

SRI LANKA STANDARD 895 : 2010

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**SPECIFICATION FOR
ROAD MARKING PAINT
(First Revision)**

SRI LANKA STANDARDS INSTITUTION

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**SLS 895 : 2010
(Incorporating Erratum Sheet)**

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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 2010-10-15.

This Specification is applicable to paints intended for marking of roads, airfield runways, parking areas and similar surfaces.

This Standard was first published in 1990. In this First Revision, the requirements specified for fineness of grind and bulk density have been changed. The requirement for light fastness has been excluded as it is covered under the requirement for resistance to weathering. A test method for the determination of skinning and the Munsell reference to the colour of the dry film of the road marking paints have been included.

For the purpose of deciding whether a particular requirement of this standard 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 obtained from the following publications is gratefully acknowledged :

MS	164 : 1985	Malaysian Standard Specification for Road Marking Paints
Munsell book of colour		
SANS 630	: 2004	South African National Standard – Decorative high gloss enamel paints

1 SCOPE

This specification prescribes the requirements, methods of sampling and test for quick drying of road marking paints. It makes provision for yellow, white and black paint but does not cover reflectorized paint and thermoplastic road marking paint.

2 REFERENCES

ASTM D	868	Standard Test Method for Laboratory Determination of Degree of Bleeding of Traffic Paint
CS	124	Test sieves
SLS	102	Rules for rounding off numerical values
SLS	428	Random sampling methods
SLS	489	Glossary of terms for paints
SLS	523	Methods of sampling for paints, varnishes and raw materials for paints and varnishes
SLS	1256	Methods of test for paints and varnishes Part 5 Determination of density 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 17 Visual comparison of the colour of paints Part 19 Method of test for contrast ratio (Opacity) of light coloured paints at fixed spreading rate (using black and white chart) Part 20 Scratch test Part 21 Bend test (Cylindrical mandrel) Part 24 Resistance to water—water immersion method Part 28 Artificial weathering and exposure to artificial radiation – Exposure to filtered xenon – arc radiation

3 DEFINITIONS

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

3.1 no pick-up time: The time period between application of a paint and the moment when the paint just ceases to be removed by a simulated tire of a vehicle passing over the painted surface.

4 REQUIREMENTS

4.1 Colour

The colours of the dry film of road marking paint shall approximately match with Munsell reference given in Table 1, when examined as prescribed in **SLS 1256: Part 17 : 2005**.

TABLE 1 – Munsell reference to colours

Sl. No. (1)	Colour (2)	Munsell reference (3)
i)	White	2.5 Y 9/2
ii)	Black	2.5 Y 3/2
iii)	Yellow	10 YR 7/14

NOTE : *Paints of slightly different shades of the standard colours as given in Table 1 may be allowed as agreed to between the purchaser and the supplier.*

4.2 Condition of paint in container

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

The manufacturer shall ensure that the paint shall not skin within 48 hours, in a three quarter filled, tightly closed container when tested in accordance with Appendix G.

4.3 Application properties

The paint shall be capable of being applied by brush, roller or by spraying. The dry film shall have a uniform matt or egg shell appearance and shall be free from wrinkles and other surface imperfections.

4.4 Storage stability

The paint shall comply with the requirements specified in Clause 4 after storage in the original closed containers at room temperature for a period of not less than 12 months from the date of manufacture.

4.5 Resistance to weathering

The paint shall not crack or blister and shall not show appreciable change in colour when exposed to accelerated weathering for 400 h when examined as in **SLS 1256: Part 28**.

4.6 Other requirements

The paint shall also comply with the requirements given in Table 2 when tested according to the relevant methods given in Column (4) of the table.

TABLE 2 – Requirements for road marking paints

Sl. No. (1)	Characteristic (2)	Requirement (3)	Method of test (4)
i)	Solid content, per cent by mass, min.	60	SLS 1256: Part 8
ii)	Consistency, KU	75 to 85	Appendix C
iii)	Fineness of grind, μm , max.	75	SLS 1256 :Part 16
iv)	Drying time a) no pick-up, minutes, max. b) hard dry, minutes, max.	15 60	Appendix D SLS 1256: Part 13
v)	Bulk density, kg/l, min.	1.3	SLS 1256: Part 5
vi)	Resistance to bleeding, min.	4	ASTM D 868
vii)	Dry opacity (contrast ratio)* min a) White b) Yellow	0.96 0.96	SLS 1256 : Part 19 SLS 1256 : Part 19
viii)	Resistance to diesel fuel	To pass the test	Appendix E
ix)	Abrasion resistance	To pass the test	Appendix F
x)	Flexibility	To pass the test	SLS 1256 : Part 21
xi)	Resistance to water	To pass the test	SLS 1256 : Part 24

* When applied at a wet film thickness equivalent to a spreading rate of $6 \text{ m}^2/\text{l}$.

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 transportation and handling.

5.2 Marking

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

- a) Name of the product as “Road Marking Paint” and colour ;
- b) Name and address of the manufacturer or distributor including the country of origin (see Note) ;
- c) Net content, by mass or volume ;
- d) Brand name ;
- e) Batch or Code Number ;
- f) Date of manufacture and shelf life or best before ; and
- g) Directions for use including approximate spreading rate.

NOTE : *Name and the address of the manufacturer and distributor need to be marked on imported products.*

6 METHODS OF TEST

Tests shall be carried out as in accordance with the methods given in **SLS 1256, ASTM D 868**, and Appendices **C to G** of this specification.

7 SAMPLING

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

NOTE: *Attention is drawn to the certification marking facilities offered by the Sri Lanka Standards Institution. See the inside back cover of this specification.*

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 standard is to be assessed based on statistical sampling and inspection.

Where compliance with this standard is to be assessed based on manufacturer's control systems coupled with Type, Testing and Check tests or any other procedure, appropriate schemes of sampling or inspection shall be adopted.

A.1 LOT

In any consignment, all the containers of the same size and paint of the same colour 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 separately for ascertaining its conformity to the requirements of this specification.

A.2.2 The method of drawing representative samples and number of containers to be selected 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 the randomness of selection, random number tables 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 packaging and marking requirements.

A.3.2 Each container inspected as in **A.3.1** shall be examined for the requirements given in **4.1** and **4.2**.

A.3.3 One container shall be selected from the containers examined as in **A.3.2** and a sample container shall be prepared as specified in **SLS 523** and shall be tested for the requirements given in **4.3** to **4.6**.

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 packaging and marking requirements.

A.4.2 Each container examined as in **A.3.2** satisfies the relevant requirements.

A.4.3 The test results on sample container when tested as in **A.3.3** satisfies the relevant requirements.

APPENDIX B TEST PANELS

B.1 MATERIAL, DIMENSIONS AND PREPARATION

Unless otherwise specified, the test panels shall be of metal or glass and shall comply with **SLS 1256: Part 11**.

B.2 PAINT APPLICATION

Unless otherwise specified, the paint shall be applied on the test panel to give a wet film thickness of $350 \pm 25 \mu\text{m}$, using a bar applicator. The panel is allowed to dry for 7 days in a horizontal position at $27^{\circ}\text{C} \pm 2^{\circ}\text{C}$ and 65 ± 5 per cent relative humidity, but of direct sunlight and with protection from the deposit of dust.

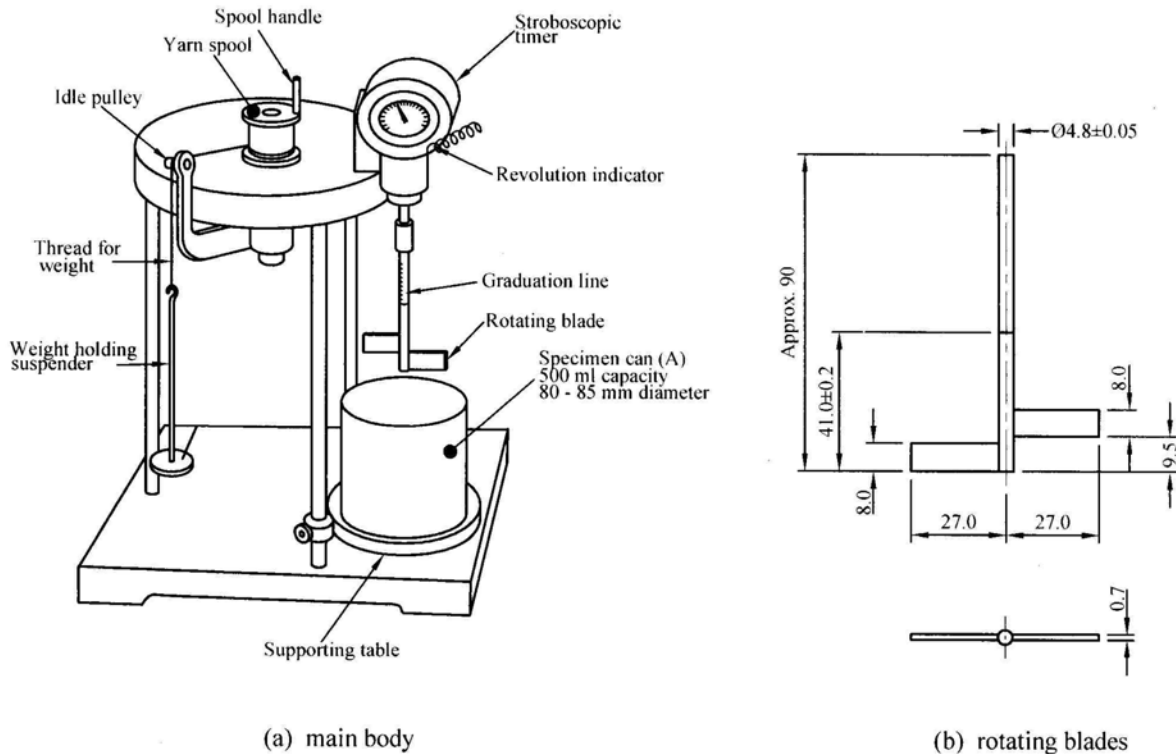
APPENDIX C DETERMINATION OF CONSISTENCY

C.1 PRINCIPLE

Consistency is measured as the load in grams required to produce the specified rate of shear.

C.2 APPARATUS

Stormer-Krebs viscometer, with the paddle – type rotor made out of stainless steel and the stroboscopic timer which indicates the rate of shear, as shown in Figure 1.



Dimensions in millimetres and subject to a tolerance of ± 0.1 mm

Figure 1 – Stormer – Krebs viscometer

C.3 PROCEDURE

Mix the sample thoroughly and strain into the specimen can (A) to fill to within 20 mm from the top of the can. Set the can on the stand of the viscometer and raise it to the graduation line on the peddle shaft. Connect the lamp circuit to a 230 volt AC line. Determine to the nearest 5 g, the mass necessary to produce the 200 rpm on the stroboscopic timer where the lines appear to remain stationary at $27 \pm 2^{\circ}$ C.

NOTE : Lines moving in the direction of paddle rotation indicate a speed greater than 200 rpm and mass should be removed. Conversely, lines moving opposite to direction of paddle rotation indicate a speed less than 200 rpm and mass should be added. Repeat the determination until consistent results are obtained. Refer Table 3 for conversion to krebs units (KU).

TABLE 3 – Conversion table for KU value

Mass (g)	Krebs Units (KU)	Mass (g)	Krebs Units (KU)	Mass (g)	Krebs Units (KU)	Mass (g)	Krebs Units (KU)
75	54	225	86	375	102	525	114
100	61	250	89	400	104	550	116
125	67	275	92	425	106	575	118
150	72	300	95	450	108	600	120
175	77	325	98	475	110	625	121
200	82	350	100	500	112	650	122

APPENDIX D DETERMINATION OF NO PICK – UP TIME

D.1 PRINCIPLE

Two rubber rings, simulating the tires of a vehicle, are rolled over a test panel ten minutes after application of the paint at one-minute intervals. The surfaces of the rings are examined for pick – up of the paint.

D.2 APPARATUS, as shown in Figure 2.

D.2.1 *Traffic wheel*, a steel cylinder fitted with two replaceable o-rings (**D.2.**) and with a steel rod serving as an axle. The total mass of the assembly, complete with o-rings, should be 5.40 ± 0.03 kg.

D.2.2 *O-rings*, made of Nitrite rubber, with the following dimensions. (tolerance ± 0.1 mm)

- a) Outside diameter : 104.8 mm
- b) Inside diameter : 85.7 mm
- c) Cross section : 9.5 mm

D.2.3 *Ramp*, having dimensions as shown in Figure 2.

D.2.4 *Glass test panels*, of dimensions 100 mm x 200 mm x 3 mm.

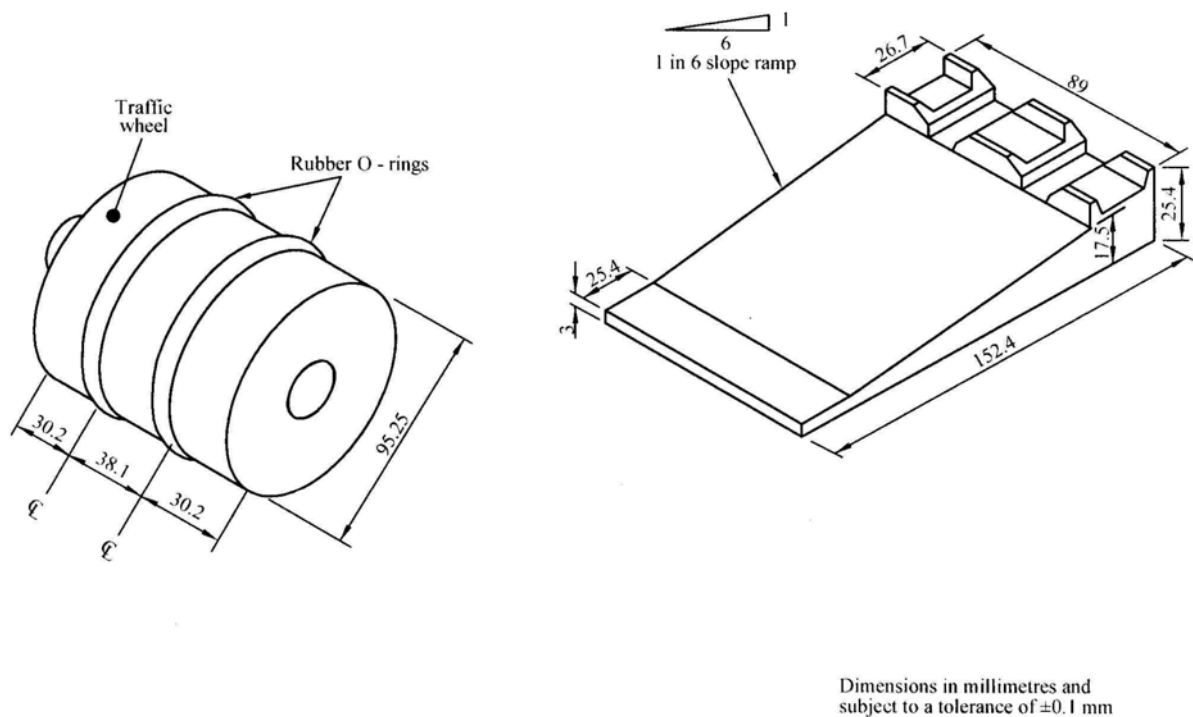


Figure 2 – Apparatus for no pick-up time test

D.3 PROCEDURE

Prepare the glass test panels as described in Appendix B, to give a film of width not less than 75 mm. Record the time of application.

Fix the painted glass panel against the ramp. After 10 minutes of application of the paint, allow the traffic wheel to roll freely down the inclined ramp over the painted film. Examine the rubber O-rings and record whether any paint is adhered.

If there is any adherent paint remove it with a cloth moistened with few drops of suitable solvent or thinner and then wipe with a clean, dry cloth. (see Note). Repeat the test every 60 seconds until no paint adheres to the o-ring when it is rolled over the paint film.

Report the time elapsed between application of the paint and the end point as “no pick-up time”.

NOTE: *Progressive softening of the rubber by commonly used paint solvents may affect the end point.*

APPENDIX E DETERMINATION OF RESISTANCE TO DIESEL FUEL

E.1 PRINCIPLE

The paint, after application to a test panel, is immersed in a bath of diesel fuel for one hour. The paint film, after a recovery period of one hour, is assessed for resistance to scratch. After a further recovery period of 3 hours, the paint film is assessed for blistering.

E.2 PROCEDURE

Prepare two chromated aluminium panels by the method described in Appendix **B**, but allow to dry for 72 hours only.

Immerse one test panel in the diesel fuel for one hour. Remove the panel from diesel fuel and dry with an absorbent paper.

Allow a recovery period of one hour and then carryout the determination of scratch resistance as described in **SLS 1256: Part 20** using a load of 0.8 kg. Examine the film visually for penetration to substrate.

Allow a further recovery period of 3 hours and examine the paint film visually for signs of blistering using the non-immersed film for comparison.

The paint is considered as pass the test if there is no penetration to substrate and no blistering.

APPENDIX F DETERMINATION OF ABRASION RESISTANCE

F.1 PRINCIPLE

Grit is allowed to impinge on the paint film and the paint is examined for damage.

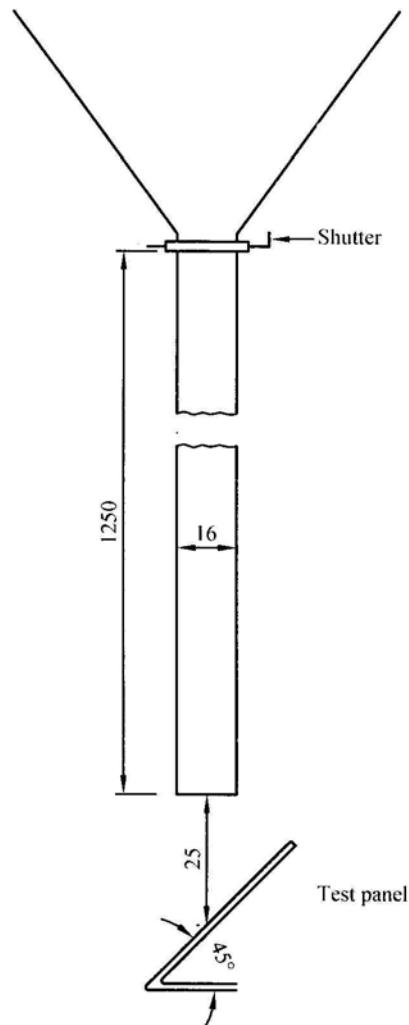
F.2 MATERIAL

Angular steel grit, which passes through a sieve with 1.18 mm aperture size and retains on a sieve with 600 μm aperture size, both sieves shall comply with **CS 124**.

F.3 APPARATUS

Funnel, of sufficient capacity to contain 2.25 kg of the grit (F.2) and with an orifice diameter

of 16 mm attached to a straight tube of 16 mm of internal diameter. The tube is fitted with a shutter with an aperture diameter of 16 mm immediately below the funnel and 1.5 mm from the open end of the tube (see Figure 3).



Dimensions in millimetres

Figure 3 – Abrasion test apparatus

F.4 PROCEDURE

Prepare glass test panels as described in Appendix B. Apply the paint at a wet film thickness of 200 μm in such a manner that a coating of uniform thickness is obtained. Allow the panel to air dry for 7 days. Fix the test panel at an angle of $45 \pm 5^\circ$ to the horizontal by means of a stand. Place the funnel in a stand in such a manner that the tube is vertical, the opening of the tube is directly above the area to be abraded and the distance from the tube to the coated surface at the nearest point is 25 mm when measured in the vertical direction.

Close the shutter and place 2.25 kg of grit in the funnel. Open the shutter fully and rapidly to allow the grit to fall down the tube in a continuous stream and impinge on the paint film.

Remove the panel after three passes of grit and examine visually for wearing out or abrasion of the film.

APPENDIX G TEST FOR SKINNING

G.1 PROCEDURE

Fill a clean 500-ml container to three quarter of its capacity with the material, cover it tightly and invert it momentarily. Restore the container to an upright position and leave it in that position for 48 hours at $27 \pm 2^\circ\text{C}$. Do not agitate or disturb the sample during this period. Inspect the contents of the tin after 48 hours for skinning.

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SRI LANKA STANDARDS INSTITUTION

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