
**Animal and vegetable fats and oils —
Determination of melting point in
open capillary tubes — Slip point**

*Corps gras d'origines animale et végétale — Détermination du point
de fusion en tube capillaire ouvert — Point de glissement*

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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).

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).

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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 11, *Animal and vegetable fats and oils*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 307, *Oilseeds, vegetable and animal fats and oils and their by-products — Methods of sampling and analysis*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 6321:2002), which has been technically revised.

The main changes compared to the previous edition are as follows:

- the requirement to measure the diameters of each capillary tube has been removed, and
- a footnote stating suggested suppliers of suitable capillary tubes has been included.

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.

Animal and vegetable fats and oils — Determination of melting point in open capillary tubes — Slip point

1 Scope

This document specifies two methods for the determination of the melting point in open capillary tubes, commonly known as the slip melting point, of animal and vegetable fats and oils (referred to as fats hereinafter).

- Method A is only applicable to animal and vegetable fats which are solid at ambient temperature and which do not exhibit pronounced polymorphism.
- Method B is applicable to all animal and vegetable fats which are solid at ambient temperature and is the method to be used for fats whose polymorphic behaviour is unknown.

For the determination of the slip melting point of palm oil samples the method given in [Annex A](#) shall be used.

NOTE 1 If applied to fats with pronounced polymorphism, method A will give different and less satisfactory results than method B.

NOTE 2 Fats which exhibit pronounced polymorphism are principally cocoa butter and fats containing appreciable quantities of 2-unsaturated, 1,3-saturated triacylglycerols.

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 661, *Animal and vegetable fats and oils — Preparation of test sample*

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 <https://www.electropedia.org/>

3.1

slip melting point in open capillary tube

temperature at which a column of fat in an open capillary tube commences to rise under the conditions specified in this document

4 Principle

A capillary tube containing a column of the fat which has been crystallized under controlled conditions is immersed to a specified depth in water, the temperature of which is increased at a specified rate. The temperature at which the column is observed to start rising in the capillary tube is recorded.

5 Apparatus

Usual laboratory apparatus and, in particular, the following.

5.1 Capillary tubes, having uniform walls and which are open at both ends, of internal diameter 0,9 mm to 1,2 mm, external diameter 1,2 mm to 1,6 mm, wall thickness 0,15 mm to 0,30 mm and length 50 mm to 70 mm¹⁾.

Before use, clean the tubes thoroughly by washing them successively with a mixture of chromic acid, water and acetone or an alternative suitable cleaning solution, for example, hydrogen peroxide can be used. Dry the capillary tubes in an oven. However, it is recommended that new tubes are used.

5.2 Thermometer, graduated in divisions of 0,1 °C, calibrated over the range of melting points expected.

5.3 Stirrer, electrical.

5.4 Cooling bath, filled with brine or other non-freezing liquid, thermostatically maintained at a temperature of -10 °C to -12 °C, or filled with a mixture of flaked ice and salt (in the proportions 2 to 1 by mass) at a temperature of -10 °C to -12 °C.

5.5 Heating apparatus, consisting of the following elements:

- a) **water jacket**, made of glass, provided with inlet and outlet tubes, and having the shape and dimensions shown in [Figure 1](#);
- b) **water heater**, capable of delivering a slow stream of water, the temperature of which can be controlled to increase at a rate of between 0,5 °C/min and 4 °C/min, through the water jacket [[5.5 a](#))].

An example of a suitable heating apparatus is shown in [Figure 2](#).

Other types of heating apparatus, such as a water bath with magnetic stirrer, capable of being controlled to produce the specified temperature rise [[5.5 b](#))], may also be used.

1) Reference 1411022 from Hilgenberg (<https://www.hilgenberg-gmbh.de/innovative-glasprodukte/>), Reference 2930201 from Marienfeld (<https://www.marienfeld-superior.com/home.html>) and Reference 9201570 from Hirschmann (<http://www.hirschmann-laborgeraete.de/>) are examples of suitable products from providers of capillary tubes. This information is given for the convenience of users of this document and does not constitute an endorsement by ISO of products by these providers.