



VERSENE™ Chelating Agents
for Personal Care Formulations

The background of the entire page is a photograph of three plastic bottles lying on a light-colored, textured towel. The bottle in the foreground is a vibrant blue and is partially filled with a clear liquid, with some bubbles visible. Behind it are two other bottles, one white and one light green, both also containing clear liquids. The lighting is soft and natural, highlighting the textures of the plastic and the towel.

VERSENE™ Chelating Agents Help Protect Product Stability and Quality

VERSENE™ Chelating Agents are ethylenediaminetetraacetate (EDTA) products that help provide protection against harmful metal-catalyzed reactions in personal care formulations. Metal ions, which are present in any water-based system, react with formulation ingredients and can cause problems, including:

- Rancidity and spoilage
- Degradation of valuable vitamins and essential fatty acids
- Fragrance degradation
- Discoloration and color changes
- Haze formation and precipitation
- Poor foaming and rinsability performance



The Reliable Protection Your Products Need

Dow has supplied VERSENE™ Chelating Agents to the market for more than 50 years. With a history of reliable performance backed by extensive application experience, VERSENE™ products are today among the most widely used chelating agents in the personal care industry. VERSENE™ Chelating Agents are extensively used across the entire spectrum of personal care products and provide the following main benefits:

Antioxidant Protection – VERSENE™ Chelating Agents control metal ions that catalyze oxidation, degradation and rancidity of emulsions. These reactions, if uncontrolled, lead to color changes and off-odors of fats and oils. Metal ions also attack important fragrance components, which are so valuable to the identity of a product. In personal care systems, which typically

contain high-purity ingredients, chelant levels of only 0.1% are sufficient to deter oxidation.

Improved Antimicrobial Performance – VERSENE™ Chelating Agents help protect product quality by acting as antimicrobial boosters. When used as part of a preservative package, EDTA works synergistically with antimicrobial additives by controlling the metal ions that contribute to microbial cell growth and viability. A chelant addition rate of 0.1 - 0.3% can significantly reduce microbial contamination, resulting in increased product shelf life.

Enhanced Ingredient Strength – VERSENE™ Chelating Agents stabilize vitamins, essential oils and essential fatty acids, which can be compromised by the presence of metal ions. This results in products with higher potency and increased shelf life.





A Range of Product Options

Dow offers a range of crystalline and liquid VERSENE™ Chelating Agents. The products most commonly used in personal care formulations are:

- **VERSENE™ Na2 Crystals** – high-purity disodium EDTA for use in products at neutral pH.
- **VERSENE™ 220 Crystals** – high-purity tetrasodium EDTA for use in products with higher pH.
- **VERSENE™ 100XL Liquid** – high purity tetrasodium EDTA in liquid form.



Reliable Performance, Consistent Purity

VERSENE™ products have earned reputations for strong, reliable performance and consistent purity. Because VERSENE™ products are potent chelating agents, addition rates are typically low, making them an economical solution to most metals problems.

The Technical Support You Require

With more than a half-century of experience, Dow's team of metal ion control experts has the ability to assist you with proper incorporation of EDTA in your product formulation. We also have the experience to assist in troubleshooting product problems that may be caused by metal ions. The METAL SIGNATURE™ Analysis Service is an exclusive Dow service that profiles metals in your system so you can eliminate trial and error and identify an effective solution with greater certainty.

Guidelines for Selecting and Incorporating VERSENE™ Products

Typically, a dosage of approximately 0.1% VERSENE™ Chelating Agent (by weight) is used to control metal ions in personal care formulations including emulsified and multiphase systems. However, addition rates may vary depending on the nature and concentration of the problem metals, as well as the type of product in which the chelating agent is incorporated. The table on page 6 provides recommendations for use of VERSENE™ Chelating Agents to help prevent or correct problems caused by metal ions in specific personal care products. Contact your Dow Account Manager for a recommendation based on your needs.

When choosing a chelating agent, selection should be based on system pH, not the pH of the chelating agent. Chelating agents should be added early in the formulating process so product degradation can be prevented before it begins. Add the chelating agent as soon as practical in the process, for example, during the water phase. VERSENE™ Chelating Agents are only soluble in aqueous solutions and have only limited solubility in acidic media (below pH 3.5).





Choosing and Incorporating VERSENE™ Chelating Agents in Personal Care Formulations

Products	Typical Symptoms	Benefits of Using VERSENE™	Dosage (weight%)	Suggested Products
Cosmetics				
Creams and Lotions	Discoloration, rancidity, spoilage, off-odors, degradation of active ingredients	Helps improve shelf life and efficacy of vitamins, essential oils and fatty acids. Protects color and fragrance.	0.1% - 0.3%	VERSENE™ Na2 VERSENE™ 220 (crystals)
Cosmetics	Discoloration, rancidity	Helps improve shelf life.	0.10%	
Wipes	Fragrance degradation	Provides preservative and fragrance protection.	0.10%	
Deodorants	Fragrance degradation	Provides antioxidant and fragrance protection.	0.1% - 0.5%	
Hair Care				
Shampoos and Conditioners	Fragrance and color degradation, haze formation and precipitation	Helps preserve fragrance and color and has a synergistic effect with antimicrobials.	0.10%	VERSENE™ Na2 VERSENE™ 220 (crystals) VERSENE™ 100 XL
Coloring Shampoos	Change of tint and color intensity	Helps stabilize the redox system and preserves formulation stability.	0.5 - 1.5%	
Soap & Body Washes				
Bar Soap	Discoloration, rancidity, poor foaming and rinsability	Helps prevent softening, brown-spotting, rancidity, cracking and discoloration due to metal ions.	0.1% - 0.2%	VERSENE™ 220 (crystals) VERSENE™ 100 XL
Liquid Soaps/ Body Washes	Fragrance and color degradation, poor rinsability	Helps preserve fragrance and color and has a synergistic effect with antimicrobials.	0.1% - 0.2%	





How do VERSENE™ Chelating Agents Help Protect Your Products?

VERSENE™ Chelating Agents surround and immobilize problem metal ions in a stable ring structure called a “chelate”. The EDTA molecule can block up to six reactive sites on a metal ion, completely deactivating the ion. These chelates are highly stable even under extremes of heat, light or pH, which can translate into fewer processing problems and better product protection than can be achieved with other materials that form less stable complexes with metal ions.

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To Learn More, Contact Us:

To learn more about VERSENE™ Chelating Agents for personal care formulations, contact the Dow location in your area, listed below:

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