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DRAFT STANDARD FOR PUBLIC COMMENT

(වෙනස්වීමට ඉඩ ඇත. திருத்தத்திற்குட்படக்கூடியது. Liable to alteration)

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Draft Sri Lanka Standard
SPECIFICATION FOR PEPPER, WHOLE AND GROUND
PART 2 : WHITE PEPPER
(THIRD REVISION) (DSLS 105 PART 2 : .....)

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This draft should not be regarded or used as a Sri Lanka Standard.

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Comments to be sent to: SRI LANKA STANDARDS INSTITUTION, 17, VICTORIA PLACE, ELVITIGALA MAWATHA, COLOMBO 08.

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Introduction

This Draft Sri Lanka Standard has been prepared by the Sri Lanka Standards Institution and is now being circulated for technical comments to all interested parties.

All comments received will be considered by the SLSI and the draft if necessary, before submission to the Council of the Institution through the relevant Divisional Committee for final approval.

The Institution would appreciate any views on this draft which should be sent before the specified date. It would also be helpful if those who find the draft generally acceptable could kindly notify us accordingly.

All Communications should be addressed to:

The Director General
Sri Lanka Standards Institution,
17, Victoria Place,
Elvitigala Mawatha,
Colombo 08.

Draft SRI LANKA STANDARD
SPECIFICATION FOR PEPPER, WHOLE AND GROUND
Part 2: White Pepper
(*Third Revision*)

DSLS 105 Part 2:
(Superseding SLS 1372)

Gr.

SRI LANKA STANDARDS INSTITUTION
17, Victoria Place
Elvitigala Mawatha
Colombo 8
Sri Lanka

Draft SRI LANKA STANDARD
SPECIFICATION FOR PEPPER, WHOLE AND GROUND
Part 2: White 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 ……

This Standard supersedes **SLS 1372** Black pepper and white pepper, ground.

SLS 105 Part 2 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 white pepper into one Standard with a view of making the referencing easy for the industry and other relevant interested parties and also to align with the corresponding ISO Standard (ISO 959-2). In addition to that, new product types for ground white 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.

White pepper is obtained in two ways:
a) from black pepper using the whole dry berry of *Piper nigrum* L., generally picked before complete ripening, and removing the outer pericarp, with or without preliminary soaking in water; if necessary, drying is carried out afterwards.
b) from the whole ripe berry of *Piper nigrum* L., removing the outer pericarp by the same procedure as described above.

Pepper is 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 quality and safe product, but 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 16521: 2017	Spices and condiments – White pepper, whole and ground - Specification
ISO 959-2: 1998	Pepper (*Piper nigrum* L.), whole or ground – Specification Part 2: White pepper

1 SCOPE

This Standard prescribes the requirements and methods of sampling and test for white 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 1: Preparation of ground sample for analysis
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/ Section 2: Horizontal method for the enumeration of yeasts and moulds/ 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 white pepper, whole: Dried berry of *Piper nigrum* L., which the pericarp has been removed

3.3 white pepper, processed: Dried pepper that has been processed (cleaning, preparation, grading)

3.4 white pepper, semi-processed: Dried pepper that has undergone a partial cleaning, without preparation or grading

3.5 white pepper, ground: Ground or crushed form of **3.2**

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

3.7 light berry: Generally immature berries without kernel with an bulk density lower than 300 g/ l

3.8 extraneous matter and foreign 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. Foreign matter includes other plant material, soil, sand metal particles.

NOTE
Black and broken berries are not considered as extraneous matter.

4 GRADES

White pepper shall be classified into the following:

4.1 Whole white pepper

4.1.1 *Processed* (*Grade* 1)
4.1.2 *Semi-processed* (*Grade* 2)

4.2 Ground white pepper

4.2.1 *Crushed/ Coarse/ Pieces*
4.2.2 *Powdered*

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 white pepper*

The product shall be free from pericarp or parts of pericarp. It shall be in matt brownish grey to ivory in colour, with a smooth surface.

5.2.2 *Ground white pepper*

5.2.2.1 Coarse white pepper shall be in pieces and ivory in colour.
5.2.2.2 Powdered white pepper shall be free-flowing and ivory in colour.

5.3 Odour and flavour

Whole and ground white pepper shall have its characteristic odour and pungent flavour. The product shall be free from foreign odours and flavours.

5.4 Mould growth, insect infestation and animal excreta

White 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 white pepper. The ground pepper shall be free from adulterants when examined under the microscope.

5.6 Physical requirements

5.6.1 *Whole white pepper*

Whole white pepper shall comply with the requirements specified in Table **1**, when tested according to the methods given in Column **5** of the table.

TABLE 1 – Physical requirements

Sl No	**Characteristic**	**Requirement**		**Method of test**
		Processed (Grade 1)	**Semi-processed (Grade 2)**	
(1)	(2)	(3)	(4)	(5)
i)	Broken berries, per cent by mass, max.	3.0	4.0	Appendix **B**
ii)	Black berries, per cent by mass, max.	1.0	2.0	Appendix **B**
iii)	Light berries, per cent by mass, max.	0.5	1.0	Appendix **C**
iv)	Extraneous and foreign matter, per cent by mass, max.	0.8	1.0	Appendix **B**
v)	Bulk density, g per l, min.	600	600	Appendix **D**

5.6.2 *Ground white pepper*

5.6.2.1 Extraneous and foreign matter

The product shall be free from extraneous and foreign matter, when examined under the microscope.

5.6.2.2 Particle size

a) *Crushed/ coarse/ pieces*
The product shall be coarse ground to such that, not less than 90 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 confirming to **SLS 124** when determined by the method specified in **Part 12** of **SLS 186**.

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

5.7 Chemical requirements

The product shall not exceed the requirements specified in Table **2,** when tested according to the methods given in Column **6** of the table.

TABLE 2 - Chemical requirements

Sl No	**Characteristic**	**Requirement**			**Method of test (SLS 186)**
		Processed (Grade 1)	**Semi-processed (Grade 2)**	**Ground**	
(1)	(2)	(3)	(4)	(5)	(6)
i)	Moisture content, percent by mass, max.	12.0	13.0	10.0	**Part 5**
ii)	Total ash on dry basis, percent by mass, max.	4.0	4.0	4.0	**Part 3**
iii)	Non-volatile ether extract on dry basis, percent by mass, min.	7.0	7.0	7.0	**Part 7**
iv)	Volatile oil on dry basis, ml/ 100 g	2.0	2.0	1.5	**Part 11**
v)	Piperine content on dry basis, percent by mass, min.	5.0	5.0	5.0	**Part 9** or **Part 10**
vi)	Acid insoluble ash on dry basis, percent by mass, max.	0.3	0.3	0.3	**Part 4**

5.8 Microbiological limits

The product shall conform to the limits given in Table **3** when tested when tested according to the methods given in Column **4** of the table.

TABLE 3 – Microbiological limits for whole and ground white 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 25g	Absent	**SLS 516 Part 5**
iii)	Moulds, cfu per g, max	1×10^4	**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 **4** when tested according to the methods given in Column **4** of the table.

TABLE 4 - 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.	2.0	**AOAC 999.11** or **2013.06**

6.2 Pesticide residues

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

6.3 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 and protects it from the ingress of moisture or loss of volatile matter.

8 MARKING AND/ OR LABELLING

8.1 Each package shall be marked and/ 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 "white pepper, whole" or "whole white pepper" or "crushed white pepper" or "coarse white pepper" or "white pepper pieces" or "powdered white pepper", as applicable;
b) Grade of the whole white 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 and type;
b) Grade of the whole white pepper;
c) Producing country; and
d) 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** and **D** 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 **5.7**.

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** (except moisture) and **6.1**.

10.5 Each sample tested from white pepper ground as in **A.6.5** satisfies the requirements given in Clause **5.8**.

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 white 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 white 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 **5**.

TABLE 5 - 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 1200	15
1201 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 white 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 white pepper or 700 g ground white 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 white pepper or 700 g ground white 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 **5.7** (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 **5.8**.

APPENDIX B
DETERMINATION OF BROKEN BERRIES, BLACK BERRIES AND EXTRANEOUS AND FOREIGN MATTER

B.1 APPARATUS

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

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

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

B.1.4 *White paper*

B.1.5 *Watch glasses*

B.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 broken berries, black berries and extraneous and foreign matter 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.

B.3 CALCULATION

Broken berries, per cent by mass = $\frac{m_1}{m_o} \times 100$

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

Extraneous and foreign matter, per cent by mass = $\frac{m_3}{m_o} \times 100$

where,

m_o is the mass, in grams, of the sample taken;
m_1 is the mass, in grams, of broken berries;
m_2 is the mass, in grams, of black berries; and
m_3 is the mass, in grams, of extraneous and foreign matter.

APPENDIX C
DETERMINATION OF LIGHT BERRIES

C.1 REAGENT

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

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).

C.2 PROCEDURE

C.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.

C.2.2 Determination

Add 300 ml of the alcohol-water solution (**C.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, fabric or other absorbent material. Leave the berries for 1 hour, then weigh to the nearest 0.01 g.

C.3 CALCULATION

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

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 D
DETERMINATION OF BULK DENSITY

D.1 PRINCIPLE

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

D.2 APPARATUS

D.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.

D.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.

D.3 PROCEDURE

D.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.

D.3.2 Number of determinations

Carry out three determinations.

D.4 CALCULATION

D.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.

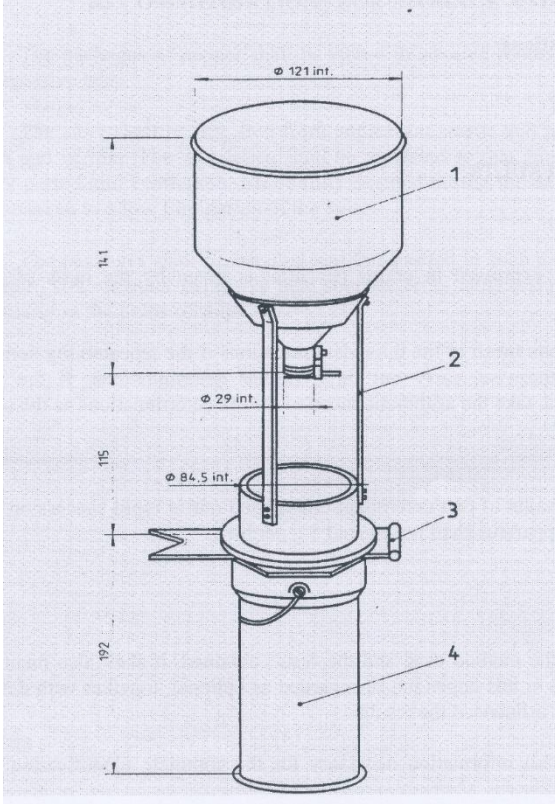
Take as the result, the arithmetic mean of the three determinations if the repeatability conditions (*see* **D.4.2**) are satisfied. Otherwise, carry out three further determinations. If the former conditions are still not satisfied, take the arithmetic mean of the six determinations as the result.

D.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.

D.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.



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.***
