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SPECIFICATION FOR CLOVE, WHOLE OR GROUND (*Second Revision*)

SRI LANKA STANDARDS INSTITUTION

Sri Lanka Standard

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(*Second Revision*)

SLS 241: 2019

Gr. 6

SRI LANKA STANDARDS INSTITUTION
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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 CLOVE, WHOLE OR GROUND
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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 2019-08-07.

Clove is one of the important and commonly used ingredients in spicing cuisine, as well as in cosmetics and for medicinal purposes. Clove is extensively used as a flavouring agent in food preparations. The essential oil and flavouring ingredients of clove is present almost entirely in flower buds. However, the spice trade concerns on the importance of the colour and external appearance of the buds.

Sri Lanka Standard on clove was first revised in 1978 and in this second revision, definitions have been revised and new physical and chemical parameters have been introduced to safeguard the consumer while catering the requirements of the trade. In addition, ground clove has been considered.

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 preparation of this Standard, valuable assistance derived from the following publication is gratefully acknowledged.

ISO 2254: 2004	Cloves, whole and ground (powdered) - Specification
IS 4404: 2010	Spices and condiments – Cloves, whole and ground - Specification

1 SCOPE

This Standard prescribes the requirements and methods of sampling and test for clove *Syzygium aromaticum* L. (synonym: *Eugenia caryophyllus* (Sprengel)) in the forms of whole and ground.

2 REFERENCES

SLS	102	Rules for rounding off numerical values
SLS	124	Test sieves
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
		Part 12: Determination of degree of fineness of grinding – Hand sieving method (Reference 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
SLS	1362	Methods of test for agricultural food products
		Part 1: Determination of crude fiber content – general method

3 DEFINITIONS

3.1 whole clove: Floral bud (Figure **1** in Appendix **B**), harvested before blooming and dried of *Syzygium aromaticum* L.

NOTE
It comprises a receptacle containing, in its upper part, two loculi containing numerous ovules, and crowned by four acute divergent sepals surrounding a dome-shaped head consisting of four paler unexpanded membranous imbricate petals enclosing numerous incurved stamens and a single stiff erect style.

3.2 headless clove: Clove consisting of only the receptacle and sepals and which has lost the dome-shaped head

3.3 fermented clove ("Khoker" clove): Fermented bud due to improper drying and which are recognized by their pale brown colour and whitish mealy appearance

3.4 clove fruits ("Mother" clove): Fruits of clove tree, (Figure **2** in Appendix **B**) which are ovoid brown berries surmounted by four incurved sepals

3.5 clove stems: Dry fragments of the stalk of the whole clove (Figure **3** in Appendix **B**)

3.6 ground clove: Product obtained by grinding whole clove

3.7 extraneous and foreign matter: Matter other than whole clove

4 GRADES

4.1 Whole clove

Whole clove shall be of four grades as follows:

4.1.1 *Special grade* (*Sri Lankan handpicked*)

4.1.2 *Grade* 1
4.1.3 *Grade* 2
4.1.4 *Grade* 3

4.2 Ground clove

Ground clove shall be of two grades as follows:

4.2.1 *Grade* 1
4.2.2 *Grade* 2

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 General requirements

Clove shall be the sufficiently dried, unopened whole flower buds of *Syzygium aromaticum* L. Merr. Et L. M. Perry as illustrated in Figure **1**. The slightly flattened thick hypanthium which forms the lower portion of the clove shall exude oil when indented with a finger nail.

5.3 Colour

5.3.1 *Whole clove*

Each grade shall be fairly uniform in colour. The colour shall range from reddish brown to blackish brown.

5.3.2 *Ground clove*

Each grade shall be of brown to light brown in colour.

5.4 Aroma and flavour

The product shall have a strong characteristic aroma and flavour. It shall be free from off flavours including mustiness.

5.5 Moulds, insect infestation and animal excreta

Clove, whole and ground 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.

5.6 Oil-extracted cloves

Cloves shall be free from oil-extracted cloves.

5.7 Other requirements

5.7.1 *Whole clove*

Whole clove shall comply with the requirements specified in Table **1**, when tested according to the method given in Column **7** of the table.

TABLE 1 – Other requirements for whole clove

Sl No.	Characteristic	Requirement				Method of test
		Special grade	Grade 1	Grade 2	Grade 3	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	Headless clove, per cent by count, max.	2	NS	NS	NS	Appendix **A**
ii)	Clove stems and clove fruits, per cent by mass, max.	NIL	2	4	6	
iii)	Fermented clove, per cent by mass, max.	NIL	2	3	5	
iv)	Extraneous and foreign matter, per cent by mass, max.	0.2	0.5	0.5	1.0	**SLS 186: Part 2**
v)	Moisture, per cent by mass, max.	12.0	12.0	12.0	12.0	**SLS 186: Part 5**
vi)	Volatile oil on dry basis, ml/ 100 g, min.	17.0	17.0	16.0	15.0	**SLS 186: Part 11**

NS: Not specified

5.7.2 *Ground clove*

Ground clove shall comply with the requirements specified in Table **2**, when tested according to the method given in Column **5** of the table.

TABLE 2 – Other requirements for ground clove

Sl No	Characteristic	Requirement		Method of test
		Grade 1	Grade 2	
(1)	(2)	(3)	(4)	(5)
i)	Moisture, per cent by mass, max.	10.0	10.0	**SLS 186: Part 5**
ii)	Total ash content on dry basis, per cent by mass, max.	8.0	8.0	**SLS 186: Part 3**

Cont...

iii)	Acid insoluble ash on dry basis, per cent by mass, max.	0.5	0.5	**SLS 186: Part 4**
iv)	Volatile oil on dry basis, ml/ 100 g, min.	16.0	14.0	**SLS 186:Part11**
v)	Crude fiber on dry basis, per cent by mass, max.	13.0	14.0	**SLS 1362:Part 1**

5.8 Particle size

Clove powder shall be sufficiently ground such that 90 per cent of the material shall pass through a sieve of 500 µm aperture size and none shall retain on a sieve of 600 µm aperture size conforming to **SLS 124** when determined by the method specified in **Part 12** of **SLS 186**.

5.9 Additives

The product shall be free from preservatives, colouring and flavouring substances.

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 vender or when there is any suspicion of pesticide contamination.

6.2 Other contaminants

The product shall not contain contaminants or undesirable substances (residues of fumigants, mineral oils) in amounts which may represent hazards to the health of the consumer.

7 PACKAGING

Clove shall be packaged in suitable, clean and sound containers/ bags made of food grade materials which shall be strong enough to withstand pressure in handling and also which shall not affect the product and protect the product from sunlight, and shall not allow the ingress of moisture and/ or egress of volatile matter. In the case of special grade, the material shall be tightly packaged in rigid cases to prevent breakage of heads of clove buds due to movement.

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 “CLOVE” or "GROUND CLOVE";
b) Grade;
c) Brand name or trademark, if any;
d) Net mass in “g” or “kg”;
e) Name and address of the processor or packer;
f) Name and address of the importer or trader;
g) Batch or code number or decipherable code marking;
h) Year of harvest, in-case of whole clove;
j) Date of packaging;
k) Date of production, in-case of ground (powder) clove;
m) Date of expiry;
n) Country of origin, in case of imported products; and
p) Instructions for storage and handling, if any.

8.2 Marking and labelling shall be in accordance with the requirements given in **SLS 467**.

8.3 Marking 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

Clove 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**, **Part 11** and **Part 12** of **SLS 186**, **Part 1** of **SLS 1362** and **Appendix A** of this Standard.

11 CRITERIA FOR CONFORMITY

A lot shall be declared as conforming to this standard if the final lot sample satisfies all the requirements given in **5**, **6**, **7** and **8**.

APPENDIX A
DETERMINATION OF HEADLESS CLOVE AND CLOVE STEMS AND CLOVE FRUITS AND FERMENTED CLOVE

A.1 APPARATUS

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

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

A.1.3 *White paper*

A.1.4 *Watch glasses*

A.2 PROCEDURE

A.2.1 Determination of headless clove

Mix the material thoroughly. Obtain a representative sample of 100 buds randomly. Spread the sample on a white sheet of matt paper. Separate headless cloves to a watch glass from the material. Use the magnifying lens whenever necessary.

Count the number of headless cloves in the watch glass and express the results as a percentage.

A.2.2 Determination of clove stems & clove fruits and fermented clove

Mix the material thoroughly. Obtain a representative sample of buds randomly and weigh the sample (m_o). Spread the sample on a white sheet of matt paper. Collect clove stems and clove fruits to a watch glass and fermented clove to another watch glass from the material by physical separation, using the magnifying lens. Weigh the contents on each watch glass (m_1 and m_2 respectively) to the nearest 0.1 g. Calculate the percentage value of each using the expressions given below.

A.3 CALCULATION

Clove stems and clove fruits, per cent by mass = $\frac{m_1}{m_o} \times 100$

Fermented clove, per cent by mass = $\frac{m_2}{m_o} \times 100$

where,

m_o is the mass, in grams, of the sample taken;
m_1 is the mass, in grams, of clove stems and clove fruits; and
m_2 is the mass, in grams, of fermented cloves.

APPENDIX B
DIAGRAMATIC REPRESENTATION OF CLOVE BUD, FRUIT AND STEM

Figure 1: Whole clove

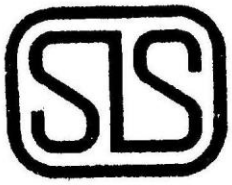
Figure 2: Clove fruit
(Mother clove)

Figure 3: Clove stems

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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