SRI LANKA STANDARD 1035: 1995
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SPECIFICATION FOR
SOYA SAUCE

SRI LANKA STANDARDS INSTITUTION

Sri Lanka Standard
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SLS 1035 : 1995

(Attached AMD 573)

Gr. 7

SRI LANKA STANDARDS INSTITUTION
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SRI LANKA

Sri Lanka Standard
SPECIFICATION FOR SOYA SAUCE

FOREWORD

This standard was finalized by the Sectoral Committee on Agriculture and Food Technology - 1 and was authorized for adoption and publication by the Council of the Sri Lanka Standards Institution on 95-04-27.

Soya Sauce is important as a component of oriental dishes and a flavor enhancer. Of all flavoring ingredients in common use in food processing today, one of the most versatile is soya sauce.

Guidelines for the determination of compliance of a lot with the requirements of this standard based on statistical sampling and inspection are given in Appendix **A**.

During the formulation of this specification due consideration has been given to the relevant provisions made under the Sri Lanka Food Act No. 26 of 1980. Specific requirements given in this specification, wherever applicable, are in accordance with the relevant regulations. However, general provisions made under the Sri Lanka Food Act have not been included in this specification and therefore, the attention of the user of this specification is drawn to these general provisions.

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 the specification.

In the preparation of this specification, the valuable assistance derived from the following publication is gratefully acknowledged:
MS 807: 1983 Malaysian Standard specification for soya sauce

1 SCOPE

This specification prescribes the requirements and methods of test for soya sauce.

2 REFERENCES

SLS 79 Edible common salt
CS 102 Presentation of numercal values
SLS 143 General principles of food hygiene
CS 144 Wheat flour
SLS 311 Determination of lead
SLS 312 Determination of arsenic
SLS 428 Random sampling methods
SLS 467 Labelling of prepackaged foods
SLS 614 Potable water
SLS 669 Soya bean, whole
SLS 913 Rice flour

3 DEFINITIONS

For the purpose of this specification, the following definition shall apply:

Soya Sauce: Product prepared from a basic mixture of extracts from the fermentation products of soya bean or defatted soya bean and flour (wheat, rice, maize or tapioca), salt (sodium chloride) and/or nutritive sweeteners such as sucrose, dextrose and liquid glucose.

4 GRADES

Soya sauce shall be of two grades:

a) Grade 1; and
b) Grade 2.

5 INGREDIENTS / ADDTIVES

5.1 Soya beans, conforming to SLS 669.

5.2 Flour: Wheat flour conforming to **CS 144**, rice flour conforming to **SLS 913**, maize flour, tapioca flour, sorghum flour, barley

5.3 Salt, conforming to **SLS 79**.

5.4 Water, conforming to **SLS 614**.

5.5 Nutritive sweeteners

5.6 Caramel

5.7 Benzoic acid, if required.

6 REQUIREMENTS

6.1 Soya sauce shall be processed under hygienic conditions as prescribed in **SLS 143**.

6.2 Soya sauce shall be a heat treated product. The heat treatment shall be done at 90 ^{o}C for 20 minutes.

6.3 Soya sauce shall have a characteristic aroma and taste. It shall be free from any objectionable odour.

6.4 Soya sauce shall be free from extraneous matter.

6.5 Soya sauce shall not contain any enhancers, artificial sweeteners and added colouring matter (except caramel).

6.6 Soya sauce shall conform to the requirements given in Table **1** when tested by the methods given in Column **5** of the table.

TABLE 1 - Requirements for soya sauce

Sl. No. (1)	Characteristic (2)	Requirement		Method of test (5)
		Grade 1 (3)	Grade 2 (4)	
i	Total nitrogen, g/100 ml, min.	0.96	0.64	Appendix **B**
ii	Amino nitrogen, g/100 ml, min.	0.41	0.28	Appendix **C**
iii	pH	4.5 to 5.1	4.5 to 5.1	Appendix **D**
iv	Salt, as sodium chloride, per cent by mass, min.	15	15	Appendix **E**

6.7 Soya sauce shall not exceed the limits for heavy metals given in Table 2 when tested by the method given in Column **4** of the table.

TABLE 2 - Limits for heavy metals

Sl No (1)	Heavy metal (2)	Limit (3)	Method of test (4)
i	Arsenic, mg/kg, max.	1.0	**SLS 312**
ii	Lead, mg/kg, max.	2.0	**SLS 311**

7 PACKAGING

Soya sauce shall be packed in clean glass bottles or other suitable containers. The containers shall be sealed air-tight.

8 MARKING

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

a) Name of the product as "SOYA SAUCE" ;
b) Brand name/trade mark;
c) Net contents, in milliliters or in liters;
d) Name and address of the manufacturer and/or distributor (including the country of origin);
e) Batch/code number;
f) Date of expiry; and
g) List of ingredients in descending order or proportion.

8.2 Marking and labelling shall also be in accordance with **SLS 467**.

NOTE

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

9 METHODS OF TEST

Tests shall be carried out as given in **SLS 311**, **SLS 312** and Appendicies **B** to **E** of this specification.

APPENDIX A
COMPLIANCE OF A LOT

The sampling scheme given in this Appendix should be applied 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 assured based on manufacturer's control systems coupled with type testing and check tests or any other procedure, appropriate schemes of sampling and inspection should be adopted.

A.1 LOT

In any consignment all the containers of soya sauce of the same grade belonging to one batch of supply or manufacture shall constitute a lot.

A.2 SCALE OF SAMPLING

A.2.1 Samples should be tested from each lot for ascertaining conformity to the requirements of this specification.

A.2.2 The number of containers to be selected from a lot shall be in accordance with Table 3.

TABLE 3 - Scale of sampling

Number of containers in the lot **(1)**	**Number of containers to be selected** **(2)**
Up to 150	03
151 to 500	04
501 to 1 200	06
1 201 to 3 200	08
3 201 and above	10

A.2.3 The containers shall be selected at random. In order to ensure randomness of selection random numbers 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 and for the requirements given in **6.3** and **6.4**.

A.3.2 Each container selected as in **A.2.2** shall be individually tested for the requirements given in Table **1**.

A.3.3 A composite sample shall be prepared by taking approximately equal quantities of soya sauce from each container tested as in **A.3.3** and the composite sample thus prepared shall be tested for the requirements given in **6.7**.

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 relevant requirements.

A.4.2 The value of the expression $\bar{X}$ - 1.1.S calculated using the test results on total nitrogen, amino nitrogen and sodium chloride is not less than the specified value of each requirement when tested as in **A.3.2**.

A.4.3 The values of the expressions $\bar{X}$ + 1.1.S and $\bar{X}$ - 1.1.S calculated using the results on pH value lie between the specified values of the requirement when tested as in **A.3.2**.

A.4.4 The composite sample tested as in **A.3.3** satisfies the relevant requirements.

APPENDIX B
DETERMINATION OF TOTAL NITROGEN

B.1 APPARATUS

Kjeldahl distillation apparatus.

B.2 REAGENTS

B.2.1 Catalyst mixture

Mix well 400g of anhydrous sodium sulfate, 16 g of cupric sulfate pentahydrate and 3 g of selenium dioxide.

B.2.2 Sulfuric acid, rel. den. = 1.84, notrogen free.

B.2.3 Sulfuric acid, Standardized, c(H_2SO_4) = 0.05 mol/l.

B.2.4 Sodium hydroxide, 50 per cent (m/m).

B.2.5 Sodium hydroxide, standardized, c(NaOH) = 0.1 mol/1.

B.2.6 Methyl red indicator solution

Dissolve 0.016 g of methyl red and 0.083 g of bromocresol green in 100 ml of ethanol.

B.3 PROCEDURE

B.3.1 Weigh, to the nearest milligram, about 10 g of the sample and tranfer quantitatively to the Kjeldahl flask with a little water. Add 8 g of the catalyst mixture (B.2.1) and 30 ml of concentrated sulfuric acid (B.2.2). Heat the flask gently in an inclined position. When the frothing has ceased, fit a loose dropping funnel to the flask and heat the flask strongly so that the liquid boils moderately. Swirl and shake the flask periodically to wash down any charred material adhearing to the flask. Continue to boil for 1 hour to 2 hours until the liquid becomes clear. Allow the flask to cool.

B.3.2 Dilute the contents in the Kjeldahl flask with 200 ml of water and transfer to the distillation flask. Wash the Kjeldahl flask with some water and add to the contents in the distillation flask. Adjust the volume to about 400 ml. Add a piece of granulated zinc. Quickly connect up the distillation equipment.

B.3.3 Measure accurately a known volume of sulfuric acid **(B.2.3)** in a flask. Add sufficient water to the acid so that the delivery adaptor dips below the level of the sulfuric acid. Add at least 75 ml of sodium hydroxide **(B.2.4)** to the distillation flask through the dropping funnel and close the funnel. The solution should be alkaline after adding the sodium hydroxide; the colour should be light to dark blue due to the effect on the copper catalyst.

B.3.4 Distill about 300 ml of the ammonia into the flask containing 0.05 mol/l sulfuric acid. Open the tap funnel before turning off the gas burner and wash down the condenser and delivery adaptor with as little water as possible into the conical flask. Titrate the excess acid with sodium hydroxide solution **(B.2.5)** using screened methyl red indicator (B.2.6) until a permanent green end point is reached.

B.3.5 Conduct a blank determination.

B.4 CALCULATION

$$\text{Total nitrogen, per cent by mass} = \frac{(V_2 - V_1)\ 0.0014}{m} \times 100$$

where,

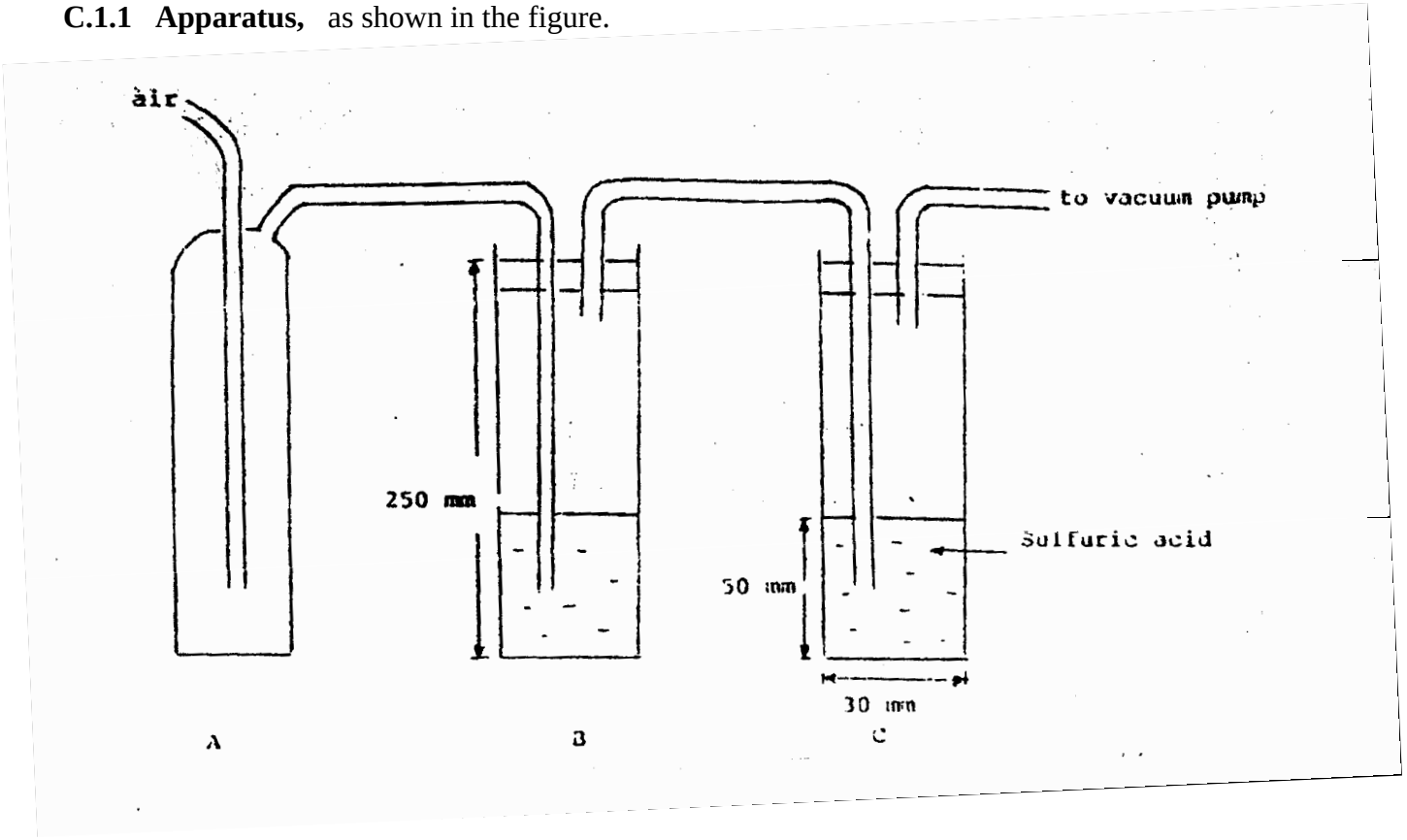
V_1 is the volume, in ml, of the sodium hydroxide solution required for the determination;
V_2 is the volume, in ml, of the sodium hydroxide solution required for the balnk titration; and
m is the mass, in g, of the sample.

APPENDIX C
DETERMINATION OF AMINO NITROGEN

Amino nitrogen content is determind by substracting ammonia nitrogen from formaldehyde nitrogen.

C.1 DETERMINATION OF AMMONIA NITROGEN

C.1.1 Apparatus, as shown in the figure.



C.1.2 Regents

C.1.2.1 Silicon/amyl alcohol

C.1.2.2 Sulfuric acid, c(H_2SO_4) = 0.01 mol/l.

C.1.2.3 Bromocresol green and methyl red mixture
Dissolve 5 g of bromocresol green and 0.1 g of methyl red in 200 ml of alcohol.

C.1.2.4 Potassium carbonate, saturated solution.

C.1.2.5 Sodium hydroxide , c(NaOH) = 0.02 mol/l.

C.1.3 Procedure

Transfer 5 ml of sample into container **B**. Add a drop of silicon/amyl alcohol **(C.1.2.1)** as defoaming agent. Measure 20 ml of sulfuric acid **(C.1.2.2)** to container **C**. Add about 2 drops of the indicator **(C.1.2.3)**. Adjust the level of solution to a height of 50 mm with distilled water. When the apparatus is ready to start add 10 ml of potassium carbonate **(C.1.2.4)** to container **B** and replace the stopper immediately. Allow the vaccum pump to run such that air will bubble not too vigorously into each of the three containers for about 3 hours. Titrate the excess sulfuric acid with sodium hydroxide **(C.1.2.5)**.

C.1.4 Calculation

$$\text{Ammonia nitrogen, g/100 ml} = (V_2 - V_1)\ 0.0014\ F \times \frac{100}{5}$$

where,

V_1 is the volume, in ml, of sodium hydroxide required to neutralize 20 ml of sulfuric acid after reaction;

V_2 is the volume, in ml, of sodium hydroxide required to neutralize 20 ml of sulfuric acid before reaction; and

F is the factor for using sodium hydroxide and sulfuric acid.

C.2 DETERMINATION OF FORMALDEHYDE NITROGEN

C.2.1 Reagents

C.2.1.1 Barium hydroxide, c $[Ba(OH)_2]$ = 0.05 mol/l, freshly prepared and standardized.

C.2.1.2 Sulfuric acid, standardized, $c(H_2SO_4)$ = 0.05 mol/l.

C.2.1.3 Formaldehyde
Titrate 50 ml of 30 per cent to 40 per cent formaldehyde with barium hydroxide to pH 8.0 using 0.5 per cent phenolpthalein as the indicator.

C.2.2 Procedure

Take 25 ml of the sample, adjust the pH to 8.0 with barium hydroxide **(C.2.1.1)**. Add excess barium hydroxide precipitate salts of sulfuroxide. phosphorous oxide and calcium carbonate. Readjust pH to 8.0 with sulfuric acid **(C.2.1.2)**. Add 20 ml of formaldehyde **(C.2.1.3)** and titrate with barium hydroxide to pH 8.0.

C.2.3 Calculation

$$\text{Formaldehyde nitrogen, g/100 ml} = \frac{V \times 0.0014 \times 100}{25}$$

where,

V is the volume, in ml, of barium hydroxide.

C.3 CALCULATION OF AMINO NITROGEN

Amino nitrogen, g/100 ml	=	Formaldehyde nitrogen g/100 ml	-	Amonia nitrogen g/100 ml

APPENDIX D
DETERMINATION OF pH

Measure the pH value of the sample to the nearest 0.1 unit using previously standardized pH meter and electrodes (with a pH 4 bufter solution).

APPENDIX E
DETERMINATION OF SALT

E.1 APPARATUS

Muffel furnace, maintained at 550 $\pm$ 50 ^{o}C.

E.2 REAGENTS

E.2.1 Sodium carbonate
Dissolve 5 g of sodium carbonate in 100 ml of water.

E.2.2 Nitric acid, 1:4 dilution.

E.2.3 Calcium carbonate, chloride free.
Dissolve 25 g of calcium carbonate in 100 ml of water to gel a suspension.

E.2.4 Potassium chromate indicator
Dissolve 5 g of potassium chromate in 100 ml of water.

E.2.5 Silver nitrate, standardized, c($AgNO_3$) = 0.1 mol/1.

E.3 PROCEDURE

E.3.1 weigh, to the nearest milligram, about 20 g of the well mixed sample into a crucible. Add 20 ml of sodium carbonate **(E.2.1)** and evaporate to dryness on a hot water-bath. Ignite in the muffle furnance **(E.1)**.

E.3.2 Cool and extract with nitric acid **(E.2.2)**. Filter and make up to 250 ml in a volumetric flask. Pipette 25 ml from the volumetric flask into a conical flask. Neutralize with calcium carbonate **(E.2.3)**. Add 1 ml of potassium chromate **(E.2.4)** and titrate with silver nitrate **(E.2.5)**.

E.4 CALCULATION

1 ml of 0.1 mol/1 silver nitrate = 0.00584 g of sodium chloride

$$\text{Salt, as sodium chloride, per cent by mass} = \frac{m_1}{m_2} \times 100$$

where,

m_1 is the mass, in g, of sodium chloride in the sample ; and

m_2 is the mass, in g, of the sample.

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AMENDMENT NO: 1 TO SLS 1035: 1995

SRI LANKA STANDARD SPECIFICATION FOR SOYA SAUCE

EXPLANATORY NOTE

This amendment is issued after a decision taken by the Working group on Soya sauce in order to be in line with Food (Preservatives) Regulation, 2019 under the Food Act 26 of 1980.

Amendment No: 1 Approved on 2022-07-07 to SLS 1035: 1995

SRI LANKA STANDARD SPECIFICATION FOR SOYA SAUCE

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Clause 5.7

Replace clause 5.7 by following.

"**5.7 Preservatives**

5.7.1 *Sorbates* (1,000 mg/ kg, max.)

5.7.2 *Sulphites* (300 mg/ kg, max.)

5.7.3 *Propionates* GMP"

SRI LANKA STANDARDS INSTITUTION

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