

# INTERNATIONAL STANDARD

# ISO 3140

Fifth edition  
2019-05

---

---

## Essential oil of sweet orange expressed [*Citrus sinensis* (L.)]

*Huile essentielle d'orange douce obtenue par expression  
[Citrus sinensis (L.)]*



Reference number  
ISO 3140:2019(E)

© ISO 2019

## ISO 3140:2019(E)



### **COPYRIGHT PROTECTED DOCUMENT**

© ISO 2019

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Fax: +41 22 749 09 47  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

<b>Contents</b>	<b>Page</b>
<b>Foreword</b> .....	<b>iv</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>1</b>
<b>4 Requirements</b> .....	<b>1</b>
4.1 General requirements.....	1
4.2 Chromatographic profile.....	2
<b>5 Flashpoint</b> .....	<b>2</b>
<b>6 Sampling</b> .....	<b>2</b>
<b>7 Packaging, labelling, marking and storage</b> .....	<b>3</b>
<b>Annex A (informative) Typical chromatograms of the analysis by gas chromatography of the essential oil of sweet orange expressed [<i>Citrus sinensis</i> (L.)]</b> .....	<b>4</b>
<b>Annex B (informative) Flashpoint</b> .....	<b>7</b>
<b>Bibliography</b> .....	<b>8</b>

## ISO 3140:2019(E)

### 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](http://www.iso.org/directives)).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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](http://www.iso.org/iso/foreword.html).

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

This fifth edition cancels and replaces the fourth edition (ISO 3140:2011), which has been technically revised. The main changes to the previous edition are as follows:

- title and botanical name of the essential oil changed;
- structure revised;
- ranges revised for the following components in [Table 2](#): Sabinene, *n*-Octanal and *n*-Nonanal.

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](http://www.iso.org/members.html).

# Essential oil of sweet orange expressed [*Citrus sinensis* (L.)]

## 1 Scope

This document specifies certain characteristics of the essential oil of sweet orange expressed [*Citrus sinensis* (L.)] with a view to facilitating the assessment of its quality.

## 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/TS 210, *Essential oils — General rules for packaging, conditioning and storage*

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

ISO 4715, *Essential oils — Quantitative evaluation of residue on evaporation*

ISO 11024 (all parts), *Essential oils — General guidance on chromatographic profiles*

## 3 Terms and definitions

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

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

— ISO Online browsing platform: available at <https://www.iso.org/obp>

— IEC Electropedia: available at <http://www.electropedia.org/>

### 3.1

#### **essential oil of sweet orange expressed**

essential oil obtained without heating, by physical extraction of the peel, from the pericarp of the fruit of *Citrus sinensis* (L.), of the Rutaceae family

Note 1 to entry: For information on CAS number, see ISO/TR 21092.

## 4 Requirements

### 4.1 General requirements

Essential oil of sweet orange expressed [*Citrus sinensis* (L.)] shall meet the requirements as given in [Table 1](#).

## ISO 3140:2019(E)

**Table 1 — Requirements for the essential oil of sweet orange expressed [*Citrus sinensis* (L.)]**

Characteristic	Requirement	ISO test method
Appearance	Clear, mobile liquid	—
Colour	Yellow to reddish yellow	—
Odour	Characteristic, orange peel odour	—
Relative density at 20 °C, $d_{20}^{20}$	0,842 to 0,850	ISO 279
Refractive index at 20 °C	1,470 to 1,476	ISO 280
Optical rotation	Between +94° and +99°	ISO 592
Residue on evaporation	1,0 % to 4,0 %	ISO 4715

**4.2 Chromatographic profile**

Carry out the analysis of the essential oil by gas chromatography. Determine the chromatographic profile in accordance with the ISO 11024 series. Identify in the chromatogram obtained the representative and characteristic components shown in [Table 2](#). The proportions of these components, indicated by the integrator, shall be as shown in [Table 2](#). This constitutes the chromatographic profile of the essential oil.

**Table 2 — Chromatographic profile**

Component	Min. %	Max. %
$\alpha$ -Pinene	0,4	0,8
$\beta$ -Pinene	0,02	0,15
Sabinene	0,2	1,0
Myrcene	1,5	3,5
Limonene	93,0	96,0
<i>n</i> -Octanal	0,1	0,6
<i>n</i> -Nonanal	0,01	0,1
<i>n</i> -Decanal	0,1	0,7
Linalool	0,15	0,7
Neral	0,03	0,1
Valencene	0,01	0,4
Geranial	0,05	0,2
$\beta$ -Sinensal	0,01	0,06

NOTE The chromatographic profile is normative, contrary to the typical chromatograms given for information in [Annex A](#), [Figures A.1](#) and [A.2](#).

**5 Flashpoint**

Information on the flashpoint is given in [Annex B](#).

**6 Sampling**

Sampling shall be performed in accordance with ISO 212. Minimum volume of test sample is 25 ml.

NOTE The volume allows each of the tests specified in this document to be carried out at least once.