DEAS 847-4: 2025

ICS 71.100.70

# DRAFT EAST AFRICAN STANDARD

## Cosmetics — Analytical methods — Part 4: Determination of acid value and free fatty acids



## EAST AFRICAN COMMUNITY



Second Edition 2025

## Copyright notice

# Foreword

Development of the East African Standards has been necessitated by the need for harmonizing requirements governing quality of products and services in the East African Community. It is envisaged that through harmonized standardization, trade barriers that are encountered when goods and services are exchanged within the Community will be removed.

The Community has established an East African Standards Committee (EASC) mandated to develop and issue East African Standards (EAS). The Committee is composed of representatives of the National Standards Bodies in Partner States, together with the representatives from the public and private sector organizations in the community.

East African Standards are developed through Technical Committees that are representative of key stakeholders including government, academia, consumer groups, private sector and other interested parties. Draft East African Standards are circulated to stakeholders through the National Standards Bodies in the Partner States. The comments received are discussed and incorporated before finalization of standards, in accordance with the Principles and procedures for development of East African Standards.

East African Standards are subject to review, to keep pace with technological advances. Users of the East African Standards are therefore expected to ensure that they always have the latest versions of the standards they are implementing.

The committee responsible for this document is Technical Committee EASC/TC 071, *Cosmetics and related products*

Attention is drawn to the possibility that some of the elements of this document may be subject of patent rights. EAC shall not be held responsible for identifying any or all such patent rights.

This second edition cancels and replaces the first edition (EAS 847-4:2017), which has been technically revised.

EAS 847 consists of the following parts, under the general title *Cosmetics — Analytical methods*:

— *Part 1: Glossary of terms*

— *Part 2 : Determination of moisture content and volatile matter content*

— *Part 3: Determination of insoluble impurities*

— *Part 4: Determination of acid value and free fatty acids*

— *Part 5: Determination of unsaponifiable matter*

— *Part 6: Determination of melting point*

— *Part 7: Determination of specific gravity*

— *Part 8: Titre test*

— *Part 9: Determination of colour*

— *Part 10: Determination of acetyl value and hydroxyl value*

— *Part 11:Determination of allyl isothiocyanate*

— *Part 12:Determination of flash point by Pensky – Martens Closed Cap Tester*

— *Part 13 :Determination of rancidity*



 

— *Part 14: Determination of Polenske value*

— *Part 15 :Determination of ash content*

— *Part 16: Determination of lead, mercury and arsenic content*

— *Part 17: Determination of pH*

— *Part 18: Determination of thermal stability*

— *Part 19: Determination of non-ionic, anionic and cationic surfactant content*

— *Part 20: Determination of lather volume (foaming power)*

— *Part 21: Determination of free acid in oils*

— *Part 22: Determination of sulphur and sulphides in oils*

— *Part 23:Test for absence of grit in powders*

— *Part 24:Determination of matter insoluble in boiling water*

— *Part 25: Determination of fineness*

— *Part 26: Determination of boric acid*

— *Part 27: Determination of total fatty substance by gravimetric method*

— *Part 28: Determination of free caustic alkali*.

# Cosmetics — Analytical methods — Part 4: Determination of acid value and free fatty acids

## 1 Scope

This Draft East African Standard prescribes the test method for the determination of acid value and free fatty acids in oils and fats for cosmetic industry.

## 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

EAS 847-1, Cosmetics — Analytical methods — Part 1: Glossary of terms

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EAS 847-1 apply. ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at http://www.iso.org/obp

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

## 4 Test method

### 4.1 Principle

The acid value is determined by directly titrating the material in an alcoholic medium with aqueous sodium or potassium hydroxide solution. Free fatty acid is calculated as oleic, lauric, ricinoleic or palmitic acids.

### 4 2 Reagents

#### 4 2.1 Ethyl alcohol, absolute ethanol, or rectified spirit neutral to phenolphthalein indicator

**4.2.2** Phenolphthalein indicator solution, dissolve 1 g of phenolphthalein in 100 mL of ethyl alcohol.

NOTE When testing oils which give dark coloured solution, the observation of the end point of the titration may be facilitated either

a) by using thymolphthalein or alkali blue 6B in place of phenolphthalein; or

b) by adding 1 mL of 0.1 % (w/v) solution of methylene blue in water to each 100 mL of phenolphthalein indicator solution before the titration.



 

**4 2.3 Standard aqueous potassium hydroxide or sodium hydroxide solutions**, 0.1 N or 0.5 N

## 4.3 Procedure

Mix the oil thoroughly before weighing. Weigh accurately a suitable quantity of the cooled oil in a 250-mL conical flask. The weight of the oil taken for the test and the strength of the alkali used for the titration shall be such that the volume of alkali required for the titration does not exceed 10 mL. Add 50 mL - 100 mL of freshly neutralized hot ethyl alcohol, and about 1 mL of phenolphthalein indicator solution. Boil the mixture for about Warm for 1 min and titrate while as hot as possible with standard aqueous alkali solution, shaking vigorously during titration.

## 4.4 Calculation

### 4.4.1 Acid value

a) The acid value, expressed in milligrams per gram, when using potassium hydroxide, (KOH) shall be calculated using the formula below:

$$\frac{56.1\,VN}{M}$$

b) The acid value , expressed in milligrams per gram, when using sodium hydroxide shall be calculated using the formula below:

$$\frac{40\,VN}{M}$$

where

*V* is the volume, in millilitres, of standard potassium hydroxide or sodium hydroxide solution used,

*N* is the normality of standard potassium hydroxide or sodium hydroxide solution, and

*M* is the mass, in grams, of the material taken for the test.

### 4.4.2 Free fatty acids

**4.4.2.1** The acidity is frequently expressed as the percentage of free acids present in the sample. The percentage of free fatty acids in most of the oils and fats is calculated on the basis of oleic acid; although in coconut oil and palm kernel oil it is often calculated in terms of lauric acid, in castor oil in terms of ricinoleic acid, and in palm oil in terms of palmitic acid.

**4.4.2.2** Different fatty acids shall be expressed as follows:

a) Free fatty acids, in terms of oleic acid, expressed in percent by mass, shall be calculated using the formula below:

$$\frac{28.2\,VN}{M}$$

b) Free fatty acids, in terms of lauric acid, expressed in percent by mass, shall be calculated using the formula below:

$$\frac{20.0\,VN}{M}$$



 

c) Free fatty acids, in terms of ricinoleic acid, expressed in percent by mass, shall be calculated using the formula below:

$$\frac{29.8\,VN}{M}$$

d) Free fatty acids, in terms of palmitic acid, expressed in percent by mass, shall be calculated using the formula below:

$$\frac{25.6\ VN}{M}$$

where

*V* is the volume in millilitres, of standard potassium hydroxide solution used;

*N* is the normality of standard potassium hydroxide solution; and

*M* is the mass, in grams, of the material taken for the test.

# Bibliography

EAS 847-4: 2017, *Cosmetics — Analytical methods — Part 4: Determination of acid value and free fatty acids.*