Import and distribution for Serbia: Farmadria DOO
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TECHNICAL DATA SHEET

Product Name: Nettle Infused Oil

INCI name: Urtica Dioica Leaf Extract, Helianthus Annuus Seed Oil, Prunus Amygdalus Dulcis Oil, Tocopherol

CAS: 84012-40-8, 8001-21-6, 8007-69-0, 59-02-9

Latin name: Urtica dioica L.

Functional category: Skin care agent ~ occlusive, Skin conditioning agent ~ emollient, Antioxidant

Maceration type: Ultrasonic maceration, cold-process.

Method of production: Infused nettle leaf oil is obtained by ultrasonic extraction using ultrasound at frequencies of 20–25 kHz. At these frequencies, ultrasonic waves generate microscopic bubbles in the oil containing the plant material, leading to the phenomenon known as cavitation. Cavitation creates extreme micro-conditions of high pressure and temperature around the imploding bubbles. These conditions mechanically break down plant cell walls, releasing active components such as essential oils, flavonoids, carotenoids, and sterols. Extraction is performed at 25°C to preserve thermolabile compounds. Cold-pressed linoleic-type sunflower oil is used as the carrier oil, providing a high content of essential linoleic acid and a smaller proportion of oleic acid, along with sweet almond oil. Vitamin E is added as a natural antioxidant, helping the oil retain freshness and quality while remaining fully natural. During extraction, the vessel containing the suspension is cooled in an ice bath to prevent temperature increase. Ultrasonic treatment is applied in short intervals with pauses. After completion, the infused oil is filtered to obtain a clear, usable product. This method is more efficient than traditional maceration because it ensures better utilization of plant material and shorter extraction time.

Description: The oil has a mild herbal aroma and a greenish-yellow color, which varies depending on extraction intensity and the quality of the plant material. Sunflower oil acts as a light carrier rich in linoleic acid, while almond oil enhances emollient properties and improves spreadability. Tocopherol further stabilizes the product by protecting unsaturated fatty acids from oxidation and extending its functional longevity. Nettle-in-

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fused oil is used in formulations intended for skin prone to flaking, irritation, and mild inflammation, as Urtica dioica possesses astringent, soothing, and remineralizing properties. Due to its bioactive components, the oil is commonly applied in products for oily and blemish-prone skin, as well as in scalp and hair treatments especially serums, lotions, and oil blends aimed at strengthening follicles and reducing hair loss. On the skin, it primarily acts as an emollient and occlusive, forming a protective film that reduces transepidermal water loss while remaining lightweight enough for daily use. It is particularly suitable for formulations intended for sensitive regions, such as the area around the eyes. Thanks to its natural origin, good tolerability, and mild action, nettle leaf infused oil is especially recommended for natural cosmetics, children's products, and formulations for sensitive and reactive skin.

Bioactive compounds: The key phytochemicals present in nettle leaf infused oil include polyphenols, flavonoids, phytosterols, chlorophyll, carotenoids, fat-soluble vitamins, as well as certain organic acids and triterpenes. The main flavonoids quercetin, kaempferol, and isorhamnetin are known for their antioxidant, anti-inflammatory, and capillary-protective effects. These molecules shield the skin from oxidative stress, soothe irritated areas, and can mildly reduce redness. Phenolic acids, particularly caffeic and ferulic acid, further protect skin lipids from peroxidation and exhibit notable photoprotective potential. Carotenoids such as beta-carotene and lutein are also present, contributing to skin barrier reinforcement and to the oil's color stability. Chlorophyll, partially extracted during the process, offers mild antiseptic activity and supports skin revitalization. Among lipophilic vitamins, the most significant are vitamin E (tocopherol) and provitamin A (retinoid precursors), which synergize with flavonoids to strengthen antioxidant protection. Phytosterols including beta-sitosterol, campesterol, and stigmasterol act as emollients, reducing inflammation, supporting epidermal regeneration, and promoting repair of the impaired skin barrier. Trace amounts of organically bound silicon may contribute to connective-tissue strength and collagen support, though in limited amounts in oil infusions. The oil also contains small quantities of lignans and tannins, which may provide mild astringent effects and help stabilize seborrheic skin. Triterpenes such as ursolic and oleanolic acid, present in lower concentrations, show potential in regulating keratinization and alleviating micro-inflammatory processes.

Benefits:

- Provides antioxidant protection against free-radical damage.

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- Soothes inflammation and reduces skin irritation.
- Strengthens capillaries and improves microcirculation.
- Protects skin lipids from oxidation and supports barrier integrity.
- Offers mild photoprotective effects.
- Reinforces the skin barrier and reduces transepidermal water loss.
- Revitalizes the skin and improves tone and texture.
- Hydrates and softens the skin due to its emollient properties.
- Supports skin regeneration and epidermal repair.
- Helps regulate sebum production in oily and blemish-prone skin.
- Supports scalp health and strengthens hair roots.
- Reduces redness and discomfort on sensitive skin.
- Improves stability in seborrheic skin.
- May help regulate keratinization and reduce micro-inflammation.
- Provides gentle protection suitable for sensitive regions.

Usage: Infused nettle leaf oil is used as a functional oil component in various cosmetic formulations, with concentration adjusted according to product type and desired effect. In facial and body emulsions, recommended usage ranges from 3% to 10%, where it acts as a mild emollient and carrier of bioactive compounds. In facial or scalp oil serums and treatment blends, concentrations may range from 10% to 100% when used as the main active oil. In hair formulations such as oil masks, scalp lotions, or pre-wash treatments, it is typically used between 5% and 20%, depending on whether it is combined with other oils. For products intended for sensitive skin, including areas such as the region around the eyes, lower levels between 2% and 5% are recommended to maintain tolerability. The oil may be incorporated into the oil phase of emulsions, used in anhydrous formulations, or applied directly to damp skin or scalp. Due to its natural tocopherol content and antioxidant profile, it remains stable with proper storage and does not require additional preservatives when used in pure oil blends.

Animal testing: Not tested on animals

GMO: Non-GMO

Vegan: Contains no animal-derived components