

TECHNICAL DATA SHEET

Product name: Hyaluronic Acid (1 kDa)

INCI name: Sodium Hyaluronate

CAS: 9067-32-7

Chemical classification: Biological polymer, glycosaminoglycan, heteropolysaccharide (carbohydrate).

Functional category: Humectant; Skin conditioning agent (miscellaneous).

Description: Hyaluronic acid with a molecular weight of 1 kDa belongs to the ultra-low molecular weight forms that, due to their extremely small molecular size, can easily penetrate the stratum corneum and reach deeper epidermal layers such as the stratum granulosum and stratum spinosum. At this level, they bind water, stimulate endogenous hyaluronate synthesis, and improve skin elasticity, providing long-lasting and intense hydration. Solutions of this fraction are almost completely fluid, without noticeable thickening or gel formation, making them ideal for light serums, facial mists (light water-based sprays that disperse as a fine mist over the face), and various essences, as well as formulations intended for sensitive regions such as the area around the eyes. Chemically, it is a glycosaminoglycan composed of glucuronic acid and N-acetylglucosamine, fully water-soluble and non-sticky. Suitable for all skin types. Does not clog pores. The best results are achieved by combining it with medium- and high-molecular-weight forms, ensuring balanced surface and deep hydration. It is of vegan origin and has no regulatory restrictions for cosmetic use.

Fractions of 8–15 kDa have slightly higher molecular weight, hence lower penetration depth than 1 kDa, but still can reach beneath the skin surface. They provide a combined moderate deep and surface hydration effect, maintaining moisture within the epidermis and prolonging the sensation of hydration. Their solutions are of low viscosity, slightly thickened, and do not form a stable gel, making them suitable for fluid serums and creams with a prolonged moisturizing effect.

Medium molecular weight fractions (100–500 kDa) remain in the upper skin layers, providing a quick visual “plumping” effect. This term refers to visible skin smoothing and filling due to increased hydration, giving the skin a fuller, firmer, and smoother

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TECHNICAL DATA SHEET

appearance with a fresher and more youthful look. The plumping effect is usually temporary and lasts as long as the skin retains moisture in its upper layers. Solutions of this fraction are moderately viscous, with a slightly gel-like texture, enhancing the sensory perception of fullness and softness in the formulation. This form is used in lotions, creams, and gels when a balance between surface effect and pleasant texture is desired.

High molecular weight hyaluronic acid (800–1500 kDa) remains on the skin surface, forming a distinct protective film that reduces transepidermal water loss and instantly increases softness. Solutions of this fraction are highly viscous and capable of forming a stable gel, allowing the creation of richer, barrier-type formulations with strong occlusive and protective properties.

Benefits:

- Increases skin hydration by binding and retaining water in the epidermis.
- Improves skin elasticity and firmness.
- Reduces fine lines and wrinkles by filling surface layers.
- Relieves dryness and tightness.
- Promotes epidermal regeneration and renewal, soothes irritation and redness.
- Provides an instant refreshed and healthier skin appearance.

Usage: In cosmetic formulations, hyaluronic acid with a molecular weight around 1 kDa is primarily used in the water phase, preferably processed cold or with gentle mixing to prevent polymer degradation. Recommended concentrations range from 0.05 % to 0.2 %, where lower values provide a subtle moisturizing effect and lighter texture, while higher values enable more intense and long-lasting hydration. In serums and essences, it is commonly used at 0.1–0.15 % to ensure balance between rapid absorption and noticeable deep-layer hydration. In creams and emulgels, similar concentrations are used, often in combination with medium- and high-molecular-weight fractions to achieve both surface and deep hydration effects. In mists and toners, it is used at lower concentrations (0.05–0.1 %) to keep the formula fully fluid and sprayable. For products intended for sensitive areas, such as the eye region, maintaining concentrations between 0.05 % and 0.1 % is optimal to avoid heaviness and ensure maximum tolerance.

TECHNICAL DATA SHEET

Natural or synthetic origin: Hyaluronic acid is most commonly produced biotechnologically through bacterial fermentation (mainly *Streptococcus zooepidemicus* or *Bacillus subtilis*) on plant-based substrates. This method yields hyaluronic acid identical to the natural form but highly pure, stable, and suitable for vegan formulations. Therefore, in cosmetics, it is classified as a naturally derived biopolymer obtained through fermentation, rather than a synthetic ingredient.

Animal testing: In accordance with current European regulations (Regulation (EC) No 1223/2009 on cosmetic products), this substance has not been tested on animals. The safety assessment of the raw material is based on available toxicological data, scientific literature, and validated alternative testing methods (in vitro and in silico). In silico refers to testing and evaluation methods conducted using computer models and simulations, rather than in living organisms (in vivo) or cell cultures (in vitro). This statement confirms compliance with the animal testing ban and serves solely as informational support for the cosmetic use of the ingredient.

GMO: Not GMO

Vegan: Does not contain ingredients of animal origin