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SPECIFICATION FOR CARDAMOM PODS (CAPSULES) OR SEEDS (*Second Revision*)

SRI LANKA STANDARDS INSTITUTION

Sri Lanka Standard

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(*Second Revision*)

SLS 166: 2019

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SRI LANKA STANDARDS INSTITUTION
17, Victoria Place
Elvitigala Mawatha
Colombo 08
Sri Lanka

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

Sri Lanka Standard
SPECIFICATION FOR CARDAMOM PODS (CAPSULES) OR SEEDS
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FOREWORD

This Sri Lanka Standard was approved by the Sectoral Committee on Food Products and authorized for adoption and publication as a Sri Lanka Standard by the Council of the Sri Lanka Standards Institution on 2019-03-07.

Cardamom is one of the important and commonly used ingredients in spicing cuisine, as well as in cosmetics and for medicinal purposes. Cardamom is extensively used as a flavouring agent in food preparations. The essential oil and flavouring ingredients of cardamom is present almost entirely in the seeds within the pods although the spice trade concerns on the importance of the colour and external appearance of the pods. Therefore, this is marketed as whole fruits (pods) as well as in the seed form. The fruits when harvested are dried slowly. Artificial curing causes retention of the green colour while sun drying tends to bleach the product.

Sri Lanka Standard on cardamom was originally issued in 1972 and revised in 1980. In the first revision, *Elettaria cardamomum* and *Elettaria ensal* were classified separately as two parts. In this second revision, the two parts have been combined and presented under the same scope. Definitions have been revised and new physical and chemical parameters have been introduced to safeguard the consumer while catering the requirements of trade.

This Standard is subject to the provisions of the 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 an analysis shall be rounded off in accordance with **SLS 102**. The number of significant places 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 obtained from the relevant publications of the International Organization for Standardization (ISO) and the Bureau of Indian Standards is gratefully acknowledged.

1 SCOPE

This Standard prescribes the requirements and methods of sampling and test for cardamom, *Elettaria cardamomum* (L.) Maton var, miniscula Burkhill and *Elettaria ensal* Gaerth Abeywick in the forms of whole pods (capsules) and seeds.

2 REFERENCES

SLS	102	Rules for rounding off numerical values
SLS	143	Code of practice for general principles of food hygiene
SLS	186	Methods of test for spices and condiments

		Part 2: Determination of extraneous matter and foreign matter content
		Part 3: Determination of total ash
		Part 4: Determination of acid-insoluble ash
		Part 5: Determination of moisture content – entrainment method
		Part 8: Determination of filth
		Part 11: Determination of volatile oil content – hydrodistillation method
SLS	310	Methods of sampling of spices and condiments
SLS	467	Code of practice for labeling of prepackaged foods
SLS	809	Recommended shipping marks for goods
SLS	1327	Code of practice for spices and other dried aromatic plants

3 DEFINITIONS

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

3.1 bleached or half bleached pods*: pods which have been bleached or half bleached. The colour of such pods ranges from pale yellow to pale buff

* Pods are also referred as capsules

3.2 cardamom pods: Pods shall be the nearly ripe, well-formed and sound fruits of *Elettaria cardamomum* and *Elettaria ensal*. The pods shall be oval with three cornered having a ribbed appearance or round in shape and shall be clipped with their pedicels removed

3.3 cardamom seeds: The decorticated black to light brown seeds, separated from the pods of cardamom (*Elettaria cardamomum* and *Elettaria ensal*)

3.4 empty and malformed pods: pods which have no seeds or are scantily filled with seeds

3.5 foreign and extraneous matter: Matter other than cardamom seeds and pods

3.6 immature and shrivelled pods: Pods which are not fully developed

3.7 light seeds: Brown or light brown immature seeds which may be broken or whole

3.8 splits: Pods which are completely or partially opened

3.9 unclipped pods: Pods with tips which have not been trimmed

4 GRADES

4.1 Pods

Cardamom pods shall be of five grades as follows:

4.1.1 *Grade* 1: *Lanka green (LG)*
4.1.2 *Grade* 2: *Lanka light green* 1 *(LLG* 1*)*

4.1.3 *Grade* 3: *Lanka light green* 2 *(LLG* 2*)*
4.1.4 *Grade* 4: *Lanka bleached (LB)*
4.1.5 *Grade* 5: *Lanka non specified (LNS)*

4.2 Seeds

Cardamom seeds shall be of three grades as follows:

4.2.1 *Grade* 1: *More than* 95% *unbroken, black colour seeds*
4.2.2 *Grade* 2: *More than* 95% *unbroken, dark brown to light brown seeds*
4.2.3 *Grade* 3: *Broken, black or brown colour seeds*

5 REQUIREMENTS

5.1 Hygiene

The product shall be processed, packaged, stored and distributed in accordance with the hygienic conditions prescribed in **SLS 143** and **SLS 1327**.

5.2 Aroma and flavour

The product shall have its characteristic and pleasant aroma and flavour. It shall be free from foreign aroma and flavour including rancidity and mustiness.

5.3 Colour

5.3.1 *Pods*

Each grade shall be fairly uniform in colour. The colour may range from apple green to pale buff as classified in Table **1**.

5.3.2 *Seeds*

Each grade shall be fairly uniform in colour as described in Clause **4.2**.

5.4 Mould, insect infestation and animal excreta

Cardamom pods and seeds shall be free from mould growth, living and dead insects, insect fragments and animal excreta, visible to the naked eye, or using the required magnifying instrument. If the magnification exceeds ×10, this fact shall be mentioned in the test report. The proportion of insect damaged matter shall not exceed 1 per cent (*m*/ *m)*.

In case of disputes, the method given in **Part 8** of **SLS 186** shall be applied.

5.5 Adulterants

No substance shall be added to or extracted from cardamom.

5.6 Foreign and extraneous matter

5.6.1 *Pods*

Cardamom pods shall be free from visible dirt, dust and other foreign matter. LG, LLG 1 , LLG 2 and LB shall be free from pieces of pods, calyx, stalks and other extraneous matter. The total percentage of extraneous matter in LNS grade shall not exceed 2 per cent by mass when determined by the method specified in Part **2** of **SLS 186**.

5.6.2 *Seeds*

Cardamom seeds shall be free from visible dirt and, dust and other foreign matter. The total percentage of extraneous matter in cardamom seeds shall not exceed 2 per cent by mass when determined by the method specified in Part **2** of **SLS 186**.

5.7 Other physical requirements for cardamom pods

The product shall comply with the requirements specified in Table **1,** when tested according to the relevant methods given in Column **5** of the table.

5.8 Chemical requirements

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

5.9 Light seeds

The proportion of light seeds in cardamom seeds of Grade 1 and 2, determined using the method specified in Appendix **C** shall not be more than 5***** per cent by mass.

*****_This is not applicable for cardamom seeds of Grade_ 3

TABLE 1: Physical requirements for cardamom pods

Sl No	**Characteristic**	**Requirement**					**Method of test**
		LG	**LLG 1**	**LLG 2**	**LB**	**LNS**	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
i)	Colour	Apple green	Light green	Light green	Pale buff	NS	Visual
ii)	Empty and malformed pods, per cent by mass, max.	0	2	5	5	NS	Appendix **B**
iii)	Immature, shrivelled and split pods, per cent by count, max.	0	1	5	5	NS	Appendix **B**
iv)	Unclipped pods, per cent by count, max.	0	0	5	5	NS	Appendix **B**
v)	Bulk density, (g/ l), min.	370	340	320	300	260	Appendix **A**

NS: Not specified

TABLE 2: Chemical requirements for cardamom pods and seeds

Sl No	Characteristic	Requirement		Method of test (SLS 186)
		Pods	Seeds	
(1)	(2)	(3)	(4)	(5)
i)	Moisture, per cent by mass, max	12.0	12.0	Part 5
ii)	Total ash percent by mass, on dry basis, max	9.5	8.0	Part 3
iii)	Acid insoluble ash, percent by mass, on dry basis, max	2.0	2.0	Part 4
iv)	Volatile oil, ml/ 100 g, min	3.5	4.0	Part 11

6 CONTAMINANTS

6.1 Pesticide residues

The product shall be cultivated and processed with special care under good agricultural practices and good manufacturing practices (**SLS 143** and **SLS 1327**), so that residues of those pesticides which may be required in the production do not remain or if practically unavoidable are reduced to the minimum level to comply with the maximum tolerable limits specified in **SLS 910**.

NOTE
It is not necessary to carry out this determination as a routine for all the samples. This should be tested in case of dispute and when required by the purchaser or vendor or when there is any suspicion of pesticide contamination.

6.2 Other contaminants

The product shall not contain contaminants or undesirable substances in amounts which may present hazards to the health of the consumer.

7 PACKAGING

7.1 Bulk packaging

Cardamom shall be packaged in suitable, clean and sound bags with black coloured food grade inner liner which shall not affect the product and protect the product from sunlight, and shall not allow the migration of moisture and volatile matter.

7.2 Retail packaging

Cardamoms shall be packaged in suitable, clean and sound, air-tight food grade packages/ containers which shall be strong enough to withstand pressure in handling.

8 MARKING AND/ OR LABELLING

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

a) The common name of the product as “CARDAMOM” or "CARDAMOM SEEDS";
b) Grade;
c) Brand name or trademark, if any;
d) Net mass in “g” or “kg”;
e) Name and address of the packer;
f) Name and address of the importer or trader;
g) Batch or code number or decipherable code marking;
h) Date of packaging;
j) Year of harvest (in case of bulk packages);
k) Date of expiry;
m) Country of origin, in case of imported products; and
n) Instructions for storage and handling, if any.

8.2 Marking and/ or labelling shall be in accordance with the **SLS 467**.

8.3 Marking and/ or labelling on packages intended for export shall be in accordance with **SLS 809**.

9 SAMPLING

Sampling shall be carried out in accordance with **SLS 310**.

10 METHODS OF TESTS

Cardamom shall be tested for ascertaining conformity of the material to the requirements of this Standard by the methods of test given in **Part 2**, **Part 3**, **Part 4**, **Part 5**, **Part 8** and **Part 11** of **SLS 186** and **Appendix A**, **B** and **C** of this Standard.

APPENDIX A
DETERMINATION OF BULK DENSITY

A.1 PRINCIPLE

Weighing a volume, exactly measured of 1-litre of cardamom

A.2 APPARATUS

A.2.1 *Cylinder*, of capacity 1-litre, or a cylinder of greater capacity but equipped with apparatus allowing leveling of the product to the 1-litre level

A.2.2 *Filling hopper*, of capacity greater than 1-litre and equipped with a gate

A.2.3 *Funnel support (device),* for fixing the hopper above the cylinder at a certain distance, to allow free fall of the product into the cylinder from a constant height

NOTE

***Figure* 1** *shows an example of such an apparatus.*
This is the apparatus applicable to the reference method. However, for routine control and when the apparatus described is not available, it is possible to use a cylinder of 1*-litre capacity and a funnel.*

A.2.3 *Balance*, A special balance allowing the cylinder to be hooked to one side of the beam and equipped on the other side with a suitable plate serving as tare

A.3 PROCEDURE

A.3.1 Determination

Weigh the empty cylinder, if necessary.

Place the cylinder on a horizontal plane and set the filling hopper on it with a fixing device. Pour the cardamom into the filling hopper until it is filled. Open the gate and allow the cardamom pods to flow freely into the cylinder until the level slightly exceeds the upper level or the l-litre level, according to the apparatus used.

Level the cardamom, according to the case, to the upper level of the cylinder with a ruler, or to the 1-litre level with a suitable device with which the cylinder is equipped. In the latter case, remove the excess pods.

Remove the filling hopper and its support, and weigh the cylinder filled with the cardamom.

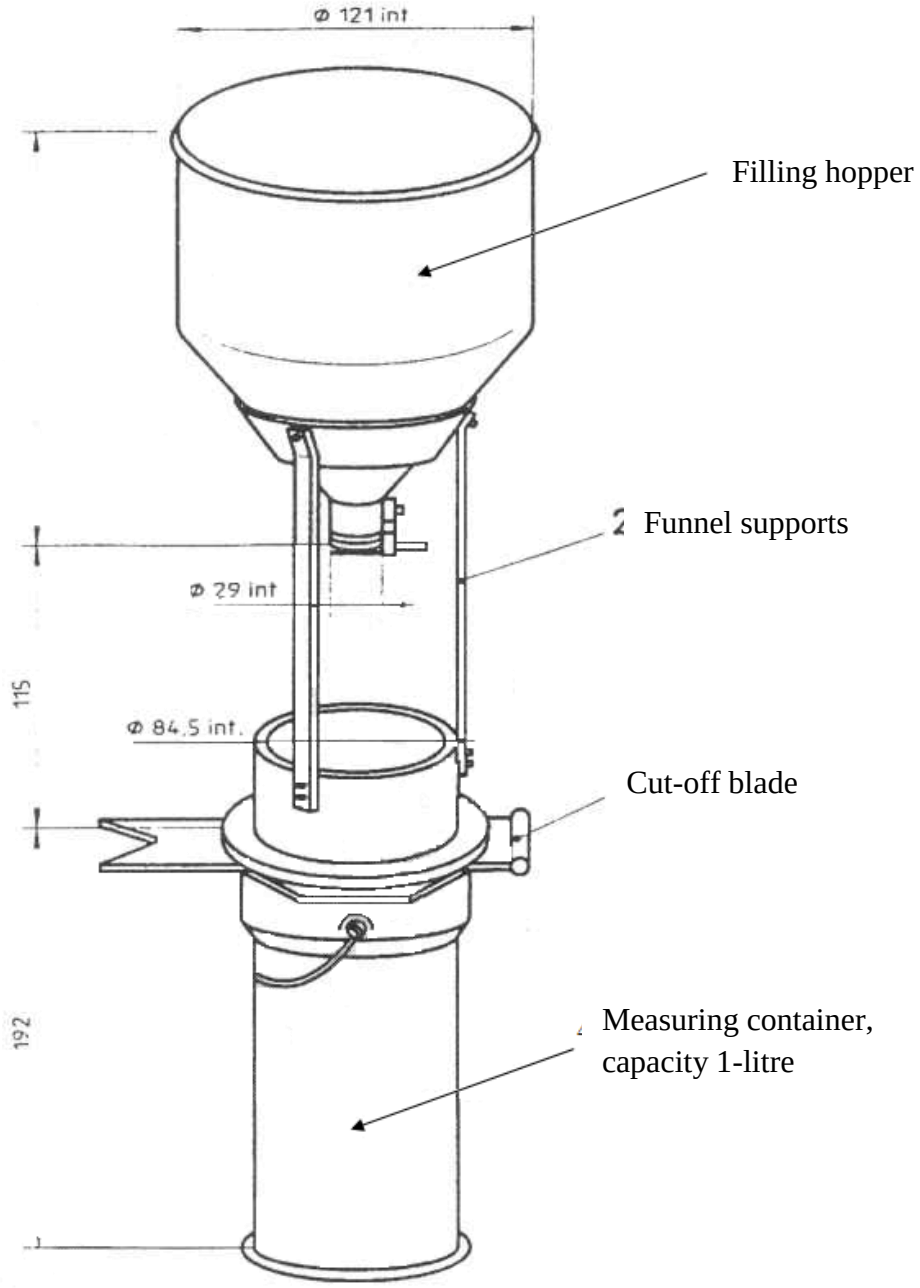


FIGURE 1: Nilema - litre apparatus

NOTE

Figure 1 *gives the dimensions of the apparatus of* 1*-litre capacity. If it is required to carry out the determination with a sample reduced to half an apparatus the dimensions of which are also reduced in the same proportions can be used, but this is solely under the responsibility of the operator.*
Only the 1*-litre method is the reference method.*

A.3.2 Number of determinations

Carry out three determinations.

A.4 EXPRESSION OF RESULTS

A.4.1 Method of calculation

The bulk density of cardamom, expressed in grams per litre, is given by the mass of cardamom contained in the cylinder.

Take as the result, the arithmetic mean of the three determinations if the repeatability conditions (*see* **A.4.2)** are satisfied. Otherwise, carry out three further determinations. If the former conditions are still not satisfied, take the arithmetic mean of the six determinations as the result.

A.4.2 Repeatability

The difference between the results of two determinations carried out in rapid succession by the same analyst using the same apparatus shall not exceed 5 g per litre.

A.5 TEST REPORT

The test report shall specify the method used and the result obtained. It shall also mention all operating details not specified in this appendix, or regarded as optional, together with details of any incidents which may have influenced the results.

The test report shall include all information necessary for the complete identification of the sample.

APPENDIX B
DETERMINATION OF EMPTY AND MALFORMED PODS/ IMMATURE, SHRIVELLED AND SPLIT PODS/ UNCLIPPED PODS

B.1 APPARATUS

B.1.1 *Magnifying lens*, having a magnification of 10

B.1.2 *Forceps*, of about 100 mm in length

B.1.3 *White paper*

B.1.4 *Watch glasses*

B.2 PROCEDURE

Mix the material thoroughly. Obtain a representative sample of 100 pods randomly. Spread the sample on a white sheet of matt paper. Separate immature, shrivelled and split pods to a watch glass and empty and malformed pods to another watch glass and unclipped pods to a separate watch glass from the material, using the magnifying lens.

Separately count the number of pods in each watch glass and express the results as a percentage.

APPENDIX C
DETERMINATION OF LIGHT SEEDS

C.1 APPARATUS

C.1.1 *Magnifying lens*, having a magnification of 10

C.1.2 *Forceps*, of about 100 mm in length

C.1.3 *White paper*

C.1.4 *Watch glasses*

C.2 PROCEDURE

Obtain approximately 50 g of cardamom seeds and weigh the sample (m_o). Spread out the sample on a white sheet of matt paper. Observe the colour and the shape of the seeds. Collect light seeds on to a watch glass by physical separation. Weigh the contents in the watch glass (m_1), to the nearest 0.1 g. Calculate the percentage value using the expression given below.

C.3 CALCULATION

$$\text{Light seeds, per cent by mass} = \frac{m_1}{m_o} \times 100$$

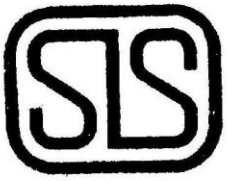
where,

m_o is the mass, in grams, of the sample taken; and
m_1 is the mass, in grams, of light seeds.

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.

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All members of the Technical and Sectoral Committees render their services in an honorary capacity. In this process 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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