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PAKISTAN STANDARD
FOR
REFINED SUNFLOWER OIL
(1ST REVISION)

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PAKISTAN STANDARDS AND QUALITY CONTROL AUTHORITY
Standards Development Centre,
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PAKISTAN STANDARD SPECIFICATION

FOR

REFINED SUNFLOWER OIL (1ST REV.)

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(ii)

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(iii)

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(1)

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REFINED SUNFLOWER OIL
(1ST REVISION)

0. FOREWORD

- 0.1 This Pakistan Standard was adopted by the Pakistan Standards & Quality Control Authority, Standards Development Centre on 28th January, 2003, after the draft finalized by the Oil Seeds & their Allied Products Sectional Committee had been approved by the Agriculture & Food Products Divisional Council.
- 0.2 This Pakistan Standard specification was originally established on 1983 keeping in view the latest development the committee felt it to revise.
- 0.3 This standard specification is based on data available on various varieties of sunflower grown in different parts of the country at present, it is used as a Edible/Vegetable Oil after suitable refining and deodourization and is also used in the manufacture of hydrogenated Vegetable Oil products.
- 0.4 In preparation of this standard, the views of the manufacturers, technologists and testing authorities, have been taken into consideration.
- 0.5 The final value, expressing the results of a test or analysis, shall be rounded off in accordance with PS:103-1991 (1st Rev.) "Methods of Rounding off Numerical Values". The number of significant places retained in the rounded off value shall be the same as that of the specified value in this standard.

(2)

0.6 All the ingredients preparation, processing, packaging storage and for transportation shall be according to PS: 3733 for Halaal Food Management System Requirement for any Organization in the Food Chain.

1. SCOPE

1.1 This standard prescribes the requirements and methods of sampling and test for refined Sunflower Oil.

2. TERMINOLOGY

2.1 For the purpose of this standard, the following definition in addition to the definitions given under 2 of PS:56-1961 Methods of Sampling & Test for Vegetable Oil shall apply.

2.1.1 Refined Sunflower Oil Sunflower Oil shall be obtained by chemical or physical refining, bleaching and deodorizing. No harmful chemicals shall be used in the manufacture.

3. REQUIREMENTS

3.1 DESCRIPTION – The material shall be obtained from good quality undamaged, mature sunflower seeds from the plant *Helianthus annuus* Linn fam. Composite or from Sunflower Seed Cake thereof by a process of Solvent extraction or by a process of expression.

3.1.1 The material shall be clear and free from adulterants, sediments, suspended and other foreign matter, separated water, and shall have acceptable taste and odour. It may contain antioxidants and synergist as follows :-

ANTIOXIDANTS	MAXIMUM LEVEL OF USE.
i. Propyl octyl, and dodecyl gallates.	100 mg/kg individually or in combination.
ii. Butylated hydroxy-toluene (BHT)	200 mg/kg individually or in combination.

(3)

Butylated Hydroxyanisole (BHA).

- | | | |
|-------|--|---|
| iii. | Any combination of gallates with BHA or BHT or both. | 200 mg/kg but gallates not to exceed 100 mg/kg. |
| iv. | Natural and synthetic tocopherols. | Not limited. |
| v. | Ascorbyl palmitate. | 200 mg/kg individually or in combination. |
| vi. | Ascorbyl stearate. | 200 mg/kg individually or in combination. |
| vii. | Dilauryl thiodiprodionate. | 200 mg/kg individually or in combination. |
| viii) | Tertiary Butyl Hydroquinone (TBHQ). | 200 mg / kg. |

ANTIOXIDANT SYNERGISTS MAXIMUM LEVEL OF USE.

- | | | |
|------|----------------------------------|---|
| i. | Citric acid and its Sodium Salt. | 0.01 % Max. |
| ii. | Isopropyl citrate mixture | 100 mg/kg. |
| iii. | Phosphoric acid. | 100 mg/kg individually or in combination. |

3.1.2 The following colours are permitted for the purpose of restoring natural colour lost in processing as long as the added colour does not deceive or mislead the consumer by concealing damage or inferiority or by making the product appear to be of greater than actual value.

MAXIMUM LEVEL OF USE

- | | | |
|------|--|--------------|
| i. | Beta-carotene. | Not limited. |
| ii. | Annatto. | Not limited. |
| iii. | Curcumin. | Not limited. |
| iv. | Canthaxanthine. | Not limited. |
| v. | Beta-apo-8 carotenal. | Not limited. |
| vi. | Methyl and ethyl esters of beta-apo-8 carotenoic acid. | Not limited. |

(4)

3.1.2.1 When added colour shall be used, the container shall be labeled with the legend “contains added permissible colour”.

3.1.3 Natural flavours and their identical synthetic equivalents except those. Which are known to represent a toxic hazard and other synthetic flavours approved by the codex Alimentarius commission are permitted for the purpose of restoring natural flavour lost in processing or for the purpose of standardizing flavour as long as the added flavour does not deceive or mislead the consumer by concealing damage or inferiority or by making the product appear to be of greater than actual value.

3.1.3.1 Use of the following solvents in flavour is prohibited :

- i. Diethylene glycol Monoethyl ether
- ii. Isopropyl alcohol

3.1.3.2 When natural flavour or artificial flavour shall be used, the container shall be labeled with legend “containing natural flavour or artificial flavour”.

3.2 The clarity of the material shall be judged by the absence of turbidity after keeping the filtered sample at 40^oC for 24 hours.

3.3 Admixture with other Oils – The material shall be free from admixture with mineral or other oils of vegetable or animal origin when tested according to the methods prescribed in PS: 56 - 1996.

3.4 The material shall also comply with the requirements given in Table – 1.

4. PACKING

4.1 The products shall be packed in suitably sealed and well closed containers made from food grade material in accordance with PS:4797-2002 for Flexible packs for the packing of Banaspati, Cooking Oil and Edible Oils or plastic containers (made from Food Grade

(5)

Material) or in accordance with PS:4773-2002 for Tinsplate Containers for Ghee, Banaspati, cooking Oil/Edible Oils.

4.2 The weight of container for Packing of Refined Sunflower Oil should be as follows :

Weight of Finished Product Litre	Weight of Tin Containers (gm)
16	880 to 890
10	660 to 670
05	330 to 340
03	200 to 210
0.1	-
500 ml	-
250 ml	-
100 ml	-

5. MARKING

5.1 The containers shall be marked with the following particulars :-

- i. Name of the material in block letter e.g. "REFINED SUNFLOWER OIL.
- ii. Date of manufacture and Date of expiry.
(PS:4449-1999 Expiration periods for food product shall be strictly followed).
- iii. Name and address of manufacturer.
- iv. The words contain Vitamin-A 33000 I.U. to 45000 I.U. and Vitamin-D₃ 3000 I.U. to 4500 I.U. per kg of the finished product when packed.
- v. Pakistan Standard Number and PS Mark.
- vi. Licence Number.
- vii. Storage conditions.
- viii. Product shall be labelled in accordance with the Pakistan Standard for Labelling of Prepackaged Foods (PS: 1485), in addition to category specific labelling / marking requirement(s).

5.1.1 No label, declaration, methods of preparation and publicity concerning the product, shall be made in a manner likely to mislead the purchaser and/or consumer as to the true nature/or composition of the product as a whole.

(6)

TABLE – 1
REQUIREMENTS FOR REFINED SUNFLOWER OIL

SL. NO.	CHARACTERISTIC	<u>LIMITS</u>	REF.TO CLAUSE OF PS: 56-1996*
i.	Moisture, percent by weight, Max.	0.1	4 & 5
ii.	Insoluble Impurities, percent by weight, Max.	0.05	4 & 5
iii.	Matter volatile at 105°C	Not more than 0.2%	-
iv.	Colour in a 5 ¼ inch cell on lovibond scale	R - 5 Y - 50	12
v.	Refractive index* at 40 °C.	1.4640 to 1.4800	9
vi.	Saponification value.	188 to 194	14
vii.	Iodine value (Wijs).	120 to 140	13
viii.	Free Fatty Acid (as oleic acid) percent by weight, max.	0.25	6
ix.	Unsaponifiable matter, percent by weight, max.	1.5	7
x.	Peroxide value, expressed as milliequivalent oxygen per kg, Max.	10	20
xi.	Anisidine Value max / Rancidity (Kries Test) ***, max.	3.0 R	See Appendix-C of PS:2212003 (3 rd Rev.)**
xii.	Vitamin-A	33000 I.U. to 45000 I.U. per kg of the finished product.	23
xiii.	Vitamin-D ₃	3000 I.U. to 4500 I.U. per kg of the finished product.	
xiv	Linolenic Acid percent by wt. max.****	0.7 (optional)	(by Gas Chromatographic Analysis).

xv	Phosphorus	Not more than 4 ppm	AOAC 986.24 Colorimetry, molybdovanadate
xvi	Soap content, ppm, max.	50	Appendix-D of PS:221-2003 (3 rd Rev.)**
xvii	Iron (Fe)	Not more than 1.5 mg/kg	-
xviii	Copper (Cu)	Not more than 0.1 mg/kg	-
xix	Lead (Pb)	Not more than 0.1 mg/kg	-
xx	Arsenic (As)	Not more than 0.1 mg/kg	-

* Methods of Sampling & Test for Vegetable Oils.

** Banaspati (1st Rev.).

*** Colour produced in Kries Test shall be interpreted alongwith Peroxide Value and shall be sensory test as negative. If the colour is not deeper than 3.0 R 1 inch cell lovibond scale.

**** The requirements to have equipment for the testing is optional for time being.

NOTE: Vitamin A & D₃ in Bulk Oils on Import Stage is not necessary.

6. SAMPLING

6.1 Representative samples of the material shall be drawn as prescribed under PS:56-1996.

7. TEST METHODS

7.1 Test should be carried out in accordance with the methods prescribed in PS:56-1996 and PS: 221-2003.

7.2 Quality of Reagents – Unless specified otherwise analytical grade chemicals and distilled water (PS:593-1991) shall be used in tests.

NOTE :- Analytical grade chemical's shall mean chemical that do not contain impurities which affect the result of analysis.