

TECHNICAL DATA SHEET

Raw Material Name: Hyaluronic Acid (Cationic)

INCI Name: Hydroxypropyltrimonium Hyaluronate

CAS: 9067-32-7

Chemical Classification: Cationic quaternised derivative of hyaluronic acid; modified glycosaminoglycan polysaccharide

Functional Category: Humectant, skin- and hair-conditioning agent, antistatic and film-forming ingredient

IUPAC Name: Not applicable as a single systematic name due to the polymeric structure and variable degree of substitution. Chemical name: hyaluronic acid derivative containing 2-hydroxy-3-(N,N,N-trimethylammonio)propyl chloride groups.

Description: Hyaluronic Acid (Cationic) is a cationic derivative of hyaluronic acid obtained by chemically modifying its polysaccharide chain through the introduction of quaternary ammonium groups. This modification retains the water-binding capacity of hyaluronic acid while increasing its adsorption onto the skin and hair. The positively charged groups are electrostatically attracted to the predominantly negatively charged surfaces of the skin and hair fibres, enabling the ingredient to form a persistent hydrating and conditioning film that is more resistant to rinsing. On the skin, it contributes to immediate and prolonged hydration, reduces the sensation of tightness and improves softness and smoothness. Owing to its improved retention on the skin surface, it is particularly suitable for rinse-off products, in which conventional hyaluronic acid has a shorter contact time with the skin. It may also be used in formulations intended for dry, dehydrated and sensitive skin, including products for sensitive areas such as the eye contour. In hair-care products, it binds to the surface of the hair fibre, improves moisture retention and reduces static electricity. It contributes to smoother, softer and more manageable hair without creating a pronounced greasy or heavy feel. It is suitable for shampoos, conditioners, masks, sprays, gels and treatments for the hair and scalp. It is compatible with cationic, anionic and non-ionic formulation systems.

Disclaimer: The details provided here are specific to the identified material and may not remain accurate if that material is combined with other substances or used in different processes. The information presented is, to the best of the company's knowledge, considered precise and trustworthy as of the date mentioned. However, the company does not make any explicit or implied assurance, guarantee, or claim regarding the information's precision, trustworthiness, or comprehensiveness, and will not be held accountable for any losses, damages, or costs, whether direct or indirect, that arise from its use. Users are encouraged to independently verify the appropriateness and thoroughness of this information for their specific purposes.

TECHNICAL DATA SHEET

Physicochemical Properties:

- Appearance: Powder
- Colour: White to pale yellow
- Odour: Mild, characteristic
- pH of a 1% aqueous solution: 5.0-7.5
- Active ingredient content: Not less than 90.0%
- Glucuronic acid content: Not less than 35.0%
- Loss on drying: Not more than 10.0%
- Protein content: Not more than 0.1%
- Heavy metals, expressed as Pb: Not more than 20 ppm
- Arsenic: Not more than 2 ppm
- Solubility: Readily soluble in water; insoluble in organic solvents
- Stability: Stable under the recommended storage conditions
- Incompatibility: Strong oxidising agents
- Shelf Life: 24 months in the original sealed packaging under the recommended storage conditions
- Storage Conditions: Store in a cool, dry place at 2-10 °C in a tightly closed container

Mechanism of Action: The action of cationic hyaluronic acid is based on the combination of the hygroscopicity of its polysaccharide chain and its electrostatic binding to the surface of the skin and hair. The hyaluronic portion of the molecule contains numerous hydrophilic functional groups that form hydrogen bonds with water molecules and create a hydrating film. Unlike conventional hyaluronic acid, this derivative contains permanently positively charged quaternary ammonium groups, which increase its affinity for negatively charged sites on keratin, the skin surface and damaged areas of the hair fibre. Following application, the polymer adsorbs onto the surface and forms a thin, uniform film that retains water and is removed more slowly during washing. On the skin, this film limits water evaporation from the surface, reduces the sensation of dryness and improves the smoothness of the stratum corneum. Its action is primarily superficial and film-forming; insufficient data are available to state reliably that this specific derivative penetrates into the dermis or directly activates fibroblast receptors. On the hair, electrostatic binding is particularly pronounced on porous and damaged areas of the cuticle, which have a higher density of negative charge. The resulting hydrophilic layer reduces friction between hair fibres, facilitates combing, reduces static electricity and contributes to softer, smoother-looking hair. Owing to its more persistent surface retention, the hydrating and conditioning effect may be maintained even after the product is rinsed off.

TECHNICAL DATA SHEET

Benefits:

- provides immediate and prolonged hydration;
- binds to the surface of the skin and hair;
- forms a persistent hydrophilic protective film;
- reduces transepidermal water loss;
- improves skin softness and smoothness;
- reduces the sensation of dryness and tightness;
- increases moisture retention in the hair fibre;
- reduces static electricity and hair tangling;
- facilitates wet and dry combing;
- improves hair smoothness and manageability;
- may help reduce the irritation potential of cleansing agents;
- suitable for leave-on and rinse-off products;
- compatible with cationic, anionic and non-ionic systems.

Directions for Use: The recommended concentration in the final formulation is 0.05-0.20%. Gradually add the powder to the aqueous phase with uniform stirring until completely dissolved. To prevent lump formation, it may be pre-dispersed in glycerin or another suitable water-soluble carrier. Addition at a lower temperature, during the cooling phase of the formulation when the temperature is below 40 °C, is recommended. Optimal stability is expected in formulations with a pH of approximately 5.0-7.5. It is used in hydrating serums, creams, gels, masks, hand creams, products for sensitive areas such as the eye contour, shampoos, conditioners, masks, sprays, gels and liquid hair treatments. It may be combined with conventional hyaluronic acid to provide immediate hydration and prolonged retention of the ingredient on the treated surface.

Safety of Use: Hyaluronic Acid (Cationic) is considered suitable for cosmetic use when applied at the recommended concentrations in properly formulated products. The supplied safety data sheet indicates the possibility of mild irritation following direct contact with the concentrated powder, particularly to the eyes and respiratory tract. During professional handling, inhalation and direct eye contact should be avoided, and appropriate protective equipment should be used. The 2009 CIR assessment covered hyaluronic acid, sodium hyaluronate and potassium hyaluronate, but does not constitute a separate assessment of this cationic derivative.

Natural or Synthetic Ingredient: A biotechnologically derived and chemically modified ingredient. The hyaluronic acid backbone is generally produced by microbial fermentation, after which cationic quaternary ammonium groups are introduced chemically. The ingredient may therefore be described more precisely as a semi-synthetic or chemically modified biotechnological polymer.

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TECHNICAL DATA SHEET

Animal Testing: In accordance with the applicable European legislation, namely Regulation (EC) No 1223/2009 on cosmetic products, the 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, including in vitro and in silico methods. In silico refers to testing and assessment methods performed using computer models and simulations rather than on living organisms (in vivo) or cell cultures (in vitro). This statement confirms compliance with the animal testing ban and is provided solely for informational purposes regarding the further use of the raw material in cosmetic formulations.

GMO: Non-GMO

Vegan: Contains no components of animal origin

Raw Material Origin: China

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