SRI LANKA STANDARD 946: 2018

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SPECIFICATION FOR
SUNFLOWER OIL
(*First Revision*)

SRI LANKA STANDARDS INSTITUTION

Sri Lanka Standard
SPECIFICATION FOR SUNFLOWER OIL
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SLS 946: 2018

Gr.5

SRI LANKA STANDARDS INSTITUTION
No 17, Victoria Place
Elvitigala Mawatha
Colombo 08
Sri Lanka

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 SUNFLOWER OIL
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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 2018-08-10

This Standard was first published in 1991. In this first revision, a new type of sunflower oil naming high oleic acid sunflower oil has been introduced. In addition to that, chemical requirements have been revised and limits for aflatoxins and the levels for heavy metals have been introduced to safeguard the consumers. Fatty acid profile has been inserted to assure the quality of the product.

This Standard is subject to the restrictions imposed under the Sri Lanka Food Act No. 26 of 1980 and the regulations framed thereunder.

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 or analysis, shall be rounded off as 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 relevant publications of the Codex Alimentarius Commission and the Bureau of Indian Standards is gratefully acknowledged.

1 SCOPE

This Standard prescribes the requirements and methods of sampling and test for sunflower (synonym: sunflowerseed) oil, derived from the seeds of sunflower **(***Helianthus annuus* L.) by the process of expression and/ or extraction.

2 REFERENCES

SLS 102 Rules for rounding off numerical values
SLS 143 Code of practice for general principles of food hygiene
SLS 313 Methods for analysis of animal and vegetable fats and oils
Part 1/ Section 1 Determination of physical characteristics/ Preparation of test sample
Part 1/ Section 2 Determination of physical characteristics/ Determination of the relative density at t ^{o}C/ t_o ^{o}C in air
Part 1/ Section 4 Determination of physical characteristics/ Determination of Lovibond colour

Part 1/ Section 5 Determination of physical characteristics/ Determination of refractive index
Part 2/ Section 1 Determination of chemical characteristics/ Determination of saponification value
Part 2/ Section 2 Determination of chemical characteristics/ Determination of iodine value
Part 2/ Section 6 Determination of chemical characteristics/ Determination of acid value and acidity
Part 3/ Section 4 Determination of foreign substances and parameters affecting quality and stability/ Determination of insoluble impurities
Part 3/ Section 5 Determination of foreign substances and parameters affecting quality and stability/ Determination of moisture and volatile matter content
Part 3/ Section 7 Determination of foreign substances and parameters affecting quality and stability/ Determination of peroxide value – Iodometric (visual) end point determination
Part 4/ Section 2 Determination of principle constituents and natural constituents/ Analysis by gas chromatography of methyl esters of fatty acids
Part 4/ Section 3 Determination of principle constituents and natural constituents/ Determination of unsaponifiable matter – Method using diethyl ether extraction

SLS 467 Code of practice for labelling of pre-packaged foods
SLS 664 Method of sampling animal and vegetable fats and oils
SLS 962 Method for determination of aflatoxin in food
Official Methods of Analysis of the Association of Official Analytical Chemists (AOAC), 20th Edition, 2016

3 DEFINITIONS

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

3.1 high oleic acid sunflower oil: Sunflower oil produced from high oleic acid oil-bearing seeds of varieties derived from sunflower seeds

3.2 crude sunflower oil/ crude high oleic acid sunflower oil: Product obtained from the sunflower seeds/ high oleic acid sunflower seeds respectively by the process of expression and/ or extraction

Not suitable for direct consumption.

3.3 refined, bleached and deodorized (RBD) sunflower oil/ refined, bleached and deodorized (RBD) high oleic acid sunflower oil: Crude sunflower oil/ crude high oleic acid sunflower oil which has been refined by neutralization with alkali, bleached with bleaching earth or activated carbon or both and deodorized with steam or any other acceptable commercial process

Suitable for direct consumption.

4 TYPES

Sunflower oil shall be of the following 2 types:

4.1 Crude sunflower oil;

4.2 Refined, bleached and deodorized (RBD) sunflower oil;

4.3 Crude high oleic acid sunflower oil; and

4.4 Refined, bleached and deodorized (RBD) high oleic acid sunflower oil.

5 REQUIREMENTS

5.1 General requirements

The product shall be free from admixtures with other oils and fats. The edible sunflower oil/ edible high oleic acid sunflower oil shall be free from rancidity, sediments, suspended matter, separated water, added colours and/ or flavouring substances. The edible sunflower oil shall be prepared from the crude sunflower oil, which is not previously used.

5.2 Hygienic requirements

The edible sunflower oil and edible high oleic acid sunflower oil shall be manufactured, processed, packaged, stored and distributed in accordance with the hygienic conditions prescribed in **SLS 143**.

5.3 Permitted antioxidants

The edible sunflower oil and edible high oleic acid sunflower oil may contain permitted antioxidants as prescribed in the relevant regulations of the Food Act.

5.4 Identity 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 – Identity requirements for sunflower oil and high oleic acid sunflower oil

Sl No	**Characteristic**	**Requirement**		**Method of test (SLS 313)**
		Sunflower oil	**High oleic acid sunflower oil**	
(1)	(2)	(3)	(4)	(5)
i)	Relative density at 25 ºC	0.918 to 0.923	0.909 to 0.915	Part **1**/ Section **2**
ii)	Refractive index (nD)	1.461 to 1.468 at 40 ºC	1.467 to 1.471 at 25 ºC	Part **1**/ Section**5**
iii)	Iodine value	118 to 141	78 to 90	Part **2**/ Section **2**
iv)	Saponification value	188 to 194	182 to 194	Part **2**/ Section **1**

Table 1 cont:

Sl No	Characteristic	Requirement		Method of test (SLS 313)
		Sunflower oil	High oleic acid sunflower oil	
(1)	(2)	(3)	(4)	(5)
v)	Fatty acid composition, (as methyl esters), per cent by mass			Part **4/** Section **2**
	C12:0	ND to 0.1	ND	
	C14:0	ND to 0.2	ND to 0.1	
	C16:0	5.0 to 7.6	2.6 to 5.0	
	C16:1	ND to 0.3	ND to 0.1	
	C18:0	2.7 to 6.5	2.9 to 6.2	
	C18:1	14.0 to 39.4	75.0 to 90.7	
	C18:2	48.3 to 74.0	2.1 to 17.0	
	C18:3	ND to 0.3	ND to 0.3	
	C20:0	0.1 to 0.5	0.2 to 0.5	
	C20:1	ND to 0.3	0.1 to 0.5	
	C20:2	ND	ND	
	C22:0	0.3 to 1.5	0.5 to 1.6	
	C22:1	ND to 0.3	ND to 0.3	
	C22:2	ND to 0.3	ND	
	C24:0	ND to 0.5	ND to 0.5	

NOTES

1. *Checking for fatty acids may not be necessary for routine analysis and may be carried out if only required or requested.*
2. *ND: Not detectable (defined as* ≤ 0.05*).*

5.5 Quality requirements

The product shall also comply with requirements specified in Table **2** when tested according to the relevant methods given in Column **5** of the table.

TABLE 2 – Quality requirements for sunflower oil and high oleic acid sunflower oil

Sl No	Characteristic	Requirement		Methods of test (SLS 313)
		Crude sunflower oil/ Crude high oleic acid sunflower oil	RBD sunflower oil/ RBD high oleic acid sunflower oil	
(1)	(2)	(3)	(4)	(5)
i)	Colour, in a 133-mm (5 ¼") cell, Lovibond tintometer scale, combination of yellow and red units, max.	NS	25 Y 2.5 R	Part **1/** Section **4**
ii)	Moisture and other volatile matter at 103 ± 2 ºC and insoluble impurities per cent by mass, max.	0.25*	0.1*	Part **3/** Section **4** Part **3/** Section **5**
iii)	Free fatty acids, as oleic acid, per cent by mass, max.	2.0	0.25	Part **2/** Section **6**
iv)	Unsaponifiable matter per cent by mass, max.	2.0	1.5	Part **4/** Section **3**
v)	Peroxide value, milliequivalent per kg, max.	20	10	Part **3/** Section **7**

NOTES
1. ***Sum of test results obtained by the test methods given in* Section **4** *and* Section **5** *of* Part **3** *of* **SLS 313**.
2. *NS: Not specified.*

6 CONTAMINANTS

6.1 Aflatoxins

The product shall not exceed the level 5.0 µg/ kg for aflatoxin B_1 and 10.0 µg/ kg for total aflatoxin, when determined according to the method given in **SLS 962**.

6.2 Potentially toxic elements

The product shall not exceed the limits given in Table **3**, when tested in accordance with the methods given in Column **4** of the table.

TABLE 3 - Limits for potentially toxic elements

Sl No (1)	Potentially toxic element (2)	Limit (3)	Methods of test (4)
i)	Arsenic, as As, mg/ kg, max.	0.1	**AOAC 986.15** or **2013.06**
ii)	Lead, as Pb, mg/ kg, max.	0.1	**AOAC 999.11** or **2013.06**
iii)	Cadmium, as Cd, mg/ kg, max.	0.1	**AOAC 999.11** or **2013.06**

NOTE
Test for heavy metals may not be necessary for routine analysis and may be carried out if only required or requested.

7 PACKAGING

7.1 The product shall be packaged in appropriate, clean and food grade packages or containers.

7.2 The packaging material which comes into contact directly with the product shall be sufficiently inert to preclude substances from being transferred to food in quantities large enough to endanger human health or to bring about an unacceptable change in the composition of the product or deterioration in its organoleptic properties.

8 MARKING AND/ OR LABELLING

8.1 The following shall be marked or labelled legibly and indelibly on each package or container:

a) Name of the product with type;
b) Brand name or trademark, if any;
c) Net content, in ‘ml’ or ‘l’;
d) Name and address of the manufacturer/ processor;
e) Name and address of the packer/ distributor;
f) Batch number or code number or a decipherable code marking;
g) Date of manufacture;
h) Date of expiry;
j) Date of repackaging, if relevant;
k) Declaration of antioxidants added, if any; and
m) Country of origin, in-case of imported products.

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

9 SAMPLING

9.1 A representative sample of the product for ascertaining conformity to the requirements of this Standard shall be obtained in accordance with the relevant Clauses of **SLS 664**.

9.1.1 The sampling method shall be applied where compliance of a lot to the requirements of this Standard is to be assessed based on statistical sampling and inspection.

9.1.2 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 method of sampling and inspection shall be adopted.

9.2 Number of tests

9.2.1 Each package/ container selected as in relevant Clauses of **SLS 664** shall be examined for packaging and marking/ labelling requirements of this Standard.

9.2.2 The laboratory sample prepared as in relevant Clauses of **SLS 664** and Section **1**, Part **1** of **SLS 313** shall be inspected/ tested for the requirements given in Clauses **5** and **6** of this Standard.

10 METHODS OF TEST

Tests shall be as carried out as prescribed in Section **2**, **4** and **5** of Part **1**, Sections **1, 2** and **6** of Part **2**, Sections **4, 5** and **7** of Part **3,** Sections **2** and **3** of Part **4** of **SLS 313**, **SLS 962** and Official Methods of Analysis of the Association of Official Analytical Chemists (**AOAC**).

11 CRITERIA FOR CONFORMITY

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

11.1 Each package/ container examined as in **9.2.1** satisfies the packaging and marking/ labeling requirements of this Standard.

11.2 The test results of the laboratory sample when tested as in **9.2.2** satisfy the requirements given in **5** and **6** of this Standard.

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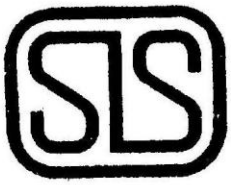
SLS CERTIFICATION MARK

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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