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TECHNICAL DATA SHEET

Product Name: Polyacrylate Crosspolymer-14

INCI Name: Polyacrylate crosspolymer-14

CAS: 9003-01-4

Chemical Classification: Synthetic Polymer

Functional Category: Thickener/Rheology Modifier

Description: Polyacrylate Crosspolymer-14 is a multifunctional polymer widely used in cosmetic products as a thickener, stabilizer, and rheology modifier. Its primary role is to ensure optimal consistency of formulations, improve stability, and enable even application of the final product on the skin. This polymer is particularly valued for its ability to create lightweight, non-sticky gels, making it suitable for products like serums, lotions, cleansing gels, and other formulations requiring a pleasant skin feel. Due to its chemical structure, Polyacrylate Crosspolymer-14 remains stable in the presence of various active ingredients commonly used in cosmetics. It does not undergo undesirable chemical reactions with components such as acids (hyaluronic, glycolic, mandelic) or reactive molecules like antioxidants and retinoids. One of the notable characteristics of this polymer is its stability across different pH levels and temperature conditions, ensuring a long shelf life for products. Additionally, it does not clog pores, making it ideal for non-comedogenic formulations, especially for oily and problematic skin types. Polyacrylate Crosspolymer-14 disperses easily in water and does not require high temperatures for processing, facilitating production and preserving thermolabile active ingredients in formulations. Typically used in low concentrations (0.1%-1%), it achieves desired effects even at minimal dosages. Thanks to its versatility, this ingredient allows for the creation of high-quality formulations that provide users with optimal skin feel, stability, and aesthetically appealing textures.

Mechanism of Action: The mechanism of action of Polyacrylate Crosspolymer-14 is based on its ability to form a stable and flexible network of polymer chains when hydrated in water or aqueous solutions. This network acts as a physical structure that increases viscosity and enables control over the rheological properties of the formulation.

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At the microscopic level, the polymer functions as a hydrogel capable of retaining large amounts of water, contributing to hydration and enhancing product texture. When dispersed in water, its chains expand and interconnect through weak intermolecular interactions, such as hydrogen bonds and Van der Waals forces. This process results in a three-dimensional structure that stabilizes the formulation by preventing phase separation and sedimentation of solid particles. Simultaneously, this structure ensures the uniform distribution of active ingredients throughout the formulation, making the product homogeneously functional. One of the key advantages of this polymer is its resistance to pH and temperature fluctuations. Regardless of harsh conditions, the network remains stable, enabling its use in a wide range of cosmetic products, including those containing acids, alkaline components, or thermolabile substances. As a rheology modifier, Polyacrylate Crosspolymer-14 enhances the product's feel on the skin by reducing stickiness and providing a silky texture. Its ability to offer a degree of emulsification aids in stabilizing oil-in-water systems without additional emulsifiers. Finally, due to its inertness, it does not react with reactive molecules such as acids, antioxidants, or UV filters, ensuring long-term formulation stability and preservation of active ingredient efficacy.

Benefits:

- Forms a stable network that increases viscosity and controls product texture.
- Prevents phase separation and particle sedimentation in formulations.
- Distributes active ingredients evenly, ensuring product homogeneity.
- Resistant to pH and temperature changes, ensuring stability.
- Suitable for formulations with acids, alkaline components, and thermolabile substances.
- Improves skin feel by reducing stickiness and providing a silky texture.
- Stabilizes oil-water systems without additional emulsifiers.
- Does not react with reactive molecules, preserving the efficacy of active ingredients.
- Contributes to long-term stability and quality of cosmetic formulations.

Usage Instructions: Polyacrylate Crosspolymer-14 can be used in both cold and hot processes, offering flexibility in formulating various products. For making clear gels, the powder is gently sprinkled over the aqueous phase while mixing at a low speed (500-1500 rpm) and left to hydrate for 5-10 minutes before adding other ingredients.

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To achieve its thickening and gelling properties, the solution must be neutralized with alkaline substances such as sodium hydroxide or triethanolamine, increasing the pH to activate the polymer. This polymer has an advantage over carbomers due to its resistance to electrolytes, allowing the addition of salts at lower concentrations without significantly reducing viscosity. For example, a neutralized 1% solution has a viscosity of 25,000-45,000 cPs at 25°C, while adding 1% sodium chloride reduces viscosity to 7,000-14,000 cPs. This enables the formation of a homogeneous and stable gel-like structure. For cream-gel production, the polymer is added to the oil phase, whether warm or cold, facilitating emulsification and product stabilization. Recommended polymer concentrations vary based on the desired effect and product type, usually ranging from 0.5% to 5%. Gels made with this polymer are stable in pH ranges between 2 and 8, enabling its use in acidic or neutral formulations. Combined with other thickeners such as gums, pectins, or cellulose derivatives, it further increases stability and viscosity of emulsions. The polymer synergistically interacts with fatty alcohols like cetyl or cetearyl alcohol, enhancing texture and skin feel. It is also compatible with anionic or nonionic surfactants, improving viscosity and foam density in products such as shampoos and shower gels.

Origin: South Korea

Animal Testing: Not tested on animals

GMO Status: Non-GMO

Vegan: Does not contain animal-derived components