

INTERNATIONAL STANDARD

**ISO
6577**

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Nutmeg, whole or broken, and mace, whole or in pieces (*Myristica fragrans* Houttuyn) — Specification

Muscade entière ou brisée et macis entier ou en morceaux (*Myristica
fragrans* Houttuyn) — *Spécifications*



Reference number
ISO 6577:1990(E)

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Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 6577 was prepared by Technical Committee ISO/TC 34, *Agricultural food products*.

Annex A of this International Standard is for information only.

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Nutmeg, whole or broken, and mace, whole or in pieces (*Myristica fragrans* Houttuyn) — Specification

1 Scope

This International Standard specifies requirements for nutmeg, whole or broken, and for mace, whole or in pieces, obtained from the nutmeg tree (*Myristica fragrans* Houttuyn) for wholesale commercial purposes.

NOTE 1 As nutmeg and mace are obtained from the same plant, it was considered preferable to give the specifications for these two spices in one International Standard.

It does not apply to Papua-type nutmeg and mace (*Myristica argentea* Warburg).

Recommendations relating to storage and transport conditions are given in annex A.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 927:1982, *Spices and condiments — Determination of extraneous matter content.*

ISO 928:1980, *Spices and condiments — Determination of total ash.*

ISO 929:1980, *Spices and condiments — Determination of water-insoluble ash.*

ISO 930:1980, *Spices and condiments — Determination of acid-insoluble ash.*

ISO 939:1980, *Spices and condiments — Determination of moisture content — Entrapment method.*

ISO 948:1980, *Spices and condiments — Sampling.*

ISO 1003:1980, *Spices and condiments — Ginger, whole, in pieces, or ground — Specification.*

ISO 2825:1981, *Spices and condiments — Preparation of a ground sample for analysis.*

ISO 6571:1984, *Spices, condiments and herbs — Determination of volatile oil content.*

3 Definitions

For the purposes of this International Standard, the following definitions apply.

3.1 fruit of the nutmeg tree: Fruit comprising a green to pale yellow pericarp (depending on its ripeness), a woody shell, an aril (mace) and a kernel (nutmeg). (See figure 1 and figure 2.)

3.2 nutmeg, whole or broken: Kernel of the dried ripe fruit of the nutmeg tree (*Myristica fragrans* Houttuyn). (See figure 2 and figure 3.)

3.3 mace, whole or in pieces: Dried aril of the ripe fruit of the nutmeg tree (*Myristica fragrans* Houttuyn). (See figure 2 and figure 3.)



Figure 1 — Nutmeg tree - Twig with fruit (about half life-size)

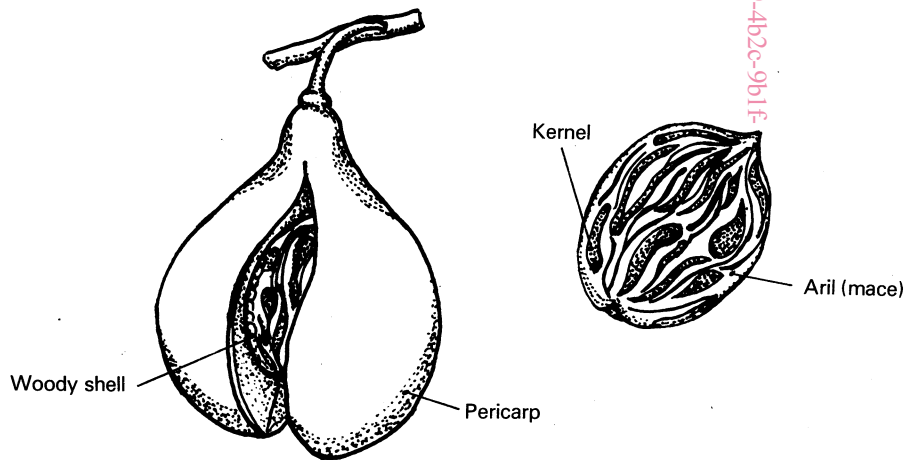


Figure 2 — Nutmeg - Schematic detail of various parts of the fruit

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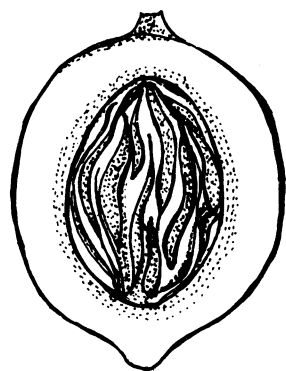
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a) longitudinal section of the fruit



b) kernel and transverse section of the kernel

Figure 3 — Nutmeg sections

3.4 aril: Fleshy or membraneous tissue surrounding certain seeds and attached to the seeds at one point only, i.e. the hilum.

4 Types and classification

4.1 Nutmeg

4.1.1 Whole or broken nutmeg (Siauw-type or Banda-type)

Origin: South-east Asia.

Siauw-type or Banda-type nutmeg is generally of a greyish-brown colour, but it may be white if it has been subjected to liming for the purpose of protecting it from insects and as an aid to conservation. It is spherical or slightly ovoid in shape, its length generally varying from 20 mm to 30 mm and its width from 15 mm to 25 mm. Its surface is hard to the touch, marked with numerous braided furrows and with a narrow groove which extends from the hilum to the chalaza on the least-convex side.

4.1.2 Whole or broken nutmeg (Grenada-type)

Origin: West Indies.

Grenada-type nutmeg has the same colour characteristics as the nutmeg described in 4.1.1. It is never limed and it is of a slightly more elongated shape than the Siauw-type or Banda-type nutmeg.

4.2 Mace

4.2.1 Mace, whole or in pieces (Siauw-type or Banda-type)

Origin: South-east Asia.

Siauw-type or Banda-type mace is a flattened, dried, quite wide aril with a horny texture, reddish-yellow to brownish-red in colour and generally 30 mm to 40 mm long and 1 mm thick.

4.2.2 Mace, whole or in pieces (Grenada-type)

Origin: West Indies

Grenada-type mace is a flattened, dried, quite wide aril with a horny texture, generally 30 mm to 40 mm long and 1 mm thick. Its colour varies according to the category (see table 3).

4.3 Commercial categories

4.3.1 Nutmeg (Siauw-type, Banda-type and Grenada-type)

Nutmegs are classified according to

- the producing region (South-east Asia or West Indies), and
- the category (see table 1).

Table 1 — Categories of nutmeg

Category	Commercial designation	Description
1	Whole sound nutmegs	Whole, sound and well-formed nutmegs classified as a function of size. ¹⁾
2	Sound shrivels	Shrivelled, but sound, nutmegs which have not been attacked by insects.
3	BWP (South-east Asia) or defectives (West Indies)	Broken nutmegs or whole nutmegs that have been attacked by insects (but with no living insects and practically free from dead insects). They may have been limed.

1) Whole nutmegs are sold either as an "assorted" mixture (ABCD), without sorting by size, or by the number of nutmegs to the (English) pound after sizing. For example, "Whole sound nutmegs 80" would indicate nutmegs of category 1, of a size corresponding to 80 to the pound.

The most commonly used size ranges in commerce are 60 to 65, 80 to 85, 100 to 110, 110 to 120, 120 to 130, and 130 to 150.

Table 2 — Categories of Siauw-type and Banda-type mace

Category	Commercial designation	Description
1	Whole	Whole mace containing not more than 5 % of about quarter-size broken pieces.
2	A	Broken mace I
	B	Broken mace II
3	A	Sifting I
	B	Sifting II

4.3.2 Mace (Siauw-type, Banda-type and Grenada-type)

Mace is classified according to

- the producing region (South-east Asia or West Indies), and
- the category (see table 2 and table 3).

Table 3 — Categories of Grenada-type mace

Category	Commercial designation	Description
1	Whole No. 1	Whole mace, pale yellow in colour, containing not more than 5 % of broken pieces.
2	Broken No. 2	Pieces ranging from yellow to dark red in colour but, overall, yellow, of at least quarter-size, with a proportion of smaller pieces and dust (less than 5 %).
3	Mace pickings	Dust and discoloured pieces of mace ranging from yellow to black and containing damaged "country" mace.

5 Requirements

5.1 Odour and flavour

The odour of nutmeg and mace shall be characteristic and aromatic, that of mace being more pronounced, however. Their flavour is bitter, acrid and hot.

5.2 Freedom from insects, moulds, etc.

Nutmeg and mace shall be free from living insects and moulds, and shall be 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 used is greater than $\times 10$, this fact shall be stated in the test report.

5.3 Extraneous matter

For the purposes of this International Standard, the following are considered to be extraneous matter:

- a) all vegetable matter other than the kernel and the aril, in particular pieces of shell;
- b) all other extraneous animal, vegetable or mineral matter.

The total content of this extraneous matter, determined using the method specified in ISO 927, shall not exceed 0,5 % (m/m).

Nutmeg in mace and, inversely, mace in nutmeg is not considered as extraneous matter but, in both cases, their content shall not be greater than 3 % (m/m).

5.4 Chemical requirements

5.4.1 Nutmeg

Whole or broken nutmeg shall comply with the requirements given in table 4.

Table 4 — Chemical requirements for nutmeg, whole or broken (Siauw-type, Banda-type and Grenada-type)

Characteristic	Requirement	Test method
Moisture content, % (m/m) max.	10	ISO 939
Total ash, % (m/m) max., on dry basis	3	ISO 928
Water-insoluble ash, % (m/m) max., on dry basis	1,5	ISO 929
Acid-insoluble ash, % (m/m) max., on dry basis	0,5	ISO 930
Volatile oils content, % (ml/100 g) min., on dry basis	6,5	ISO 6571
Calcium content expressed as CaO, % (m/m) max., on dry basis	0,35	ISO 1003:1980, annex A

5.4.2 Mace

Mace, whole or in pieces, shall comply with the requirements given in table 5.

Table 5 — Chemical requirements for mace, whole or in pieces (Siauw-type, Banda-type and Grenada-type)

Characteristic	Requirement	Test method
Moisture content, % (m/m) max.	10	ISO 939
Total ash, % (m/m) max., on dry basis	4	ISO 928
Acid-insoluble ash, % (m/m) max., on dry basis	0,5	ISO 930
Volatile oils content, % (ml/100 g) min., on dry basis		ISO 6571
Categories 1 and 2	7,5	
Category 3	5	

6 Sampling

Sampling shall have been carried out in accordance with ISO 948.

7 Test methods

Prepare the ground sample for analysis using the method specified in ISO 2825.

Because of the high fat content of these two spices, heating during the grinding process should be avoided: cryogenic grinding is therefore strongly recommended.

The product thus ground shall be tested for conformity with the requirements of this International Standard using the test methods indicated, **with the exception that for the determination of total ash, heating should be carried out at 600 °C, instead of 550 °C as specified in ISO 928, to achieve total incineration.**

8 Packing and marking

8.1 Packing

Nutmeg and mace shall be packed in clean, dry and sound containers made of a material which does not affect the product.

8.2 Marking

The following particulars shall be marked on each container or on a label attached to the container:

- a) name of the product (botanical name) and trade-name, if any;
 - b) name and address of the producer or packager and, if applicable, the trade-mark;
 - c) batch or code number;
 - d) net mass;
 - e) category;
 - f) producing country;
- and, if necessary,
- g) any other information required by the purchaser, such as year of harvest and date of packing;
 - h) reference to this International Standard.

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Annex A (informative)

Recommendations relating to storage and transport conditions

A.1 The packages of nutmeg and mace shall be stored in covered premises, well protected from the sun, rain and excessive heat.

A.2 The store shall be dry, free from objectionable odours and proofed against the entry of insects and vermin. The ventilation shall be controlled so as to ensure good ventilation during dry weather and to be fully closed during wet weather. Suitable ar-

rangements shall be made to allow fumigation of the store.

A.3 The packages shall be handled and transported in such a way that they are protected from rain, from the sun or other sources of excessive heat, from objectionable odours and from any other contamination, especially in the holds of ships.

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