

ISO/TC 34/SC 7

Secretariat: BIS

Voting begins on:
2023-03-09

Voting terminates on:
2023-05-04

**Spices and condiments — Fennel seed,
whole or ground —**

**Part 1:
Bitter fennel seed specification
(*Foeniculum vulgare* P. Miller var.
vulgare)**

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Reference number
ISO/FDIS 7927-1:2023(E)

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Published in Switzerland

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 34, *Food products*, Subcommittee SC 7, *Spices, culinary herbs and condiments*.

This second edition, along with ISO 7927-2:¹, cancels and replaces the first edition (ISO 7927-1:1987), which has been technically revised.

The main changes are as follows:

- definitions for “foreign matter” and “extraneous matter” have been added in accordance with ISO 927;
- a requirement for Fenchone content has been introduced to distinguish bitter fennel from sweet fennel;
- the requirements for moisture content and volatile oil content for ground bitter fennel have been modified.

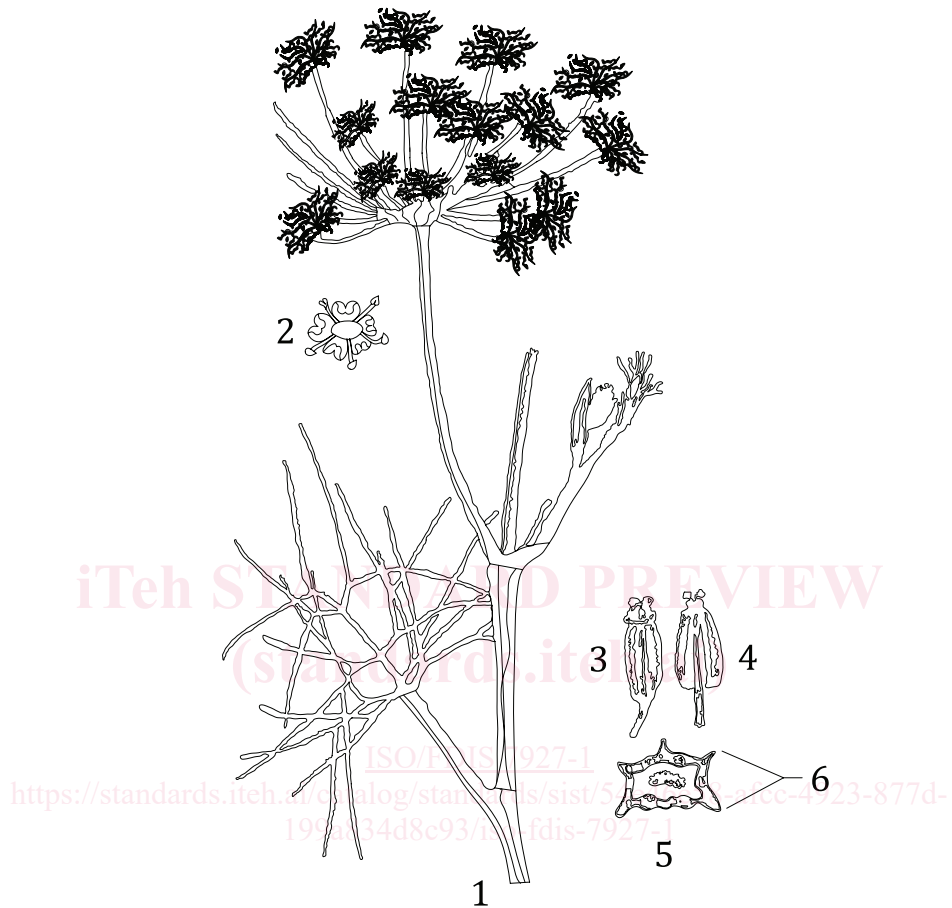
A list of all parts in the ISO 7927 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

1) Under preparation.

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*

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 product shall not be less than 5 % (mass fraction), 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 [ISO/FDIS 7927-1](#)

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4.6.1 Whole bitter fennel [199a834d8c93/iso-fdis-7927-1](#)

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;