

## TECHNICAL DATA SHEET

**Product Name:** Macadamia Oil

**INCI name:** Macadamia Ternifolia Seed Oil

**CAS:** 128497-20-1

**Latin name (botanical):** Macadamia ternifolia

**Synonyms:** Macadamia Oil, Macadamia Nut Oil, Macadamia Seed Oil, Macadamia Ternifolia Seed Oil, macedonian: makadamiski maslo, slovenian: makadamijevo olje, hungarian: makadám-dió olaj, romanian: ulei de macadamia, german: Macadamiaöl

**Chemical classification:** Fats and Oils

**Functional category:** Skin and hair conditioning agent ~ Emollient

**Extraction method:** Expeller-pressed (cold-pressed using a mechanical press)

**Processing type:** RBD

**Description:** Macadamia oil is a stable vegetable oil obtained by mechanical pressing of Macadamia ternifolia seeds. It is rich in oleic and palmitoleic acids, making its composition highly similar to skin lipids. It has a light texture, absorbs quickly, and forms a pleasant emollient film that softens the skin without a heavy feel. In formulations, it improves elasticity and helps restore the hydrolipid barrier, while natural antioxidants provide stability and resistance to oxidative stress. It is particularly suitable for products intended for dry, sensitive, and mature skin, as well as for hair care, where it restores shine and smoothness without weighing the hair down. Its mild soothing effect helps reduce irritation, and it often improves the tolerability of formulations containing active ingredients. Typical usage levels range from 1% to 100%, depending on the product type and desired texture. The Cosmetic Ingredient Review (CIR) considers macadamia oil safe for cosmetic use and reports no irritation or sensitization potential at recommended concentrations. At room temperature, it is liquid with a mild nutty odor. It is refined, filtered, and highly resistant to oxidation. HLB value is 7.

**Bioactive compounds:** Macadamia oil contains a characteristic combination of bioactive

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components that determine its functionality in cosmetic formulations. The most significant group consists of fatty acids, primarily oleic, palmitoleic, palmitic, stearic, linoleic, and arachidic acids, making its lipid profile highly compatible with the physiology of the skin barrier. Palmitoleic acid is particularly important as it naturally occurs in human sebum and supports epidermal integrity. The oil also contains natural tocopherols, predominantly  $\alpha$ -tocopherol with smaller amounts of  $\gamma$ -tocopherol, contributing to antioxidant stability and protection against peroxidation. Tocotrienols are also present and further enhance antioxidant activity. The oil contains squalene, a key component of sebum, acting as a powerful emollient and antioxidant. Trace amounts of phytosterols, mainly  $\beta$ -sitosterol, campesterol, and stigmasterol, contribute to barrier repair, reduce redness, and stabilize the lipid structure of the skin surface. Minor fractions include polyphenolic compounds and natural waxes that enhance skin protection and improve formulation texture. This phytochemical profile explains the oil's strong emollient properties, stability, and contribution to a pleasant sensory profile in finished cosmetic products.

### Benefits:

- Improves skin elasticity
- Soothes irritation and dryness
- Strengthens the hydrolipid barrier
- Acts as a powerful antioxidant
- Reduces oxidative stress
- Adds shine and smoothness to hair
- Softens and hydrates the skin
- Improves formulation texture

**Directions for use:** Macadamia oil is incorporated into the oil phase or added at the end of the formulation. In creams and lotions, it is typically used at 3%–10%, while in oil-based serums it is used at 5%–30%, depending on the desired texture. In lip balms and solid formulations, it can be used at 5%–20%, and in hair treatments, oils, and masks at 2%–10%. It can also be applied directly to skin and hair in its pure form. For external use only.

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**Animal testing:** In accordance with EU Regulation (EC) No. 1223/2009 on cosmetic products, the substance has not been tested on animals. Safety assessment is based on available toxicological data, scientific literature, and validated alternative methods (in vitro and in silico). "In silico" refers to testing methods performed using computer models and simulations rather than live organisms (in vivo) or cell cultures (in vitro). This statement confirms compliance with the ban on animal testing and is provided for informational purposes only.

**GMO:** Non-GMO

**Vegan:** Does not contain ingredients of animal origin

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