

## TECHNICAL DATA SHEET

**Product Name:** Cationic Guar Gum

**INCI Name:** Guar Hydroxypropyltrimonium Chloride, Water, Sodium Chloride

**CAS:** 65497-29-2, 7732-18-5, 7647-14-5

**Chemical Classification:** Quaternary ammonium compound, Gum, Hydrophilic colloid, and Derivative

**Functional Category:** Antistatic agent, Hair conditioning agent, Skin conditioning agent  
~ Miscellaneous, Viscosity modifier ~ Thickening agent

**Description:** Cationic guar gum is a modified polysaccharide derived from natural guar gum, obtained from the seeds of the *Cyamopsis tetragonoloba* plant. This natural resin undergoes chemical modification, typically through a reaction with quaternary ammonium compounds, introducing positively charged (cationic) groups onto its structure. This modification enhances the molecule's ability to bond with negatively charged surfaces, such as hair and skin. In cosmetic products, cationic guar gum is valued for its conditioning properties. It forms a thin film on the hair surface, smoothing the cuticle, reducing friction, and facilitating detangling, leaving hair softer and silkier to the touch. Its anti-static properties reduce hair static, preventing unwanted frizz, which is especially useful in products like shampoos and conditioners. In addition to hair care, it is used in skincare products, where it creates a protective layer that enhances smoothness and hydration. Its hydrophilic nature allows it to bind water, aiding in moisture retention on the skin's surface, which is beneficial in lotions, creams, and serums. Another significant feature of cationic guar gum is its ability to modify product viscosity. In aqueous solutions, it forms a gel-like structure, increasing the formulation's thickness, which is crucial for achieving the desired texture and stability. This property also allows for even distribution of active ingredients and contributes to a pleasant application feel. Thanks to its natural origin and efficiency, cationic guar gum is a common choice in personal care products. It is compatible with most surfactants and other cosmetic raw materials, allowing the formulation of stable and effective products that combine care and protection.

**Mechanism of Action:** The mechanism of action of cationic guar gum is based on electrostatic interaction between its positively charged molecules and negatively charged surfaces such as hair and skin. Once incorporated into a formulation and applied to the

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## TECHNICAL DATA SHEET

target surface, the positive ions from guar gum naturally attract negatively charged particles present on damaged hair cuticles or the skin's surface. On hair, this process results in the binding of guar gum molecules to damaged, porous areas, neutralizing the negative charge. This reduces static electricity, making detangling easier and decreasing hair breakage. The created layer further smooths the surface, leaving hair softer, shinier, and more manageable. Additionally, this protective film helps retain moisture, supporting scalp and hair hydration. On the skin, cationic guar gum functions similarly. Upon application, its positively charged molecules bind to negatively charged areas of the skin, creating a thin protective film. This layer helps maintain moisture by preventing excessive water evaporation from the skin's surface, enhancing smoothness and hydration. It also improves product application by reducing friction and allowing even distribution of other active ingredients. This interaction is not only physical but also functional, enhancing the efficiency of other ingredients in the formulation. Cationic guar gum stabilizes emulsions and increases viscosity, improving texture and extending the product's shelf life. Thus, its effects are multifaceted—providing conditioning, protection, and improving formulation structure.

### Benefits:

- Reduces static electricity in hair, facilitating detangling
- Provides a conditioning effect, leaving hair soft and smooth
- Smooths the hair surface, making it shinier and less prone to breakage
- Forms a protective layer on the skin, aiding moisture retention
- Enhances skin hydration, leaving it smooth and soft
- Increases formulation viscosity, improving product texture
- Stabilizes emulsions, extending product longevity and effectiveness
- Allows even distribution of active ingredients on skin and hair

**Application Method:** Cationic guar gum is used in various cosmetic formulations for its ability to improve product texture and provide conditioning effects. During production, it is first dispersed in water or the aqueous phase with constant stirring to prevent clumping. It is usually added during the heating phase or at the beginning when used in formulations without heating. After dispersion, gentle stirring is required to allow hydration, activating its thickening and film-forming properties. Recommended concentrations vary depending on the product type and desired effect. In hair conditioners, it is used at concentrations from 0.1% to 0.5%, providing optimal conditioning without

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## TECHNICAL DATA SHEET

weighing down the hair. In shampoos, concentrations range from 0.1% to 0.3%, sufficient for improving spreadability and reducing static electricity. In skincare products such as creams and lotions, it is used in lower concentrations, typically from 0.1% to 0.2%, to enhance hydration and create a protective layer without a heavy feel. When used as a thickener in gels or serums, concentrations can reach up to 1%, achieving the desired product density. It is important to note that cationic guar gum works best in formulations containing surfactants, as its interaction with negatively charged molecules enhances its conditioning effect. After full hydration, the product's pH can be adjusted to optimize stability and ingredient effectiveness.

**Natural or Synthetic Ingredient:** Cationic guar gum is a natural ingredient that has undergone chemical modification. It is derived from natural guar gum, extracted from the seeds of the *Cyamopsis tetragonoloba* plant. While its origin is entirely natural, it undergoes chemical modification to introduce cationic (positively charged) groups. This modification enhances its functional properties, particularly its ability to bond with negatively charged surfaces such as hair and skin. Thus, although it retains a natural base, it is considered a semi-synthetic ingredient due to chemical adjustments.

**Animal Testing:** The substance has not been tested on animals.

**GMO:** Not GMO

**Vegan:** Does not contain ingredients of animal origin