

Rubber compounding ingredients — Stearic acid — Definition and test methods

ICS 83.040.20

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Summary of pages

This document comprises a front cover, an inside front cover, the ISO title page, pages ii and iii, a blank page, pages 1 to 21 and a back cover.

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This British Standard, having been prepared under the direction of the Sector Committee for Materials and Chemicals, was published under the authority of the Standards Committee and comes into effect on 15 March 2000

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ISBN 0 580 34346 4

Amendments issued since publication

Amd. No.	Date	Comments

Rubber compounding ingredients — Stearic acid — Definition and test methods

Ingrédients de mélange du caoutchouc — Acide stéarique — Définition et méthodes d'essai



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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

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 8312 was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 3, *Raw materials (including latex) for use in the rubber industry*.

It cancels and replaces ISO 8312-1:1988, which has been technically revised.

Annexes A to K form a normative part of this International Standard. Annex L is for information only.

Rubber compounding ingredients — Stearic acid — Definition and test methods

WARNING — Persons using this International Standard should be familiar with normal laboratory practice. This standard does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to ensure compliance with any national regulatory conditions.

1 Scope

1.1 This International Standard defines stearic acid (including blends of stearic and palmitic acid) for use as a compounding ingredient in the rubber industry and specifies the test methods for describing its properties.

1.2 Classification of stearic acid and stearic acid/palmitic acid blends according to iodine value and typical chemical and physical properties for such materials for use in the rubber industry are given in annex L. This annex is given for information only.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 660:1996, *Animal and vegetable fats and oils — Determination of acid value and acidity.*

ISO 662:1998, *Animal and vegetable fats and oils — Determination of moisture and volatile matter content.*

ISO 935:1988, *Animal and vegetable fats and oils — Determination of titre.*

ISO 1042:1998, *Laboratory glassware — One-mark volumetric flasks.*

ISO 3596-1:1988, *Animal and vegetable fats and oils — Determination of unsaponifiable matter — Part 1: Method using diethyl ether extraction (Reference method).*

ISO 3596-2:1988, *Animal and vegetable fats and oils — Determination of unsaponifiable matter — Part 2: Rapid method using hexane extraction.*

ISO 3657:1988, *Animal and vegetable fats and oils — Determination of saponification value.*

ISO 3961:1996, *Animal and vegetable fats and oils — Determination of iodine value.*

ISO 4058:1977, *Magnesium and its alloys — Determination of nickel — Photometric method using dimethylglyoxime.*

ISO 5508:1990, *Animal and vegetable fats and oils — Analysis by gas chromatography of methyl esters of fatty acids.*

ISO 5509:—¹⁾, *Animal and vegetable fats and oils — Preparation of methyl esters of fatty acids.*

ISO 5794-1:1994, *Rubber compounding ingredients — Silica, precipitated, hydrated — Part 1: Non-rubber tests.*

ISO 6685:1982, *Chemical products for industrial use — General method for determination of iron content — 1,10-Phenanthroline spectrophotometric method.*

ISO 7780:1998, *Rubber and rubber latices — Determination of manganese content — Sodium periodate photometric methods.*

ISO 8053:1995, *Rubber and latex — Determination of copper content — Photometric method.*

ISO 15528:—²⁾, *Paints, varnishes and raw materials for paints and varnishes — Sampling.*

3 Term and definition

For the purposes of this International Standard, the following term and definition apply:

3.1

stearic acid (for use in the rubber industry)

a mixture of straight-chain saturated fatty acids composed substantially of stearic acid in the form $C_{17}H_{35}COOH$ and palmitic acid in the form $C_{15}H_{31}COOH$

4 Sampling

Sampling shall be carried out in accordance with ISO 15528, using a stainless-steel sampling device.

5 Physical and chemical properties

The physical and chemical properties shall be determined by the methods of test listed in Table 1.

1) To be published. (Revision of ISO 5509:1978)

2) To be published. (Revision of ISO 842:1984 and ISO 1512:1991)

Table 1 — List of physical and chemical properties of stearic acid and the methods used for their determination

Property	Test method
Acid value, mg KOH/g	ISO 660
Saponification value, mg KOH/g	ISO 3657
Titre value, °C	ISO 935
Fatty acids, C ₁₆ – C ₁₈ , including unsaturates, % (m/m) total	ISO 5508 and ISO 5509
Matter volatile at 105 °C ± 3 °C, % (m/m)	ISO 662, oven method
Ash at 550 °C ± 25 °C, % (m/m)	Annex A
Iodine value, g/100 g	ISO 3961
Mineral acidity, cm ³ /100 g	Annex F
Copper, mg/kg	Annex B or G ^a
Manganese, mg/kg	Annex C or H ^a
Iron, mg/kg	Annex D or J ^a
Unsaponifiable matter, % (m/m)	ISO 3596-1 or ISO 3596-2
Nickel, mg/kg	Annex E or K ^a
^a For speed and simplicity, the methods given in annexes B, C, D and E are recommended. Where an atomic absorption spectrometer is not available, the molecular absorption spectrometric methods given in annexes G, H, J and K may be used.	

6 Test report

The test report shall include the following information:

- a) all details necessary for complete identification of the product tested;
- b) a reference to this International Standard (ISO 8312);
- c) the results obtained:
 - 1) percentage ash w_A , from A.4,
 - 2) copper content w_{Cu} , from B.6 or from annex G (state the method used),
 - 3) manganese content w_{Mn} , from C.6 or from annex H (state the method used),
 - 4) iron content w_{Fe} , from D.6 or from annex J (state the method used),
 - 5) nickel content, w_{Ni} , from E.6 or from annex K (state the method used),
 - 6) mineral acidity, N_{ma} , from F.5,
 - 7) the results of other tests which may have been performed (see Table 1);
- d) any unusual features noted during the determinations;
- e) any operations not included in this International Standard, or in the other International Standards cited, which might have affected the results;
- f) the dates of the tests.