SRI LANKA STANDARD 940 : 1991

UDC 664.3.033 : 667.777

SPECIFICATION FOR

FOOD COLOURING MATTER, BRILLIANT BLUE FCF

SRI LANKA STANDARDS INSTITUTION

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SLS 940:1991

Gr. 6

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This standard does not purport to include all the necessary provisions of a contract.

SRI LANKA STANDARD
SPECIFICATION FOR FOOD COLOURING MATTER, BRILLIANT BLUE FCF

FOREWORD

This Sri Lanka Standard was authorized for adoption and publication by the Council of the Sri Lanka Standards Institution on 1991 - 11 - 14 , after the draft, finalized by the Drafting Committee on Food Additives, had been approved by the Agricultural and Food Products Divisional Committee.

This is one of the series of standard specifications for food colours.

The colour brilliant blue FCF is hygroscopic in nature and its shade changes with the pH value.

This specification is subject to the provisions of the Food Act No. 26 of 1980 and the regulations framed thereunder.

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 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.

In the preparation of this specification the valuable assistance obtained from the relevant publications of the Food and Agriculture Organization (FAO) and the Bureau of Indian Standards is gratefully acknowledged.

1 SCOPE

This specification prescribes the requirements and methods of sampling and test for brilliant blue FCF used as a colouring matter of food stuffs .

2 REFERENCES

CS 102 Presentation of numerical values.
SLS 394 Analysis of water soluble coal-tar dyes.
SLS 467 Labelling of prepackaged foods
Part 1 : General guidelines.
Part 2 : Guidelines on claims.
SLS 543 Sampling of food colours.

3 DESCRIPTION

3.1 **Common name** : Brilliant blue FCF.

3.2 **Synonyms** : CI Food Blue 2.
FD & C Blue No. 1.

3.3 **Colour index number and EEC number** : 42090, E 133.

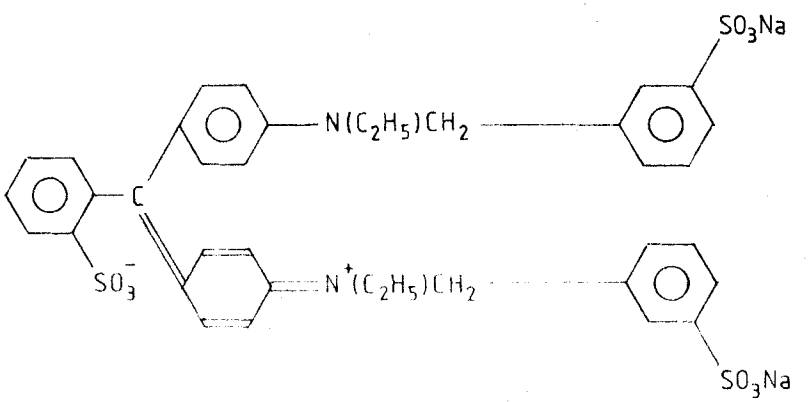
3.4 **Class** : Triarylmethane

3.5 **Chemical name** : Disodium ∝-[4-(N-ethyl-3-sulfonatobenzylamino) phenyl] - ∝ - [4-(N-ethyl-3-sulfonatobenzylamino) cyclohexa-2,5-dienylidene] toluene-2-sulfonate.

3.6 **Empirical formula** : $C_{37}H_{34}N_2Na_2O_9S_3$.

3.7 **Molecular mass** : 792.84

3.8 **Structural formula** :



4 REQUIREMENTS

4.1 Brilliant blue FCF shall consist of disodium ∝- [4-(N-ethyl - 3-sulfonatobenzylamino) phenyl]-∝-[4- (N-ethyl(-3-sulfonatobenzylamino) cyclohexa-2,5-dienylidene] toluene-2-sulfonate.

It shall not contain any extraneous matter injurious to health.

4.2 Brilliant blue FCF shall be in the form of blue powder or granules.

4.3 Brilliant blue FCF shall conform to the requirements given in Table 1, when tested by the methods prescribed in Column 4 of the table.

TABLE 1 - Requirements for brilliant blue FCF

Sl. No. (1)	Characteristic (2)	Requirement (3)	Method of test (4)
(i)	Total dye content, per cent by mass, min.	85	Appendix A
(ii)	Matter volatile at 135 ± 1 °C, per cent by mass and Chlorides and sulfates, as sodium salts, per cent by mass	15 max.	2.1, 2.5 and 2.6 of SLS 394:1976
(iii)	Water insoluble matter, per cent by mass, max.	0.2	2.2 of SLS 394:1976
(iv)	Subsidiary dye content, per cent by mass, max.	06	Appendix B
(v)	Organic compounds other than dye, per cent by mass, max. a) 2-formyl benzene sulfonic acid b) 3-formyl benzene sulfonic acid c) 4-formyl benzene sulfonic acid d) 3-[[ethyl] (4-sulfophenyl) amino] methyl benzene sulfonic acid	01	Appendix C
(vi)	Ether extractable matter, per cent by mass, max.	0.2	2.3 of SLS 394:1976
(vii)	Arsenic, mg/kg, max.	03	2.8 of SLS 394:1976
(viii)	Lead, mg/kg, max.	10	
(ix)	Heavy metals, as sulfides	Lighter in colour than the reference standard	2.9 of SLS 394:1976

5 PACKAGING AND MARKING

5.1 Packaging

Brilliant blue FCF shall be packed in suitable containers which shall not affect the nature and composition of the material.

5.2 Marking

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

a) Name of the product as"Brilliant blue FCF, Food Grade";
b) Colour index number "42090";
c) Brand name or trade name, if any;
d) Net mass,in grams;
e) Name and address of the manufacturer and/or distributor (including the country of origin); and
f) Batch or code number.

5.2.2 Marking and labelling shall be in accordance with SLS 467.

NOTE

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

6 SAMPLING

Sampling shall be carried out in accordance with SLS 543. The composite sample for testing shall be prepared as given in the relevant clauses of SLS 543.

7 METHODS OF TEST

Tests shall be carried out as prescribed in relevant clauses of SLS 394 and Appendices A to C of this specification.

8 CRITERIA FOR CONFORMITY

A lot shall be declared as conforming to the requirements of this specification if the test results obtained on the composite sample satisfy the relevant requirements.

APPENDIX A
DETERMINATION OF TOTAL DYE CONTENT

A.1 APPARATUS

A.1.1 *Spectrophotometer*, having a cell length of 10.0 mm.

A.1.2 *Oven*, maintained at 105 °C.

A.2 REAGENT

Ammonium acetate, 200 mg/l solution.

A.3 PROCEDURE

Weigh, to the nearest 0.01 mg, about 100 mg of the dye sample and dissolve in ammonium acetate solution (**A.2**) in a 250-ml volumetric flask. Dilute with the same solvent to make the final concentration of approximately 0.2 mg per 100 ml .

Measure the optical density of diluted solution against ammonium acetate solution as the blank at a wave length of 630 nm.

Simultaneously weigh, to the nearest milligram, about 2 g of the dye sample and dry in the oven (**A.1.2**) at 105 $\pm$ 1 °C for 2 hours. Calculate the loss of mass on drying.

Calculate the dry mass of the sample (m) in the final solution taken for the measurement of the optical density.

A.4 CALCULATION

$$\text{Total dye content, per cent by mass} = \frac{A \times 100}{m \times 1640}$$

where,

A is the measured optical density; and
m is the dry mass, in mg, of the sample in 100 ml of solution.

APPENDIX B
DETERMINATION OF SUBSIDIARY DYES

B.1 APPARATUS

The apparatus listed in 2.4.2 of SLS 394 : 1976.

B.2 REAGENTS

B.2.1 *Atmosphere saturating solvent/developing solvent*

Butan - 2 - one	700 ml
Acetone	300 ml
Water	300 ml
Ammonia solution (rel.den. = 0.88)	2 ml

B.2.2 *Extracting solvent*
Acetone : water (1:1)

B.3 PROCEDURE

B.3.1 Proceed as given in 2.4.4 (a) of SLS 394 : 1976.

Continue the procedure as given in 2.4.4 (b) developing the chromatogram for approximately 20 hours and measure the absorbance as given in 2.4.4(c).

B.3.2 Prepare 0.06 per cent solution from the 1.0 per cent solution of the dye sample. Apply 0.10 ml of this solution on a 180-mm x 7-mm rectangle of a chromatographic paper as uniformly as possible, holding the nozzle of the micro-syringe steadily in contact with the paper. Dry the paper at 50 °C to 60 °C for 10 minutes to 15 minutes. Cut the band from the paper as a strip. Cut an equivalent strip from a plain but marked paper. Proceed as given in 2.4.4 (c) of SLS 394:197 and determine the net optical density (A_S) of the standard solution.

$$\text{Subsidiary dyes, per cent by mass} = \frac{a + b + c + \ldots + n}{A_S} \times L \times \frac{D}{100}$$

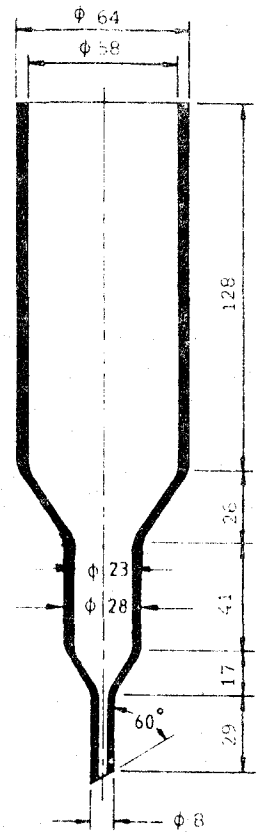
where,

a,b,c etc. are the net optical densities of the subsidiary dyes;
D is the total dye content of the sample (see Appendix A);
A_S is the optical density of the standard solution; and
L is the limit of subsidiary dye content.

APPENDIX C
DETERMINATION OF ORGANIC COMPOUNDS OTHER THAN DYE

C.1 APPARATUS

C.1.1 *Chromatographic tube*, as given in Figure 1.



Dimensions in millimetres

FIGURE 1 - Chromatographic tube

C.1.2 *Spectrophotometer*, suitable for ultraviolet range.

C.2 REAGENTS

The reagents used shall be of analytical grade.

C.2.1 *Ammonium sulfate*, 250 g/l solution.

C.2.2 *Ammonium sulfate*

C.2.3 *2-formyl benzene sulfonic acid*

C.2.4 *3- formyl benzene sulfonic acid*

C.2.5 *4 - formyl benzene sulfonic acid*

C.2.6 *3 - [[ethyl] (4 - sulfophenyl) amino] methyl benzene sulfonic acid*

C.3 PROCEDURE

C.3.1 Preparation of the column

Prepare a slurry using about 75 g of Whatman powdered cellulose or an equivalent and 500 ml of ammonium sulfate solution (**C.2.1**). Wash the tube with 200 ml of the ammonium sulfate solution (**C.2.1**). Place a small disc of stainless steel gauze in the constriction above the tip of the tube. Pour sufficient amount of slurry into the tube until the tube is filled up to a level of 50 mm from the rim. Tap the tube occasionally to ensure a well packed column. Wash the column with 200 ml of the eluant.

C.3.2 Determination

Weigh, to the nearest milligram, about 0.2 g of the dye sample in a beaker. Dissolve in 20 ml of water. Add approximately 5 g of powdered cellulose and 50 g of ammonium sulfate. Transfer the mixture to the column, rinse the beaker with the ammonium sulfate solution (**C.2.1**) and add the washings to the tube. Allow the column to drain until flow ceases, or nearly so. Add the ammonium sulfate solution to the column at a rate equivalent to the rate of flow through the column. Collect the effluent in 100-ml fractions. Collect twelve fractions. Reserve the column and the contents.

Shake each fraction and obtain the ultraviolet absorption spectrum from 220 nm to 400 nm. If the spectrum of the twelfth fraction shows the presence of any compound, continue collecting fractions until all compounds present are eluted.

Compare the absorption spectra of the eluted material with the spectra of solutions of pure compound (C.2.3, C.2.4, C.2.5 and C.2.6) in the same solvent for identification and quantification.

NOTE

If more than one compound is present in significant quantities in any fraction the amounts of these compounds should be determined by the procedure customarily used in spectrophotometric analysis of mixtures of absorbing materials.

C.3.3 Correction for background absorption

Determine the absorption of the fractions collected from the column immediately before and after each fraction containing the compounds. Subtract one-half of the sum of these two determinations from the observed absorbance of the fraction containing the compounds. This should be taken as the absorbance due to the compound present.

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.*

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SRI LANKA STANDARDS INSTITUTION

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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.

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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.

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