

SRI LANKA STANDARD 602:1983
UDC 648.27

SPECIFICATION FOR
LAUNDRY BLUE

BUREAU OF CEYLON STANDARDS

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SLS 602:1983

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BUREAU OF CEYLON STANDARDS

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FOREWORD

This Sri Lanka Standard was authorized for adoption and publication by the Council of the Bureau of Ceylon Standards on 1983-04-08, after the draft finalized by the Drafting Committee on Laundry Blue had been approved by the Chemicals Divisional Committee.

Laundry Blue covered by this specification is divided into two types. Type 1 laundry blue belongs to a family of inorganic pigments referred to as ultramarine pigments which are insoluble in water and form only a suspension when mixed with water. Type 2 laundry blue belongs to a category of organic dyestuffs which is watersoluble and chemically grouped under monoazo dyes. This type of blue is intended for use in laundries to neutralize any residual alkali that may be present in fabric after completion of rinsing cycle, to neutralize any alkali that may be present in the water supply, and to neutralize any natural slightly yellow shade of fabric.

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 shall be the same as that of the specified value in this specification.

All standard values given in this specification are in SI units.

In the formulation of this specification, considerable assistance derived from the publications of the Indian Standards Institution, South African Bureau of Standards and the General Services Administration of the USA is gratefully acknowledged.

1 SCOPE

This specification prescribes the requirements and methods of sampling and test for laundry blue.

2 REFERENCES

- CS 52 Determination of colour fastness of textile materials to washing at 40 °C (Test 1)
- CS 102 Presentation of numerical values
- CS 124 Test sieves
- SLS 428 Random sampling methods
- SLS 554 Laundry soap

3 TYPES AND CLASSES

Laundry blue shall be of the types and classes as given in Table 1.

TABLE 1 - Types and classes of laundry blue

Type 1 Dispersible (1)	Type 2 Water soluble	
	Class A (non-acidic) (2)	Class B (acidic) (3)
Generally used for household or small batch blueing.	Generally used by laundries for flat work. Not altered by the presence of dilute alkali.	Generally used by laundries for shirts, collars and other starched articles and also used for flat work. Not altered by the presence of dilute acids.

4 REQUIREMENTS

4.1 Laundry blue Type 1

4.1.1 *Material*

4.1.1.1 The blue shall be water insoluble and the colouring substance shall be a good quality ultramarine blue. When tested in accordance with Appendix A, the blue shall give a positive reaction.

4.1.1.2 The blue shall be in powder form.

4.1.2 *Residue on sieve*

When tested in accordance with Appendix B, the blue shall not leave more than 0.5 per cent by mass of residue on a sieve of nominal aperture 63 µm.

4.1.3 *Colour of liquid*

When the blue is suspended in water the colour of the liquid shall be blue to reddish blue and the liquid shall show no tendency towards a green colour. When measured on a Lovibond tintometer in accordance with Appendix D the colour of the liquid shall be of the order given in Table 2.

TABLE 2 - Colour of liquid (Type 1)

Blue min. (1)	Yellow max. (2)	Brightness (3)
20	5	Nil

4.1.4 *Fineness of suspended particles*

When tested in accordance with Appendix F, the particles shall not settle completely within 2 h.

4.1.5 *Tint uniformity*

When tested in accordance with Appendix G, the tinting of the bluing shall be uniform, not streaked or spotty.

4.1.6 *Tint washability*

When tested in accordance with Appendix H, the fabric shall be free from any traces of tint.

4.1.7 *Moisture and volatile matter content*

When tested in accordance with Appendix J, the blue shall not contain more than 0.5 per cent by mass of moisture and volatile matter.

4.1.8 *Free sulphur content*

When tested in accordance with Appendix K, the blue shall not contain more than 0.1 per cent by mass of free sulphur.

4.1.9 *Alkalinity*

When tested in accordance with Appendix L, alkalinity (as Na_2CO_3) per cent by mass shall not be greater than 0.1.

4.1.10 *Soluble organic colouring matter*

The blue shall pass the test prescribed in Appendix M.

4.2 Laundry blue Type 2

4.2.1 *Material*

4.2.1.1 The blue shall be a water soluble organic dyestuff, chemically grouped under monoazo dyes.

4.2.1.2 The blue shall be in powder, tablet or granular form.

4.2.2 *Residue on sieve*

When tested in accordance with Appendix B, the blue shall not leave more than 0.6 per cent by mass of residue on a sieve of nominal aperture 63 μm .

4.2.3 *Solubility*

4.2.3.1 Laundry blue, Type 2 : Class A

When tested in accordance with C.1, dissolution shall be rapid and there shall be no indication of settling out of solution or sediment.

4.2.3.2 Laundry blue, Type 2 : Class B

When tested in accordance with C.2, dissolution shall be rapid and there shall be no indication of settling out of solution or sediment.

4.2.4 *Colour of solution*

When the blue is dissolved in water the colour of the solution shall be blue to reddish blue and the solution shall show no tendency towards a green colour. When measured on a Lovibond tintometer in accordance with Appendix E, the colour of the solution shall be in accordance with Table 3.

TABLE 3 - Colour of solution (Type 2)

Blue min. (1)	Yellow max. (2)	Brightness (3)
20	5	3

4.2.5 *Tint uniformity*

When tested in accordance with Appendix G, the tinting of the bluing shall be uniform.

4.2.6 *Tint washability*

When tested in accordance with Appendix H, the cloth shall be free from any traces of tint.

5 PACKAGING

5.1 Laundry blue shall be packed in suitable containers to prevent damage in transit and to prevent deterioration of quality under normal conditions of storage.

6 MARKING

6.1 The following shall be marked legibly and indelibly on each container:

- a) Name of the material;
- b) Brand name, if any;
- c) Type of the material - to be indicated by the words *dispersible* or *water soluble non - acidic* or *water soluble acidic*; as the case may be;
- d) Name and address of the manufacturer;
- e) Net mass of contents, in grams; and
- f) Batch or code number.

6.2 The containers may also be marked with the Certification Mark of the Bureau of Ceylon Standards illustrated below on permission being granted for such marking by the Bureau of Ceylon Standards.



NOTE - The use of the Bureau of Ceylon Standards Certification Mark (SLS Mark) is governed by the provisions of the Bureau of Ceylon Standards Act and 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 Bureau and operated by the producer. SLS marked products are also continuously checked by the Bureau 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 Bureau of Ceylon Standards.

7 SAMPLING

7.1 Lot

In a single consignment all the containers of same size, containing material of same type and class drawn from one batch of manufacture shall constitute a lot.

7.2 General requirements of sampling

In drawing, preparing, storing and handling samples, the following precautions and directions shall be observed.

- 7.2.1 Sampling instruments when used shall be clean and dry.
- 7.2.2 Precautions shall be taken to prevent the samples from contamination.
- 7.2.3 The samples shall be placed in suitable clean and dry containers.
- 7.2.4 Each sample container shall be sealed air-tight after filling, and marked with necessary details of sampling.
- 7.2.5 Samples shall be stored in such a manner that the conditions of storage do not affect the quality of the material.

7.3 Scale of sampling

- 7.3.1 Samples shall be tested from each lot for ascertaining the conformity of the material to the requirements of this specification.
- 7.3.2 The number of containers to be selected from the lot shall be in accordance with Table 4.
- 7.3.3 The containers shall be selected at random. In order to ensure randomness of selection random number tables as given in SLS 428 shall be used.

TABLE 4 - Scale of sampling

Number of containers in the lot (1)	Number of containers to be selected (2)
Up to 100	8
101 to 300	12
301 to 500	16
501 to 1 000	20
1 001 and above	24

7.4 Composite sample

7.4.1 An equal quantity of material shall be drawn from top, middle, and bottom portion of each container selected as in 7.3.2 using an appropriate sampling instrument. The materials so obtained shall be mixed to form a composite sample weighing not less than 150 g to represent the lot.

7.5 Number of tests

7.5.1 Each container shall be examined for marking requirement (this may be done at the place of inspection).

7.5.2 Tests for all the requirements in this specification shall be carried out on the composite sample prepared as in 7.4.

8 METHODS OF TEST

8.1 Tests shall be carried out as prescribed in Appendices A to L.

9 CONFORMITY TO STANDARD

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

9.1.1 Each container examined as in 7.5.1 satisfies the relevant requirements.

9.1.2 The test results on the composite sample tested as in 7.5.2 satisfy the relevant requirements.

APPENDIX A

IDENTIFICATION OF TYPE 1 LAUNDRY BLUE

Treat a portion of the sample with dilute hydrochloric acid (1:4). If the material is ultramarine blue, the colour will be destroyed with the evolution of hydrogen sulphide.

APPENDIX B

DETERMINATION OF RESIDUE ON SIEVE

B.1 APPARATUS

B.1.1 *Sieve*, with a mesh of nominal aperture width of 63 μm conforming to CS 124.

B.1.2 *Watch glass*, of diameter 75 mm previously tared.

B.2 REAGENTS

B.2.1 *Ethanol*, 95 per cent (V/V).

B.3 PROCEDURE

Weigh 20 g of the test sample of blue in a beaker and swirl for 1 min with 50 ml of the ethanol. Add to the suspension 500 ml of water and then quickly transfer the suspension onto the sieve with water.

Wash the residue remaining on the sieve with water (not under pressure), gently brush the residue with a soft camel-hair pencil until the washings collected in a white porcelain basin are completely colourless.

Wash the residue with ethanol and then dry the sieve and contents in an oven for 15 min at 105 ± 2 °C. Carefully remove the residue from the sieve onto the tared watch glass with the aid of a soft, camel-hair pencil and weigh the watch glass and residue to the nearest milligram.

B.4 CALCULATION

$$\text{Residue on sieve, per cent by mass} = \frac{100 m}{M}$$

where,

m = mass, in g, of residue;

M = mass, in g, of sample taken.

APPENDIX C**DETERMINATION OF THE SOLUBILITY OF TYPE 2 LAUNDRY BLUE****C.1 LAUNDRY BLUE, TYPE 2 : CLASS A**

Dissolve 1 g of the blue in 100 ml of distilled water at 90 °C. Keep the solution standing at room temperature for 24 h.

C.2 LAUNDRY BLUE TYPE 2 : CLASS B

Dissolve 1 g of the blue in 100 ml of distilled water at 90 °C, and then add 1 ml glacial acetic acid. Keep the solution standing at room temperature for 24 h.

APPENDIX D

DETERMINATION OF THE COLOUR OF LIQUID (FOR TYPE 1 BLUE)

D.1 COTTON FLANNEL FABRIC REQUIREMENTS

The cotton flannel shall comply with the fabric requirements specified in Table 5.

TABLE 5 - Cotton flannel fabric requirements

Weave (1)	Finish (2)	Mass per m ² , g (3)	No. of threads per cm	
			Warp (4)	Weft (5)
Plain	Bleached and raised	135 ± 7	24 ± 2	24 ± 2

D.2 PREPARATION OF TESTING LIQUID

Weigh to the nearest 0.1 g about 2 g of the sample of blue under test. Carry out the weighing on a double layer of the cotton flannel of 50-mm square. Fold the opposite ends of the cotton flannel inwards so that it envelopes the sample.

Place the covered sample of blue in a flat porcelain dish containing 200 ml of distilled water and work the blue through the cotton flannel with the fingers so as to obtain a uniform suspension of the blue. When it appears that the bluing has been worked through the cloth, open the cloth so as to ascertain whether all the blue has passed through. Repeat the above operation with any remaining residue until all the blue has passed the cloth. Then transfer the contents of the porcelain dish gravimetrically to 500-ml measuring flask and make up to the mark with distilled water. Stopper the flask and mix thoroughly by shaking.

D.3 PROCEDURE

Mix the suspension obtained in accordance with D.2 thoroughly by shaking. Then pour the thoroughly mixed suspension into a 25-mm glass absorption cell and measure the colour before settling begins on a Lovibond tintometer.

APPENDIX E

TEST FOR THE DETERMINATION OF THE COLOUR OF SOLUTION
(FOR TYPE 2 LAUNDRY BLUE)

E.1 COTTON FLANNEL FABRIC REQUIREMENTS

See D.1.

E.2 PREPARATION OF TESTING SOLUTION

Weigh to the nearest 0.01 g, about 0.2 g of the sample of blue under test and transfer to a 500-ml measuring flask. Add about 200 ml of hot distilled water to the flask and whirl the flask to dissolve the blue. Allow the solution to cool to room temperature and make up to the volume, stopper the flask and mix thoroughly by shaking.

E.3 PROCEDURE

Pour the solution obtained in accordance with E.2 to a 3-mm glass absorption cell and measure the colour of the solution on a Lovibond tintometer.

APPENDIX F

DETERMINATION OF THE FINENESS OF SUSPENDED PARTICLES

Keep the suspension, prepared in accordance with D.2 standing at room temperature for 2 h.

APPENDIX G

DETERMINATION OF TINT UNIFORMITY

G.1 BLEACHED COTTON SHEETING REQUIREMENTS

The bleached cotton sheeting shall comply with the fabric requirements specified in Table 6.

TABLE 6 - Bleached cotton sheeting requirements

Weave (1)	Finish (2)	Mass per m ² , g (3)	No. of threads per cm	
			Warp (4)	Weft (5)
Plain	Bleached	160 ± 8	29 ± 2	27 ± 2

G.2 PREPARATION OF SHEETING

Launder the bleached cotton sheeting specified in G.1 with hot water and soap (see SLS 554 Type 1). Rinse the sheeting thoroughly with hot water and allow to dry. Cut a specimen of 175 mm x 175 mm for the test.

G.3 PREPARATION OF TESTING FLUID

G.3.1 Testing liquid for laundry blue, Type 1

See D.2.

G.3.2 Testing solution for laundry blue, Type 2

See E.2.

G.4 PROCEDURE

Place the 175-mm x 175-mm specimen in a 500-ml jar, and 100 ml of distilled water at room temperature and shake the jar in order to wet the cloth thoroughly. Add to the jar 50 ml of the thoroughly mixed testing fluid (G.3). Close the jar and shake it vigorously with the same motion for 15 min. Remove the blued specimen from the jar and dry.

G.5 REPORT

Report whether the tinting of the specimen is uniform or streaked or spotty.

APPENDIX H DETERMINATION OF THE TINT WASHABILITY OF LAUNDRY BLUE

H.1 PRINCIPLE

A specimen of the textile specified is immersed in the testing fluid and subsequently agitated mechanically under the specified conditions of time and temperature, in a soap solution, rinsed and dried. The specimen is examined for traces of tint.

H.2 APPARATUS

The apparatus specified in CS 52 or any other suitable mechanical device adjusted to perform normal commercial or domestic laundering. (The adjustment could be done according to the instructions given on the particular machine).

H.3 REAGENTS

Laundry soap (Type 1) complying with SLS 554.

Soap solution, prepared by dissolving 5.5 g of laundry soap (Type 1) complying with SLS 554 in 1 litre of distilled water.

H.4 SPECIMEN

H.4.1 Material

Bleached cotton sheeting complying with the fabric requirements given in Table 6.

H.4.2 Preparation of test specimen

Launder the bleached cotton sheeting specified in G.1 with hot water and soap (see SLS 554 Type 1). Rinse the sheeting thoroughly with hot water and allow to dry. Cut a specimen of the sheeting (175 mm x 175 mm) for the test.

H.5 PROCEDURE

H.5.1 Wet the test specimen thoroughly in the testing fluid (D.2 for Type 1 and E.2 for Type 2) according to the procedure specified in G.4 and allow to dry in air.

H.5.2 Place the specimen in the container and add the necessary amount of reagent specified in H.3 previously heated to 40 ± 2 °C, so as to give a liquor ratio of 50:1.

H.5.3 Treat the specimen at 40 ± 2 °C for 30 minutes.

H.5.4 Remove the specimen, rinse it twice in cold distilled water and then in cold running tap water for 10 minutes and squeeze it.

H.5.5 Dry it in air at a temperature not exceeding 60 °C.

H.5.6 Examine the specimen for any traces of tint.

H.6 REPORT

Report whether the specimen is free of any traces of tint or not.

APPENDIX J

DETERMINATION OF MOISTURE AND VOLATILE MATTER CONTENT

J.1 PRINCIPLE

The percentage loss on heating the material to constant mass in an oven at 100 ± 2 °C will give the moisture and volatile matter content of the sample.

J.2 PROCEDURE

Weigh about 2 g of the sample to the nearest 1 mg in a tared wide-mouthed cylindrical glass weighing bottle (flat-bottomed, about 30 mm in height and about 70 mm in diameter) provided with a ground-glass stopper. Remove the stopper and place the bottle containing the sample in an oven maintained at 100 ± 2 °C for two hours. At the end of this period replace the stopper, cool the weighing bottle in a desiccator containing concentrated sulphuric acid or silica gel and weigh. Repeat heating and weighing operation until the difference in mass between two successive weighings does not exceed 1 mg.

J.3 CALCULATION

$$\text{Moisture and volatile matter, per cent by mass} = \frac{100(M_1 - M_2)}{M_1}$$

where,

$$M_1 = \text{mass, in g, of the sample taken for test; and}$$

$$M_2 = \text{mass, in g, of the sample after heating.}$$

APPENDIX K

DETERMINATION OF FREE SULPHUR CONTENT (FOR TYPE 1 LAUNDRY BLUE)

K.1 PRINCIPLE

The blue is extracted with chloroform, in Soxhlet apparatus and the solvent evaporated from the extracted material. The amount of free sulphur is calculated from the residue left after evaporation.

K.2 APPARATUS

Soxhlet apparatus.

K.3 REAGENTS

Chloroform, analytical reagent grade.

K.4 PROCEDURE

Weigh to the nearest mg about 60 g of the blue and extract with sufficient quantity of chloroform in a Soxhlet apparatus for about 4 h. Distil off the contents and evaporate the residue to dryness at 60 °C, weigh the residue obtained.

K.5 CALCULATION

$$\text{Free sulphur, per cent by mass} = \frac{100 M_1}{M_2}$$

where,

M_1 = mass, in g, of residue; and

M_2 = mass, in g, of the material taken.

APPENDIX L

DETERMINATION OF ALKALINITY (FOR TYPE 1 LAUNDRY BLUE)

L.1 Weigh about 5 g of the test sample of blue to the nearest 0.01 g and dry it in an oven maintained at 100 ± 2 °C for 2 h. Wet it thoroughly with 10 ml of 95 per cent (v/v) ethanol. Make up the liquid to a volume of 200 ml by adding freshly boiled and cooled carbon dioxide free distilled water. Shake for 5 min, allow the sediment to settle, filter on neutral filter paper, discard the first 10 ml and transfer about 120 ml of the clear filtrate to a flask.

L.2 Ascertain qualitatively with a small portion of the filtrate using methyl orange as indicator, whether the extract is acidic or alkaline.

L.3 If the extract is alkaline then titrate a 50-ml portion of the filtrate with 0.1 N standard solution of hydrochloric acid, using methyl orange as indicator. Calculate and express the result as per cent sodium carbonate (Na_2CO_3) of the mass of the material taken for test.

APPENDIX M
TEST FOR SOLUBLE ORGANIC COLOURING MATTER

M.1 PRINCIPLE

To a boiling solution of the blue in ethanol, sodium hydroxide solution and acetic acid are added separately and examined for any development of colour.

M.2 REAGENTS

M.2.1 *Ethyl alcohol*, 95 per cent by volume.

M.2.2 *Acetic acid*, 10 per cent by volume.

M.2.3 *Sodium hydroxide solution*, Approximately 4 N.

M.3 PROCEDURE

M.3.1 Add to ethyl alcohol in a beaker, a small quantity of the blue and bring to boiling. Divide the boiling solution into two test tubes. To the test tubes, add a few ml of acetic acid and sodium hydroxide respectively. Observe the colour of the liquid in the test tube.

M.3.2 The blue shall be considered to have passed this test if the colour of the liquids remain unchanged.

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