

TECHNICAL DATA SHEET

Carica Papaya Extract

Product Name: Water-Glycerin Carica Papaya Extract

INCI Name: Water, Glycerin, Carica Papaya Extract, Benzyl Alcohol, Dehydroacetic Acid

CAS: 7732-18-5, 56-81-5, 84012-30-6, 100-51-6, 520-45-6

Botanical Name: *Carica papaya* L.

Chemical Classification: Mixture of natural botanical extracts (water-glycerin base with preservatives)

Functional Category: Skin and hair conditioning agent, humectant, emollient.

Extraction Method:

The extract is produced using an ultrasonic extraction process employing ultrasound frequencies between **20 and 25 kHz**. At these frequencies, ultrasonic waves generate microscopic bubbles within the liquid containing the plant material, resulting in a phenomenon known as **cavitation**. Cavitation creates localized zones of extremely high pressure and temperature around the collapsing bubbles, mechanically disrupting plant cell walls and releasing intracellular bioactive compounds, thereby significantly improving extraction efficiency and yield.

The extraction process is carried out at **25°C** to preserve thermolabile constituents such as flavonoids, vitamins, enzymes, and volatile compounds. Compared with conventional maceration techniques, ultrasonic extraction provides shorter processing times, higher extraction yields, and more efficient utilization of botanical raw materials.

The finished extract is preserved with **0.86% benzyl alcohol** and **0.14% dehydroacetic acid**, a preservative system approved for use in natural cosmetics and compliant with **ECOCERT** and **COSMOS** standards. The extract is water-soluble, allowing easy incorporation into a wide range of water-based cosmetic formulations. The finished extract has a pH ranging from **4.0 to 6.5**, making it suitable for most dermal applications without requiring significant pH adjustment.

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Description:

Water-Glycerin Carica Papaya Extract (*Carica papaya* L.) is a multifunctional botanical ingredient widely used in cosmetic formulations for its moisturizing, conditioning, revitalizing, and gentle exfoliating properties.

Papaya is naturally rich in **papain**, a proteolytic enzyme, as well as **fruit acids, vitamins, minerals, and antioxidants**, all of which contribute to the extract's keratolytic and skin-conditioning benefits.

Papain gently exfoliates the outermost layer of the skin by breaking down protein residues that bind dead skin cells together, thereby promoting epidermal renewal and improving skin smoothness. Naturally occurring fruit acids help brighten the complexion and refine skin texture.

The water-glycerin base provides additional moisturizing benefits, as glycerin functions as a powerful humectant that attracts and retains moisture within the upper layers of the epidermis.

In hair care formulations, the extract improves manageability, facilitates detangling, and restores natural shine while conditioning the hair fiber.

Its emollient properties make it particularly suitable for products intended for dry and sensitive skin, as well as anti-aging formulations, since papaya contains antioxidant compounds that help neutralize free radicals and support the preservation of skin elasticity.

The preservative system consisting of **benzyl alcohol** and **dehydroacetic acid** ensures microbiological stability without compromising the extract's natural properties.

The extract is **light yellow in color, odorless, and water-soluble.**

Bioactive Compounds:

Carica Papaya Extract contains a wide variety of naturally occurring bioactive compounds responsible for its cosmetic efficacy.

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The most important constituent is **papain**, a natural proteolytic enzyme that provides gentle enzymatic exfoliation by breaking down keratinized proteins on the skin surface. This process promotes smoother skin, enhances epidermal renewal, and improves the penetration of other cosmetic actives.

The extract also contains naturally occurring **alpha-hydroxy fruit acids (AHAs)**, including **citric and malic acids**, which further contribute to gentle exfoliation, skin renewal, and improvement of overall skin texture.

Papaya is an excellent source of **vitamin C (ascorbic acid)**, which supports collagen synthesis, brightens the complexion, and protects the skin against oxidative stress.

Naturally occurring **carotenoids**, particularly **beta-carotene**, together with **lycopene**, provide antioxidant protection by helping neutralize free radicals generated by environmental exposure and UV radiation.

The extract additionally contains **flavonoids** and other **polyphenolic compounds**, which exhibit antioxidant and soothing properties while supporting the skin's natural defense mechanisms.

Trace amounts of **minerals**, including potassium and magnesium, contribute to maintaining healthy skin function, while the glycerin vehicle provides lasting hydration and enhances the delivery of botanical actives.

Benefits:

- Helps relieve skin dryness and improves elasticity.
- Provides gentle enzymatic exfoliation.
- Promotes regeneration and renewal of the epidermis.
- Improves skin texture and helps even skin tone.
- Restores natural shine to the hair.

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- Softens hair and improves detangling.
- Provides antioxidant protection against environmental stress.
- Supports healthy, smooth, and revitalized skin.

Recommended Use:

Carica Papaya Extract is incorporated into cosmetic formulations as an active ingredient in the aqueous phase, preferably during the **cool-down phase** to preserve the stability of papain and other bioactive compounds.

Recommended use levels include:

- **Creams, serums, and facial gels: 2–5%**
- **Facial cleansers, foams, and cleansing gels: up to 7%**
- **Shampoos and conditioners: 1–3%**
- **Hair masks: up to 5%**

The extract is compatible with most commonly used emulsifiers, thickeners, and preservative systems.

The optimal formulation **pH ranges from 4.5 to 6.0**. Within this range, papain retains its enzymatic activity while naturally occurring fruit acids remain effective and skin compatibility is maintained.

For cleansing products, a pH closer to **4.5** may enhance the exfoliating effect, whereas moisturizing creams and serums are generally formulated around **pH 5.5** to maintain compatibility with the skin's natural barrier.

For external use only.

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Safety:

The **Cosmetic Ingredient Review (CIR) Expert Panel** evaluated the safety of **Carica papaya**-derived ingredients, including fruit, leaf, and seed extracts, in its **2017 safety assessment**.

Based on the available toxicological and dermatological data, the panel concluded that **Carica Papaya Extract is safe for cosmetic use** when used under current conditions of use and at the concentrations commonly employed in cosmetic formulations.

Typical use levels are **0.1–5%** in **leave-on** products, while **rinse-off** products may contain concentrations of up to **7%**.

The CIR assessment noted that the naturally occurring enzyme **papain** may cause irritation in individuals with particularly sensitive skin. Therefore, careful formulation, quality control, and stability monitoring are recommended to minimize the potential for adverse skin reactions.

Overall, water-glycerin papaya fruit extracts are considered safe cosmetic ingredients when manufactured according to **Good Manufacturing Practice (GMP)** and used within the recommended concentration ranges.

Animal Testing:

In accordance with **Regulation (EC) No. 1223/2009 on Cosmetic Products**, this ingredient has **not been tested on animals**.

Its safety assessment is based on available toxicological data, scientific literature, and validated alternative testing methods, including **in vitro** and **in silico** approaches.

The term **in silico** refers to safety assessment methods performed using computer-based models and simulations rather than studies conducted on living organisms (**in vivo**) or cell cultures (**in vitro**).

This statement confirms compliance with the European ban on animal testing and is provided solely for informational purposes regarding the cosmetic use of this raw material.

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GMO: Non-GMO

Vegan: Contains no ingredients of animal origin.

Storage and Shelf Life:

Store in a cool, dry place in tightly closed containers. Approximate shelf life is **2 years** under recommended storage conditions.

Country of Origin: China

