**SRI LANKA STANDARD 105 PART 1: 2022**

**UDC 633.841:664.51**

# SPECIFICATION FOR PEPPER, WHOLE AND GROUND PART 1: BLACK PEPPER

**(*Third Revision*)**

**SRI LANKA STANDARDS INSTITUTION**

# Sri Lanka Standard
# SPECIFICATION FOR PEPPER, WHOLE AND GROUND
## Part 1: Black Pepper
**(*Third Revision*)**

**SLS 105 Part 1: 2022**
**(Superseding SLS 1372)**
***(incorporating Erratum No 01)***

**Gr. 10**


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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

# Sri Lanka Standard
# SPECIFICATION FOR PEPPER, WHOLE AND GROUND
# Part 1: Black Pepper
# (*Third Revision*)

## FOREWORD

This 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 2022-07-07.

This Standard supersedes **SLS 1372** Sri Lanka Standard Specification for Black pepper and white pepper, ground.

**SLS 105 Part 1** was first published in 1971 and subsequently revised in 1980 and 2008. In this third revision, it was decided to combine the requirements for whole and ground black pepper into one Standard with a view of making the referencing easy for the industry and other relevant interested parties, as well as to align with the corresponding ISO Standard (**ISO 959-1**). In addition to that, new product types for ground black pepper in crushed and powdered forms have been incorporated. Definitions have been updated and chemical requirements have been revised to meet the required quality of the product. Microbiological limits have been revised with a view of ensuring the safety of the product.

When compared to the pepper grown in other countries, Sri Lankan pepper is well-known for its superior inherent properties such as the high content of piperine. Black pepper (*Piper nigrum* L.), known as the "king of spices", is the most important and widely used spice in the world and is the second most important spice grown in Sri Lanka after Cinnamon. Pepper is also one of the most important commodities exported from Sri Lanka. Hence, the broad objective of this Standard will be not only to enable the local consumer to get the standard product, but will also to help in promoting the exportation of pepper.

This Standard is subject to the restrictions imposed under 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 result 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 derived from the following publications is gratefully acknowledged.

| | |
|---|---|
| CXS 326: 2017 | Standard for black, white and green peppers |
| IS 1978: 2010 | Spices and condiments – Black pepper, whole and ground - Specification |
| ISO 959-1: 1998 | Pepper (*Piper nigrum* L.), whole or ground – Specification<br>Part 1: Black pepper |


## 1 SCOPE

This Standard prescribes the requirements and methods of sampling and test for black pepper (*Piper nigrum* L.), 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 content
Part 3: Determination of total ash
Part 4: Determination of acid insoluble ash
Part 5: Determination of moisture content – Entrainment method
Part 7: Determination of non-volatile ether extract
Part 8: Determination of filth
Part 9: Determination of piperine content in black and white pepper – Spectrophotometric method
Part 10: Determination of piperine content in pepper and pepper oleoresins – High performance liquid chromatographic method
Part 11: Determination of volatile oils
Part 12: Determination of degree of fineness of grinding – Hand sieving method (Reference method)
SLS 310 Method for the sampling of spices and condiments
SLS 428 Random sampling methods
SLS 516 Methods of test for microbiology of food and animal feeding stuffs
Part 2: Horizontal method for the enumeration of yeasts and moulds
Section 2: Colony count technique in products with water activity less than or equal to 0.95

Part 5: Horizontal method for the detection of *Salmonella* spp.
Part 12: Horizontal method for the detection and enumeration of presumptive *Escherichia coli* (Most probable number technique)
SLS 910 Maximum residue limits for pesticides in food
SLS 1327 Code of hygienic practice for spices and other dried aromatic plants
SLS 1523 Requirements for good agricultural practices
Part 3: Cinnamon, Pepper, Coffee
Official methods of Analysis, Association of Official Analytical Chemists (AOAC) 20th edition, 2016

## 3 DEFINITIONS

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

**3.1 black pepper, whole**: Dried berry of *Piper nigrum* L., having reached appropriate degree of maturity of 7 to 8 months with an unbroken pericarp

**3.2 black pepper, ground**: Ground or crushed form of **3.1**

**3.3 black pepper, non-processed (NP)**: Dried black pepper that has not undergone any cleaning, preparation or grading

**3.4 black pepper, semi-processed**: Dried black pepper that has undergone partial cleaning, but without preparation or grading

**3.5 black pepper, processed**: Dried pepper that has been processed (cleaning, preparation and grading)

**3.6 broken berry**: Berry that has been broken into two or more pieces

**3.7 light berry**: Berry that has reached four to five and a half months age of maturity and the kernel is immature

**3.8 pinhead**: Developed from unfertilized flowers. Berries with a diameter of less than 2 mm with more angularity than normal berries. They have soft texture (collapse under heavy pressure) and have less odour and flavour than pepper berries.

**3.9 extraneous matter**: All material other than black pepper berries, pieces or powder. Extraneous matter includes leaves, loose stalks and stems of pepper. Extraneous matter does not include light berries, broken berries and/ or pinheads.

**3.10** **foreign matter**: Foreign matter includes other plant material, soil, sand metal particles.

## 4 TYPES/ GRADES

Black pepper shall be classified into the following.

**4.1** Whole black pepper

**4.1.1** *Grade 1*
**4.1.2** *Grade 2*
**4.1.3** *Grade 3*

**4.2** Ground black pepper*
**4.2.1** *Crushed/ Coarse/ Pieces*
**4.2.2** *Powder*

**May commercially known as grey pepper*

## 5 REQUIREMENTS

### 5.1 Hygiene

The product shall be harvested, processed, packaged, stored and transported under hygienic conditions as prescribed in **SLS 143** and **SLS 1327**.

### 5.2 Appearance

**5.2.1** *Whole black pepper*

Whole black pepper berries shall have a diameter of 3 mm to 6 mm and shall be black in colour with a wrinkled pericarp.

**5.2.2** *Ground black pepper*

5.2.2.1 Coarse black pepper shall be in pieces and greyish black in colour.

5.2.2.2 Black pepper powder shall be free-flowing and grey in colour.

### 5.3 Odour and flavour

Whole and ground black pepper shall have its characteristic, strongly sharp and pungent odour and flavour. It shall be free from foreign odours and flavours.

### 5.4 Mould growth, insect infestation and animal excreta

Black pepper whole and ground shall be free from mould growth, living and dead insects, insect fragments and animal excreta, visible to the naked eye (corrected, if necessary, for abnormal vision), 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 substances shall be added to or extracted from whole or ground black pepper. The ground pepper shall be free from adulterants when examined through the microscope.

### 5.6 Particle size

#### **5.6.1** *Coarse/ Pieces*

The product shall be coarse ground to such that not less than 80 per cent by mass of the material is retained on the sieve of 1000 µm aperture size and 100 per cent by mass of the material shall pass through a sieve of 2500 µm aperture size conforming to **SLS 124** when determined by the method specified in **Part 12** of **SLS 186**.

#### **5.6.2** *Powder*

Black pepper powder shall be sufficiently ground such that a minimum of 95 per cent by mass of it passes through a sieve of 1000 µm aperture size conforming to **SLS 124** when determined by the method specified in **Part 12** of **SLS 186**.

### 5.7 Physical requirements

#### **5.7.1** *Whole black pepper*

Whole black pepper shall comply with the requirements specified in Table **1**, when tested according to the methods given in Column **6** of the Table.

**TABLE 1 – Physical requirements**

| Sl No | Characteristic | Requirement | | | Method of test |
|---|---|---|---|---|---|
| | | Grade 1 | Grade 2 | Grade 3 | |
| (1) | (2) | (3) | (4) | (5) | (6) |
| i) | Extraneous matter, per cent by mass, max. | 1.0 | 2.0 | 2.0 | **SLS 186: Part 2** |
| ii) | Foreign matter, per cent by mass, max. | 0.1 | 0.5 | 0.5 | Appendix **D** |
| iii) | Light berries, per cent by mass, max. | 1.0 | 5.0 | 10.0 | Appendix **B** |
| iv) | Broken berries, per cent by mass, max. | 0.5 | 1.0 | 2.0 | Appendix **D** |
| v) | Pinheads, per cent by mass, max. | 0.5 | 1.0 | 2.0 | Appendix **C** |
| vi) | Bulk density, g per l, min. | 550 | 500 | 450 | Appendix **E** |

**5.7.2** *Ground black pepper*

5.7.2.1 Extraneous and foreign matter

Ground black pepper shall be free from extraneous and foreign matter when examined under the microscope.

## 5.8 Chemical requirements

**5.8.1** *Whole black pepper*

The whole black pepper shall comply with the requirements specified in Table **2**, when tested according to the methods given in Column **6** of the Table.

**TABLE 2 - Chemical requirements for whole black pepper**

| Sl No | Characteristic | Requirement | | | Method of test (SLS 186) |
|---|---|---|---|---|---|
| | | Grade 1 | Grade 2 | Grade 3 | |
| (1) | (2) | (3) | (4) | (5) | (6) |
| i) | Moisture content, per cent by mass, max. | 12.0 | 12.0 | 13.0 | **Part 5** |
| ii) | Total ash on dry basis, per cent by mass, max. | 6.0 | 7.0 | 7.0 | **Part 3** |
| iii) | Acid insoluble ash on dry basis, per cent by mass, max. | 1.5 | 1.5 | 1.5 | **Part 4** |
| iv) | Non-volatile ether extract on dry basis, per cent by mass, min. | 7.0 | 7.0 | 6.0 | **Part 7** |
| v) | Volatile oils on dry basis, ml per 100 g, min. | 3.0 | 3.0 | 3.0 | **Part 11** |
| vi) | Piperine content on dry basis, per cent by mass, min. | 6.0 | 6.0 | 6.0 | **Part 9** or **Part 10** |

**5.8.2** *Ground black pepper*

The ground black pepper shall comply with the requirements specified in Table **3**, when tested according to the methods given in Column **4** of the table.

**TABLE 3 - Chemical requirements for ground black pepper**

| Sl No | Characteristic | Requirement | Method of test |
|---|---|---|---|
| (1) | (2) | (3) | (4) |
| i) | Moisture content, per cent by mass, max. | 12.0 | **SLS 186 Part 5** |
| ii) | Total ash on dry basis, per cent by mass, max. | 6.0 | **SLS 186 Part 3** |
| iii) | Acid insoluble ash on dry basis, per cent by mass, max. | 1.0 | **SLS 186 Part 4** |
| iv) | Non-volatile ether extract on dry basis, per cent by mass, min. | 7.0 | **SLS 186 Part 7** |
| v) | Volatile oils on dry basis, ml/ 100 g, min. | 2.5 | **SLS 186 Part 11** |
| vi) | Piperine content on dry basis, per cent by mass, min. | 6.0 | **SLS 186 Part 9** or **Part 10** |
| vii) | Crude fibre on dry basis, per cent by mass, max. | 17.5 | **SLS 1362 Part 1** |

### 5.9 Microbiological limits

The product shall not exceed the limits given in Table **4** when tested according to the methods given in Column **4** of the table.

**TABLE 4 – Microbiological limits for whole and ground black pepper**

| **Sl No** (1) | **Organism** (2) | **Limit** (3) | **Method of test** (4) |
|---|---|---|---|
| i) | *Escherichia coli*, MPN, per g | Absent | **SLS 516 Part 12** |
| ii) | *Salmonella*, per 25 g | Absent | **SLS 516 Part 5** |
| iii) | Moulds, per g, max | $1\times10^4$ | **SLS 516: Part 2/ Section 2** |

## 6 CONTAMINANTS

### 6.1 Potentially toxic elements

The product shall not exceed the limits for potentially toxic elements given in Table **5** when tested according to the methods given in Column **4** of the table.

**TABLE 5 - Limits for potentially toxic elements**

| **Sl No.** (1) | **Potentially toxic element** (2) | **Limit** (3) | **Method of test** (4) |
|---|---|---|---|
| i) | Arsenic as As, mg/ kg, max. | 0.1 | **AOAC 986.15** or **2013.06** |
| ii) | Cadmium as Cd, mg/ kg, max. | 0.1 | **AOAC 999.11** or **2013.06** |
| iii) | Lead as Pb, mg/ kg, max. | 0.2 | **AOAC 999.11** or **2013.06** |

### 6.2 Pesticide residues

The crop shall be cultivated and processed with special care under Good Agricultural Practices (**SLS 1523: Part 3**) and Good Manufacturing Practices (**SLS 143** and **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.*

### 6.3 Aflatoxins

The product shall not exceed the level 5.0 µg/ kg for aflatoxin $B_1$ and 10.0 µg/ kg for total aflatoxins, when determined according to the method given in **968.22** of **AOAC**.

## 7 PACKAGING

The product shall be packaged in clean, sound, dry packages, made of food grade material which does not affect the product but which protects it from the ingress of moisture and/ or loss of volatile matter.

## 8 MARKING AND/ OR LABELLING

**8.1** Each package shall be marked or labelled 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 **8.2**:

a) Name of the product as "Black Pepper, Whole" or "Whole Black Pepper" or "crushed black pepper" or "powdered black pepper", as applicable;
b) Grade of the whole black pepper;
c) Brand name or trade name, if any;
d) Net mass, in 'g' or 'kg';
e) Instructions for storage and handling, if any;
f) Name and address of the manufacturer and packer or distributor in Sri Lanka;
g) The batch number or code number or a decipherable code marking;
h) Date of manufacture;
j) Date of expiry; and
k) Country of origin, in case of imported products.

**8.2** The following information shall be marked and/ or labelled on packages intended for export:

a) Name of the product including grade (for whole black pepper);
b) Producing country; and
c) Any other information requested by the buyer.

## 9 METHODS OF TEST

Tests shall be carried out in accordance with the methods prescribed in **Appendix B**, **C**, **D** and **E** of this Standard, **Parts 2**, **3**, **4**, **5**, **7**, **8**, **9**, **10**, **11** and **12** of **SLS 186**, **Section 2 of Part 2**, **Parts 5** and **12** of **SLS 516** and Methods of Analysis of the Association of Official Analytical Chemists (**AOAC**), 20th edition, 2016.

## 10 CRITERIA FOR CONFORMITY

**10.1** Each container examined as in clause **A.6.1** satisfies the packaging, marking and/ or labeling requirements.

**10.2** Each container examined as in **A.6.2** satisfies the relevant requirements given in Clauses **5.2** and **5.3**.

**10.3** Each container tested as in **A.6.3** satisfies the requirement for moisture given in Clause **5.8**.

**10.4** The composite sample tested as in **A.6.4** satisfies the requirements given in Clauses **5.4**, **5.5**, **5.6**, **5.7**, **5.8** (except moisture) and **6.1**.

**10.5** Each sample tested from black pepper ground as in **A.6.5** satisfies the requirements given in Clause **5.9**.

# APPENDIX A
# SAMPLING

## A.1 LOT

In any consignment all the containers belonging to one batch of manufacture or supply shall constitute a lot.

## A.2 GENERAL REQUIREMENTS OF SAMPLING

In drawing, preparing, storing and handling samples, following precautions and directions shall be taken.

**A.2.1** Samples shall be drawn in a protected place not exposed to damp, air, dust or soot.

**A.2.2** The sampling instruments shall be clean and dry when used. When drawing samples for microbiological examination, the sampling instruments shall be sterilized.

**A.2.3** Precautions shall be taken to protect the samples, the product being sampled and the sample container from adventitious contamination.

**A.2.4** The samples shall be placed in clean and dry containers. The size of the sample containers shall be of such size that they are almost completely filled by the sample. When drawing samples for microbiological examination, the sample containers shall be sterilized.

**A.2.5** The sample containers shall be sealed, air-tight after filling and marked with necessary details of sampling.

**A.2.6** Samples shall be stored in such a manner that the temperature of the material does not vary unduly from the room temperature.

## A.3 SCALE OF SAMPLING

Samples shall be tested from each lot for ascertaining its conformity to the requirements of this Standard.

### A.3.1 Sampling of whole black pepper from bulk containers

**A.3.1.1** Representative samples of the product for ascertaining conformity to the requirements of this Standard shall be drawn in accordance with **SLS 310**.

### A.3.2 Sampling of whole or ground black pepper from retail containers

**A.3.2.1** The number of retail containers to be selected from a lot shall be in accordance with Table **6**.

**TABLE 6 - Scale of sampling**

| **No of retail containers in the lot** (1) | **No of containers to be selected** (2) |
|---|---|
| Up to 280 | 10 |
| 281 to 500 | 12 |
| 501 to 1 200 | 15 |
| 1 201 and above | 20 |

**A.3.2.2** The retail containers shall be selected at random. In order to ensure randomness of selection tables of random numbers as given in **SLS 428** shall be used.

### A.3.3 Sampling of ground black pepper from bulk containers

Samples shall be taken from all bulk containers in the lot.

## A.4 PREPARATION OF SAMPLES

### A.4.1 Samples from retail containers

Sufficient quantity of material shall be drawn from each container selected as in **A.3.2.1** and mixed to form a composite sample of at least 1200 g whole black pepper or 700 g ground black pepper as applicable and the composite sample thus obtained shall be transferred to a sealed air-tight sample container.

### A.4.2 Samples from bulk containers

Sufficient quantity of material shall be drawn from five different places of each bulk container using an appropriate sampling instrument and mixed to form a composite sample of at least 1200 g whole black pepper or 700 g ground black pepper as applicable. The sample thus obtained shall be transferred to a sample container and sealed air-tight.

## A.5 REFERENCE SAMPLES

If a reference sample is required the size of the sample to be taken shall be three times the size given in **A.3.1**, **A.3.2** or **A.3.3** and the sample so obtained shall be divided into three equal parts using coning and quartering method. Samples shall be transferred into three sample containers and sealed air-tight. One such sample shall be marked for the purchaser, one for the supplier and the third shall be kept at a place agreed to between the purchaser and the supplier to be used in case of dispute.

## A.6 NUMBER OF TESTS

**A.6.1** Each container selected as in **A.3.1**, **A.3.2** or **A.3.3** shall be inspected for packaging and marking and/ or labeling requirements.

**A.6.2** Each container selected as in **A.3.1**, **A.3.2** or **A.3.3** shall be inspected for the requirements given in **5.2** and **5.3**.

**A.6.3** Samples drawn from each container selected as in **A.3.1**, **A.3.2** or **A.3.3** shall be tested individually for moisture content.

**A.6.4** The composite sample obtained as in **A.3.1**, **A.3.2** or **A.3.3** shall be tested for the requirements given in **5.4** to **5.8** (except for the moisture content), and in **6.1**.

**A.6.5** A sub sample of 05 units shall be drawn from the containers selected as in **A.3.1**, **A.3.2** or **A.3.3** and tested for microbiological limits given in **5.9**.

## APPENDIX B
## DETERMINATION OF LIGHT BERRIES

### B.1 REAGENT

**B.1.1** Alcohol-water solution, of relative density $d\ \frac{25}{25}$ = 0.80 to 0.82

If the temperature is different from 25℃, a correction factor shall be used.

The alcohol used in the preparation of this solution can be ethanol, denatured alcohol previously rectified, or propan-2-ol (isopropanol).

### B.2 PROCEDURE

#### B.2.1 Test portion

Weigh, to the nearest 0.01 g, about 50 g of sample, from which the extraneous matter has been previously removed, into a 600-ml glass beaker.

#### B.2.2 Determination

Add 300 ml of the alcohol-water solution (**B.1.1**) to the glass beaker and mix the contents with a spoon. Leave the product standing for 2 min, then remove the floating berries with the spoon. Only berries floating on the surface shall be removed and not those that remain in suspension some distance below the surface of the alcohol-water solution. Repeat the stirring, standing and removal operations until no more berries float after two successive stirrings.

Dry the berries removed on blotting paper to eliminate the excess liquid, then spread them in dry air on a piece of paper, textile or other absorbent material. Leave the berries for 1 h, then weigh to the nearest 0.01 g.

## B.3 CALCULATION

$$\textit{Light berries}, \text{ per cent by mass} = \frac{m_1}{m_0} \times 100$$

where,

$m_0$ is the mass, in grams, of the sample taken; and
$m_1$ is the mass, in grams, of the light berries.

# APPENDIX C
# DETERMINATION OF PINHEADS

Weigh, to the nearest gram, 100 g to 200 g of the sample. Separate the extraneous matter. Sift the test portion through a 2.36 mm sieve and weigh the pinheads passing through the sieve.

Calculate the percentage of pinheads as the basis of the mass of the sample taken.

# APPENDIX D
# DETERMINATION OF FOREIGN MATTER AND BROKEN BERRIES

## D.1 APPARATUS

**D.1.1** *Analytical balance*, of sensitivity 0.1 g

**D.1.2** *Magnifying lens*, having a magnification of 10

**D.1.3** *Forceps*, of about 100 mm in length

**D.1.4** *White paper*

**D.1.5** *Watch glasses*

## D.2 PROCEDURE

Mix the material thoroughly. Obtain a representative sample of approximately 25 g, weigh to the nearest milligram. Spread the sample on a white sheet of matt paper. Distinct foreign matter and broken berries separately from the material using the magnifying glass and transfer to dry tared separate watch glasses. Separately weigh the watch glasses which contain materials to the nearest 0.1 g.
Calculate the percentage of each matter (foreign matter and broken berries) using the expressions given below.

## D.3 CALCULATION

$$\textit{Foreign matter,}\ \text{per cent by mass} = \frac{m_1}{m_o} \times 100$$

$$\textit{Broken berries,}\ \text{per cent by mass} = \frac{m_2}{m_o} \times 100$$

where,

$m_o$ is the mass, in grams, of the sample taken;
$m_1$ is the mass, in grams, of foreign matter; and
$m_2$ is the mass, in grams, of broken berries.

# APPENDIX E
# DETERMINATION OF BULK DENSITY

## E.1 PRINCIPLE

Weighing a volume, exactly measured, of 1-litre of pepper.

## E.2 APPARATUS

**E.2.1** *Apparatus for measuring bulk density,* consisting of;

- 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;

- hopper, of capacity greater than 1-litre and equipped with a gate;
- 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.

**Figure 1** shows an example of such an apparatus.

**NOTE**
*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.*

**E.2.2** *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.

## E.3 PROCEDURE

### E.3.1 Determination

Weigh the empty cylinder, if necessary.

Place the cylinder on a horizontal plane and set the hopper on it with a fixing device.

Pour the pepper into the hopper until it is filled. Open the gate and allow the pepper berries to flow freely into the cylinder until the level slightly exceeds the upper level or the 1-litre level, according to the apparatus used.

Level the pepper, 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 berries.

Remove the hopper and its support, then weigh the cylinder filled with the pepper.

### E.3.2 Number of determinations

Carry out three determinations.

## E.4 CALCULATION

### E.4.1 Method of calculation

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

Take as the result, the arithmetic mean of the three determinations if the repeatability conditions (see **E.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.

### E.4.2 Repeatability

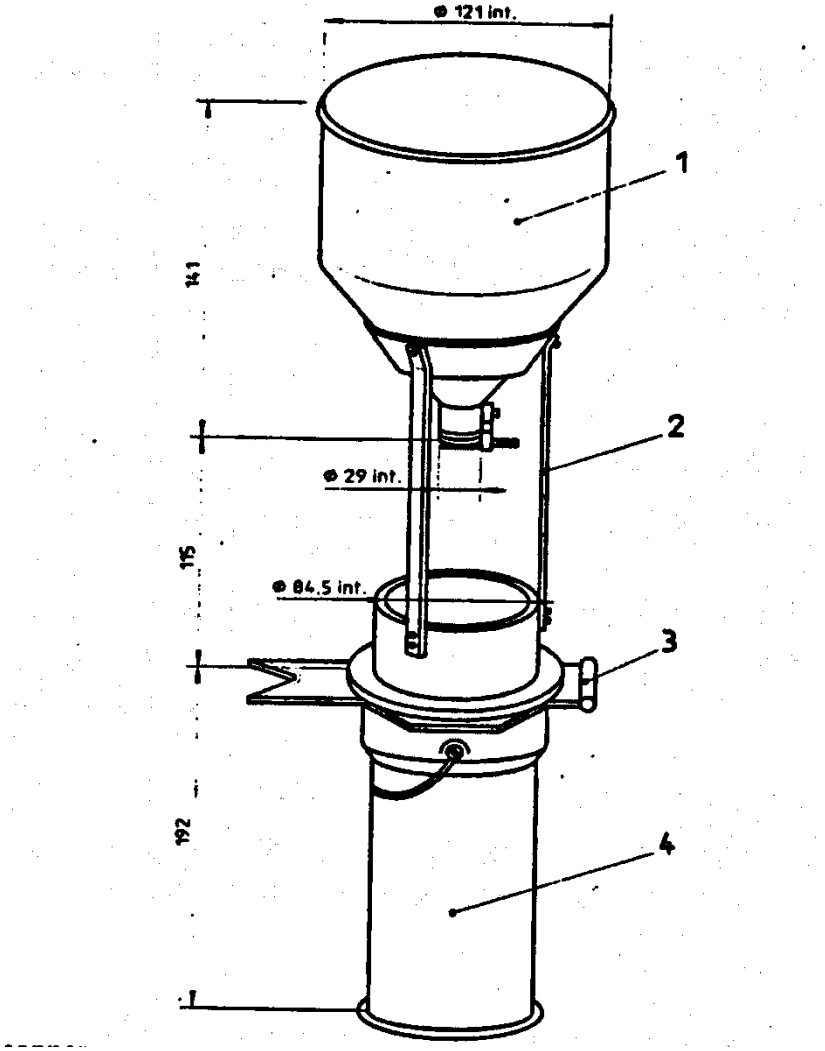
The difference between the results of two determinations carried out in rapid succession by the same analyst using the same apparatus shall not exceed 5 g per litre.

## E.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.

Dimensions in millimeters




**Key**

1 Filling hopper
2 Funnel supports
3 Cut-off blade
4 Measuring container, capacity 1-litre

**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.***

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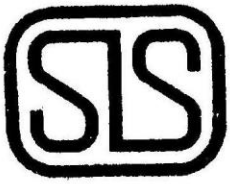
# *SLS CERTIFICATION MARK*

*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

The Sri Lanka Standards Institution (SLSI) is the National Standards Organization of Sri Lanka established under the Sri Lanka Standards Institution Act No. 6 of 1984 which repealed and replaced the Bureau of Ceylon Standards Act No. 38 of 1964. The Institution functions under the Ministry of Technology.

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.

The development and formulation of National Standards is carried out by Technical Experts and representatives of other interest groups, assisted by the permanent officers of the Institution. These Technical Committees are appointed under the purview of the Sectoral Committees which in turn are appointed by the Council. The Sectoral Committees give the final Technical approval for the Draft National Standards prior to the approval by the Council of the SLSI.

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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