

ICS 67.220.10

DMS 1289-1:2016

First edition

DRAFT MALAWI STANDARD

**Pepper (*Piper nigrum* L.), whole or
ground – Specification, Part 1:
Black pepper**

NOTE – This is a draft proposal and shall neither be used nor regarded as a Malawi standard

Pepper (*Piper nigrum* L.), whole or ground – Specification, Part 1: Black pepper

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Price based on 11 pages

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TABLE OF CONTENTS

Contents	Page
Foreword.....	i
Technical committee.....	i
Notice.....	i
Scope.....	1
Normative references.....	1
Terms and definitions.....	2
Description.....	2
Requirements.....	3
Hygiene.....	4
Packing and labelling.....	4
Sampling.....	5
Test methods.....	5
Annex A (normative) – Determination of percentage of light berries in black pepper.....	6
Annex B (normative) – Whole black pepper: determination of apparent bulk density.....	7
Annex C (informative) – Recommendations for storage and transport.....	10
Annex D (informative) – Microscopic section of pepper berry (<i>piper nigrum</i> L.).....	11

FOREWORD

This draft Malawi standard has been prepared by MBS/TC 8, the Technical Committee on *Spices and condiments*, to provide requirements for whole or ground black pepper.

The standard is based on the International standard, ISO 959-1:1998, *Pepper (Piper nigrum L), whole or ground – Specification, Part 1: Black pepper*.

Acknowledgement is made for the use of the information.

TECHNICAL COMMITTEE

This draft Malawi standard was prepared by MBS/TC 8, the Technical Committee on Spices and condiments, and the following companies, organizations and institutions were represented:

Blantyre City Council;
Blantyre District Health Office (Ministry of Health);
Blantyre ADD;
Lilongwe University of Agriculture and Natural Resources (Bunda College Campus);
Malawi Bureau of Standards;
Nali Limited;
Peoples Trading Centre;
Rab Processors Ltd;
Tajo Foods; and
Unilever South East (Malawi) Ltd.

NOTICE

This standard shall be reviewed every five years, or earlier when it is necessary, in order to keep abreast of progress. Comments are welcome and shall be considered when the standard is being reviewed.

DRAFT PROPOSAL

**Pepper (*Piper nigrum* L.), whole or ground –
Specification, Part 1: Black pepper**

1 SCOPE

This part of MS 1289 specifies requirements for black pepper (*Piper nigrum* L.) (see MS 1068), whole or ground at the following commercial stages:

1.1 pepper sold by the producing country without cleaning or after a partial cleaning, without preparation or grading, called “non-processed (NP) or semi-processed (SP) pepper” in this part of MS 1289;

1.2 pepper sold by the producing country after cleaning, preparation and/or grading, called “processed (P) pepper”, which can, in certain cases, be re-sold directly to the consumers.

When the term "black pepper" is used alone, it means that the specification applies to both types described, without distinction.

This part of MS 1289 is not applicable to black pepper categories called “light”.

NOTE: Specifications for white pepper are given in MS 1289-2.

Recommendations relating to storage and transport conditions are given in annex C. Information regarding the microscopic structure of the pepper berry is given in annex D.

2 NORMATIVE REFERENCES

The following standards contain provisions which, through reference in this text, constitute provisions of this standard. All standards are subject to revision and, since any reference to a standard is deemed to be a reference to the latest edition of that standard, parties to agreements based on this standard are encouraged to take steps to ensure the use of the most recent edition of the standard indicated below. Information on currently valid national and draft Malawi standards may be obtained from the Malawi Bureau of Standards.

MS 19, *Labelling of pre-packed foods – General standard*;

MS 21, *Food and food processing units – Code of hygienic conditions*;

MS 139, *Spices and condiments – Determination of extraneous matter and foreign matter content*;

MS 141, *Spices and condiments – Determination of total ash*;

MS 142, *Spices and condiments – Determination of filth*;

MS 918, *Spices and condiments – Determination of moisture content – Entrainment method*;

MS 919, *Spices and condiments – Determination of acid-insoluble ash*;

MS 920, *Spices, condiments and herbs – Determination of volatile oil content*.

MS 922, *Spices and condiments – Determination of non-volatile ether extract*;

MS 1068, *Spices and condiments – Botanical nomenclature*;

ISO 948, *Spices and condiments – Sampling*;

ISO 5564, *Black pepper and white pepper, whole or ground – Determination of piperine content – Spectrophotometric method*; and

ISO 5498, *Agricultural food products – Determination of crude fibre content – General method*.

3 TERMS AND DEFINITIONS

For the purposes of this standard, the following terms and definitions shall apply:

3.1

black pepper

dried berry of *Piper nigrum* L., having an unbroken pericarp

3.2

black pepper, non-processed (NP)

pepper that has not undergone any clearing, preparation or grading by the producing country before being exported, and that conforms to the requirements of this part of MS 1289

3.3

black pepper, semi-processed (SP)

pepper that has undergone partial cleaning but without preparation or grading by the producing country before being exported, and that conforms to the requirements of this part of MS 1289

3.4

black pepper processed

pepper that has been processed (cleaning, preparation, grading, etc.) by the producing country before being exported, and that conforms to the requirements of this part of MS 1289

3.5

black pepper, ground

pepper obtained by grinding black pepper berries without adding any foreign matter to the pepper, and that conforms to the requirements of this part of MS 1289

3.6

broken berry

berry that has been separated into two or more pieces

3.7

extraneous matter

all materials other than black pepper berries, irrespective of whether they are of vegetable (e.g. stems and leaves) or mineral (e.g. sand) origin

NOTE: Light berries, pinheads or broken berries are not considered as extraneous matter.

3.8

grey pepper

commercial name sometimes given to ground black pepper

3.9

light berry

berry that has reached an apparently normal stage of development but the kernel does not exist

3.10

pinhead

berry of very small size that has not developed

4 DESCRIPTION

Whole black pepper is the whole dry berry of *Piper nigrum* L., generally picked before complete ripening. Berries of black pepper generally have a diameter of 3 mm to 6 mm and are brown, grey or black in colour with a wrinkled pericarp.

Ground black pepper is obtained by grinding black pepper berries, without adding any foreign matter to the pepper.

5 REQUIREMENTS

5.1 Odour and flavour

When ground, the odour and flavour shall be characteristic of black pepper, strongly sharp and very aromatic. The product shall be free from foreign odours and flavour.

NOTE: The appearance of berries has no direct relation to their flavour. Smaller berries can be more aromatic than berries of larger size or better appearance.

5.2 Freedom from mould, insects, etc.

Black pepper shall be free from mould growth and living insects, and practically free from dead insects, insect fragments and rodent contamination visible to the naked eye (corrected, if necessary, for abnormal vision) or with such magnification as may be necessary in any particular case. If the magnification exceeds x10, this fact shall be mentioned in the test report.

In the case of ground black pepper, impurities shall be determined according to the method given in MS 142.

5.3 Physical characteristics

Whole black pepper shall meet the requirements specified in table 1.

Table 1 – Physical characteristics of whole black pepper

Characteristics	Requirements		Reference test method
	Pepper NP or SP	Pepper P	
Extraneous matter, % (m/m), max.	2.5	1.5	MS 139
Light berries, % (m/m), max.	10	5.0	Annex A
Pinheads or broken berries, % (m/m), max.	7.0	4.0	Physical separation and weighing
Bulk density, g/l, min.	450	490	Annex B
NOTE: In addition, especially in the case of ground pepper, it is recommended that microscopic examination be carried out (see annex D)			

5.4 Chemical characteristics

The black pepper shall meet the requirements specified in table 2 when tested by the specified method.

Table 2 – Chemical requirements of black pepper, whole or ground

Characteristics	Requirements			Reference test method
	Pepper NP or SP	Pepper P	Ground pepper	
Moisture content, % (m/m), max.	13.0	13.0	13.0	MS 918
Total ash, % (m/m), max., on dry basis	7.0	6.0	6.0	MS 141
Non-volatile ether extract, % (m/m), min., on dry basis	6.0	6.0	6.0	MS 922
Volatile oils, % (ml/100 g), min.	2.0	2.0	1.0*	MS 920
Piperine content, % (m/m), min., on dry basis	4.0	4.0	4.0	ISO 5564
Acid-insoluble ash, % (m/m), max., on dry basis	–	–	1.2	MS 919
Crude fibre, insoluble index, % (m/m), max., on dry basis	–	–	17.5	ISO 5498
* The volatile oil content should be determined immediately after grinding				

6 HYGIENE

It is recommended that the products covered by the provisions of this standard be prepared and handled in accordance with MS 21.

7 PACKAGING AND LABELLING**7.1 Packaging**

Whole black pepper and ground black pepper shall be packed in clean, sound, dry packages, made of material which does not affect the product but which protects it from the ingress of moisture or loss of volatile matter.

The packaging shall also comply with any national legislation relating to environmental protection.

7.2 Labelling

In addition to the requirements prescribed in MS 19, the following specific provisions shall be marked on each package or on a label attached to the package:

- a) name of the product and the trade-name, if any;
- b) name and address of the manufacturer or packer, or trademark;
- c) code or batch number;
- d) net mass;
- e) commercial stage (NP or SP or P);
- f) producing country;
- g) storage conditions;
- h) best before date; and
- i) any other information requested by the buyer, such as the year of harvest and the date of packaging.

8 SAMPLING

Black pepper shall be sampled using the method specified in ISO 948.

Samples of whole black pepper shall be ground so that all material passes through a sieve with aperture of size 1 mm. The material thus obtained shall be used for determining the characteristics given in table 2.

9 TEST METHODS

Samples of black pepper shall be analysed to ensure conformity with the requirements of this part of MS 1289 by following the methods specified in tables 1 and 2.

ANNEX A
(normative)

DETERMINATION OF PERCENTAGE OF LIGHT BERRIES IN BLACK PEPPER

A.1 Reagent

A.1.1 Alcohol-water solution, of relative density $d_{20}^{20} = 0.80$ to 0.82.

If the temperature is different from 20 °C, 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.

A.2 Procedure

A.2.1 Test portion

Weigh, to the nearest 0.01 g, 50.0 g of sample, from which the extraneous matter has been previously removed, into a 600 ml glass beaker.

A.2.2 Determination

Add 300 ml of the alcohol-water solution in **A.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.

A.3 Expression of results

The percentage by mass of light berries in the sample is equal to $\frac{m_1}{m_0} \times 100 \%$

Where,

m_0 is the mass, in grams, of the test portion; and

m_1 is the mass, in grams, of the light berries removed.

ANNEX B
(normative)

WHOLE BLACK PEPPER: DETERMINATION OF APPARENT BULK DENSITY

B.1 Scope

This annex specifies a method for the determination of the apparent bulk density of whole black pepper.

B.2 Principle

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

B.3 Apparatus

B.3.1 Apparatus for measuring bulk density, consisting of:

- a) **cylinder**, of capacity 1 litre, or a cylinder of greater capacity but equipped with apparatus allowing levelling of the product to the 1 litre level;
- b) **hopper**, of capacity greater than 1 litre and equipped with a gate; and
- c) **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 B.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.

B.3.2 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.

B.4 Procedure

B.4.1 Determination

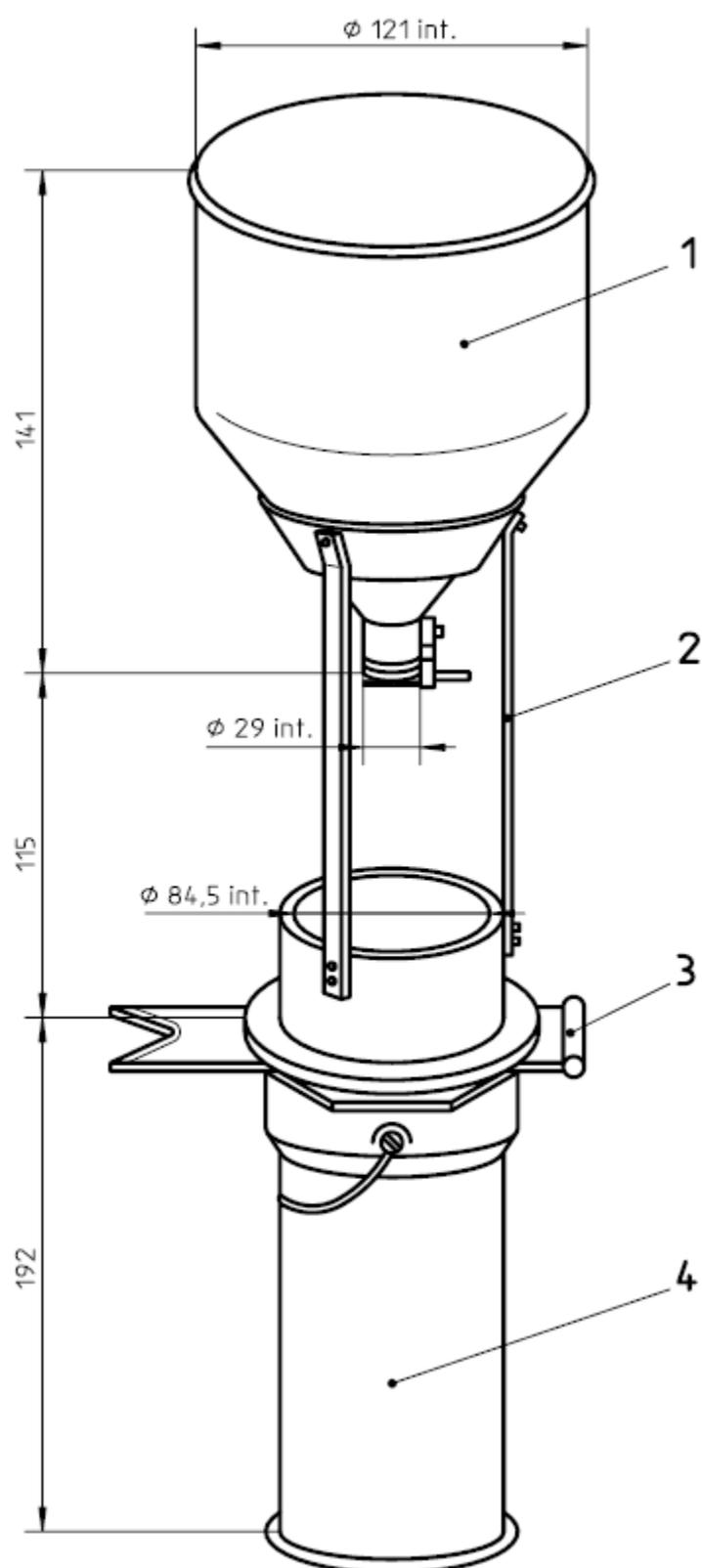
Weigh the empty cylinder, if necessary.

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.



Key

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

NOTE: Figure B.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.**

Figure B.1 – Nilema-litre apparatus**B.4.2 Number of determinations**

Carry out three determinations.

B.5 Expression of results**B.5.1 Method of calculation**

The apparent 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 **B.5.2**) 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.

B.5.2 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.

B.6 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 annex, 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.

ANNEX C
(informative)

RECOMMENDATIONS FOR STORAGE AND TRANSPORT

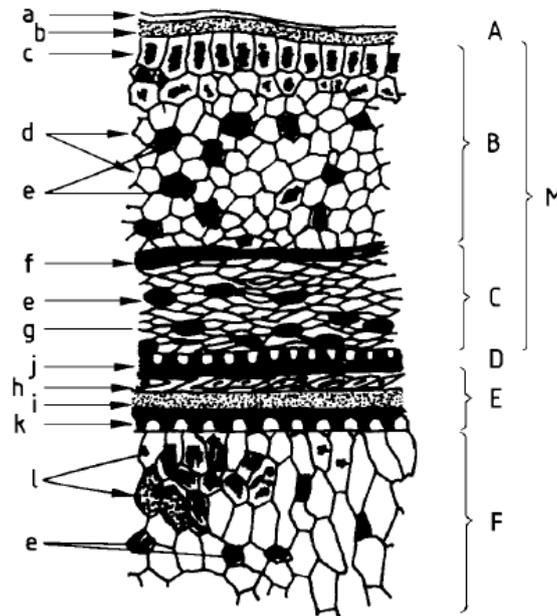
C.1 The packages of pepper should be stored in covered rooms, well protected from sun, rain and excessive heat.

C.2 The store should be dry, free from unpleasant smells and protected against penetration of insects and vermin. The ventilation should be regulated so that good ventilation is ensured during the dry period and ventilation can be fully stopped during the damp period. Suitable provisions should be taken to allow fumigation of the store.

C.3 The packages should be handled and transported in such a manner that they are protected from rain, sun, or other excessive heat sources, from unpleasant smells and all contamination, particularly in the holds of ships.

ANNEX D
(informative)

MICROSCOPIC SECTION OF PEPPER BERRY (PIPER NIGRUM L.)



A Epicarp { a cuticle
b epidermis (exocarp)

M Mesocarp { B external mesocarp { c sclerified cellular layer of very thick wall, dotted, yellow
d thin-walled external mesocarp cells
e essential oil cells
C internal mesocarp { f fibre-vascular vessels
g flattened thin-walled cells of the internal mesocarp

D Endocarp j iron cells on both sides of the endocarp

E Teguments of semen { h
i three layers of cells forming the teguments of semen
k

F Perisperm (nucellus albumen) l perisperm cells, filled with starch (this is presented only in some of the cells)

Figure D.1 – Longitudinal section

THE MALAWI BUREAU OF STANDARDS

The Malawi Bureau of Standards is the standardizing body in Malawi under the aegis of the Ministry of Industry and Trade. Set up in 1972 by the Malawi Bureau of Standards Act (Cap: 51:02), the Bureau is a parastatal body whose activities aim at formulating and promoting the general adoption of standards relating to structures, commodities, materials, practices, operations and from time to time revise, alter and amend the same to incorporate advanced technology.

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