

ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION R 150

RAW, REFINED AND BOILED LINSEED OIL

1st EDITION

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BRIEF HISTORY

The ISO Recommendation R 150, *Raw, Refined and Boiled Linseed Oil*, was drawn up by Technical Committee ISO/TC 35, *Paints, Varnishes and Related Products and their Raw Materials*, the Secretariat of which is held by the Nederlands Normalisatie-instituut (NNI).

Work on this question by the Technical Committee began in 1950 and led, in 1958, to the adoption of a Draft ISO Recommendation.

In June 1958, this Draft ISO Recommendation (No. 158) was circulated to all the ISO Member Bodies for enquiry. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies:

Austria	Ireland	Portugal
Burma	Israel	Republic of
Chile	Italy	South Africa
Czechoslovakia	Japan	Romania
Denmark	Mexico	Spain
Germany	Netherlands	Sweden
Greece	New Zealand	U.S.A.
India	Poland	U.S.S.R.

Four Member Bodies opposed the approval of the Draft:

Belgium
Canada
France
United Kingdom

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided, in February 1960, to accept it as an ISO RECOMMENDATION.

RAW, REFINED AND BOILED LINSEED OIL

1. SCOPE

This ISO Recommendation establishes the more important requirements for raw, refined and boiled linseed oils and the methods of test for these requirements.

2. DEFINITIONS

- 2.1** *Raw linseed oil.* The oil obtained solely from mature seeds of linseed (*Linum usitatissimum* L.).
- 2.2** *Refined linseed oil.* The oil obtained by refining raw linseed oil as defined in clause 2.1.
- 2.3** *Boiled linseed oil.* The oil obtained from raw or refined linseed oil as defined in clause 2.1 or 2.2, by the incorporation of driers and by heating with or without blowing with air or oxygen.

3. REQUIRED CHARACTERISTICS AND THEIR TOLERANCES

The raw, refined and boiled linseed oils should have the following characteristics:

Property	Raw linseed oil	Refined linseed oil	Boiled linseed oil	Clause describing test method
Density ⁽¹⁾ ρ_{20} (ρ_{40}) g/ml	0.926 to 0.933 (0.912 to 0.919)	0.926 to 0.933 (0.912 to 0.919)	0.928 to 0.950 (0.914 to 0.936)	5.1
Colour	Not darker than test solution	To be agreed between purchaser and vendor	To be agreed between purchaser and vendor	5.2
Clarity	—	No sediment ⁽²⁾	No sediment ⁽²⁾	5.3
Refractive index ⁽³⁾ n_D^{20} (n_D^{40})	1.4790 to 1.4840 (1.4720 to 1.4770)	1.4785 to 1.4825 (1.4715 to 1.4755)	— —	5.4
Volatile matter, max. %	0.20	0.10	0.20	5.5
Ash, max. %	0.15	0.02 ⁽⁴⁾	⁽⁵⁾	5.6
Acid value, max.	4	acid refined 9 ⁽⁶⁾	8 ⁽⁴⁾	5.7
Saponification value	188 to 195	188 to 195	185 to 200	5.8
Unsaponifiable matter, max. %	1.8	1.5	2.0	5.9
Iodine value, min. (Wijs method) ⁽⁷⁾	175	175	—	5.10
Foots, max. %	1.0	nil	—	5.11
Drying time, max.	—	—	24 h at 15 to 20 °C or 18 h at 25 to 30 °C	5.12
Colophony	negative test	negative test	negative test	5.13
Fish oil	negative test	negative test	negative text	5.14
Mineral acid	—	negative test	—	5.15

⁽¹⁾ The figures between brackets are for use in countries with a tropical climate.
As factor of variation per degree C, 0.000 68 is used.

⁽²⁾ Stricter requirements may be agreed between purchaser and vendor. See also "Foots" and 5.11.

⁽³⁾ The figures between brackets are for use in countries with a tropical climate.
As factor of variation per degree C, 0.000 35 is used.

⁽⁴⁾ Or to be agreed between purchaser and vendor.

⁽⁵⁾ It is recommended that requirements for the ash content be agreed between purchaser and vendor.
The ash may contain metallic oxides.

⁽⁶⁾ The value for alkali refined linseed oil to be agreed between purchaser and vendor.

⁽⁷⁾ Raw or refined linseed oil with an iodine value of over 190 should be designated "high iodine value linseed oil".
If the Hanus method is used, it should be taken into account that this method can give different values from those obtained by the Wijs method.

4. SAMPLING

See ISO Recommendation R . . . , *Sampling Raw Materials for Paints and Varnishes* *.

5. TEST METHODS

5.1 Density

Refer to the Annex A, subject to the provision that ISO recommends that densities, like refractive indices, be quoted at 20 °C (and if necessary at 40 °C in countries with a tropical climate).

5.2 Colour

Prepare a solution of 0.08 g of iodine and 0.8 g of pure potassium iodide (free from iodate) in 100 ml of water. Compare the iodine solution with the oil in identical glass tubes, 1 cm in diameter and about 10 cm long, by viewing them transversely by transmitted light.

5.3 Clarity

The oil is kept at a temperature of 15 to 20 °C for a period of 24 hours and then examined for the presence of sediment and for other insoluble matter. See also 5.11, Foots.

5.4 Refractive index

Refer to the Annex A, subject to the provision that ISO recommends taking the reading at 20 °C (and if necessary at 40 °C in countries with a tropical climate).

5.5 Volatile matter

Weigh about 10 g of oil (m g) with an accuracy of 1 mg into a 200 ml conical flask (diameter of the bottom 73 mm, height 125 mm). Heat the flask for 30 min in an oil bath of 105 to 110 °C, drawing a dry inert gas over the surface of the oil at a rate of 10 litres per hour. Remove the inert gas before weighing. (Loss of mass m_1 g.)

Calculate the percentage of volatile matter (V) with the formula:

$$V = \frac{m_1}{m} \times 100$$

in which

m = mass, in grammes, of the sample

m_1 = loss of mass, in grammes.

5.6 Ash

5.7 Acid value

5.8 Saponification value

} Refer to the Annex A.

5.9 Unsaponifiable matter

Refer to the Annex A.

The solvent to be used should be agreed upon between purchaser and vendor.

5.10 Iodine value

Refer to the Annex A.

* At present Second Draft ISO Recommendation No. 731.

5.11 Foots

5.11.1 Apparatus. The test is carried out in a cone-shaped or a pear-shaped sediment tube (see Fig. 1 and 2 below).

5.11.2 Procedure. Place 100 ml of the oil in the tube and allow it to stand there in a vertical position for 4 days (96 hours) at a temperature between 15 and 20 °C. During this time, the tube should remain undisturbed. At the end of the 4 days (96 hours), read the volume of sediments or foots at the bottom of the tube. Report that value as the percentage of foots, by volume.

Dimensions in millimetres

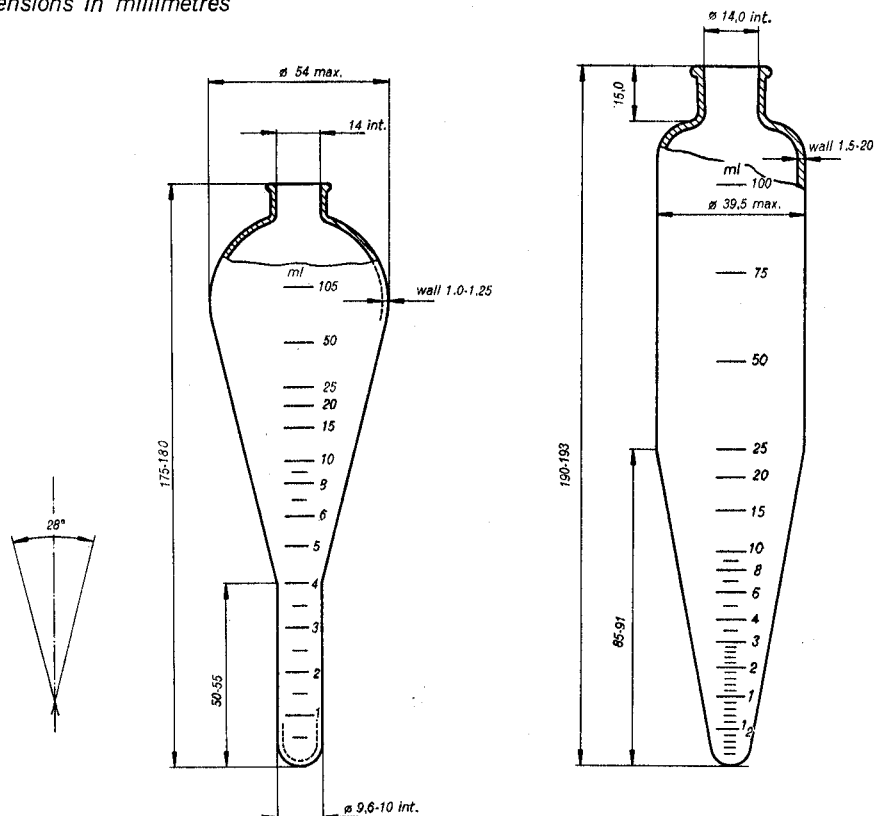


FIG. 1.— Pear-shaped sediment tube

FIG. 2.— Cone-shaped sediment tube

5.12 Drying time

Spread two drops of oil (about 75 mg) with the finger evenly over the whole surface of a glass panel, dimensions 9 cm × 12 cm.

Place the panel in diffuse daylight in a room at a temperature between 15 and 20 °C and at a relative humidity between 60 and 70%.

The end of the drying time is when clean sand, graded so as to pass a sieve with a width of aperture of 0.315 mm, but to be retained on a sieve with a width of aperture of 0.160 mm, placed on the surface of the panel and allowed to remain there for a minute, can be removed by means of a camel-hair brush without injury to the oil film.