Avena Lab
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info@avenalab.com
+381 (0) 69 / 55 65 029
www.avenalab.com

# TECHNICAL DATA SHEET

## Birch Leaf Infused Oil

**Product Name:** Birch Leaf Infused Oil
**INCI Name:** Betula Alba Leaf Extract, Helianthus Annuus Seed Oil, Prunus Amygdalus Dulcis Oil, Tocopherol
**CAS:** 84012-15-7, 8001-21-6, 8007-69-0, 59-02-9
**Synonyms:** Birch leaf infused oil, Birch macerated oil, Birch leaf oil extract, Infused Betula Alba oil
**Chemical Classification:** Mixture – botanical oil extract (lipophilic macerate)

**Functional Category:** Skin conditioning agent ~ occlusive, Skin conditioning agent ~ emollient, Antioxidant

**Type of Maceration:** Ultrasonic maceration, cold process.

**Method of Production:** Birch leaf infused oil is obtained by ultrasonic extraction using ultrasound frequencies of 20–25 kHz. At these frequencies, ultrasonic waves generate microscopic bubbles in the oil containing the extract, leading to a phenomenon known as cavitation. Cavitation creates extreme localized conditions of high pressure and temperature around the imploding bubbles. These conditions mechanically disrupt plant cell walls, releasing active components such as essential oils, flavonoids, carotenoids, and sterols. Extraction is performed at a temperature of 25°C in order to preserve the stability of thermolabile components. Cold-pressed sunflower oil of the linoleic type is used as the carrier oil, containing a higher proportion of essential linoleic acid and only a smaller amount of oleic acid, together with sweet almond oil. By adding vitamin E as a natural preservative, the oil retains its freshness and quality while remaining completely natural. During extraction, the suspension vessel is cooled in an ice-water bath to prevent temperature increase. Ultrasonic treatment is applied in short intervals with pauses. After completion of the process, the infused oil is filtered to obtain a clear and usable oil. This method is more efficient than traditional maceration techniques because it enables better utilization of raw materials and shorter extraction time.

**Description:** Birch leaf infused oil is a cosmetic ingredient obtained by maceration of dried birch leaves (Betula alba) in plant oils, specifically sunflower oil and almond oil, with the addition of tocopherol as a natural antioxidant. The process is performed using ultrasonic extraction, allowing the bioactive components of birch leaves—

primarily lipophilic fractions such as triterpene alcohols, flavonoids, and plant tannins—to be efficiently transferred into the oil phase without the need for heating. In this way, sensitive molecular structures that contribute to the regenerative and soothing properties of the oil are preserved. This raw material acts as an emollient that softens and hydrates the skin while simultaneously creating a mild occlusive barrier that prevents transepidermal water loss. Due to the presence of antioxidant compounds, it helps neutralize free radicals and protects the skin from oxidative stress caused by UV radiation and environmental pollution. Birch leaves are also known for their mild anti-inflammatory and detoxifying properties, making this oil suitable for the care of skin prone to irritation, redness, or epidermal recovery after sun exposure.

**Bioactive Compounds:** Birch leaf infused oil contains a complex mixture of bioactive phytochemicals. The most significant groups of active compounds present in birch leaves include triterpenes, among which betulinic acid, betulin, and lupeol predominate. These compounds exhibit pronounced regenerative, antioxidant, and anti-inflammatory activity, making the oil particularly suitable for treatments of dry, sensitive, and irritated skin. In addition to triterpenes, birch leaves contain flavonoids such as hyperoside, quercetin, and myricetin, which act as powerful antioxidants and stabilizers of capillary permeability while also contributing to the soothing effect on the skin. The oil contains plant tannins that mildly tighten the skin surface and provide an astringent effect, helping regulate excess sebum and improve skin texture. The presence of phytosterols further strengthens the skin’s lipid barrier, enhancing elasticity and resilience. Organic acids such as ascorbic acid and caffeic acid may also be present in smaller amounts, contributing to protection against oxidative stress and providing a mild brightening effect on the complexion. Chlorophyll and carotenoids, present in trace amounts, contribute to the antioxidant profile and overall photoprotective function of the infused oil.

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**Benefits:**
• Helps regenerate damaged and dehydrated skin.
• Soothes irritation and redness.
• Improves skin elasticity and softness.
• Protects the skin from oxidative stress.
• Strengthens the epidermal barrier function.
• Helps regulate sebum production and mattifies the skin.
• Provides anti-inflammatory benefits for reactive skin.
• Mildly evens out and brightens the complexion.
• Reduces the appearance of enlarged pores.

**Directions for Use:** Birch leaf infused oil is used as a botanical active ingredient in various types of cosmetic formulations, including creams, lotions, serums, balms, and oil blends. It is most commonly added to the oil phase of formulations or directly into the finished product during the cooling phase in thermolabile systems. The recommended concentration in facial care products and products for sensitive areas ranges from 1–5%, while in body care formulations it may be used in higher concentrations, up to 10%, depending on the desired effect and formulation type. In oil serums or emulsions intended for dry and irritated skin, it may constitute the main part of the lipid component. Due to its gentle yet effective activity, the oil combines well with other botanical macerates, essential oils, and lipids, and is recommended for use in natural and dermocosmetic product lines free from synthetic additives.

**Safety in Use:** CIR (Cosmetic Ingredient Review) has not conducted a separate safety assessment specifically for birch leaf infused oil; however, birch leaf extract (Betula Alba Leaf Extract) has been evaluated as part of a broader safety assessment of botanical derivatives used in cosmetics. In its 2015 report, CIR concluded that birch leaf extracts are safe for use in cosmetic products when used at concentrations that do not cause skin irritation or sensitization, and examples were provided of formulations containing up to 5% of these extracts without reported adverse effects. Although no specific limit has been established for the infused oil as a lipophilic derivative, the same guidelines apply as for similar botanical macerates—controlled incorporation into formulations is recommended, along with prior evaluation of stability and skin compatibility, particularly in products intended for sensitive skin. It is also emphasized that the quality of the raw material depends on proper processing methods and the absence of contaminants, which are essential prerequisites for safe use in cosmetic products.

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**Animal Testing:** Substance not tested on animals

**GMO:** GMO-free

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