SRI LANKA STANDARD 1030 : 1994

UDC 667 . 638.2 : 669.71

SPECIFICATION FOR ALUMINIUM WOOD PRIMER

SRI LANKA STANDARDS INSTITUTION

SPECIFICATION FOR ALUMINIUM WOOD PRIMER

SLS 1030 : 1994

Gr. 6

Copyright Reserved

SRI LANKA STANDARDS INSTITUTION
53, Dharmapala Mawatha,
Colombo 3,
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 ALUMINIUM WOOD PRIMER

FOREWORD

This standard was finalized by the Sectoral Committee on Polymer and Polymer Products and was authorized for adoption and publication as a Sri Lanka Standard by the Council of the Sri Lanka Standards Institution on 1994-12-22.

The aluminium wood primer is suitable for providing a good foundation in respect of sealing properties and prevention of ingress of moisture for the subsequent application of undercoating and finishing.

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 analysis, shall be rounded off in accordance with SLS 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.

Guidelines for the determination of compliance of a lot with the requirements of this standard based on statistical sampling and inspection are given in Appendix A.

In the preparation of this standard, the valuable assistance derived from the following publications is gratefully acknowledged :

SS 5		Methods of test for paints, varnishes and related meterials
Part B 14	:1987	Determination of pigment content (centrifuge)
Part C2	:1987	Determination of aluminium metal content
SS 38	:1971	Aluminium wood primer
SABS 678	:1973	Primers for wood for interior and exterior use.

1 SCOPE

This specification prescribes the requirements and methods of test for aluminium wood primer to be used on the wood surfaces.

2 REFERENCES

ISO 6503	Paints and varnishes - Determination of total lead Flame atomic absorption spectrometric method
SLS 102	Presentation of numerical values
SLS 428	Random sampling method
SLS 489	Glossary of terms for paints
SLS 523	Methods of sampling paints
SLS 535	Methods of test for paints
Part 1 : 1981	Tests on liquid paints (excluding chemical tests)
Part 2 : 1981	Tests involving chemical examination of liquid paints and dried paint films
Part 3 : 1981	Tests associated with paint film formation
Part 5 : 1981	Mechanical tests on paint films
Part 6 : 1981	Durability tests on paint films.

3 DEFINITIONS

For the purpose of this specification, the definitions given in SLS 489 shall apply.

4 REQUIREMENTS

4.1 Composition

4.1.1 *Pigment*

The pigment shall consist of non leafing aluminium paste. Extenders such as china clay and whiting may be used where appropriate.

4.1.2 *Vehicle*

The vehicle shall consist of alkyd resin or oleo-resinous varnish with a suitably low acid value to give adequate storage stability.

4.2 Condition in the container

The aluminium wood primer 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 a 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 Brushing properties

The aluminium wood primer shall posses good levelling properties when applied at a spreading rate of approximately 13 m^2/l, on a smooth wood panel. The primer when dry shall have a smooth film free from sagging and /or wrinkling.

4.4 Lead content

The total lead content of the aluminium wood primer shall be not more than 0.5 per cent (m/m) when tested in accordance with ISO 6503 : 1984.

4.5 Other requirements

The aluminium wood primer 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 wood primer

Sl No. (1)	Characteristic (2)	Requirement (3)	Method of test (4)
i)	Aluminium metal content, per cent by mass,min.	12.5	Appendix B
ii)	Solid content, per cent by mass, min.	55	SLS 535:Part 2:1981 Section 2-3
iii)	Flow time (Ford cup 4), seconds,at 30°C	40 to 50	SLS 535:Part 1:1981 Section 1 - 3
iv)	Fineness of grind, um	40 to 50	SLS 535:Part 3:1981 Section 3-8
v)	Drying time		
	a) surface dry, hours,max	6	SLS 535:Part 3:1981 Section 3-4
	b) hard dry, hours,Max,	16	SLS 535:Part 3:1981 Section 3-5
vi)	Uncombined water, per cent by mass, max.	0.2	SLS 535:Part 2:1981 Section 2-2
vii)	Resistance to water	To pass the test	SLS 535:Part 6:1981 Section 5-3
viii)	Scratch hardness (under a load of 1 kg)	To pass the test	SLS 535:Part 5:1981 Section 5-2
ix)	Flexibility and adhession	To pass the test	SLS 535:Part 5:1981 Section 5-3
x)	Flash point,°C, min.	32	SLS 535 :Part 2:1981 Section 2-5

4.6 Storage stability

The Aluminium Wood primer shall comply with the requirements specified in 4.2 to 4.5 and shall not show thickening, gelling, hard caking and curdling after storage in original closed containers at 27° - 32° C for not less than 6 months. The paint shall also be easily dispersed for use.

5 PACKAGING AND MARKING

5.1 Packaging

The aluminium wood primer shall be packed in clean, dry containers. The containers shall be strong enough to withstand normal usage and shall be adequately sealed to prevent any contamination of the contents during transportation and handling.

5.2 Marking

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

a) Name of the product as "Aluminium Wood Primer";
b) Name and address of the manufacturer including country of origin;
c) Brand name;
d) Net content, in millilitres or in litres;
e) Batch or code number;
f) Month and year of manufacture; and
g) Directions for use and warnings if any.

NOTE

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

6 METHODS OF TEST

Tests shall be carried out in accordance with the methods given in **Parts 1,2,3,5,** and **6** of **SLS 535** and **Appendix B** of this specification.

APPENDIX A
COMPLIANCE OF A LOT

Sampling scheme given in this Appendix should be applied where compliance of a lot to the requirements of this standard is to be assessed based on statistical sampling and inspection.

Where compliance with this standard is to be assured based on manufacturer's control system coupled with type tests and check tests or any other procedure, and appropriate scheme of sampling and inspection should be adopted.

A.1 LOT

In any consignment all the containers of aluminium wood primer of the same size and belonging to one batch of manufacture or supply shall constitute a lot.

A.2 SCALE OF SAMPLING

A.2.1 Samples shall be tested from each lot for ascertaining its conformity to the requirements of this specification.

A.2.2 The method of drawing representative samples,the number of containers to be selected and preparation of samples from a lot shall be as specified in the relevant clauses of SLS 523.

A.2.3 The containers shall be selected at random. In order to ensure randomness of selection tables of random number as given in SLS 428 shall be used.

A.3 NUMBER OF TESTS

A.3.1 Each container selected as in A.2.2 shall be inspected for the requirements given in 4.2, 4.3, 5.1 and 5.2.

A.3.2 Equal quantities of paint shall be drawn from each container inspected as in A.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 4.4 and 4.5.

A.4 CRITERIA FOR CONFORMITY

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

A.4.1 Each container inspected as in A.3.1 satisfies the relevant requirements.

A.4.2 The test results on the composite sample tested as in A.3.2 satisfy the relevant requirements.

APPENDIX B
DETERMINATION OF ALUMINIUM METAL CONTENT

B.1 APPARATUS

B.1.1 *Centrifuge*, having an individual tube capacity of 60 ml speed of around 2000 rpm.

B.1.2 *Oven*, well-ventilated gravity convection-type thermostatically controlled to the specified temperature at 105 ± 2 °C.

B.2 REAGENTS

All reagents used shall be of analytical reagent grade.

Deionised or distilled water shall be used.

B.2.1 *EDTA standard 0.05 mol/l solution.* Dissolve 18.612 g of sodium edetate [($C_{10}H_{14}Na_2O_8.2H_2O$)] in water and dilute to 1 litre.

B.2.2. *Zinc standard 0.05 mol/l solution.* Dissolve 3.269 g of high purity zinc in 40 ml of hydrochloric acid (1:1). Add 2 drops of methyl red indicator and neutralise with ammonia (sp.gr=0.91). Make acid with hydrocholoric acid (1:1) and boil for 5 minutes. Cool and dilute to 1 litre with water.

NOTE: *If turbidity develops on dilution add just enough hydrochloric acid (1:1) to clear it up before making up to volume.*

B.2.3 *Sodium acetate, 30 per cent (m/v) solution.* Dissolve 300 g of sodium acetate ($CH_3COONa.3H_2O$) in water and dilute to 1 litre.

B.2.4 *Sodium fluoride saturated solution.*
Dissolve 60 g of sodium fluoride in 1 litre of boiling water, cool and filter into a polythene bottle.

B.2.5 *Methyl red indicator, 0.02 per cent (m/v) solution.* Dissolve 0.02 g of methyl red in 100 ml of 95 per cent (v/v) ethanol.

B.2.6 *Bromo-cresol green indicator, 0.05 per cent (m/v) solution.* Dissolve 0.05 g of bromo-cresol green in 100 ml of 96 per cent (v/v) ethanol.

B.2.7 *PAN indicator, 0.05 per cent (m/v) solution.* Dissolve 0.05 g of PAN {1-(2- Pyridylazo)-2-naphthol} in 100 ml of 95 per cent (v/v) ethanol.

B.2.8 *Hydrochloric acid (1:1).* Mix 1 volume of concentrated hydrochloric acid (sp.gr=1.18) with 1 volume of water.

B.2.9 *Hydrochloric acid (1:7).* Mix 1 volume of concentrated hydrochloric acid (sp.gr=1.18) with 7 volumes of water.

B.2.10 *Nitric Acid (1:1).* Mix 1 volume of concentrated nitric acid (sp.gr=1.42) with 1 volume of water.

B.2.11 *Ammonia (sp.gr=0.91).*

B.3 PROCEDURE

B.3.1 *Separation of pigment* Weigh to the nearest milligram, 15 g of the sample into the weighed centrifuge tube. Add 20 ml to 30 ml of one of suitable solvent and mix thoroughly with a glass rod. Wash the rod with more of the solvent and make up to 60 ml with solvent. Centrifuge until well settled. Decant the clear supernatant liquid. Repeat the extraction twice with 40 ml of the solvent. After drawing off the liquid, hold the tube in nearly horizontal position, tap the side of the tube to dislodge the pigment cake from the bottom of the glass tube, set the tube in a steam bath for 10 minutes, then in the oven (B.1.2) for 2 hours, cool and weigh.

B.3.2 *Determination* Weigh to the nearest milligram, 0.5 g of the pigment extracted from the paint (see B.3.1)in a 250-ml conical flask. Add in 100 ml of hydrochloric acid (B.2.9) cover and cool in a water bath to prevent too vigorous reaction at the start. When the reaction subsides warm on a hot plate at low heat until most of the aluminium metal has dissolved.

Add a few drops of nitric acid (B.2.10) to dissolve any dark residue of copper or lead. Samples containing high silicon content yield a dark residue insoluble in the hydrochloric acid. Heat to boiling for one minute. Rinse down and dilute to about 120 ml with water and heat to boiling for 1/2 minute to expel nitrogen dioxide. Cool and transfer the solution to a 250-ml volumetric flask. If there is any appreciable insoluble matter, filter the solution before making up to 250 ml.

Pipette 25 ml of this solution into a 500-ml conical flask covered with a funnel. Introduce 10 ml of hydrochloric acid (B.2.9), 50 ml of water and 50 ml of 0.05 mol/l EDTA solution (B.2.1) . Add two drops of methyl red indicator (B.2.5) and ammonia (B.2.11) dropwise until the colour of the indicator changes to yellow. Add 25 ml of sodium acetate solution (B.2.3) 3 glass beads and heat to boiling for 3 minutes. Cool to room temperature, add 25 ml ethanol 0.05 ml bromo-cresol-green indicator and 0.5 ml PAN indicator (B.2.7). Titrate with 0.05 mol/l zinc solution (B.2.2) until the green colour changes to reddish tint. Add 25 ml of sodium fluoride solution (B.2.4) and heat to boiling for 3 minutes. Cool to room temperature, add 25 ml ethanol and titrate the released EDTA with zinc solution (B.2.2) until the green colour changes to a definite violet red.

B.4 CALCULATION

Calculate the aluminium content using the following equation.

$$\text{Aluminium metal content, \% (m/m)} = \frac{V \times (m_1 - m_2) \times 1.348}{m_0 \times m_3}$$

where,

V is the Volume, in millilitres, of 0.05 mol/l zinc solution required in the final titration (see B.3.2)

m_0 is the mass, in grams, of the test sample (see B.3.1)

m_1 is the mass, in grams, of the tube (including stirring rod) plus pigment, (see B.3.1)

m_2 is the mass, in grams, of the tube (including stirring rod) (see B. 3.1)

m_3 is the mass, in grams, of pigment taken for analysis. (see B.3.2)

SLS CERTIFICATION MARK

The Sri Lanka Standards Institution is the owner of the registered certification mark shown below. Beneath the mark, the number of the Sri Lanka Standard relevant to the product is indicated. This mark may be used only by those who have obtained permits under the SLS certification marks scheme. The presence of this mark on or in relation to a product conveys the assurance that they have been produced to comply with the requirements of the relevant Sri Lanka Standard under a well designed system of quality control inspection and testing operated by the manufacturer and supervised by the SLSI *which includes surveillance inspection of the factory, testing of both factory and market samples.*

Further particulars of the terms and conditions of the permit may be obtained from the Sri *Lanka Standards Institution, 17, Victoria Place, Elvitigala Mawatha, Colombo 08.*

Printed at SLSI (Printing Unit)

SRI LANKA STANDARDS INSTITUTION

The Sri Lanka Standards Institution (SLSI) is the National Standards Organization of Sri Lanka established under the Sri Lanka Standards Institution Act No. 6 of 1984 which repealed and replaced the Bureau of Ceylon Standards Act No. 38 of 1964. The Institution functions under the Ministry of Science & Technology.

The principal objects of the Institution as set out in the Act are to prepare standards and promote their adoption, to provide facilities for examination and testing of products, to operate a Certification Marks Scheme, to certify the quality of products meant for local consumption or exports and to promote standardization and quality control by educational, consultancy and research activity.

The Institution is financed by Government grants, and by the income from the sale of its publications and other services offered for Industry and Business Sector. Financial and administrative control is vested in a Council appointed in accordance with the provisions of the Act.

The development and formulation of National Standards is carried out by Technical Experts and representatives of other interest groups, assisted by the permanent officers of the Institution. These Technical Committees are appointed under the purview of the Sectoral Committees which in turn are appointed by the Council. The Sectoral Committees give the final Technical approval for the Draft National Standards prior to the approval by the Council of the SLSI.

All members of the Technical and Sectoral Committees render their services in an honorary capacity. In this process the Institution endeavours to ensure adequate representation of all view points.

In the International field the Institution represents Sri Lanka in the International Organization for Standardization (ISO), and participates in such fields of standardization as are of special interest to Sri Lanka.

Printed at the Sri Lanka Standards Institution, 17, Victoria Place, Elvitigala Mawatha, Colombo 08.