

मसाले — सौंफ, साबुत या पिसी
भाग 1 तेज़ सौंफ — विशिष्टि
(फोनीकुलम वल्गारे पी. मिलर वार. वल्गारे)

Spices and Condiments — Fennel
Seed, Whole or Ground
Part 1 Bitter Fennel Seed — Specification
(*Foeniculum Vulgare* P. Miller Var.
Vulgare)

ICS 67.220.10

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NATIONAL FOREWORD

This Indian Standard which is identical to ISO 7927-1 : 2023 'Spices and condiments — Fennel seed, whole or ground — Part 1: Bitter fennel seed specification (*Foeniculum vulgare* P. Miller var. *vulgare*)' issued by the International Organization for Standardization was adopted by the Bureau of Indian Standards, on recommendation of the Spices and Condiments Sectional Committee and approval of the Food and Agriculture Division Council.

This standard is published in two parts under the general title 'Spices and condiments — Fennel seed, whole or ground'. Part 2 specifies requirements and methods of test for sweet fennel seed.

The text of ISO standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

- a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'; and
- b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appears to the following International Standards for which Indian Standard also exists. The corresponding Indian Standard which is to be substituted in its place is listed below along with its degree of equivalence for the editions indicated:

<i>International Standard</i>	<i>Corresponding Indian Standard</i>	<i>Degree of Equivalence</i>
ISO 927 Spices and condiments — Determination of extraneous matter and foreign matter content	IS 1797 : 2017 Spices and Condiments — Methods of test (<i>third revision</i>)	Technically equivalent
ISO 928 Spices and condiments — Determination of total ash		
ISO 930 Spices and condiments — Determination of acid-insoluble ash		
ISO 939 Spices and condiments — Determination of moisture content		
ISO 948 Spices and condiments — Sampling	IS 13145 : 2014 Spices and Condiments — Methods of Sampling (<i>second revision</i>)	Technically equivalent
ISO 2825 Spices and condiments — Preparation of a ground sample for analysis	IS 1797 : 2017 Spices and Condiments — Methods of test (<i>third revision</i>)	Technically equivalent
ISO 6571 Spices, condiments and herbs — Determination of volatile oil content (hydrodistillation method)		

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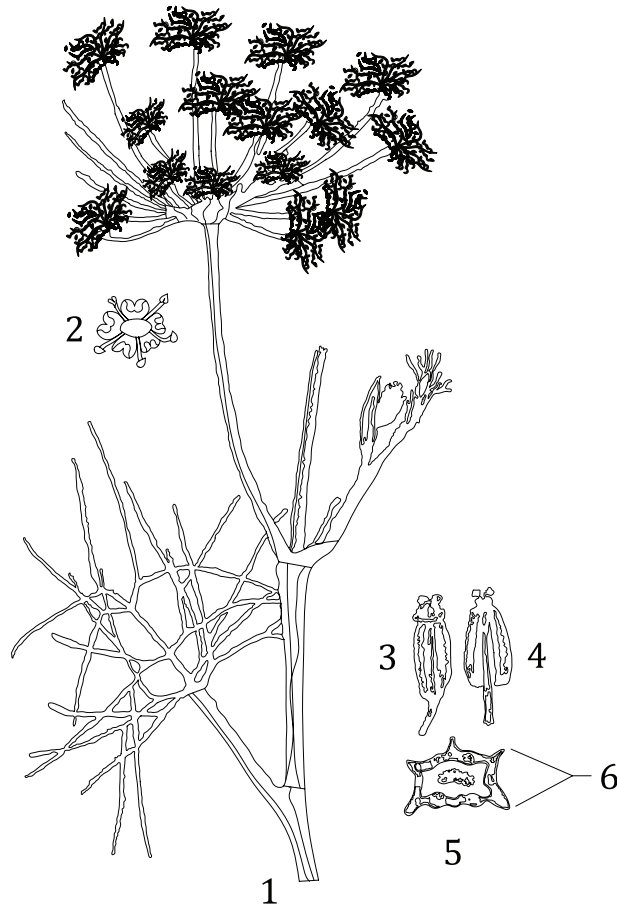
Contents

Page

Introduction	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Requirements	2
4.1 Odour and flavour.....	2
4.2 Freedom from insects, moulds, etc.....	2
4.3 Extraneous matter in whole fennel.....	2
4.4 Foreign matter.....	2
4.4.1 Foreign matter from animals.....	2
4.4.2 Foreign matter from non-animals.....	3
4.5 Defective seeds in whole fennel.....	3
4.6 Chemical requirements.....	3
4.6.1 Whole bitter fennel.....	3
4.6.2 Ground bitter fennel.....	3
5 Sampling	4
6 Methods of test	4
7 Packaging and marking	4
7.1 Packaging.....	4
7.2 Marking.....	4
7.2.1 Whole bitter fennel.....	4
7.2.2 Ground bitter fennel.....	4
Annex A (informative) Recommendations relating to storage and transport conditions	6

Introduction

Whole bitter fennel is the dried fruit of *Foeniculum vulgare* P. Miller var. *vulgare*, commonly called “bitter fennel seed”, and occurs as small seeds about 3 mm to 10 mm in length, 2 mm to 2,5 mm in breadth, oblong in shape and yellowish to greenish-brown in colour (see [Figure 1](#)).



Key

- 1 plant
- 2 flower
- 3 fruit
- 4 separated achenes
- 5 transverse section of achene
- 6 ribs

Figure 1 — *Foeniculum vulgare* P. Miller var. *vulgare*

Indian Standard

SPICES AND CONDIMENTS — FENNEL SEED, WHOLE OR
GROUND

PART 1 BITTER FENNEL SEED — SPECIFICATION
(*Foeniculum Vulgare* P. Miller Var. *Vulgare*)

1 Scope

This document specifies requirements for bitter fennel seed (*Foeniculum vulgare* P. Miller var. *vulgare*), whole or ground.

Recommendations relating to storage and transport conditions are given in [Annex A](#).

ISO 7927-2 specifies requirements for sweet fennel seed.

NOTE Although, botanically speaking, the product is a “fruit”, the term “seed” is in common commercial use.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 927, *Spices and condiments — Determination of extraneous matter and foreign matter content*

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

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

ISO 939, *Spices and condiments — Determination of moisture content*

ISO 948, *Spices and condiments — Sampling*

ISO 1208, *Spices and condiments — Determination of filth*

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

ISO 6571, *Spices, condiments and herbs — Determination of volatile oil content (hydrodistillation method)*

ISO 11024-1, *Essential oils — General guidance on chromatographic profiles — Part 1: Preparation of chromatographic profiles for presentation in standards*

ISO 11024-2, *Essential oils — General guidance on chromatographic profiles — Part 2: Utilization of chromatographic profiles of samples of essential oils*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1

bitter fennel

dried fruit of *Foeniculum vulgare* P. Miller var. *vulgare*, in whole, broken or ground form

3.2

foreign matter

matter visible to the naked eye or with a maximum 10 times magnifying power that is not part of the species to which the spice or herb belongs

Note 1 to entry: The origin of macro foreign matter can be non-animal (e.g. stem, stones, straw, visible moulds, mineral, plastic) or animal (e.g. excreta, insects, insect-defiled product) foreign matter.

3.3

extraneous matter

matter visible to the naked eye or with a maximum 10 times magnifying power that is species waste belonging to the plant to which the spice or herb belongs

Note 1 to entry: Macro extraneous matter can be floral waste.

4 Requirements

4.1 Odour and flavour

Bitter fennel seed, whole or ground, shall have a characteristic odour and an aromatic aniseed flavour characteristic of the spice. It shall be free from mustiness and other foreign flavours.

The Fenchone content of the volatile oil obtained in accordance with ISO 6571 shall not be less than 15 % (area percentage), when determined using ISO 11024-1 and ISO 11024-2.

4.2 Freedom from insects, moulds, etc.

Bitter fennel seed, whole or ground, 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 can be necessary in any particular case. If the magnification exceeds $\times 10$, this fact shall be stated in the test report.

In case of dispute, contamination in ground fennel shall be determined by the method specified in ISO 1208.

4.3 Extraneous matter in whole fennel

The proportion of extraneous matter in whole bitter fennel, when determined by the method described in ISO 927, shall not exceed 0,5 % (mass fraction).

Extraneous matter includes straw or chaff, stalks and stems from species to which the spice or herb belongs.

4.4 Foreign matter

4.4.1 Foreign matter from animals

The product shall be free from rodent and other excreta, whole insects and parts (dead or alive, including mites and psocids), larvae, mouldy material and insect-defiled products when determined by the method specified in ISO 927.

4.4.2 Foreign matter from non-animals

The product shall not contain non-animal foreign matter exceeding 0,5 % (mass fraction), when determined by the method specified in ISO 927.

For final consumption, the products shall be free from foreign matter, when determined by the method specified in ISO 927.

4.5 Defective seeds in whole fennel

The proportion of defective seeds in whole bitter fennel shall not exceed the values given in [Table 1](#), according to the grade.

Defective seeds include:

- seeds which are damaged split, broken or which have been bored or attacked by weevils or other insects;
- seeds which have not developed properly, or which are shrivelled or have been discoloured or blackened.

Table 1 — Grading of whole bitter fennel

Grade	Defective seeds % (mass fraction) max.
1	3,0
2	5,0
3	9,0

4.6 Chemical requirements

4.6.1 Whole bitter fennel

Whole bitter fennel shall conform to the requirements given in [Table 2](#).

Table 2 — Chemical requirements for whole bitter fennel

Characteristics	Requirement	Method of test
Moisture content, % (mass fraction) max.	12,0	ISO 939
Total ash, % (mass fraction) on dry basis, max.	10,0	ISO 928
Acid-insoluble ash, % (mass fraction) on dry basis, max.	2,0	ISO 930
Volatile oil content, ml/100 g on dry basis, min.	1,0	ISO 6571

4.6.2 Ground bitter fennel

Ground bitter fennel shall conform to the requirements given in [Table 3](#).

Ground bitter fennel shall pass completely through a sieve of nominal size of openings 500 µm.

Table 3 — Chemical requirements for ground bitter fennel

Characteristics	Requirement	Method of test
Moisture content, % (mass fraction) max.	10,0	ISO 939
Total ash, % (mass fraction) on dry basis, max.	10,0	ISO 928
Acid-insoluble ash, % (mass fraction) on dry basis, max.	2,0	ISO 930
Volatile oil content, ml/100 g on dry basis, min.	0,8	ISO 6571

5 Sampling

Sample the bitter fennel, whole or ground, by the method specified in ISO 948.

6 Methods of test

Samples of bitter fennel, whole or ground, shall be tested for conformity with the requirements of this document by the methods of test referred to in [4.2](#) and [4.3](#), and [Tables 2](#) and [3](#).

The ground sample for analysis shall be prepared in accordance with ISO 2825.

7 Packaging and marking

7.1 Packaging

The containers used for packing the dried bitter fennel, whole or ground, shall be impermeable to air, such as cases, plywood or fibre board boxes, or sacks. They shall be clean, sound and made of a material that does not affect the product and which protects it from moisture and bright light.

The product shall be loosely packed. The containers used for packing shall be lined with paper to facilitate loose packing.

7.2 Marking

7.2.1 Whole bitter fennel

The container shall be marked or labelled with the following:

- a) name, form and grade of the product (botanical name and type of presentation);
- b) trade name or trademark, if any;
- c) name and address of producer and/or packer;
- d) producing country;
- e) batch or code number;
- f) the year of harvest and date of packaging;
- g) shelf life of the product or best-before date;
- h) net mass;
- i) any other information requested by the purchaser;
- j) references to the relevant International Standard if the product fulfils its specification.

7.2.2 Ground bitter fennel

The container shall be marked or labelled with the following:

- a) name and form of the product (botanical name and type of presentation);
- b) trade name or trademark, if any;
- c) name and address of producer and/or packer;
- d) producing country;

- e) batch or code number;
- f) the year of harvest and date of packaging;
- g) shelf life of the product or best-before date;
- h) net mass;
- i) any other information requested by the purchaser;
- j) references to the relevant International Standard if the product fulfils its specification.

Annex A **(informative)**

Recommendations relating to storage and transport conditions

A.1 Containers of bitter fennel, whole or ground, should be stored in covered premises, well protected from the sun, rain and excessive heat.

A.2 The storeroom should be dry, free from objectionable odours and proofed against the entry of insects and vermin. The ventilation should be controlled so as to give good ventilation under dry conditions and to be fully closed under damp conditions. In a storage warehouse, suitable facilities should be available for fumigation.

A.3 The containers should be so handled and transported that they are protected from rain, from the sun or other source of excessive heat, from unpleasant odours and from cross-infestation, especially in the holds of ships.

(Continued from second cover)

<i>International Standard</i>	<i>Corresponding Indian Standard</i>	<i>Degree of Equivalence</i>
ISO 11024-1 Essential oils — General guidance on chromatographic profiles — Part 1: Preparation of chromatographic profiles for presentation in standards	IS 326 (Part 29/Sec 1) : 2018/ISO 11024-1 : 1998 Methods of sampling and test for natural and synthetic perfumery materials: Part 29 General guidance on chromatographic profiles, Section 1 Preparation of chromatographic profiles for presentation in standards	Identical
ISO 11024-2 Essential oils — General guidance on chromatographic profiles — Part 2: Utilization of chromatographic profiles of samples of essential oils	IS 326 (Part 29/Sec 2) : 2018/ISO 11024-2 : 1998 Methods of sampling and test for natural and synthetic perfumery material: Part 29 General Guidance on Chromatographic Profiles, Section 2 Utilization of chromatographic profiles of samples natural and synthetic perfumery material	Identical

The Committee has reviewed the provisions of the following International Standard referred in the adopted standard and has decided that it is acceptable for use in conjunction with this standards:

<i>International Standard</i>	<i>Title</i>
ISO 1208	Spices and condiments — Determination of filth

In reporting the results of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Bureau of Indian Standards

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Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the website- www.bis.gov.in or www.standardsbis.in.

This Indian Standard has been developed from Doc No.: FAD 09 (24210).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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