



**RWANDA
STANDARD**

**DRS
489-5**

Second edition

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**Oils for cosmetic use — Specification
Part 5: Macadamia oil**

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Foreword

Rwanda Standards are prepared by Technical Committees and approved by Rwanda Standards Board (RSB) Board of Directors in accordance with the procedures of RSB, in compliance with Annex 3 of the WTO/TBT agreement on the preparation, adoption and application of standards.

The main task of technical committees is to prepare national standards. Final Draft Rwanda Standards adopted by Technical committees are ratified by members of RSB Board of Directors for publication and gazettment as Rwanda Standards.

DRS489-5 was prepared by Technical Committee RSB/TC 011, *Cosmetics and related products*.

This edition cancels and replaces the first edition of RS 380:2018, of which has been technically revised.

DRS 489 consists of the following parts, under the general title *Oils for cosmetic use — Specification*:

- Part 1: *Baobab seed oil*
- Part 2: *Chia seeds oil*
- Part 3: *Passion fruits (maracuja) seed oil*
- Part 4: *Castor oil*

Committee membership

The following organizations were represented on the Technical Committee on *Cosmetics and related products* (RSB/TC 011) in the preparation of this standard.

Paragraph of participants

University of Rwanda -College of Science and Technology (UR-CST)

Rwanda Food and Drugs Authority (Rwanda-FDA)

Rwanda Inspectorate, Competition and Consumer Protection Authority (RICA)

Rwanda Forensic Laboratory (RFL)

Kipharma

SULFO Industries Rwanda

ORIBUT Company Ltd

Uburanga products

Rwanda Medical Supply (RMS)

Rwanda Standards Board(RSB) – Secretariat

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Introduction

Oils and fats are among the most important cosmetic ingredients and are frequently used for a variety of external applications. They can be used directly as skin and hair care products but also as the basic substances for the manufacture of cosmetic products. Many of the cosmetic and hair care products on the market today rely on hydrocarbon molecules, derived from either mineral or vegetable oils, to provide antistatic, plasticiser and viscosity properties.

Macadamia nuts contain over 75 % of their weight as oil, the remainder is: 9.0 % proteins, 9.3 % carbohydrates, 1.5 % moisture, 1.6 % mineral matters and 2.0 % fiber. The kernels of macadamia contain vitamin A1, B1, B2, niacin and essential elements such as calcium, iron, phosphorus, magnesium and potassium. The oil is a triglyceride oil and contains primarily monounsaturated fats ranging from 80 % up to 84 %. Macadamia oil contains the highest percentage of mono-unsaturates when compared to both olive and canola oils.

Palmitoleic acid at such a high concentration is rarely found in vegetable oils. This fatty acid is mostly found in fish oils. Palmitoleic acid is found in macadamia oil in concentrations as high as 21 %. Derivatives of macadamia oil in cosmetics include the light emollient ethyl macadamiate and water-soluble PEG-16 macadamia glycerides.

Polarity of the oil phase has a great influence on the formulation and properties of the cosmetic emulsions. Polarity of the oil phase is considered as an essential factor for the stability of water-in-oil emulsions. Polarity of macadamia nut oil was found to be $525.50 \text{ nm} \pm 0.29 \text{ nm (SE)}$. This is considered as highly polar. Polar oils may enhance solubility of oil soluble cosmetic ingredients. Heat stability of emulsions prepared with strongly polar and non-polar oils were found to give emulsions with poor stability which is generally experienced with natural oils.

Macadamia oil is an excellent botanical replacement for mink oil in most applications. It is also used for hair.

Oils for cosmetic use industry — Specification— Part 5:Macadamia oil

1 Scope

This Draft Rwanda Standard specifies the requirements, sampling and test methods for macadamia oil 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.

RS EAS 346, *Labelling of cosmetics — General requirements*

RS EAS 846, *Glossary of terms relating to the cosmetic industry*

RS EAS 847-2, *Cosmetics — Analytical methods — Part 2: Determination of moisture content and volatile matter content*

RS EAS 847-5, *Cosmetics — Analytical methods — Part 5: Determination of unsaponifiable matter*

RS EAS 847-7, *Cosmetics — Analytical methods — Part 7: Determination of specific gravity*

RS EAS 847-9, *Cosmetics — Analytical methods — Part 9: Determination of colour*

RS EAS 847-10, *Cosmetics — Analytical methods — Part 10: Determination of acetyl value and hydroxyl value*

RS EAS 847-12, *Cosmetics — Analytical methods — Part 12: Determination of flash point by Pensky — Martens Closed Cap Tester*

RS EAS 847-13, *Cosmetics — Analytical methods — Part 13: Determination of rancidity*

RS EAS 847-16, *Cosmetics — Analytical methods — Part 16: Determination of lead, mercury and arsenic content*

RS ISO 660, *Animal and vegetable fats and oils — Determination of acid value and acidity*

RS ISO 663, *Animal and vegetable fats and oils — Determination of insoluble impurities content*

RS ISO 3657, *Animal and vegetable fats and oils — Determination of saponification value*

RS ISO 3961, *Animal and vegetable fats and oils — Determination of iodine value*

RS ISO 6320, *Animal and vegetable fats and oils — Determination of refractive index*

RS ISO 24153, *Random sampling and randomisation procedures*

3 Terms and definitions

For the purposes of this standard, the terms and definitions given in RS 846 and the following apply.

3.1

macadamia oil or macadamia nut oil

non-volatile oil expressed from the nutmeat of the macadamia (*Macadamia integrifolia*) tree, a native Australian nut

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4 Requirements

4.1 General requirements

4.1.1 The product shall be macadamia oil obtained from the nut meat of the macadamia tree (*Macadamia integrifolia*), by a process of cold expression, followed by a full refining process to render an oil which is light in color and mild in odor.

4.1.2 When examined visually, the product shall be clear and free from sediments and other foreign matter, separated water and added colouring and flavouring substances.

4.1.3 The product shall be free from admixture with other oils.

4.2 Specific requirements

4.2.1 Macadamia oil shall comply with the specific requirements given in Table 1 when tested in accordance with the test methods specified therein.

Table 1— Specific requirements for macadamia oil for cosmetic industry

S/N	Characteristic	Requirement	Test method
i.	Moisture content, % m/m, max.	0.5	RS EAS 847-2
ii.	Insoluble impurities, % m/m, max.	0.25	RS ISO 663
iii.	Colour in a 1" cell on the Lovibond scale, expressed as Y + 5R, max. deepness	4.0	RS EAS 847-9
iv.	Refractive index at 20°C, range	1.4660 – 1.4700	RS ISO 6320
v.	Specific gravity at 30/30°C, range	0.924 -0.930	RS EAS 847-7
vi.	Saponification value, range	190–200	RS ISO 3657
vii.	Iodine value, range	70–80	RS ISO 3961
viii.	Acid value, max.	1.0	RS ISO 660
ix.	Unsaponifiable matter, % m/m, max.	1.5	RS EAS 847-5
x.	Acetyl value, min	143	RS EAS 847-10
xi.	Flash point, °C(Pensky Martens closed), min.	300	RS EAS 847-12
xii.	Test for rancidity	Shall be free from rancidity	RS EAS 847-13
xiii.	Critical solution temperature, °C, max	0	Annex A

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4.2.2 heavy metals contaminants

Macadamia oil shall comply with the limits for heavy metal contaminants in accordance with Table 2 when tested in accordance with the test methods specified therein.

Table 2— Limits of heavy metals contaminants for macadamia oil

S/N	Characteristics	Requirements mg/kg, max	Test method
i.	Lead	10	RS EAS 847-16
ii.	Arsenic	2	
iii.	Mercury	2	
NOTE1 The total amount of heavy metals as lead, mercury and arsenic, in combination, in the finished product should not exceed 10 mg/kg.			
NOTE 2 The heavy metals including lead, mercury and arsenic may be as a result of contamination during processing and should not be deliberately added as ingredients			

5 Packaging

The product shall be packaged in suitable well-sealed containers that shall protect the contents and shall not cause any contamination or react with the products.

6 Labelling

6.1 In addition to the requirements of RS EAS 346, the Material Safety Data Sheet shall be provided.

6.2 The phrase **'For external use only'** shall be conspicuously marked (either printed on the label affixed to the container, or lithographed, or stenciled thereon with indelible ink).

7 Sampling

Sampling of the product shall be done in accordance with RS 278.

Annex A
(normative)

Determination of critical solution temperature

A.1 Reagent

The reagent shall be prepared by diluting ethyl alcohol or rectified spirit with distilled water till the relative density of the mixture at 15.5 °C is 0.8303 ± 0.0001 , when compared with distilled water at the same temperature. De-natured alcohol shall not be used for this test.

A.2 Procedure

Mix in a test tube, 1.0 g of the oil, with 4.15 times its mass of the reagent. Upon examination, the solution thus obtained shall be perfectly clear at 20 °C and shall remain clear when cooled and maintained for 5 minutes at a temperature of 0 °C.

Bibliography

[1] RS 380:2018, *Macadamia oil for cosmetic industry— Specification*

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