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TECHNICAL DATA SHEET

Product Name: Polyquaternium-7

INCI Name: Polyquaternium-7

CAS: 26590-05-6

Chemical Classification: Synthetic Polymer, Quaternary Ammonium Compound

Functional Category: Hair Conditioning Agent

IUPAC Name: Acrylamide-diallyldimethylammonium chloride copolymer

Description: Polyquaternium-7 is a synthetic polymer widely used in the cosmetic industry for its ability to provide softness, hydration, and control of static electricity. Its positively charged structure allows it to bind effectively to negatively charged surfaces like hair and skin layers, reducing friction and making hair easier to comb. This binding quality makes Polyquaternium-7 ideal for use in shampoos and conditioners, where it facilitates hair styling and provides a smooth, soft texture that lasts throughout the day. In addition to its conditioning effect, Polyquaternium-7 forms a thin protective film on hair that retains moisture, which is essential for treating damaged and dry hair. This protective layer does not create a heavy or greasy feel, allowing hair to appear natural and vibrant, even with regular use. It also helps in color retention and prevents mechanical damage during combing and styling. Polyquaternium-7 is water-soluble and commonly used in formulations requiring a smooth and homogeneous texture. Its application in lotions, shower gels, and other moisturizing products further softens the skin and reduces dryness without causing irritation or tightness. It is suitable for daily-use formulations, including products for sensitive skin. Due to its compatibility with various ingredients, including emulsifiers and stabilizers, Polyquaternium-7 easily incorporates into formulations.

Mechanism of Action: Polyquaternium-7 is a synthetic polymer classified as a cationic polymer with quaternary ammonium, meaning it contains positively charged ammonium groups. Polyquaternium-7 is composed of acrylamide and dimethyldiallylammonium chloride (DMDAAC) chains connected by polymerization. The cationic nature comes from the quaternary ammonium ions ($-NR_4$), which are positively charged, allowing strong binding to negatively charged surfaces, such as hair and skin. Acrylamide units

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provide polymer flexibility, while dimethyldiallylammonium chloride adds positive charge. The polymer's positive ions are not easily rinsed away, enabling Polyquaternium-7 to bond permanently to hair or skin surfaces, forming a stable protective film that is water-resistant and prevents moisture loss and damage.

Benefits:

- Hydrates and softens hair, making it easier to style.
- Reduces static electricity, preventing hair from becoming frizzy.
- Leaves hair silky and shiny, enhancing its natural luster.
- Adds a film-forming protection that helps retain moisture.
- Compatible with various formulations, including shampoos and shower gels.
- Minimizes irritation from surfactants.
- Improves product distribution on hair and skin.
- Helps maintain hair elasticity and resilience.

Usage Instructions: Polyquaternium-7 is used in various cosmetic products such as shampoos, conditioners, shower gels, and skincare products as a moisturizing and conditioning agent. In shampoos and conditioners, it is typically used at concentrations between 0.5% and 2%, effectively reducing static electricity, easing detangling, and enhancing shine. In shower gels and body care products, concentrations are usually lower, between 0.1% and 0.5%, to ensure hydration and added softness without excessive film formation. This ingredient is added to the aqueous phase of the formulation and mixes well with other components, even without heating, making it suitable for different formulation types.

Animal Testing: Not tested on animals.

GMO: Non-GMO

Vegan: Contains no animal-derived components.

Source Origin: China