SRI LANKA STANDARD 918:2021
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SPECIFICATION FOR ANTICORROSIVE METAL PRIMER - SOLVENT BORNE

(*First Revision*)

SRI LANKA STANDARDS INSTITUTION

Sri Lanka Standard

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SLS 918:2021

Gr. 6

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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 ANTICORROSIVE METAL PRIMER - SOLVENT BORNE
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FOREWORD

This Sri Lanka Standard was approved by the Sectoral Committee on Chemical and Polymer Technology and was authorized for adoption and publication as a Sri Lanka Standard by the Council of the Sri Lanka Standards Institution on 2021-02-24.

Anticorrosive priming paint, covered by this Specification is used as the first coat on iron and steel or non-ferrous surfaces to provide good protection against corrosion. This material could be used under oil based and/or synthetic resin based undercoats and/or finishing paints and is commercially known as "Red oxide primer".

This Specification was first published in 1983. In this first Revision, requirements for pigment, durability, bulk density and dry film thickness have been removed. Limits for heavy metals have been introduced considering the adverse impact on human health and safety. The limits for flow time and fineness have been changed.

This Specification is subject to the restrictions imposed under the Consumer Affairs authority Act No. 09 of 2003 and any other relevant Acts.

For the purpose of deciding whether a particular requirement of this Specification is complied with, the 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.

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

AS /NZS 3750.20:2008	Paints for steel structures Part 20: Anticorrosive metal primer- Solvent – borne- Lead and Chromate free
IS 2074: 2015	Ready mixed paint, air drying, red oxide Zinc phosphate

1 SCOPE

1.1 This Specification prescribes the requirements, methods of sampling and test for anticorrosive priming paint for use under indoor and outdoor weather conditions for the protection of iron and steel against atmospheric corrosion.

1.2 This Specification does not cover Zinc phosphate priming paint.

2 REFERENCES

ASTM	D5895	Standard Test Methods for Evaluating Drying or Curing During Film Formation of Organic Coatings Using Mechanical Recorders
SLS	102	Presentation of numerical values.
SLS	489	Glossary of terms for paints.
SLS	523	Methods of sampling paints.
SLS	1256	Methods of test for paints and varnishes
	Part 2	Determination of flow time by the use of flow cups
	Part 4	Determination of flash point – closed cup method
	Part 7	Determination of water by the dean and stark method
	Part 8	Determination of non-volatile matter
	Part 11	Standard panels for testing
	Part 13	Determination of hard drying time
	Part 16	Determination of fineness of grind
	Part 19	Determination of contrast ratio (opacity) of light coloured paints at a fixed spreading rate (using black and white charts)
	Part 20	Scratch test
	Part 23	Resistance to continuous salt spray
	Part 29	Bend test (Cylindrical mandrel)
	Part 30	Determination of surface drying time ballotini method
	Part 40	Preparation of standard panels for testing (panels other than burnished steel,glass, wood and asbestos)

3 TERMINOLOGY

For the purpose of this Specification, the definitions given in **SLS 489** shall apply:

4 REQUIREMENTS

4.1 Composition

4.1.1 *Product*

The product shall consist of a binder, drying oils, treated drying oils, synthetic or natural resin or a mixture thereof, together with pigments, solvents, driers and other additives.

4.1.2 *Condition in the container*

The product shall be free from skin and shall not show excessive settling in a freshly opened can. It shall be easily redispersed to a smooth homogeneous state by stirring with a spatula. The product shall not show curdling, livering, caking, dry sediment or colour separation and shall be free from lumps, loose skin pieces and foreign matter.

4.2 Colour

Colour shall be agreed to between the purchaser and the manufacturer.

4.3 Application properties

4.3.1 *Brushing properties*

The material, as received, shall easily possess good leveling properties when applied as per manufacturer's instructions to a smooth, mild steel panel as given in Appendix **B.1**. The paint shall dry to a smooth uniform film, and shall be free from running, sagging, streaking or wrinkling.

4.3.2 *Spraying properties*

The material when sprayed as specified in **SLS 1256: Part 11: Section 2** as per manufacturer's instructions to a smooth, mild steel panel as given in Appendix **B.1**, to obtain an even and uniform coat (It shall not be poured or spilled upon the panel), the air dried film shall not show seeding, floating or other film defects.

4.3 Finish

When tested and examined as prescribed in Appendix **B**, the product shall have a smooth surface.

4.5 Spreading capacity

The declared spreading capacity shall comply with the capacity measured by the method prescribed in Appendix **C**.

4.6 Other requirements

The product 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 anticorrosive priming paint

SI No. (1)	**Characteristic** (2)	**Requirement** (3)	**Method of test** (4)
i)	Solid content, per cent by mass, min.	60	SLS1256 : Part 8
ii)	Fineness of grind, µm, max.	30	SLS1256 : Part 16
iii)	Flow time (Ford cup 4), at 27 ± 2 °C, seconds, min,	80	SLS1256 : Part 2
iv)	Drying time:		
	(a) surface dry, h, max.	6	Appendix D
	(b) hard dry, h, max.	24	

Continued Table 01

v)	Uncombined water, per cent by mass, max.	0.5	SLS1256 : Part 7
vi)	Scratch hardness (under a load of 1 kg)	To pass the test	SLS1256 : Part 20
vii)	Flexibility and adhesion	To pass the test	SLS1256 : Part 29
viii)	Protection against corrosion under conditions of condensation	To pass the test	Appendix E
ix)	Resistance to continuous salt spray	To pass the test	SLS1256 : Part 23
x)	Flash point, °c, min.	30	SLS1256 : Part 4

TABLE 2- Limits of heavy metals

Sl. No. (1)	Characteristic (2)	Limit (3)	Method of test (4)
i)	Total Lead content, as Pb, mg/kg, max.	90	Appendix F
ii)	Total Chromium content, as Cr, mg/kg, max.	50	Appendix F
iii)	Total Cadmium content, as Cd, mg/kg, max.	5	Appendix F
iv)	Total Mercury content, as Hg, mg/kg, max.	0.5	Appendix F

4.7 Storage stability

The product shall comply with the requirements specified in **4.2** to **4.6** after storage in the original closed container at room temperature for a period of not less than 12 months from the date of manufacture.

5 PACKAGING AND MARKING

5.1 Packaging

The product 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 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 “Anticorrosive metal primer solvent borne”;

b) Name and address of the manufacturer including country of origin;
c) Brand name, if any:
d) Net content in millilitres or litres;
e) Batch or code number or lot identification number;
f) Date of manufacture;
g) Shelf life/ best before:
h) Spreading capacity, in m^2/litre;
j) Special precautions to be obtained in use, if required;
k) Lead content;
l) Colour;
m) Specific warning statement(s), where necessary; and
n) Directions for use.

6 METHODS OF TEST

6.1 Tests shall be carried out as specified in **4.2** to **4.7**, Appendices **B** to **F, ASTM D 5895** and the relevant Parts of SLS **1256**.

6.2 During the analysis, unless otherwise stated, use only reagents of analytical grade and only deionized water.

6.3 For testing purposes, the primer shall be from the same source.

7 SAMPLING

Representative samples of the product for ascertaining conformity to the requirements of their specification shall be drawn as prescribed in Appendix **A**.

APPENDIX A
COMPLIANCE OF A LOT

The sampling scheme given in this Appendix shall apply where compliance of a lot to the requirements of this Specification has to be assessed based on sampling and inspection.

Where compliance with this Specification is to be assured, appropriate schemes of sampling and inspection shall be adopted based on manufacturer's control systems coupled with type tests and testing procedures.

A.1 LOT

In any consignment, all the containers of the same size containing paint material of one batch of manufacture shall constitute a lot.

A.2 SAMPLING

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**.

A.3 NUMBER OF TESTS

A.3.1 Each container selected shall be examined for the packaging and marking requirements.

A.3.2 From each of the sample container prepared as specified in **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 another sample container.

A.3.3 The remaining portion of material from each sample container shall constitute an individual sample representing a particular container in the lot.

A.3.4 Tests for requirements given in **4.2**, **4.3, 4.4**, **4.5, 5.1** and **5.2** shall be carried out on each individual sample.

A.3.5 Tests for requirements given in **4.6** and **4.7** shall be carried out on the composite sample.

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 examined as in **A.3.1** satisfies the packaging and marking requirements.

A.4.2 Each individual sample satisfied the relevant requirements tested as in **A.3.4**.

A.4.3 The composite sample satisfied the relevant requirements tested as in **A.3.5.**

APPENDIX B
TEST FOR FINISH

B.1 TEST PANELS

A mild steel panel of 150 mm x 150 mm in size conforming to **SLS 1256: Part 11: Section 1**.

B.2 PROCEDURE

B.2.1 The material is applied by brushing or spraying as specified in **SLS 1256: Part 40** on a clean mild steel panel as given in **B.1** so as to obtain an even and uniform coat and allowed to hard dry for 18 hours.

B.2.2 The film so produced shall be firmly adherent, flexible, smooth and free from wrinkling or sagging with a semi-glossy or glossy surface or as agreed to between the purchaser and supplier.

APPENDIX C
DETERMINATION OF WET HIDING POWER
(BLACK AND WHITE CHART BRUSHOUT METHOD)

C.l APPARATUS

Black and white hiding power charts, as described in **SLS 1256: Part 19** with a test area of about 0.1 m^2.

C.2 PROCEDURE

Determine the density of the paint, as prescribed in **SLS 1256: Part 2**.

Weigh the brush and the paint container together. Apply the paint on the chart until the geometrical pattern is completely obscured. View the test surface flat upon a horizontal surface. Two additional observers should view the chart to ensure complete hiding of the pattern.

Reweigh the brush and the paint container together.

C.3 CALCULATION

Wet hiding power, $\frac{m^2}{\text{litre}} = \frac{10^3 A\, D}{m}$

where,

A is the area, in m^2, of the hiding power chart;
D is the density, in kg/1, of the paint; and
m is the mass, in g, of the paint applied.

APPENDIX D
DETERMINATION OF DRYING TIME

Two methods have been prescribed for each of the determination for surface drying and hard drying times. The method prescribed in **D.1** shall be the reference method and shall be carried out in case of any dispute.

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D.1 METHOD 1

D.1.1 Determination of surface drying time (Ballotini method)

This test shall be carried out as specified in **SLS 1256: Part 30.**

D.1.2 Determination of hard drying time

This test shall be carried out as prescribed in **SLS 1256: Part 13.**

D.2 METHOD 2

D.2.1 Surface drying time and hard drying time shall be determined as prescribed in **ASTM D 5895**.

APPENDIX E
DETERMINATION OF PROTECTION AGAINST CORROSION UNDER CONDITIONS OF CONDENSTAION

E.1 PRINCIPLE

This test is carried out by suspending the painted panel after a specified period of drying in a corrosion cabinet maintained at 100 per sent relative humidity and a temperature cycle of 42 ^{o}C. for seven days and examining it for any signs of deterioration and corrosion of metal surface.

E.2 APPARATUS

The apparatus consists essentially of a closed chest in which the relative humidity is maintained at about 100 per cent and the temperature continuously cycles over a range from 42 ^{o}C to 48 ^{o}C. There shall be copious condensation of water on test panels positioned vertically within the chest. The apparatus may be of any design, but it shall satisfy the following essential conditions:

E.2.1 Humidification

Humidity shall be maintained by evaporation of water from a reservoir situated at the bottom of the cabinet. The water shall be kept free from grease or oil.

E.2.2 Heating

The cabinet shall be heated through the medium of water by a heater placed immediately below the water reservoir or a heater completely immersed in water.

E.2.3 Temperature cycles

The heating arrangement shall be thermostatically controlled in such a way that the temperature of the air space cycles vary continuously from 42 ºC to 48 ºC and back to 42 ºC in a total period of not less than 45 minutes and not more than 75 minutes. The time required for heating and cooling shall be approximately equal.

E.2.4 Air circulation

The air in the cabinet shall be kept in circulation by means of a fan to ensure that the temperature in any part of the air space does not differ by more than 0.5 ºC at any given moment.

E.2.5 Spacing of test panels

Test panels shall not be placed less than 40 mm apart, or less than 40 mm from any side of the cabinet.

E.2.6 Suspension of panels

If suspended, the panels shall be held by non- metallic supports. If placed on metal racks, the panels shall be suitable insulated at points of contact which the metal surface.

E.3 PROCEDURE

E.3.1 Apply one coat of enamel paint at a wet film thickness of 60 µm to 65 µm, with an adjustable film applicator to a burnished steel panel conforming to **SLS 1256: Part 11: Section 1**. Allow to air dry for 24 h and then dry at a temperature l60 °C to 65 °C for one hour. Cool the panel to room temperature and protect the edges to a depth of 5 mm with paraffin wax and then suspend it vertically in a corrosion cabinet satisfying the conditions prescribed under **E.2**. After exposure under these conditions for seven days, remove the panel and examine for signs of deterioration of the paint film. Remove 25 mm strip of the film from the center of the panel carefully with a suitable paint remover and examine the exposed metal for signs of corrosion neglecting 25 mm portions of the exposed surface from each end.

E.3.2 The metal surface shall not show signs of corrosion. Changes in appearance and condition of the paint film shall not be taken into consideration.

APPENDIX F
DETERMINATION OF METALS

Atomic Absorption Spectroscopy (AAS) methodology or Inductively Coupled Plasma Mass Spectrometry (ICP-MS) shall be used for the determination of metals.

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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.*

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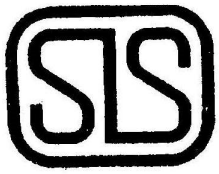

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