

# INTERNATIONAL STANDARD

# ISO 4733

Second edition  
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## Oil of cardamom [*Elettaria cardamomum* (L.) Maton]

*Huile essentielle de cardamome [Elettaria cardamomum (L.) Maton]*



Reference number  
ISO 4733:2004(E)

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## ISO 4733:2004(E)

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## **Foreword**

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 4733 was prepared by Technical Committee ISO/TC 54, *Essential oils*.

This second edition cancels and replaces the first edition (ISO 4733:1981), which has been technically revised.



# Oil of cardamom [*Elettaria cardamomum* (L.) Maton]

## 1 Scope

This International Standard specifies certain characteristics of the oil of cardamom [*Elettaria cardamomum* (L.) Maton.], in order to facilitate assessment of its quality.

## 2 Normative references

The following referenced documents are indispensable for the application 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/TR 210, *Essential oils — General rules for packaging, conditioning and storage*

ISO/TR 211, *Essential oils — General rules for labelling and marking of containers*

ISO 212, *Essential oils — Sampling*

ISO 279, *Essential oils — Determination of relative density at 20 °C — Reference method*

ISO 280, *Essential oils — Determination of refractive index*

ISO 356, *Essential oils — Preparation of test samples*

ISO 592, *Essential oils — Determination of optical rotation*

ISO 709, *Essential oils — Determination of ester value*

ISO 875, *Essential oils — Evaluation of miscibility in ethanol*

ISO 1242, *Essential oils — Determination of acid value*

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.

### 3.1 oil of cardamom

essential oil obtained by steam distillation of the fruits of cardamom [*Elettaria cardamomum* (L.) Maton] of the Zingiberaceae family, growing mainly in Central America/Guatemala and India/Sri Lanka

NOTE For information on the CAS number, see ISO/TR 21092.

## 4 Requirements

### 4.1 Appearance

Liquid.

### 4.2 Colour

Almost colourless to pale yellow.

### 4.3 Odour

Characteristic, spicy and cineolic.

### 4.4 Relative density at 20 °C, $d_{20}^{20}$

|          | Central America/<br>Guatemala | India/<br>Sri Lanka |
|----------|-------------------------------|---------------------|
| Minimum: | 0,920                         | 0,919               |
| Maximum: | 0,940                         | 0,936               |

**ISO 4733:2004(E)****4.5 Refractive index at 20 °C**

|          | Central America/<br>Guatemala | India/<br>Sri Lanka |
|----------|-------------------------------|---------------------|
| Minimum: | 1,460                         | 1,460               |
| Maximum: | 1,467                         | 1,468               |

**4.6 Optical rotation at 20 °C**

| Central America/<br>Guatemala | India/<br>Sri Lanka      |
|-------------------------------|--------------------------|
| Between<br>+24° and +39°      | Between<br>+22° and +41° |

**4.7 Miscibility in ethanol, 70 % (volume fraction), at 20 °C**

It shall not be necessary to use more than 3 volumes of ethanol, 70 % (volume fraction), to obtain a clear solution (sometimes opalescent) with 1 volume of essential oil.

**4.8 Acid value**

|          | Central America/<br>Guatemala | India/<br>Sri Lanka |
|----------|-------------------------------|---------------------|
| Maximum: | 6                             | 6                   |

**4.9 Ester value**

|          | Central America/<br>Guatemala | India/<br>Sri Lanka |
|----------|-------------------------------|---------------------|
| Minimum: | 92                            | 92                  |
| Maximum: | 150                           | 150                 |

**4.10 Chromatographic profile**

Analysis of the essential oil shall be carried out by gas chromatography. In the chromatogram obtained, the representative and characteristic components shown in Table 1 shall be identified. The proportions of these components, indicated by the integrator, shall be as shown in Table 1. This constitutes the chromatographic profile of the essential oil.

**Table 1 — Chromatographic profile**

| Component               | Central America/<br>Guatemala |           | India/<br>Sri Lanka |           |
|-------------------------|-------------------------------|-----------|---------------------|-----------|
|                         | Min.<br>%                     | Max.<br>% | Min.<br>%           | Max.<br>% |
| $\alpha$ -Pinene        | 1                             | 2         | 1                   | 2         |
| Sabinene                | 3                             | 5         | 2                   | 4         |
| Myrcene                 | traces                        | 2,5       | traces              | 2,5       |
| Limonene                | 2                             | 3         | 3                   | 7         |
| 1,8-Cineole             | 27                            | 35        | 23                  | 33        |
| Linalol                 | 3                             | 6         | 3,5                 | 7         |
| Linalyl acetate         | 4                             | 6         | 4                   | 9         |
| Terpinen-4-ol           | 0,8                           | 1,5       | 1                   | 3         |
| $\alpha$ -Terpineol     | traces                        | 2,5       | 3                   | 7         |
| Terpinyl acetate        | 35                            | 45        | 32                  | 42        |
| <i>trans</i> -Nerolidol | 0,5                           | 1         | 1                   | 2         |

NOTE The chromatographic profile is normative, contrary to typical chromatograms given for information in Annex A.

**4.11 Flashpoint**

Information on the flashpoint is given in Annex B.

**5 Sampling**

See ISO 212.

Minimum volume of test sample: 25 ml.

NOTE This volume allows each of the tests specified in this International Standard to be carried out at least once.

**6 Preparation of test sample**

See ISO 356.

**7 Test methods****7.1 Relative density at 20 °C,  $d_{20}^{20}$** 

See ISO 279.