SRI LANKA STANDARD 390 : 1989

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SPECIFICATION FOR

TOMATO JUICE

(FIRST REVISION)

SRI LANKA STANDARDS INSTITUTION

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SLS 390:1989

Gr. 6

SRI LANKA STANDARDS INSTITUTION
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Sri Lanka Standards are subject to periodical revision in order to accommodate the progress made by industry. Suggestions for improvement will be recorded and brought to the notice of the Committees to which the revisions are entrusted.

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

SRI LANKA STANDARD

SPECIFICATION FOR TOMATO JUICE

(FIRST REVISION)

FOREWORD

This Sri Lanka Standard was authorized for adoption and publication by the Council of the Sri Lanka Standards Institution on 1989-12-14, after the draft, finalized by the Drafting Committee on Tomato Products, had been approved by the Agricultural and Food Products Divisional Committee.

This specification was originally issued in 1976. In this revision, changes have been made to the microbiological limits and the methods of test.

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

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 an analysis, shall be rounded off in accordance with CS 102. The number of figures to be retained in the rounded off value shall be the same as that of the specified value in this specification.

In the revision of this specification, the valuable assistance derived from the publications of the International Organization for Standardization and the Codex Alimentarius Commission, is gratefully acknowledged.

1 SCOPE

This specification prescribes the requirements, methods of sampling and test for tomato juice preserved by physical means.

2 REFERENCES

ISO 2173 Fruit and vegetable products - Determination of soluble solids content - refractometric method.
SLS 79 Edible common salt.
CS 102 Presentation of numerical values.
SLS 209 Code of practice for processing of fruits and vegetables.
SLS 260 Tomato sauce.

SLS 311 Determination of lead.
SLS 312 Determination of arsenic.
SLS 315 Determination of tin.
SLS 516 Microbiological test methods.
Part 10 : Commercial sterility,
SLS 581 Chillie sauce.

3 DEFINITIONS

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

3.1 **tomato juice** : The liquid extracted from red or reddish varieties of wholesome, ripe tomatoes *(Lycopersicon esculentum Mill.)*

The liquid is neither concentrated nor diluted.

4 REQUIREMENTS

4.1 Hygiene

Tomato juice shall be processed under strict hygienic conditions prescribed in SLS 209.

4.2 Raw material

The tomatoes from which the juice is obtained shall be wholesome fresh, fully ripe, and red or reddish in colour. They shall be free from fungal attack, insect infestation and any signs of deterioration.

4.3 Ingredient

Salt added shall comply with SLS 79.

4.4 Finished product

4.4.1 *Appearance*

The product shall have the colour of well ripened tomatoes. It shall be free from skin, seeds and other coarse or hard substances but may carry finely divided insoluble solids derived from the flesh of the tomato. It shall be free from extraneous matter.

4.4.2 *Colouring material*

The product shall not contain any added artificial colouring material.

4.4.3 *Preservatives*

The product shall not contain any preservatives.

4.4.4 *Flavour and odour*

The product shall have the characteristic flavour and odour of tomato juice derived from well ripened, wholesome tomatoes.

4.4.5 *Salt-free soluble solids content*

The salt-free soluble solids content of the product shall be not less than 4 per cent by mass, when tested according to the method described in Appendix B.

4.4.6 *Sodium chloride content*

The sodium chloride content shall not exceed 1.5 per cent by mass, when tested according to the method described in Appendix C.

4.4.7 *Microbiological quality*

4.4.7.1 *Commercial sterility*

The product when tested according to the method described in SLS 516 : Part 10, shall not show any of the following signs of spoilage:

a) Leakage or positive pressure; or
b) Any signs of proliferation of microorganisms as indicated by discolouration of the product or container, change in the shape of the container, objectionable odour, or a change in pH.

4.4.7.2 *Howard mould count*

The Howard mould count of the product expressed as the percentage of fields containing mould filaments, shall not exceed 20, when tested according to the method described in Appendix D.

4.4.8 *Limits for heavy metals*

The product shall conform to the limits for heavy metals given in Table 1, when tested according to the methods described in Column 4 of the table.

TABLE 1 - Limits for heavy metals

Sl. No. (1)	Heavy metal (2)	Limit mg/kg, max. (3)	Method of test (4)
i)	Arsenic	0.2	)
ii)	Lead	0.3	)Appendix E
iii)	Copper	5.0	)
iv)	Tin *	250.0	)

* *applicable to canned products only.*

4.4.9 *Vacuum of can*

In the case of canned products the vacuum of the can shall be not less than 16.6 kPa, when tested according to the method described in Appendix F.

4.4.10 *Fill of container*

The product shall occupy not less than 90 per cent of the total volume of the container, when tested according to the method described in Appendix G.

5 PACKAGING

The product shall be packed in clean containers, which shall have no deleterious effects on the taste and appearance of the product. In the case of metal containers, there shall be no signs of corrosion. The containers shall be hermetically sealed. The product shall be heat processed before or after sealing, so as to prevent spoilage.

6 MARKING

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

a) The name of the product as "TOMATO JUICE";
b) Brand name or trade name;
c) Net content, in millilitres;
d) Name and address of the manufacturer, distributor or importer, including the country of origin;
e) Batch or code number;
f) Date of expiry; and
g) Declaration of added salt, if any.

NOTE

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

7 SAMPLING

Representative samples for testing shall be drawn as prescribed in Appendix A.

8 METHODS OF TEST

Tests shall be carried out as prescribed in the relevant Sri Lanka Standards and Appendices B to G of this specification.

9 CRITERIA FOR CONFORMITY

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

9.1 Each container inspected as in A.3.1 satisfies the packaging and marking requirements.

9.2 The contents of each container tested as in A.3.2 satisfies the relevant requirements.

9.3 The number of containers, the contents of which do not conform to the relevant requirements when tested as in A.3.3, is less than or equal to the corresponding acceptance number given in Column 5 of Table 2.

9.4 The composite sample when tested as in A.3.4 satisfies the relevant requirements.

9.5 The contents of each container when tested as in A.3.5 satisfies the relevant microbiological requirements.

APPENDIX A
SAMPLING

A.1 LOT

In any consignment, all the containers of same size 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 for ascertaining its 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 the Column 2 of Table 2. The number of containers so selected shall be further divided into two sub-samples as given in Columns 3 and 4.

TABLE 2 - Scale of sampling

Number of containers in the lot (1)	Number of containers to be selected (2)	Size of sub-sample 1 (3)	Size of sub-sample 2 (4)	Acceptance number (5)
Up to 200	09	06	3	0
201 to 300	11	08	3	1
301 to 500	14	10	4	1
501 to 800	16	12	4	1
801 to 1 500	19	14	5	1
1 501 to 3 200	24	16	8	2
3 201 and above	29	20	9	2

A.2.3 The containers shall be selected at random. In order to ensure randomness of selection, tables of random numbers as given in SLS 428 shall be used.

A.3 NUMBER OF TESTS

A.3.1 Each container selected as in Column 2 of Table 2 shall be inspected for packaging and marking requirements.

A.3.2 Each container of sub-sample 1 shall be tested for the requirements given in 4.4.9, and 4.4.10.

A.3.3 After the testing as in A.3.2, the contents of each container shall be tested for the requirements given in 4.4.1 and 4.4.4.

A.3.4 The contents tested as in A.3.3 shall be mixed together to form a composite sample and the composite sample shall be tested for the requirements given in 4.4.2, 4.4.3, 4.4.5, 4.4.6 and 4.4.8.

A.3.5 The contents of one container of the sub-sample 2 shall be examined for the Howard mould count and the contents of the remaining containers shall be tested for commercial sterility.

APPENDIX B
DETERMINATION OF SALT-FREE SOLUBLE SOLIDS CONTENT

The percentage of salt-free soluble solids content is determined by substracting the salt content, determined as in Appendix C, from the percentage of soluble solids content determined according to the refractometric method given in ISO 2173.

APPENDIX C
DETERMINATION OF SODIUM CHLORIDE CONTENT

C.1 REAGENTS

C.1.1 *Standard silver nitrate solution*, c($AgNO_3$) = 0.1 mol/l.

C.1.2 *Standard potassium thiocyanate solution*, c(KCNS) = 0.1 mol/l.

C.1.3 *Nitro-benzene.*

C.1.4 *Ferric ammonium alum*, saturated solution.

C.1.5 *Calcium acetate solution*, 10 per cent (V/V).

C.1.6 *Nitric acid*, 25 per cent (V/V).

C.2 PROCEDURE

Weigh, to the nearest milligram, about 10 g of the sample in a silica or platinum dish. Add 2 ml of calcium acetate (C.1.5) to the dish and heat on a water bath until water is expelled. Heat slowly over a flame until swelling stops. Place the dish in a muffle furnace at 525 °C until a white ash is obtained. Transfer the ash to a flask with 25 ml of nitric acid (C.1.6). Add a known volume of standard silver nitrate solution (C.1.1), which is more than sufficient to precipitate all the chloride as silver chloride. Then add 2 ml to 3 ml of pure nitrobenzene (C.1.3) and 5 ml of ferric alum indicator (C.1.4) and shake vigorously to coagulate the precipitate. Titrate the residual silver nitrate with the standard potassium thiocyanate solution (C.1.2) until a permanent reddish brown colour appears.

Carry out a blank test using the same amounts of reagents but excluding the sample.

From the volume of silver nitrate originally added, substract the volume of silver nitrate solution equivalent to the volume of standard thiocyanate required. Make appropriate corrections if required for any standard silver nitrate used up for the blank titration. Calculate the percentage of sodium chloride in the sample as follows:

1 ml of standard silver nitrate solution used up (C.1.1) ≡ 0.0058 g sodium chloride.

APPENDIX D
DETERMINATION OF HOWARD MOULD COUNT

D.1 PREPARATION OF SAMPLE

Before opening, shake the container 60 times in 30 seconds through a 300 mm arc. Open the container. If considerable foam is produced, pass the flame of a bunsen burner lightly over the surface to disperse the foam.

D.2 PROCEDURE

Proceed as given in SLS 260 : 1989, commencing from sub Clause B.4.2 using the undiluted sample.

APPENDIX E
DETERMINATION OF HEAVY METALS

E.1 DETERMINATION OF ARSENIC

Weigh to the nearest milligram, approximately 10 g of the well mixed sample and proceed as given in A.1 of SLS 260 : 1989.

E.2 DETERMINATION OF LEAD

Determine the lead content as given in A.2 of SLS 260 : 1989.

E.3 DETERMINATION OF COPPER

Weigh, to the nearest milligram, approximately 10 g of the well mixed sample and proceed as given in A.3 of SLS 260 : 1989.

E.4 DETERMINATION OF TIN

E.4.1 *Reagents*

E.4.1.1 *Nitric acid,* rel den. = 1.42.

E.4.1.2 *Sulfuric acid,* rel. den. = 1.84.

E.4.2 *Apparatus*

E.4.2.1 *Kjeldahl digestion flask,* 250-ml.

E.4.2.2 *Volumetric flask,* 50-ml.

E.4.3 *Procedure*

Weigh to the nearest milligram, approximately 5 g of the sample, in to the kjeldahl digestion flask (E.4.2.1). Add 10 ml of nitric acid (E.4.1.1), mix and after 10 minutes, add 5 ml of sulfuric acid (E.4.1.2). Oxidise over a flame adding small amounts of nitric acid as charring commences. Boil vigorously until white fumes of sulfur dioxide appear. Cool, add 20 ml of water and transfer to a volumetric flask (E.4.2.2) and make upto mark with water.

Proceed as given in SLS 315 or by using a suitable atomic absorption specrophotometric method.

Carry out a blank test using the same amounts of reagents omitting only the sample. Transfer blank into a graduated flask, make upto mark with water and subject it to the same procedure.

APPENDIX F
DETERMINATION OF VACUUM OF CAN

F.1 APPARATUS

F.1.1 *Vacuum gauge,* indicating vacuum and pressure.

F.2 PROCEDURE

The vacuum is preferably measured using an electric recording type machine without opening the can. Where such a machine is not available, the piercing type may be used.

In this case, pierce the hollow pointed edge of the guage near the edge of the lid so that the rubber gasket makes a gas-tight seal and prevents the loss of vacuum. Do not press too hard as this will alter the head space. Do not use swollen cans. The readings should be taken when the can is at room temperature. Record the vacuum. Necessary corrections for altitude may be made.

APPENDIX G
DETERMINATION OF THE FILL OF THE CONTAINER

G.1 PROCEDURE

G.1.1 Ensure that the container and contents are maintained at a constant temperature as far as possible throughout this determination. Mark the level of the contents. Transfer the contents to a receptacle. Wash, dry and determine the mass of the container with the lid (m_0). In the case of a container with a top attached by a double seam (see Note), fill the container with water upto a vertical distance of 5 mm below the top level of the container. Weigh the container with the water and the lid (m_1).

NOTE

In the case of a container with a lid attached otherwise, remove the lid and proceed as given above, except that the container should be filled to the top.

G.1.2 Draw off the water from the filled container to the marked level of the contents. Weigh the container with the remaining water and the the lid (m_2).

G.2 CALCULATION

Percent of the total volume of the container occupied by the contents. $= \frac{(m_2 - m_0)}{(m_1 - m_0)} \times 100$

where,

m_0 is the mass, in g, of the empty container with the lid;
m_1 is the mass, in g, of the container filled with water; and
m_2 is the mass, in g, of the container with water filled upto the level of the contents.

SRI LANKA STANDARDS INSTITUTION

The Sri Lanka Standards Institution (SLSI) is the national standards organization of Sri Lanka established by the Sri Lanka Standards Institution Act No. 6 of 1984 which repeals the Bureau of Ceylon Standards Act No. 38 of 1964. The Institution functions under the Ministry of Industries and Scientific Affairs.

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 from other services. Financial and administrative control is vested in a Council appointed in accordance with the provisions of the Act.

The detailed preparation of standard specifications is done by Drafting Committees composed of experts in each particular field assisted by permanent officers of the Institution. These Committees are appointed by the Divisional Committees, which in turn are appointed by the Council. All members of the Drafting and Divisional Committees render their services in an honorary capacity. In preparing the standard specifications, the Institution endeavours to ensure adequate representation of all view points.

In the international field the Institution represents Sri Lanka in the International Organization for Standardization (ISO), and participates in such fields of standardization as are of special interest to Sri Lanka.

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