign matter.

4.3 Colour

The paint shall have a bright silver colour characteristic of aluminium flake pigment.

4.4 Lustre

The paint film prepared on a burnished steel panel described as in **SLS 535 : Part 3 : Section 3.2** and allowed to dry for 24 hours at room temperature shall show a bright aluminium lustre.

4.5 Application properties

4.5.1 *Brushing properties*

The paint shall brush easily and possess good levelling properties when applied at a spreading rate of approximately 13 m^2/l on a smooth burnished steel panel. The surface of the dried paint film shall be smooth and free from sagging and/or wrinkling.

4.5.2 *Spraying properties*

The paint shall not show running, sagging, streaking or pronounced orange peel when sprayed (see Note) to give a dry film thickness of approximately 25 um on a smooth burnished steel panel. The dried film shall not show seeding, floating and other film defects.

NOTE

The paint should be thinned down to achieve the required dry film thickness.

4.6 Resistance to weathering

When examined as in Section 6.4 of SLS 535 : Part 6 : 1981, the paint shall not crack or blister and shall not show appreciable change in colour and lustre.

4.7 Other requirements

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

TABLE 1 - Requirements for aluminium paint

Sl. No. (1)	Characteristic (2)	Requirement (3)	Method of test (4)
(i)	Aluminium metal content, per cent by mass.	13 to 17	Appendix B
(ii)	Solid content, per cent by mass, min.	50	SLS 535 : Part 2: 1981 : Section 2.3
(iii)	Flow time (Ford cup No. 4), s.	35 to 45	SLS 535 : Part 1: 1981 : Section 1.3
(iv)	Bulk density, kg/l.	0.90 to 1.00	SLS 535 : Part 1: 1981 : Section 1.6
(v)	Drying time;		
	a) surface dry, h, max.	4	SLS 535 : Part 3: 1981 : Section 3.4
	b) hard dry, h, max.	24	SLS 535 : Part 3: 1981 : Section 3.5
(vi)	Flash point, ^{o}C , min.	30	SLS 535 : Part 1: 1981 : Section 1.5
(vii)	Gloss (specular reflection value), units.	60 to 100	SLS 535 : Part 4: 1981 : Section 4.3
(viii)	Flexibility and adhesion	To pass the test	SLS 535 : Part 5: 1981 : Section 5.3
(ix)	Resistance to water	To pass the test	SLS 535 : Part 6: 1981 : Section 6.3
(x)	Protection against corrosion under conditions of condensation	To pass the test	SLS 606 : 1983 Appendix B

4.8 Storage stability

The paint shall comply with the requirements specified in 4.2 to 4.7 after storage in the original closed container at room temperature for not less than 6 months from the date of manufacture.

5 PACKAGING AND MARKING

5.1 Packaging

The paint shall be packed in clean, dry containers. The containers shall be strong enough to withstand normal usage and shall be adequately sealed to prevent leakage and contamination of the contents during transporation and handling.

5.2 Marking

Each container shall be marked or labelled legibly and indelibly with the following :

(a) Name of the product as " Bright Aluminium Paint";
(b) Name and address of the manufacturer including country of origin;
(c) Brand name;
(d) Net content, in millilitres or litres;
(e) Batch or code number;
(f) Date of manufacture; and
(g) Directions for use.

NOTE

Attention is drawn to the certification facilities offered by the Sri Lanka Standards Institution. See the inside back cover of this standard.

6 SAMPLING

6.1 Lot : In any consignment all containers of Aluminium paint of the same size belonging to one batch of manufacture or supply shall constitute a lot.

6.2 Scale of sampling

6.2.1 Samples shall be tested from each lot for ascertaining its conformity to the requirements of this specification.

6.2.2 The method of drawing representative samples, number of containers to be selected and preparation of samples from a lot shall be as specified in the relevant clauses of SLS 523.

6.2.3 The containers shall be selected at random. In order to ensure randomness of selection tables of random numbers as given in SLS 428 shall be used.

6.3 Number of tests

6.3.1 Each container selected as in 6.2.2 shall be inspected for 4.2, 4.3, 4.4, 4.5, 5.1 and 5.2.

6.3.2 Equal quantities of paint shall be drawn from each container inspected as in 6.3.1 and mixed to form a composite sample given as in 7.2.1 (e) of SLS 523 and transferred to a sample container. The composite sample thus prepared shall be tested for the requirements given in 4.1.1, 4.6, 4.7 and 4.8.

7 METHODS OF TEST

Tests shall be carried out in accordance with the methods given in Parts 1 to 6 of SLS 535, Appendix B of SLS 606 and Appendices A and B of this specification.

8 CRITERIA FOR CONFORMITY

A lot shall be declared as conforming to the requirements of this specification, if the following conditions are satisfied.

8.1 Each container inspected as in 6.3.1 satisfies the relevant requirements.

8.2 The test results on the composite sample tested as in 6.3.2 satisfy the relevant requirements.

APPENDIX A
DETERMINATION OF LEAFING VALUE

A.1 APPARATUS

A.1.1 *Spatula or steel strip,* rectangular, square - ended and of polished steel with length not less than 140 mm, width 13 ± 1 mm and thickness not more than 1 mm.

A.1.2 *Glass cylinder,* preferably without spout, about 200 mm in height and 40 mm in internal diameter.

A.1.3 *Test tube,* about 150 mm in length with a diameter of about 20 mm and graduated to a length of about 110 mm from the base.

A.1.4 *Cork stoppers,* two, to fit the glass cylinder, one being slotted to hold the steel strip when suspended vertically in the cylinder.

A.1.5 *Evaporating dish,* of about 50 ml capacity.

A.2 REAGENTS

A.2.1 *Mineral turpentine,* the aromatics content of which has been adjusted to 20 per cent (V/V) by the addition of xylene. The relative density should then be within the range 0.780 to 0.790.

A.2.2. *Coumarone - Indene resin,* with an acid value of not greater than 0.5, completely soluble in mineral turpentine (A.2.1) when made up as the leafing test vehicle (A.3) without precipitating after standing for 24 hours at room temperature.

A.3 PREPARATION OF LEAFING TEST VEHICLE

Dissolve 50 g of ground resin (A.2.2) in 100 ml of mineral turpentine (A.2.1) stirring continuously while heating gently with a temperature not exceeding 50 ^{o}C . Make up any loss of solvent on a mass basis. Adjust the specific gravity of the solution within the range of 0.877 to 0.883.

A.4 PROCEDURE

Place 5 ml of the leafing test vehicle (A.3) in the glass cylinder (A.1.2). Close with the unslotted stopper and leave overnight.

Measure another 25 ml of the leafing test vehicle. Weigh to the nearest milligram, 3 g of aluminium pigment and add about 4 ml of the leafing test vehicle out of the 25 ml quantity. Mix to a stiff uniform paste. Add another 5 ml of the vehicle and stir to a smooth paste. Add the remainder gradually, mixing it carefully without introducing air bubbles into the mixture.

Immediately transfer enough of this mixture to the test tube (A.1.3) to give a depth of about 110 mm with the spatula immersed.

Dip the spatula to the bottom of the mixture and rotate it gently for about 10 seconds at about one-quarter turn (90°) per second, reversing the direction once per second and avoiding air bubbles and excessive splashing. Withdraw the spatula at a uniform rate in a total time of 6 $\pm$ 1 seconds without touching the sides of the test tube.

NOTE

Not more than 2 to 3 drops of the mixture should drain from the spatula.

Suspend the spatula vertically in the glass cylinder (A.1.2), in which the atmosphere is saturated with the vapour from the leafing test vehicle, using the slotted stopper to hold the spatula. Shelter the assembly from sunlight and ensure that the spatula is not at any time in contact with the vehicle at the bottom of the cylinder.

Allow to stand for 6 minutes (by which time the leafing comes to rest). Measure the length of the leafed area (the compeltely covered surface, free from cracks or breaks) (See Figure 1) and the total immersed length. Carry out two determinations with each test portion, taking readings to the nearest millimetre on both sides of the spatula. Calculate the mean of the readings for each test portion.

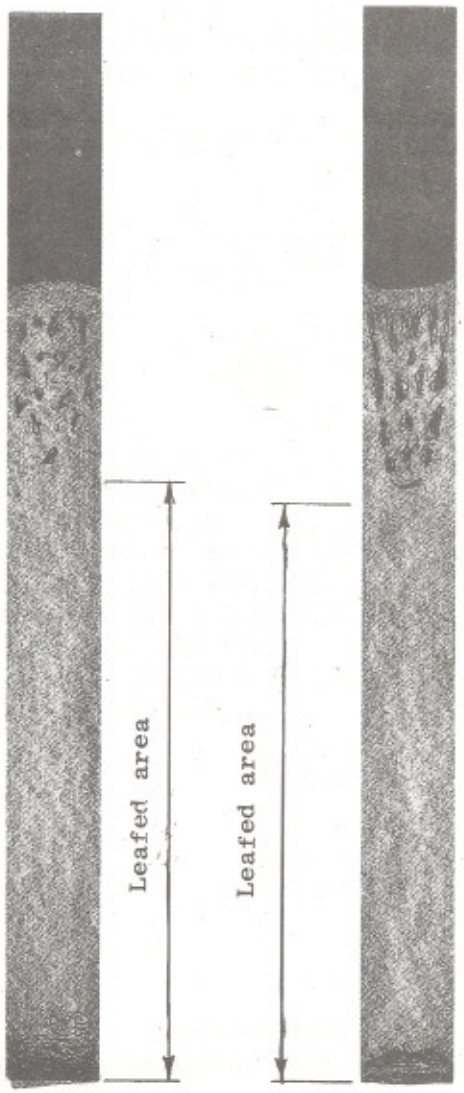

Figure 1 - Examples of measurement of leafed area.

A.5 CALCULATION

$$\text{Leafing value, per cent} = 100\,\frac{l_1}{l_2}$$

where,

l_1 is the length, in millimetres, of the completely leafed area; and

l_2 is the total immersed length, in millimetres.

APPENDIX B
DETERMINATION OF ALUMINIUM METAL CONTENT

B.1 APPARATUS

B.1.1 *Centrifuge*, with a multi-unit head, a speed of around 2000 rpm and an individual tube capacity of 60 ml minimum.

B.1.2 *Air oven*, thermostatically controlled at 105 ± 2 °C.

B.2 **Extraction mixture**, prepared by mixing Diethyl ether, Toluene, Methanol, and Acetone in the proportions of 10:6:4:1 by volume repectively.

B.3 PROCEDURE

Weigh to the nearest milligram, 15 g of the sample into a weighed centrifuge tube. Add 20 ml to 30 ml of the extraction mixture (B.2). Mix thoroughly with a glass rod. Wash the rod with the extraction mixture and make upto 60 ml in the tube. Place the tube in the centrifuge (B.1.1) and counterbalance with a similar tube with water. Centrifuge until well settled. Decant the supernatant liquid. Repeat the extraction twice with 40 ml of the extraction mixture. Set the tube in a steam bath for about 10 minutes, dry in air oven (B.1.2) at 105 ± 2 °C for about 2 hours. Cool and weigh.

B.4 CALCULATION

$$\text{Pigment content, per cent by mass} = \frac{m_1 - m_2}{m_0} \times 100$$

Where,

m_0 is the mass in g, of the test sample;
m_1 is the mass in g,of the tube (including stirring rod) and the pigment; and
m_2 is the mass in g, of the tube (including stirring rod).

SRI LANKA STANDARDS INSTITUTION

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