SRI LANKA STANDARD 386 : 1978
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SPECIFICATION FOR SESAME (GINGELLY) SEEDS

(FIRST REVISION)

BUREAU OF CEYLON STANDARDS

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SLS 386 : 1978

Gr. 4
(Attached AMD 57 and AMD 107)

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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.

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SRI LANKA STANDARD SPECIFICATION FOR SESAME (GINGELLY) SEEDS (FIRST REVISION)

FOREWORD

This Sri Lanka Standard Specification (First Revision) has been prepared by the Drafting Committee of the Bureau on Sesame Seeds. It was approved by the Agricultural and Chemicals Divisional Committee of the Bureau of Ceylon Standards and was authorised for adoption and publication by the Council of the Bureau on 1978-03-14.

This standard was first approved for publication in 1976. In this revision, sesame seeds have been graded as "Super Grade"and "Grade 1". The specifications for impurities and moisture content of these grades differ from the corresponding specifications of the original grades. The upper limit for the percentage of white seeds in Type 2 seeds has also been changed in this revision.

The standard values given in this specification are in SI units.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with CS 102:1971*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

In the preparation of this standard, the assistance obtained from the publications of the Indian Standards Institution and the Ethiopian Standards Institution is gratefully acknowledged.

1. SCOPE

This standard prescribes the requirements and the methods of sampling and tests for sesame seeds, **Sesamum indicum** Linn, family Pedaliaceae.

*CS 102:1971 Presentation of Numerical Values.

2. DEFINITIONS

For the purpose of this standard the following definitions shall apply to:

2·1 Impurities—Foreign bodies other than pure seeds or parts thereof, whichcould consist of the following:

(a) **Dust**—Particles passing through a 0·500 mm sieve conforming to CS 124:1971*.

(b) **Non-oleaginous bodies**—Stalks, fibrous matter, stones, silica, debris, and other matter which does not pass through the above sieve.

(c) **Other oil seeds**—seeds other than sesame seeds.

3. TYPES

3·1 Sesame seeds grown in Sri Lanka shall be grouped into the following two types:

3·1·1 Type 1: White seeds—Shall consist of white seeds (colour of the outer coating can range from white to cream) containing not more than 10% m/m brown and/or black seeds as determined by the method prescribed in Appendix B-2.

3·1·2 Type 2: Mixed seeds—Shall consist of a mixture of white, brown aud black seeds or brown and black seeds containing not more than 66% white seeds as determined by the method prescribed in Appendix B-2.

4. GRADES

Sesame seeds of both types shall be graded as follows, depending on the requirements prescribed in Clause 5.

(a) Super Grade

(b) Grade 1

5. REQUIREMENTS

5·1 Sesame seeds of both types shall be sound, free from visible mould and reasonably free from insect damage.

*CS 124:1971 Test Sieves.

5·2 Sesame seeds of both types shall comply with the specifications given in Table 1.

Table 1–Specifications for Sesame Seeds

Sl. No.	Characteristic	Specification for		Method of test (Reference to Appendix)
		Super Grade	Grade 1	
(1)	(2)	(3)	(4)	(5)
(i)	Impurities, per cent by mass, max.	1	3	B-1
(ii)	Moisture content, per cent by mass, max.	7·5	7·5	B-3
(iii)	Oil content (on moisture and impurity free basis), per cent by mass, min.	48	45	B-4
(iv)	Acid value of extracted oil.	4	6	B-5

6. PACKAGING

6·1 Sesame seeds shall be supplied in clean, dry, sound, gunny bags or in any other suitable container as agreed to between the buyer and the seller.

7. MARKING

7·1 The containers shall be marked with the following:

(a) Name and/or registered trade mark if any, of the seller

(b) The words "Sesame seeds"

(c) Type and Grade

(d) Net mass in kg

(e) The words "Produce of Sri Lanka"

(f) Shipping marks identifying the consignment (if any).

8. SAMPLING

8·1 The method of drawing representative samples of the material shall be as prescribed in Appendix A.

9. TESTS

9·1 Tests shall be carried out as prescribed in Appendix B.

9·2 Quality of Reagents—Unless specified otherwise, chemicals of analytical grade and distilled water shall be employed in test.

10. CRITERIA FOR CONFORMITY

10·1 The criteria for conformity with this standard shall be as specified in Appendix A-3.

APPENDIX-A

SAMPLING

A-1 Scale of Sampling

A 1·1 Lot-All containers containing sesame seeds belonging to the same consignment shall be grouped together to form a lot.

A-1·2 The number of containers to be selected from a lot shall depend on the size of the lot and shall be in accordance with Table 2.

TABLE 2-SCALE OF SAMPLING

Number of containers in the lot (N)	Number of containers to be selected (n)
Up to 50	5
51 to 100	8
101 to 150	13
151 to 400	20
401 and above	Sq root of No. of containers ($\sqrt{N}$)

A-1·3 The containers to be selected from a lot shall be chosen a random and for this purpose a random number table as specified in SLS 428* shall be used.

A-1·4 Equal portions of sesame seeds shall be taken from each of the selected containers at 3 different regions to give a total sample of at least 100g per container. A slotted tube sampler, scoop or other suitable sampling instrument may be used for the purpose of drawing these samples. All portions taken as indicated above shall be mixed together thoroughly and if necessary coned and quartered down to form a final sample of at least 2 kg.

A-1·5 The final sample shall be reduced suitably for obtaining a set of 3 laboratory samples and three moisture samples (samples intended for determination of moisture). One laboratory sample shall be marked for the purchaser, another for the supplier and the third for reference in case of dispute. The three moisture samples shall also be marked in a similar manner. The minimum mass of a laboratory sample shall be 200g while that of a moisture sample shall be 100 g.

A-2 Packaging and Labelling of Samples

A-2·1 All the samples shall be kept in suitable containers so as to preserve, as far as possible, all the characteristics till the time of their use in testing. The containers shall carry labels with full particulars for identification.

A-2·2 Laboratory samples with the exception of moisture samples shall be enclosed in suitable containers.

A-2·3 The samples for moisture determination shall be placed first in polyethylene bags, which after filling shall be heat sealed and then placed in suitable containers.

A-3 Criteria for Conformity

A-3·1 Laborotary Sample—A lot shall be declared to be in conformity with the specified requirements of the specification in respect to all characteristics other than moisture content, if the laboratory sample representing the lot satisfies the said requirements.

*SLS 428 Random Sampling Methods

A-3·2 Moisture Sample —A lot shall be declared to be in conformity with the specified requirements of the specification in respect to moisture content, if the moisture sample representing the lot satisfies the said requirement.

APPENDIX-B

METHODS OF TEST

(See Clause 9·1)

B-1 Determination of Impurities

B-1·1 Take a sample of 100g of the material and weigh to the nearest 0·1g. Sieve through a 0·500 mm CS sieve*. Collect the dust passing down the sieve; weigh to the nearest 0·01g.

B-1·2 Transfer the sample left on the sieve to a wide mouthed beaker and soak in 150–200 ml of chloroform. Separate the seeds and light impurities such as stalks, stems, other oleaginous seeds, etc., from the heavier impurities such as sand, stone etc., by the method of flotation. Dry the seeds and light impurities and spread on a glazed paper. Hand separate with the aid of a brush and hand lens the light impurities from the sesame seeds. Weigh to the nearest 0·01g the light impurities. Dry also the sand and stones remaining in the beaker and weigh to the nearest 0·01g.

NOTE: This determination should be carried out as quickly as possible if the same sesame seeds are used to determine the oil content in the seeds.

B-1·3 Calculate the percentage of impurities in the test sample using the following formula:

$$\text{Impurities, per cent by mass} = \frac{m_1 + m_2 + m_3}{m_0} \times 100$$

where,

m_0 = mass, in g, of the test sample before cleaning

m_1 = mass, in g, of the dust passing through specified sieve

*CS 124:1971 Test Sieves

m_2 = mass, in g, of the light impurities such as stalks, stems and other oleaginous seeds

m_3 = mass, in g, of the heavier impurities such as sand, stones, etc.

B-2 Determination of Brown and/or Black Seeds in Type 1 Sesame Seeds and Determination of White Seeds in Type 2 Sesame Seeds

B 2·1 Take a sample of 10g of the pure sesame seeds after separation of impurities as specified in Clauses B-1·1 and B-1·2, and weigh to the nearest 0·1g. In the case of Type 1 seeds hand separate the brown and/or black seeds and weigh to the nearest 0·01g. In the case of Type 2 seeds, hand separate the white seeds and weigh the white seeds to the nearest 0·01g.

B-2·1·1 Calculate the percentage of brown and/or black seeds in the test sample using the following formula:

$$\text{Brown and/or Black seeds in Type 1 sesame seeds, percent by mass} = \frac{m_1}{m_0} \times 100$$

B 2·1·2 Calculate the percentage of white seeds in the test sample, using the following formula:

$$\text{White seeds in Type 2 sesame seeds, percent by mass} = \frac{m_2}{m_0} \times 100$$

where,

m_0 = mass, in g, of the pure seeds

m_1 = mass, in g, of the brown and/or black seeds (in the case of Type 1 seeds)

m_2 = mass, in g, of the white seeds (in the case of Type 2 seeds)

B-3 Determination of Moisture Content

B-3·1 Principle—The percentage of moisture in sesame seeds is determined by drying to constant mass at a temperature close to 103°C in a temperature-controlled oven at atmospheric pressure.

B-3·2 Apparatus

B-3·2·1 Moisture dish of metal resistant to attack, with flat bottom, provided with a well fitting lid, 70-80mm in diameter and 30-40mm deep.

B-3·2·2 Desiccator—containing an efficient desiccant such as phosphorus pentoxide.

B-3·2·3 Air-oven preferably electrically heated with temperature control devices.

B-3·3 Determination—Weigh to the nearest 1 mg the moisture dish with its lid, the assembly having been dried previously in a desiccator. Weigh in this dish, to the same accuracy, $5 \pm 0 \cdot 5$g of the pure seeds. Remove the lid and place the dish containing the pure seeds in the air-oven for approximately 3 hours at 103 ± 2°C. Remove the dish from the oven, having closed it by means of its lid, cool in a desiccator to room temperature and weigh. Repeat this procedure, keeping the dish in the oven only for 1 hour each time until the difference between the two successive weighings does not exceed 5 mg.

B-3·4 Calculation

$$\text{Moisture, per cent by mass (A)} = \frac{m_1}{m_0} \times 100$$

where,

m_1=loss in mass, in g, of the material upon drying and

m_0=mass, in g, of the material taken for the test.

B-4 Determination of Oil Content

B-4·1 Principle—The oil content is determined by extraction with a petroleum hydrocarbon solvent.

B-4·2 Apparatus

B-4·2·1 Soxhlet extraction apparatus—capacity of flask, 150 to 250ml.

B-4·2·2 Air-oven

B-4·3 Reagents

B-4·3·1 Petroleum ether, boiling between 40°C and 60°C Residue on evaporation should not exceed 2mg/100 ml.

B-4·3·2 Sand—about 180 micrometres grain size washed with hydrochloric acid and calcined.

B-4·4 Determination—Weigh to the nearest 0·01g about 5 g of the pure seeds (i.e. after separating the impurities). Crush the seeds in a mortar and transfer to an extraction thimble, avoiding any losses. Place the thimble in the extractor, previously fitted with a weighed flask. Rinse the mortar and its pestle with the solvent, transferring the washings to the extractor. Add the quantity of solvent required for efficient working of the extractor to this apparatus; affix the condenser and allow through it a current of cold water to flow. Heat the extractor so that the action is moderate and not violent.

B-4·4·1 Continue the extraction for 4 hours. Remove the extractor from its bath, take the extraction thimble after it has drained out, of the extractor and allow the solvent to evaporate from it in a current of air.

B-4·4·2 Dry the thimble and the contents in the oven at 103±2°C for 30 minutes. Empty the thimble into a mortar and add approximately 10 g of the fine sand (see Clause B-4·3·2). Grind the mixture as finely as possible. Transfer the ground material to the thimble again; place the thimble in the extractor, rinse pestle and mortar with solvent and transfer rinsings to the extractor. Repeat the extraction process further for 2 hours.

B-4·4·3 Remove the thimble again from the extractor dry it with the contents as before; grind the contents again without the addition of more sand. Transfer the ground material to the extractor. Fit a second weighed flask to the extractor. Rinse pestle and mortar with solvent as before and extract for 2 hours.

B-4·4·4 Remove the greater part of the solvent in the two flasks by distillation from a hotwater bath. Heat the flask in an oven at 103±2°C for one hour to romove solvent. Cool them to room temperature and weigh. Repeat the heating and cooling process until the mass of the flask is constant. If the mass of oil in the second flask does not exceed 10 mg, the extraction is complete; should it exceed this amount, repeat the extraction of the ground material, re-grinding between extraction, until the mass of material removed in a given extraction does not exceed 10 mg.

B-4·4·5 Add together the masses of oil extracted in the successive flasks as found in this manner.

B-4·4·6 If the oil recovered as above is not clear, it may be dissolved in solvent and filtered through a filter paper. The paper should be washed thoroughly with solvent and the oil solution and the washings should be combined. Solvent should be evaporated as in Clause B-4·4·4 and the flask containing the oil dried and weighed as above to obtain the true amount of oil.

B-4·5 Calculation

$$\text{Oil, percent by mass (on moisture and impurity free basis)} = \frac{m_1 \times 100}{m_0} \times \frac{100}{100-A}$$

where,

m_1 = mass, in g, of the oil extracted

m_0 = mass, in g, of the analysis sample taken for the test and

A = moisture, percent by mass, of the sample as determined under Clause B-3·4.

NOTE: Duplicate determinations should not differ by more than 0·3 percent. The figure to be reported shall be the arithmetic mean of such duplicates. If the difference between duplicates shall be more than 0·3 percent, repeat the analysis on two further portions of the sample.

B-5 Determination of Acid Value of Extracted Oil

B-5·1 Principle

B-5·1·1 The acid value of the oil is determined by directly titrating the material in an alcoholic medium with aqueous sodium or potassium hydroxide solution using phenolphthalein as indicator.

B-5·1·2 The oil for the determination of acid value shall be extracted as soon as the seeds are ground, and analysed as soon as the last weighings of the extraction flasks have been made.

B-5·2 Reagents

B-5·2·1 Ethyl alcohol (95% v/v)

B-5·2·2 Phenolphthalein indicator solution–Dissolve one gramme phenolphthalein in 100ml of ethyl alcohol.

B-5·2·3 Standard aqueous potassium hydroxide or sodium hydroxide solutions–0·1N or 0·5N.

B-5·3 Procedure—Mix the oil thoroughly before weighing. Weigh a suitable quantity of the oil in a 200ml conical flask. The mass of the oil taken for the test and the strength of the alkali used for the titration shall be such that the volume of alkali required for the titration does not exceed 10ml. Add 50ml to 100ml of freshly neutralized hot ethyl alcohol, and about one millilitre of phenolphthalein indicator solution. Boil the mixture for about five minutes and titrate while as hot as possible with standard aqueous alkali solution, shaking vigorously during titration.

B-5·4 Calculation

$$\text{Acid value} = \frac{56{\cdot}1\ VN}{m}$$

where,

V = volume, in ml, of standard potassium hydroxide or sodium hydroxide solution used.

N = normality, of standard potassium hydroxide or sodium hydroxide solution, and

m = mass, in g, of the material taken for the test.

AMENDMENT NO. 1 APPROVED ON 1982-09-30.

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Page 6 Clause 3.1.2

Delete the existing text and substitute the following:

"Type 2 : Mixed seeds - shall consist of a mixture of white, brown and black seeds or brown and black seeds containing not more than 80 per cent white seeds as determined by the method prescribed in Appendix B.2"

AMENDMENT NO. 2 APPROVED ON 1988-08-25

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Clause 7 - MARKING

Substitute the existing clause with the following:

7 MARKING

7.1 Each package shall be marked legibly and indelibly or a label shall be attached to the package, with the following information, except for packages intended for export where marking shall be in accordance with **7.2.**

a) Name of the product;
b) Type/Grade;
c) Trade name, if any;
d) Batch or code number, if any;
e) Net weight in grams or in kilograms; and
f) Name and address of the producer or trader.

7.2 Marking on packages intended for export shall be accordance with **SLS 809***. In addition to the standard shipping marks stipulated in **SLS 809*,** the following information marks shall be given on each package.

a) Name of the product; and
b) Grade designation.

* **SLS 809** ***Recommended shipping marks for goods***

BUREAU OF CEYLON STANDARDS

The Bureau of Ceylon Standards (BCS) is the national standards organisation of Sri Lanka and was established by the Hon. Minister of Industries & Fisheries, as provided for by the Bureau of Ceylon Standards Act. No. 38 of 1964.

The principal objects of the Bureau as set out in the Act are to promote standards in industry and commerce, prepare national Standard Specifications and Codes of Practice and operate a Standardisation Marks Scheme and provide testing facilities, as the need arises.

The Bureau is financed by Government grants and the sale of its publications. 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 Bureau These Committees are appointed by Divisional Committees, which 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 Bureau endeavours to ensure adequate reprentation of all view points.

In the international field the Bureau represents Sri Lanka in the International Organisation for Standardisation (ISO) and will participate in such fields of Standardisation as are of special interest to Sri Lanka.

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