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பொதுசனக் கருத்துரைக்கான கட்டளை வரைவு
DRAFT STANDARD FOR PUBLIC COMMENT

(වෙනස්වීමට ඉඩ ඇත, திருத்தத்திற்குட்படக்கூடியது, Liable to alteration)

නිකුත් කළ දිනය
வெளியிடும் திகதி
Date of Issue

} 2023-04-21

අදහස් ජවය යුතු අවසාන දිනය
அபிப்பிராயங்களை தெரிப்பதற்கான இறுதித்திகதி
Latest Date for Receipt of Comments

} 2023-06-21



Draft Sri Lanka Standard
SPECIFICATION FOR FROZEN CONFECTIONS/ FROZEN DESSERTS AND FREEZE DRINKS
(FIRST REVISION) (DSLS 967 :)

අධිශීතකල අතුරුපස්/අධිශීතකල බීම වර්ග සඳහා වන
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(පළමු ප්‍රතිශෝධනය) (ශ්‍රීලංප්‍ර කෙටුම්පත 967 :)

මෙම කෙටුම්පත ශ්‍රී ලංකා ප්‍රමිතියක් ලෙස නොසැලකිය යුතු මෙන් ම භාවිතා නොකළ යුතු ද වේ.
இவ்வரைவு இலங்கைக் கட்டளையெனக் கருதப்படவோ அன்றிப் பிரயோகிக்கப்படவோ கூடாது
This draft should not be regarded or used as a Sri Lanka Standard.

අදහස් ජවය යුත්තේ : ශ්‍රී ලංකා ප්‍රමිති ආයතනය, 17, වික්ටෝරියා පෙදෙස, ඇල්විටිගල මාවත, කොළඹ 08.

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DRAFT SRI LANKA STANDARD
SPECIFICATION FOR FROZEN CONFECTIONS/FROZEN DESSERTS AND
FREEZE DRINKS
(First Revision)

DSLS :

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DRAFT SRI LANKA STANDARD
SPECIFICATION FOR FROZEN CONFECTIONS/FROZEN DESSERTS AND
FREEZE DRINKS
(First Revision)

FOREWORD

This Sri Lanka Standard was approved by the Sectoral Committee on Food Products and was authorized for adoption and publication as a Sri Lanka Standard by the Council of the Sri Lanka Standards Institution on

This Standard was first published in 1992 under the title of Specification for frozen confections and freeze drinks. In this first revision, the title is changed as Specification for frozen confections/ frozen desserts and freeze drinks. In this revision, definitions have been revised and new types have been introduced. Further, the ingredient list and chemical requirements have been revised to cater market requirements. Microbiological limits were amended and limits for potentially toxic elements have been introduced to safeguard the consumers.

This Standard covers a group of frozen confectionery products and frozen desserts commonly known by various names such as ice lollies, ice-palam, popsicles, sherbet, sorbet, frozen yoghurt and freeze drinks. These products are manufactured and retailed by numerous units all over Sri Lanka and are very popular particularly among young children. It is known that the conditions and methods involved in the preparation, packaging, storage and distribution of some of these products possess a health hazard to the consumer. This Standard is intended to safeguard the interests of the consumers and covers safety and basic compositional requirements.

This Standard is subject to the Food Act No. 26 of 1980 and the regulations framed thereunder and other applicable regulations where applicable.

For the purpose of deciding whether a particular requirement of this Standard is complied with, the final value, observed or calculated, expressing the results of a test shall be rounded off in accordance with **SLS 102**. The number of significant figures to be retained in the rounded off value shall be the same as that of the specified value in this Standard.

In the revision of this Standard, valuable assistance derived from the following publications are gratefully acknowledged.

CODEX STAN 137: 1981 - Edible ices and ice mixes

KS 1517: 2018 - Dairy based desserts and ice mixes - Specification

1 SCOPE

This Standard prescribes the requirements and methods of test and sampling for frozen confections/ frozen desserts and freeze drinks.

2 REFERENCES

- SLS 102 Presentation of numerical values
- SLS 143 Code of practice for general principles of food hygiene
- SLS 191 White Sugar
- SLS 223 Ice cream
- SLS 428 Random sampling methods
- SLS 516 Method of test for the microbiology of food and animal feeding stuffs
 Part:1 Horizontal method for the enumeration of microorganisms
 Section1: Colony count at 30 °C by the pour plate technique
 Part 3: Horizontal method for the detection and enumeration of coliforms
 Section 1: Most probable number technique
 Part 5: Horizontal method for the detection of *Salmonella* spp.
 Part 6: Horizontal method for the enumeration of coagulase- positive Staphylococci (*Staphylococcus aureus* and other species)
 Section 1: Technique using Baird- Parker agar medium
 Part 12: Horizontal method for the detection and enumeration of presumptive *Escherichia coli* (Most probable number technique)
 Part 15: Horizontal method for the detection and enumeration of *Listeria monocytogenes* and of *Listeria* spp.
 Section 1: Detection method
 Section 2: Enumeration method
- SLS 614 Potable water
- SLS 735 Method of test for milk and milk products
 Part 1: Determination of fat content
 Section 2: Dried milk and dried milk product
 Part 2: Methods of test for milk and milk products Determination of titratable Acidity
 Part 5: Determination of total solids
- SLS 824 Fermented milk products
 Part 2: Yoghurt
- SLS 872 Code of hygienic practice for dairy industry
- SLS 883 Brown sugar
- SLS 1332 Methods of test for fruit and vegetable products
 Part 2: Determination of soluble solids refractometric method
- DSLS ISO 750 Fruit and vegetable products - Determination of titratable acidity
 Official methods of Analysis, Association of Official Analytical Chemists (AOAC) 21st edition, 2019

3 DEFINITIONS

For the purpose of this Standard, the following definitions shall apply:

3.1 frozen confections/ frozen dessert: Products prepared using a suitable combination of ingredients and additives given in clause 5, stored, distributed and consumed in the frozen state

3.2 freeze drinks: Products prepared using a suitable combination of ingredients and additives given in clause 5, and intended for consumption in the frozen state but stored and distributed in the liquid state or the semi-frozen state

3.3 sorbet: Frozen dessert prepared typically using fruit, fruit juice, fruit purée, fruit flavouring, water and sugars or other sweeteners with or without addition of other ingredients given in clause 5

3.4 sherbet: Frozen dessert prepared typically using fruit, fruit juice, fruit purée, fruit flavouring, water, milk solids and sugars or other sweeteners with or without addition of other ingredients given in clause 5

3.5 frozen yoghurt: Product prepared by freezing a mixture of stirred yoghurt and ice cream with or without addition of optional ingredients given in clause 5

4 TYPES

4.1 Freeze drinks

4.1.1 Edible ices

4.1.2 Ice lollies/ palams

4.2 Frozen confections / frozen desserts

4.2.1 Sorbet

4.2.2 Sherbet

4.2.3 Frozen yoghurt

5 INGREDIENTS

The following ingredients and additives may be used.

5.1 Potable water, conforming to **SLS 614**

5.2 White sugar, conforming to **SLS 191**
Brown sugar, conforming to **SLS 883**

5.3 Fruit ingredients, derived from wholesome matured fruits which are free from fungal attack, insect infestation or diseases. Where the name of the product implies the presence of a particular fruit ingredient, that ingredient shall constitute not less than 5 per cent by mass of the product

- 5.4** Dairy ingredients, conforming to the relevant Sri Lanka Standards. Where the name of the product implies the presence of milk, the milk solids content shall be not less than 5 per cent by mass of the product
- 5.5** Other food ingredients, e.g. coffee, cocoa, ginger, honey, edible nuts, honey, treacle, jaggery
- 5.6** Salt conforming to **SLS 80**
- 5.7** Flavouring substances, natural or artificial
- 5.8** Acidity regulators, permitted by Food (Additives – General) regulations
- 5.9** Permitted natural or artificial colouring substances not exceeding 100 mg/ kg in the final product
- 5.10** Emulsifiers and stabilizers, not exceeding 10g/ kg, singly or in combination
- 5.10.1** Alginic Acid & its Sodium, Potassium ammonium and Calcium salts
(INS 400, INS 401, INS 402, INS 403, INS 404)
- 5.10.2** Carrageenan (INS 407)
- 5.10.3** Guar Gum (INS 412)
- 5.10.4** Gum Arabic (acasia gum) (INS 414)
- 5.10.5** Gelatine
- 5.10.6** Hydroxypropyl distarch phosphate (INS 1442)
- 5.10.7** Locust Bean Gum (INS 410)
- 5.10.8** Methylcellulose (INS 461)
- 5.10.9** Mono and Diglycerides of Fatty Acids (INS 471)
- 5.10.10** Pectins (E 440)
- 5.10.11** Sodium/Potassium/Calcium caseinates
- 5.10.12** Lecithin (INS 322(i))
- 5.10.13** Polyglycerol Esters of fatty acids (INS 475)
- 5.10.14** Propylene glycol esters of fatty acids (INS 477)

| | | | | |
|----------------|---|---------------|------------------|-------------|
| 5.10.15 | Sorbitan esters of fatty acids | (INS 491-495) | | |
| 5.10.16 | Polyoxyethylene(20) of sorbitan mono-oleate | (INS 433) | | |
| 5.10.17 | Polyoxyethylene(20) of sorbitan monostearate | (INS 435) | | |
| 5.10.18 | Polyoxyethylene(20) of sorbitan tristearate | (INS 436) | | |
| 5.10.19 | Sodium Carboxy Methyl Cellulose (cellulose gum) | (INS 466) | | |
| 5.10.20 | Tara Gum | (INS 417) | | |
| 5.10.21 | Xanthan Gum | (INS 415) | | |
| 5.11 | Bulking agents | | | |
| 5.11.1 | Polydextroses | (INS 1200) | | |
| 5.11.2 | Maltodextrins | | } Limited by GMP | |
| 5.11.3 | Inulin | | | |
| 5.11.4 | Citrus fiber | | | |
| 5.11.5 | Modified starch | | | |
| 5.12 | Permitted sweeteners | | | |
| 5.12.1 | <i>Sorbitol/ sorbitol syrup</i> | INS 420 | } Limited by GMP | |
| 5.12.2 | <i>Mannitol</i> | INS 421 | | |
| 5.12.3 | <i>Isomalt</i> | INS 953 | | |
| 5.12.4 | <i>Maltitol/ maltitol syrup</i> | INS 965 | | |
| 5.12.5 | <i>Lactitol</i> | INS 966 | | |
| 5.12.6 | <i>Xylitol</i> | INS 967 | | |
| 5.12.7 | <i>Erythritol</i> | INS 968 | | |
| 5.12.8 | <i>Neotame</i> | INS 961 | | 26 mg/kg |
| 5.12.9 | <i>Sucralose</i> | INS 955 | | 320 mg/kg |
| 5.12.10 | <i>Steviol glycoside</i> | INS 960 | | 200 mg/kg * |

* As steviol equivalents

NOTE

Ingredients permitted under SLS 223 and Part 2 of SLS 824 are also permitted for frozen yoghurt

6 REQUIREMENTS**6.1 Processing requirements****6.1.1 Frozen confections/ Frozen desserts**

Products prepared using dairy ingredients, fruit ingredients and/ or other food ingredients shall be pasteurized and frozen within 2- 4 hours after heat treatment.

NOTE

If freezing cannot be done after 2 to 4 hours after pasteurization of the ingredients, shall be stored under chilled condition at 0 to 4 °C temperature maximum up to 3 days.

6.1.2 Freeze drinks

All freeze drinks, the mixture, with the exception of colouring substances and flavouring substances shall be subjected to adequate heat treatment.

6.2 Storage and distribution**6.2.1 Hygiene**

Product shall be processed, packaged, stored and distributed under hygienic conditions in accordance with **SLS 143** and **SLS 872**.

Product shall be stored to prevent contamination, particularly through contamination with other raw or unprocessed food items. This requirement is especially applicable to freeze drinks where the package comes into direct contact with the mouth during consumption.

6.2.2 Storage temperature**6.2.2.1 Frozen confections/ Frozen desserts**

Frozen confections shall be stored below -18 °C and distributed below -15 °C. (Where necessary, either conveyances or containers used for transporting foodstuffs shall be capable of maintaining foodstuffs at appropriate temperatures and allow those temperatures to be monitored.)

6.2.2.2 Freeze drinks

Freeze drinks shall be stored and distributed at refrigeration temperatures of less than 6 °C.

6.3 Product requirements

6.3.1 Odour, flavour and appearance

The product shall have a pleasant odour, flavour, and appearance, characteristic of the descriptions appearing on the label. It shall also be free from extraneous matter.

6.3.2 Other requirements

The product shall conform to the requirements given in Table 1 when tested according to the methods given in Column 5 of the table.

TABLE 1 - Requirements for frozen confections/ frozen desserts and freeze drinks

| SI No (1) | Characteristic (2) | Requirement | | | | | Method of test (8) |
|--------------|---|---------------------------|-----------------------|----------------|---------------|----------------------|-------------------------------|
| | | Frozen Confections (3) | Frozen yoghurt (4) | Sherbet (5) | Sorbet (6) | Freeze Drinks (7) | |
| i) | Soluble solids content, as ° Brix, min. ^a * | 18 | - | - | 18 | 18 | SLS 1332 Part 2 |
| ii) | Total solids content, per cent by mass, min. | - | 25 | 25 | - | - | SLS 735 Part 5 |
| iii) | Acidity, as anhydrous citric acid, per cent by mass, max. | 0.5 | - | 0.5 | 0.5 | 0.5 | DSLS ISO 750 (pending) |
| iv) | Titratable acidity (as lactic acid) per cent by mass. | - | 0.3- 0.7 | - | - | - | SLS 735 Part 2 |
| v) | Fat per cent by mass, min. | - | 2.0** | - | - | - | Appendix B |

^a For energy reduced products, total soluble solids requirement is 12 Brix, max.

* This limit is not applicable for sugar free/no added sugar products

** For low-fat yoghurt, fat content is 0.5 per cent by mas, max.

6.3.3 Microbiological limits

The product shall conform to the microbiological limits given in Table 2 or Table 3 when tested as given in Column 7 of the table.

TABLE 2 - Microbiological limits for non-dairy products

| SI No (1) | Test (2) | n (3) | c (4) | Limit | | Method of test (7) |
|--------------|-------------------------------------|----------|----------|-------------------|----------|----------------------------------|
| | | | | m (5) | M (6) | |
| i) | Aerobic plate count, cfu per g | 5 | 2 | 2.0×10^4 | 10^5 | SLS 516: Part 1 Section 1 |
| ii) | <i>Coliforms</i> , MPN per g | 5 | 2 | 10 | 10^2 | SLS 516: Part 3 Section 1 |
| iii) | <i>Escherichia coli</i> , MPN per g | 5 | 0 | Absent | - | SLS 516: Part 12 |
| iv) | <i>Salmonella</i> spp., per 25 g | 5 | 0 | Absent | - | SLS 516: Part 5 |

TABLE 3 - Microbiological limits for products with dairy ingredients

| SI No (1) | Test (2) | n (3) | c (4) | Limit | | Method of test (7) |
|--------------|---|----------|----------|-----------------|-----------------|---|
| | | | | m (5) | M (6) | |
| i) | Aerobic plate count*, cfu per g | 5 | 2 | 5×10^4 | 2×10^5 | SLS 516: Part 1 Section 1 |
| ii) | <i>Coliforms</i> , MPN per g | 5 | 2 | 10 | 1×10^2 | SLS 516: Part 3 Section 1 |
| iii) | <i>Escherichia coli</i> , MPN per g | 5 | 0 | Absent | - | SLS 516: Part 12 |
| iv) | <i>Staphylococcus aureus</i> , per g (coagulase positive) | 5 | 1 | 10 | 1×10^2 | SLS 516: Part 6 Section 1 |
| v) | <i>Salmonella</i> spp., per 25 g | 5 | 0 | Absent | - | SLS 516: Part 5 |
| vi) | <i>Listeria monocytogenes</i> , per 25 g | 5 | 0 | Absent | - | SLS 516: Part 15 Section 1 and 2 |

where,

n is the number of sample units to be tested;

c is the maximum allowable number of sample units yielding values between m and M;

m is the limit, below which a count is acceptable for any sample unit; and

M is the limit above which a count is unacceptable for any sample unit.

* Not applicable for cultured products

7 CONTAMINANTS

The product shall not exceed the limits for potentially toxic elements when tested according to the methods given in Column 4 given in Table 4.

TABLE 4- Limits for potentially toxic elements

| SI No (1) | Potentially toxic element (2) | Limit (3) | Method of test (4) |
|---------------------|---|---------------------|------------------------------|
| i) | Cadmium (as Cd), mg/ kg max. | 0.1 | AOAC 986.15/ 2013.06 |
| ii) | Lead (as Pb) , mg/ kg max. | 0.1 | AOAC 999.10/ 2013.06 |
| iii) | Arsenic (as As), mg/ kg, max. | 0.1 | AOAC 999.10/ 2013.06 |

8 PACKAGING

The product shall be packaged in any suitable food grade containers which will safeguard the hygienic, and product qualities. The containers including the packaging material shall be made of substances which are safe and suitable for intended use and shall not impart any toxic substances or undesirable odour or flavour to the product.

9 MARKING AND/ OR LABELLING

The wrapper or package shall be legibly and indelibly marked and/ or labelled with the following:

- a) Name of the product, as any of the following as applicable;
 “ice-lolly”, “water ice”, “ice palam”, “fruit ice”, “milk pop/ popsicle”, “freeze drink”,
 “flavoured ice”, “Sherbet”, “Sorbet”, “Frozen yoghurt” or “popsicle”

Products flavoured by the addition of flavouring ingredients to impart the characteristic flavour of a particular food shall be marked, “X - flavoured”, where “X” denotes the name of the flavouring ingredient;

- b) Brand name or registered trade mark, if any;
 c) Net content in milliliters, liters, grams or kilograms;
 d) Name and address of the manufacturer;
 e) Country of origin in case of imported products;
 f) Batch number or code number or a decipherable code marking;
 g) Date of manufacture;
 h) Date of expiry;
 k) List of ingredients, in descending order of proportion;
 m) Any food additives name and INS number, if added;
 n) Information for storage and use;
 p) The statement “take home and freeze/ freeze before eating” or similar instruction, in case of freeze drinks; and
 q) Any declarations as required by the relevant/ applicable regulations.

10 METHODS OF TEST

Tests shall be carried out as prescribed in Appendix B of this Standard, **DSLS ISO 750, Part 2, Part 5 of SLS 735, Section 1 of Part 1, Section 1 of Part 3, Part 5, Section 1 of Part 6, Part 12, Section 1 and 2 of Part 15 of SLS 516, Part 2 of SLS 1332** and Official methods of Analysis of the Association of Official Analytical Chemists (AOAC), 21st edition, 2019.

APPENDIX A COMPLIANCE OF A LOT

The sampling scheme given in Appendix A 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, appropriate schemes of sampling and inspection shall be adopted based on manufacturer's control systems coupled with type tests and testing procedures.

A.1 LOT

In any consignment, all the containers or packages of same size containing of frozen confections/ frozen desserts or freeze drinks drawn from a single batch of manufacture of a supply shall constitute a lot.

A.2 GENERAL REQUIREMENTS OF SAMPLING

When drawing samples, the following precautions should be taken.

- A.2.1 Samples for microbiological analysis should be drawn aseptically.
- A.2.2 The samples should be protected against adventitious contamination.
- A.2.3 The sampling instruments should be clean and dry when used. When drawing samples for microbiological examination, the sampling instruments should be sterilized.
- A.2.4 The samples should be kept in glass or suitable containers. They should be clean and dry when used. The samples for microbiological examination should be kept in sterilized containers.
- A.2.5 The samples should be stored in such a manner that there will be no deterioration of the quality of the material.
- A.2.6 The sample containers should be sealed air-tight after filling and marked with necessary details of sampling.

A.3 SCALE OF SAMPLING

A.3.1 The number of packages of frozen confections/ frozen desserts or freeze drinks to be selected from a lot should be in accordance with Table 5.

TABLE 5 - Scale of sampling

| Number of packages in the lot (1) | Number of packages to be selected (2) |
|--------------------------------------|--|
| Up to 3 200 | 10 |
| 3 201 to 10 000 | 12 |
| 10 001 to 35 000 | 15 |
| 35 001 and above | 20 |

A.3.2 The packages should be selected at random. In order to ensure randomness of selection, tables of random numbers as given in **SLS 428** should be used.

A.4 PREPARATION OF SAMPLES

A.4.1 *For microbiological examination*

Five sample units should be drawn from the packages selected as in **A.3.1**. Approximately 200g should be drawn (See **NOTE**) from each sample unit using an appropriate sterile sampling instrument and transferred to five sample containers.

NOTE

If mass of a package is less than 200 g, sufficient number of packages should be selected to obtain a sample size of about 200 g. The number of packages so selected should be treated as one sample unit.

A.4.2 *Composite sample*

Sufficient quantities should be taken from each package selected as in **A.3.1** and mixed to form a composite, sample and transferred to a sample container.

NOTE

If mass of a package is less than 100g, sufficient number of packages should be selected to obtain a sample size of about 400 g.

A.5 NUMBER OF TESTS

A.5.1 Each package selected as in **A.3.1** should be inspected for packaging and marking and/ or labelling requirements.

A.5.2 Samples prepared as in **A.4.1** should be tested for requirements given in **6.3.3**

A.5.3 The composite sample prepared as in **A.4.2** should be tested for the requirements given in **6.3.1** and **6.3.2**.

A.6 CRITERIA FOR CONFORMITY

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

A.6.1 Each package inspected as in **A.5.1** satisfies the packaging and marking and/ or labelling requirements.

A.6.2 The samples when tested as in **A.5.2** satisfy the microbiological limits.

A.6.3 The test results on the composite sample tested as in **A.5.3** satisfy the relevant requirements.

**APPENDIX B
DETERMINATION OF FAT
(MODIFIED WERNER - SCHMID METHOD)**

B.1 APPARATUS

Siphon type fat extraction tube.

B.2 REAGENTS

B.2.1 Hydrochloric acid, concentrated, rel. den. = 1.18.

B.2.2 Ethyl alcohol, 95 to 96 per cent (V/V).

B.2.3 Diethyl ether, rel. den. = 0.720 and peroxide free.

B.3 PROCEDURE

Weigh, to the nearest milligram, about 4 g to 5 g of the prepared sample into the extraction tube. Add 3 ml of hot water and mix. Add 10 ml of hydrochloric acid (**B.2.1**) and mix. Place the tube in a water bath maintained at 50 ± 2 °C for 30 minutes swirling gently during the first 5 minutes. Cool, add 10 ml of ethyl alcohol (**B.2.2**) and mix. Add 25 ml of diethyl ether (**B.2.3**) and proceed as described in **SLS 735**: Part 1/Section 2.

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