

INTERNATIONAL
STANDARD

ISO
11020

First edition
1998-07-01

**Oil of turpentine, Iberian type (*Pinus
pinaster* Sol.)**

Huile essentielle de térébenthine, type Ibérique (Pinus pinaster Sol.)

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Reference number
ISO 11020:1998(E)

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 11020 was prepared by Technical Committee ISO/TC 54, *Essential oils*.

Annexes A and B of this International Standard are for information only.

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Oil of turpentine, Iberian type (*Pinus pinaster* Sol.)

1 Scope

This International Standard specifies certain characteristics of oil of turpentine, Iberian type (*Pinus pinaster* Sol.), in order to facilitate assessment of its quality.

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/TR 210:—¹⁾, *Essential oils — General rules for packaging, conditioning and storage*.

ISO/TR 211:—²⁾, *Essential oils — General rules for labelling and marking of containers*.

ISO 212:1973, *Essential oils — Sampling*.

ISO 279:—³⁾, *Essential oils — Determination of relative density at 20 °C — Reference method*.

ISO 280:—⁴⁾, *Essential oils — Determination of refractive index*.

ISO 592:—⁵⁾, *Essential oils — Determination of optical rotation*.

ISO 1242:—⁶⁾, *Essential oils — Determination of acid value*.

ISO 3405:1988, *Petroleum products — Determination of distillation characteristics*.

ISO 4715:1978, *Essential oils — Quantitative evaluation of residue on evaporation*.

ISO 11024-1:—⁷⁾, *Essential oils — General guidance on chromatographic profiles — Part 1: Preparation of chromatographic profiles for presentation in standards*.

ISO 11024-2:—⁷⁾, *Essential oils — General guidance on chromatographic profiles — Part 2: Utilization of chromatographic profiles of samples of essential oils*.

3 Definition

For the purposes of this International Standard, the following definition applies.

3.1

oil of turpentine, Iberian type

essential oil, obtained by superheated steam distillation at a temperature below 180 °C, of the gum resin from *Pinus pinaster* Sol., of the Pinaceae family, mainly produced in Portugal and Spain

¹⁾ To be published. (Revision of ISO 210:1961)

²⁾ To be published. (Revision of ISO 211:1961)

³⁾ To be published. (Revision of ISO 279:1981)

⁴⁾ To be published. (Revision of ISO 280:1976)

⁵⁾ To be published. (Revision of ISO 592:1981)

⁶⁾ To be published. (Revision of ISO 1242:1973)

⁷⁾ To be published.

4 Requirements

4.1 Appearance

Clear, mobile liquid.

4.2 Colour

Colourless.

4.3 Odour

Characteristic.

4.4 Taste

Piquant and acid.

4.5 Relative density at 20 °C, d_{20}^{20}

Minimum: 0,860

Maximum: 0,872

4.6 Refractive index at 20 °C

Minimum: 1,465 0

Maximum: 1,475 0

4.7 Optical rotation at 20 °C

Range from -40° to -28° .

4.8 Distillation test

The temperature at the beginning of the distillation shall be higher than 150 °C, and at least 90 % of distillate shall be obtained at a temperature not exceeding 170 °C.

4.9 Residue on evaporation, as a percentage

Maximum: 2,5 % (m/m)

4.10 Acid value

Maximum: 1,0

4.11 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.

4.12 Flashpoint

Information on the flashpoint is given in annex B.

5 Sampling

See ISO 212.

Minimum volume of final sample: 150 ml.

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

6 Test methods

6.1 Relative density at 20 °C, d_{20}^{20}

See ISO 279.

6.2 Refractive index at 20 °C

See ISO 280.

6.3 Optical rotation at 20 °C

See ISO 592.

Table 1 — Chromatographic profile

Component	Minimum %	Maximum %
α -Pinene	71	85
Camphene	0,6	1,5
β -Pinene	11	20
Myrcene	0,4	1,5
Limonene	1,0	7,0
δ -3-Carene	—	0,1
β -Caryophyllene	0,3	3,0
Longifolene	0,2	2,5
Caryophyllene oxide	—	0,5

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

6.4 Distillation test

See ISO 3405.

6.5 Residue on evaporation, as a percentage

See ISO 4715.

Test portion: 2 g.

Evaporation time: 3 h.

6.6 Acid value

See ISO 709.

6.7 Chromatographic profile

See ISO 11024-1 and ISO 11024-2.

7 Packaging, labelling, marking and storage

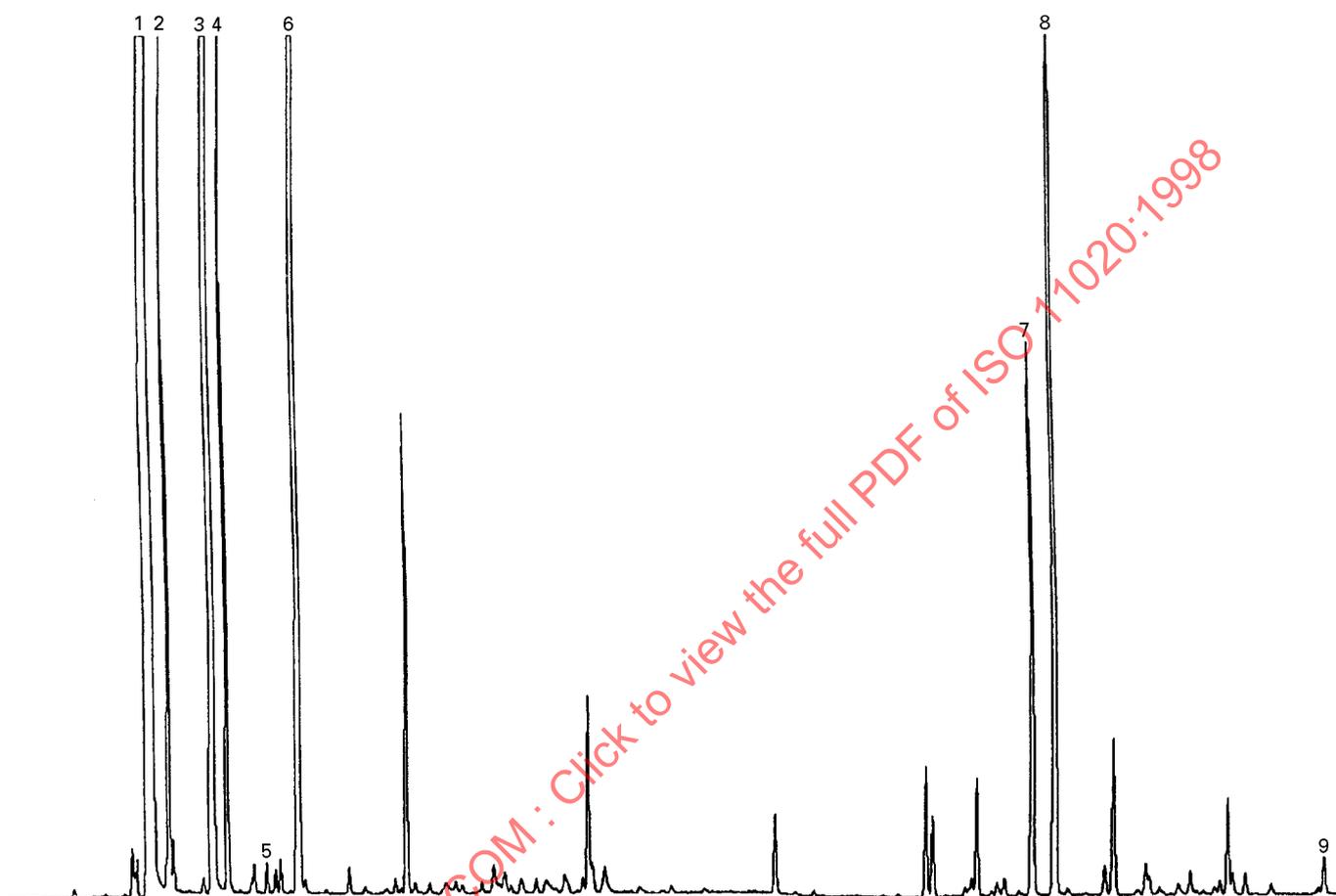
See ISO/TR 210 and ISO/TR 211.

NOTE — This essential oil is particularly prone to oxidation.

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Annex A (informative)

Typical chromatograms of the essential oil of turpentine, Iberian type (*Pinus pinaster* Sol.)



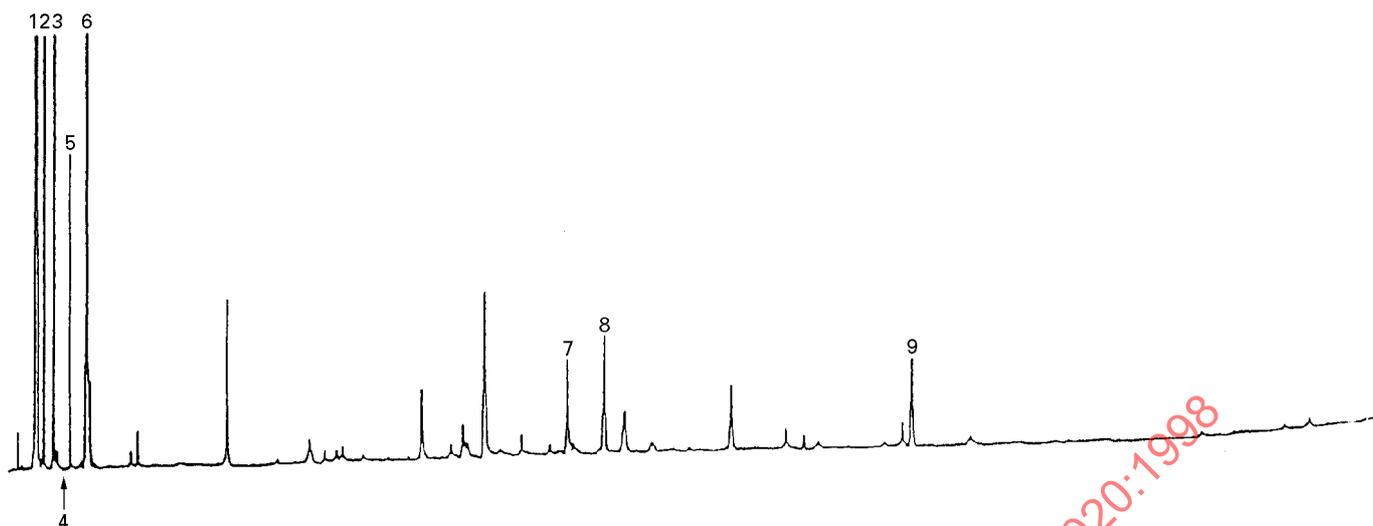
Peak identification

- 1 α -Pinene
- 2 Camphene
- 3 β -Pinene
- 4 Myrcene
- 5 δ -3-Carene
- 6 Limonene
- 7 Longifolene
- 8 β -Caryophyllene
- 9 Caryophyllene oxide

Operating conditions

Column: capillary, in fused silica, length 50 m, internal diameter 0,25 mm
 Stationary phase: 100 % fluid methyl silicon
 Oven temperature: programming temperature, 70 °C to 180 °C, at a rate of 2 °C/min
 Injector temperature: 240 °C
 Detector temperature: 250 °C
 Detector: flame ionization
 Carrier gas: helium
 Volume injected: 0,2 μ l
 Carrier gas flow rate: 1 ml/min.

Figure A.1 — Typical chromatogram taken on an apolar column

**Peak identification**

- 1 α -Pinene
- 2 Camphene
- 3 β -Pinene
- 4 δ -3-Carene
- 5 Myrcene
- 6 Limonene
- 7 Longifolene
- 8 β -Caryophyllene
- 9 Caryophyllene oxide

Operating conditions

Column: capillary, in fused silica, length 50 m, internal diameter 0,22 mm

Stationary phase: polyethylene glycol 20 000

Oven temperature: isotherm at 70 °C for 10 min, then temperature programming from 70 °C to 200 °C at a rate of 1,5 °C/min, followed by final isotherm of 10 min

Injector temperature: 250 °C

Detector temperature: 250 °C

Detector: flame ionization

Carrier gas: hydrogen

Volume injected: 0,20 μ l

Carrier gas flow rate: 2 ml/min.

Figure A.2 — Typical chromatogram taken on a polar column

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Annex B (informative)

Flashpoint

B.1 General information

For reasons of safety, transport companies, insurance companies, people in charge of safety services, etc. require information about the flashpoint of essential oils, which in most cases are inflammable products.

A comparative study on the relevant methods of analysis (see ISO/TR 11018⁸⁾) led to the understanding that it was hard to find a single method for standardization purposes, given that:

- essential oils are varied and their chemical compositions differ to a large extent;
- the volume of the sample needed for certain test equipment is incompatible with the high price of essential oils;
- there are different types of equipment that satisfy

the desired objective, but users cannot be obliged to use one type of equipment rather than another.

Consequently, it was decided to give a mean value for the flashpoint in an informative annex in each International Standard, for information purposes, in order to meet the request of the interested parties.

If possible, the method by which this value was obtained should be specified.

For further information, see ISO/TR 11018⁸⁾.

B.2 Flashpoint of the essential oil of turpentine, Iberian type

The mean value is +38 °C.

NOTE — Obtained with "Setaflash" equipment.

⁸⁾ ISO/TR 11018:1997, *Essential oils — General guidance on the determination of flashpoint.*