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SPECIFICATION FOR

BITUMINOUS ANTICORROSIVE PAINT

SRI LANKA STANDARDS INSTITUTION

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SLS 713:1985

Gr. 7

SRI LANKA STANDARDS INSTITUTION
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SRI LANKA STANDARD
SPECIFICATION FOR BITUMINOUS ANTICORROSIVE PAINT

FOREWORD

This Sri Lanka Standard was authorized for adoption and publication by the Council of the Sri Lanka Standards Institution on 1985-10-11, after the draft, finalized by the Drafting Committee on Paints, had been approved by the Chemicals Divisional Committee.

Bituminous paint covered by this specification is used as a general purpose anticorrosive paint for the protection of steel pipes, water tanks, chimneys, boilers, equipment, machines etc.

All standard values given in this specification are 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.

In the preparation of this specification the assistance derived from the publications of the Indian Standards Institution and the American Society for Testing and Materials is gratefully acknowledged.

1 SCOPE

This specification prescribes requirements and methods of sampling and test for bitumen based general purpose anticorrosive paint.

2 REFERENCES

CS 102 Presentation of numerical values

SLS 489 Glossary of terms for paints

SLS 523 Methods of sampling of paints

SLS 535 Methods of test for paints

Part 1: Section 1.7 Determination of quantity of material in a container

Part 3: Section 3.2 Standard panels for testing

Part 3: Section 3.3 Application of paints on panels

SLS 606 Zinc chromate priming paint.

3 TERMINOLOGY

3.1 For the purpose of this specification definitions given in SLS 489 and the following shall apply:

3.1.1 bitumen : A viscous liquid or a solid, consisting essentially of hydrocarbons and their derivatives, which is soluble in carbon disulphide. It is substantially non-volatile and softens gradually when heated. It is black or brown in colour and possesses water-proofing and adhesive properties. It is obtained by refining processes from petroleum and is also found as a natural deposit or as a component of naturally occurring asphalts, in which it is associated with mineral matter.

3.1.2 natural asphalt : A naturally occurring mixture of bitumen with a substantial proportion of inert mineral matter.

4 TYPES

There shall be two types of the material.

Type 1 - Anticorrosive paint generally used for protection of equipment, machines and apparatus.

Type 2 - Heat resistant anticorrosive paint generally used for chimneys, boilers and apparatus.

5 REQUIREMENTS

5.1 General requirements

5.1.1 *Composition*

The material shall normally consist of bitumen, natural asphalts and a suitable volatile solvent.

NOTE - When required for protection of water tanks and pipes, the material shall not contain any deleterious substances.

5.1.2 *Consistency*

The material shall not show excessive settling in a freshly opened can and shall be easily redispersed with a metal rod or spatula to a smooth, homogeneous consistency suitable for application by brushing without appreciable drag on the brush.

5.1.3 *Application properties and finish*

The material when applied by brushing, as recommended by the manufacturer shall dry to a smooth film, free from sagging and excessive brush marks.

5.2 Quantity of material

The volume of the material when tested as prescribed in **SLS 535:Part 1:Section 1.7** shall not differ by more than ± 2 per cent from the declared volume at 27 ± 2 °C.

5.3 Keeping properties

The material when stored for one year and tested as described in **Appendix C of SLS 606** shall show no signs of skinning, gelling, hard caking or curdling.

NOTE - It is not necessary to carry out this test as a routine for all the samples. The test should be carried out only when required by the purchaser.

5.4 Resistance to heat

5.4.1 Paint of Type 1, when tested and examined as prescribed in E.1, shall not show any blistering, sagging or slipping.

5.4.2 Paint of Type 2, when tested and examined as prescribed in E.2, shall not show any signs of deterioration of the coating or change in colour.

5.5 Other requirements

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

5.6 Freedom from lead

Lead free material in addition to the requirements specified in 5.1 to 5.5 shall also be tested for freedom from lead in accordance with **SLS 535:Part 2:Section 2.5**. When thus tested the material shall not contain lead or lead compound or a mixture of both calculated as metallic lead (Pb), exceeding 0.03 per cent by mass.

TABLE 1 - Requirements for bituminous anticorrosive paints

Sl. No. (1)	Characteristic (2)	Requirement (3)	Method of test reference (4)
i	Drying time, hard dry, h, max.	8	A.2 of SLS 606: 1983
ii	Non volatile matter, per cent by mass, min.	50	SLS 535:Part 2 Section 2.3
iii	Uncombined water, per cent by mass, max.	0.5	SLS 535:Part 2 Section 2.2
iv	Flash point, ^{o}C, min.	30	SLS 535:Part 2 Section 2.5
v	Bending properties	No visible damage	SLS 535:Part 5 Section 5.3
vi	Protection against corrosion under conditions of condensation	No signs of corrosion	Appendix B of SLS 606:1983
vii	Resistance to acid	To pass the test	Appendix A
viii	Resistance to alkali	To pass the test	Appendix B
ix	Resistance to chlorine	To pass the test	Appendix C
x	Resistance to water	To pass the test	Appendix D

6 PACKAGING

The material shall be packed in suitable containers. Unless otherwise agreed to between the purchaser and supplier the material shall be packed in the following measures : 500 ml, 1 l, 4 l and 5 l.

7 MARKING

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

a) The name of the product;

b) The words **'LEAD FREE'** (in case of lead free paints);

c) The words **'NOT SUITABLE FOR WATER TANKS'** (in case of paints not suitable for water tank application);

d) Type (whether general purpose or heat resistant anticorrosive paint);

e) Volume of the material, in ml or l;

f) Name and address of the manufacturer; and

g) Date of manufacture.

7.2 The containers may also be marked with the Certification Mark of the Sri Lanka Standards Institution illustrated below on permission being granted for such marking by the Sri Lanka Standards Institution.

NOTE - The use of the Sri Lanka Standards Institution Certification Mark (SLS Mark) is governed by the provisions of the Sri Lanka Standards Institution Act and the regulations framed thereunder. The SLS mark on products covered by a Sri Lanka Standard is an 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 the Institution and operated by the producer. SLS marked products are also continuously checked by the Institution for conformity to that standard as a further safeguard. Details of conditions under which a permit for the use of the Certification Mark may be granted to manufacturers or processors may be obtained from the Sri Lanka Standards Institution.

8 SAMPLING

8.1 The method of drawing representative samples of the material shall be as specified in the relevant clauses of SLS 523.

8.2 Number of tests

8.2.1 Each container selected as in 7.2.3 (e) of SLS 523:1981 shall be subjected to the requirements specified in 5.1.2, 5.2, 6 and 7 of this specification.

8.2.2 After testing as in 8.2.1 an equal quantity of material shall be taken from each container and mixed thoroughly to form a composite sample. The composite sample shall be transferred to a sample container. Tests for requirements given in 5.1.3 and 5.5 shall be carried out on the composite sample.

8.2.3 The remaining portion of material in each container, mentioned in 8.2.2 shall constitute an individual sample. Test for requirements given in 5.3, 5.4 and 5.6 shall be carried out on each individual sample.

9 METHODS OF TEST

9.1 Tests shall be carried out as specified in 5.1.2, 5.1.3, Appendices A to E and relevant Sections of SLS 535.

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

10 CONFORMITY TO STANDARD

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

10.1 Each container tested as in 8.2.1 satisfies the relevant requirements.

10.2 Test results on the composite sample tested as in 8.2.2 satisfies the relevant requirements.

10.3 Each individual sample tested as in 8.2.3 satisfies the relevant requirements.

APPENDIX A

DETERMINATION OF RESISTANCE TO ACID

A.1 PRINCIPLE

An air-dried film of the material is immersed in dilute sulfuric acid, for a specified period and at the end of the test period the film is examined for any deterioration.

A.2 REAGENTS

Dilute sulfuric acid, 1 : 20 (*V/V*).

A.3 PREPARATION OF TEST PANEL

Apply a coat of material by brushing as specified in **SLS 535:Part 3:Section 3.3** to a 150-mm x 100-mm clean glass panel conforming to **SLS 535:Part 3:Section 3.2** to give a dry film mass commensurate with the mass in kg/10 litre of the material as given below:

Mass of the wet material (kg/10 l)	**Limit of dry film mass (g/m^2)**
Up to 12	27 to 34
Over 12 and up to 14	34 to 44
Over 14 and up to 16	44 to 54
Over 16 and up to 18	54 to 68
Over 18	68 to 80

Allow the panel to air-dry in a horizontal position for 24 hours under standard conditions (27 ± 2 °C and a relative humidity of 65 ± 5%).

A.4 PROCEDURE

Partially, immerse the panel, prepared as described in A.3 in dilute sulfuric acid for 24 hours. Take out the panel, wash carefully and examine the immersed portion of the film after drying for one hour.

The material shall be deemed to have passed the test if the paint film on the panel shows no signs of softening, blistering, cracking, dulling or change of colour.

APPENDIX B

DETERMINATION OF RESISTANCE TO ALKALI

B.1 PRINCIPLE

An air-dried film of the material is immersed in a solution of sodium carbonate for a specified period and at the end of the test period the film is examined for any deterioration.

B.2 REAGENTS

Sodium carbonate solution, five per cent anhydrous sodium carbonate in water (*m/V*).

B.3 PROCEDURE

Partially immerse a panel, prepared as prescribed in A.3, in the aqueous solution of sodium carbonate for 4 hours. Take out the panel, wash and examine the immersed portion of the film after drying for one hour.

The material shall be deemed to have passed the test if the paint film on the panel shows no signs of softening, blistering, cracking, dulling or change of colour.

APPENDIX C

DETERMINATION OF RESISTANCE TO CHLORINE

C.1 PRINCIPLE

An air dried film is immersed in an aqueous solution of chlorine in the dark for a specified period and at the end of the test period the film is examined for the nature and extent of deterioration.

C.2 REAGENTS

Chlorine water, containing 0.05 per cent of chlorine (*m/V*).

C.3 PROCEDURE

Immerse three quarter of a panel, prepared as prescribed in A.3, in chlorine water in a suitable glass container, which is either covered with black paper or painted outside with a black paint and keep in a dark place for 72 hours. After this period, take out the panel wash and examine the immersed portion of the film after drying for 24 hours.

The material shall be deemed to have passed the test if the paint film on the panel shows no blistering and cracking. Slight dulling and change of colour shall not be a cause of rejection.

APPENDIX D

DETERMINATION OF RESISTANCE TO WATER

D.1 PRINCIPLE

A tinned container is internally coated with the material and, after drying for a specified period, is filled with water and kept with the lid on for a stipulated time. Thereafter, the water is tested for odour before and after boiling and the condition of the film is also examined.

D.2 PROCEDURE

Apply a coat of the material, by brushing, to the inside surface of a clean tin container, with a lever lid, 125 mm high and 90 mm in diameter, to give a dry film mass commensurate with the mass in kg/10 l of the material as specified in A.3. Allow the paint film to air-dry for 7 days. At the end of this period, store water in the container for 24 hours and rinse the container thoroughly with water.

Then fill the container with water. Allow the water to remain in contact with the paint film for three days with the lid closed. Examine the water for odour and taste at the end of this period. Then take the water from the container in a beaker, heat it to boiling, cool it and again examine for odour and taste.

The material shall be deemed to have passed the test if the paint film remains firmly adherent and imparts no unpleasant odour or taste to water.

APPENDIX E

DETERMINATION OF RESISTANCE TO HEAT

Two methods have been specified for determination of heat resistance. Method 1 shall be used for paints of Type 1 and Method 2 shall be used for paints of Type 2.

E.1 METHOD 1

E.1.1 Principle

An air dried panel is suspended in an oven at specified temperature and period and at the end of the test period the film is examined for deterioration.

E.1.2 Apparatus

An oven, with internal dimensions not less than 300 mm x 300 mm and capable of maintaining a uniform temperature of 100 $\pm$ 3 ^{o}C.

E.1.3 Test panel

For preparation of the test panel a burnished steel panel conforming to SLS 535:Part 3:Section 3.2 shall be used. Prepare the test panel as described in A.3.

E.1.4 Procedure

Scratch lightly two parallel reference lines, 25 mm apart, across the test film and continue them to the edges of the test panel.

Suspend the test panel vertically in the oven with the reference lines horizontal, and maintain at 100 ± 3 °C for 2 hours.

At the end of the test period examine the coating for blistering, sagging and slipping. Record any sagging of the lines within the test film or slipping of the film beyond the lower reference line.

E.2 METHOD 2

E.2.1 Principle

An air-dried panel is heated to a maximum temperature under stipulated conditions. After this, it is cooled and dipped in water. The extent of deterioration of the film is then examined.

E.2.2 Apparatus

Electric furnace, capable of maintaining a temperature of 300 °C.

E.2.3 Procedure

Heat the test panel prepared as described in A.3 in a vertical position in an electrical furnace, the temperature of which is gradually raised from room temperature up to a temperature of 300 °C in 1½ hours time. Maintain the panel at the maximum temperature of 300 °C for half an hour. Remove the panel from the furnace, cool to room temperature and immerse it in water at room temperature for 24 hours. Take out the panel and examine it after air drying for one hour.

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SRI LANKA STANDARDS INSTITUTION

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