

## TECHNICAL DATA SHEET

**Product Name:** Birch Leaf Extract

**INCI name:** Glycerin, Aqua, Betula Pendula, Benzyl Alcohol, Dehydroacetic Acid

**CAS:** 56-81-5, 7732-18-5, 85940-29-0, 100-51-6, 520-45-6

**Latin name:** Betula pendula

**Chemical classification:** Mixture

**Functional category:** Skin and hair conditioning agent, humectant, emollient

**Extraction method:** The extract is obtained by ultrasound-assisted extraction using ultrasound frequencies between 20 and 25 kHz. At these frequencies, ultrasonic waves create microscopic bubbles in the liquid containing the plant material, which leads to the phenomenon known as cavitation. Cavitation produces extreme localized conditions of increased pressure and temperature in the micro-environment around the imploding bubbles. This mechanically disrupts the cell walls of the plant, releasing intracellular active components and significantly increasing the speed and efficiency of extraction. The process is carried out at 25 °C in order to preserve thermolabile constituents such as flavonoids, vitamins and traces of essential oils. Compared with conventional maceration, ultrasound extraction enables a shorter processing time, higher yield and better utilization of the plant raw material. The obtained extract is preserved with a combination of benzyl alcohol (0.86%) and dehydroacetic acid (0.14%), a system approved for use in natural cosmetics and compliant with ECOCERT and COSMOS standards. The extract is water-soluble, which allows easy incorporation into various water-based cosmetic formulations. The pH value of the finished extract ranges from 4.0 to 6.5, making it suitable for most dermal applications without the need for additional pH adjustment.

**Description:** Water-glycerin birch leaf extract is used in skincare and haircare formulations due to its moisturizing, soothing and regenerative properties. The extract contains flavonoids, tannins, saponins and phenolic acids. Thanks to its high glycerin content, the extract acts as a humectant and helps retain moisture in the skin and hair. This makes it suitable for moisturizing serums, lotions and shampoos, especially for dry and sensitive skin. In addition to hydration, glycerin helps improve skin elasticity and reduce irritation.

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The extract is also frequently used in haircare formulations because it supports scalp regeneration, reduces dandruff and improves natural hair shine. Its ability to strengthen the hair structure and improve its moisture content contributes to better hair appearance and elasticity. To ensure stability and safety in formulations, the extract is preserved with a combination of caprylhydroxamic acid and glyceryl caprylate. These components act synergistically to prevent microbial contamination while helping to maintain the texture and sensory characteristics of the product. Due to its mild nature and wide spectrum of activity, birch leaf extract can be used in different cosmetic formulations from moisturizing creams and refreshing toners to haircare products. The extract is light yellow, odorless and water-soluble.

**Phytochemicals:** The bioactive compounds in birch leaf extract are responsible for its cosmetic benefits. Flavonoids such as quercetin and myricetin act as strong antioxidants that neutralize free radicals and reduce oxidative stress. Their ability to slow collagen degradation contributes to maintaining elasticity and a youthful skin appearance, while also reducing inflammatory responses beneficial for sensitive and problematic skin. Phenolic acids, particularly ferulic and chlorogenic acid, provide strong protective effects. Ferulic acid enhances the effectiveness of vitamins C and E, strengthening the antioxidant defense of the skin. Chlorogenic acid soothes irritation, reduces redness and contributes to a healthier complexion. The presence of saponins gives the extract refreshing and detoxifying activity. Their ability to disperse oils and impurities makes them especially useful in formulations for oily and problematic skin, as well as scalp-care products. They gently cleanse and help remove excess sebum without disturbing the skin's natural balance. Tannins, known for their astringent effect, help tighten pores, regulate sebum production and mattify the skin. They contribute to strengthening the epidermis and preserving skin structure, resulting in a smoother and more balanced complexion. Triterpenes especially betulin and betulinic acid accelerate skin regeneration and have strong anti-inflammatory properties. Betulin supports barrier recovery, soothes irritation and strengthens the skin, making the extract valuable for calming irritated or damaged skin.

### Benefits:

- Protects the skin from free-radical damage caused by pollution and UV exposure.

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- Slows the appearance of wrinkles, fine lines and age spots, improving overall skin appearance.
- Soothes irritation, reduces redness and alleviates inflammatory processes.
- Tightens pores, tones the skin and reduces excessive sebum production.
- Maintains skin moisture and improves elasticity.
- Helps inhibit bacterial growth and supports protection against skin infections.
- Strengthens hair fibers and supports healthy hair growth.
- Supplies the skin with vitamins, minerals and amino acids, improving regeneration.
- Inhibits elastase activity and helps prevent loss of elastic fibers.

**Directions for use:** Water-glycerin birch leaf extract is used across a wide range of cosmetic formulations, with concentration adjusted according to product type and desired effect. Moisturizing creams and serums: 2–5% Facial toners and refreshing mists: 5–10% Shampoos and conditioners: 3–7% (supports scalp balance, reduces dandruff, improves hair elasticity) Masks and gels for problematic skin: 5–8% Body lotions and milks: 2–6%. The extract is best incorporated into the aqueous phase at temperatures below 40 °C to preserve bioactive compounds. It may be added directly to emulsions after emulsification or during the cooling phase of gels and toners. Because of its natural origin and mild profile, the extract is compatible with most cosmetic raw materials and can be combined with other botanical extracts, hyaluronic acid, panthenol and niacinamide for synergistic effects.

**Animal testing:** In accordance with 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 testing methods (in vitro and in silico). "In silico" refers to computer-based models and simulations rather than testing on live organisms or cell cultures.

**GMO:** Not GMO

**Vegan:** Contains no ingredients of animal origin

**Storage and shelf life:** Store in a cool, dry place. Approximate shelf life: 2 years.

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