



Geogard[®] 221 Preservative

Description

Geogard[®] 221 preservative is a unique blend featuring dehydroacetic acid as the primary active ingredient. This product has been designed to replace parabens and paraben-containing blends in personal care and cosmetic formulations, offering higher efficacy and lower cost in use.

Geogard[®] 221 has global approval for virtually every personal care and cosmetic application. Tests comparing Geogard[®] 221 versus parabens and paraben blends show higher efficacy across the board and substantially better performance in formulations with a lower pH. Geogard[®] 221 continues Lonza's leadership role established by its tradition of preservative advances for the personal care industry.

Features/Benefits

<u>Feature</u>	<u>Benefit</u>	<u>What It Means for You</u>
* Global Approval (including Japan)	Wide Applicability	Reduced Cost
* Broad-Spectrum Activity	Bacterial/Fungal Control	Fewer Drums to Inventory
* Excellent Toxicity Profile	Increased Safety	Wider Safety Cushion
* No Animal Testing	No Label Warnings	End-Product Labelling

Typical Properties (as supplied)

Physical Form	Clear, Pale Yellow Liquid
Dehydroacetic Acid, %	8
Total Alcohol, %	87
Color (Gardner)	4

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Applications and Suggested Use Rates

Geogard® 221 preservative is based on dehydroacetic acid (DHA) and benzyl alcohol, and therefore is recognized by major cosmetic, toiletry and fragrance regulatory authorities worldwide for use in cosmetic and personal care products. Geogard® 221 is very soluble in water, light in color, essentially odorless and compatible in a diverse range of product formulations including:

Hair Care

Shampoos, Conditioners, Rinses

Skin Care

Liquid Soaps, Shower Gels, Sensitive Skin Lotions, Moisturizers, Cold Creams

Baby Products

Mild Shampoos, Hair Detanglers, Bubble Baths, Baby Wipes, Towlettes

Sun Products

Sunscreens Lotions and Creams

Raw Materials

Surfactants, Shampoo Blends, Conditioner Blends

A cost-effective preservative blend, Geogard® 221 is typically used at 0.2 to 0.8% in both rinse-off and leave-on product formulations.

Global Regulatory Information

A significant feature of Geogard® 221 is its widespread regulatory acceptance. Broad regulatory acceptance results in an enhanced ability to formulate cosmetic products targeted for worldwide distribution. Below are key regional guidelines and some important additional pieces of regulatory information for Geogard® 221.

There is an extensive body of safety data available on the constituents of Geogard® 221. This information has been reviewed by independent experts globally. There is uniform agreement that these ingredients may be safely used in cosmetic applications. Therefore, Geogard® 221 itself has not been tested on animals. This is of particular importance in Europe, as regulators there seek to ban cosmetic ingredient testing on animals in the near future.

North America

Both DHA and benzyl alcohol are approved by key North American regulatory authorities including the Cosmetic, Toiletry and Fragrance Association in the United States and the Canadian Cosmetic, Toiletry and Fragrance Association. The components in Geogard® 221 are approved for both rinse-off and leave-on applications.

Europe

DHA and benzyl alcohol have been thoroughly tested and reviewed by the key cosmetic regulatory expert panels and are on the European "Positive List". Geogard® 221 can therefore be used in all countries in both rinse-off and leave-on applications. Note that DHA cannot be used in end-use formulations that are intended to be aerosolized.

Latin and South America

DHA and benzyl alcohol are approved by regulatory authorities in key countries throughout these regions. Similar to the European “Positive List”, DHA cannot be used in end-use formulations intended to be aerosolized in Brazil.

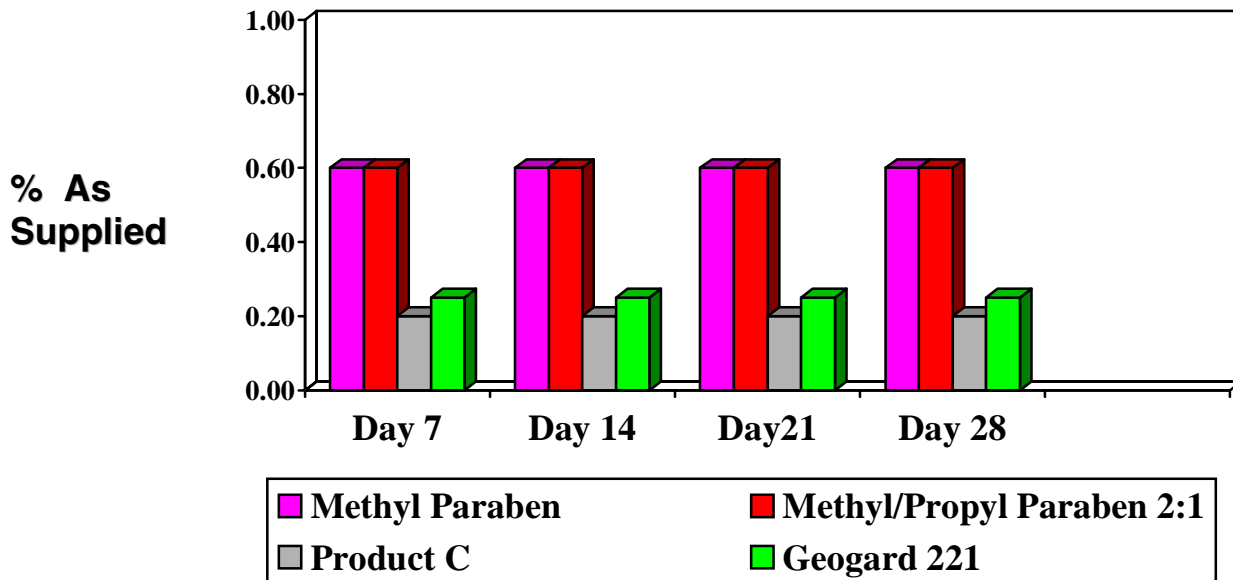
Japan

Again, DHA and benzyl alcohol are approved for use in personal care and cosmetic products under the Japanese Ministry of Health and Welfare for both rinse-off and leave-on products.

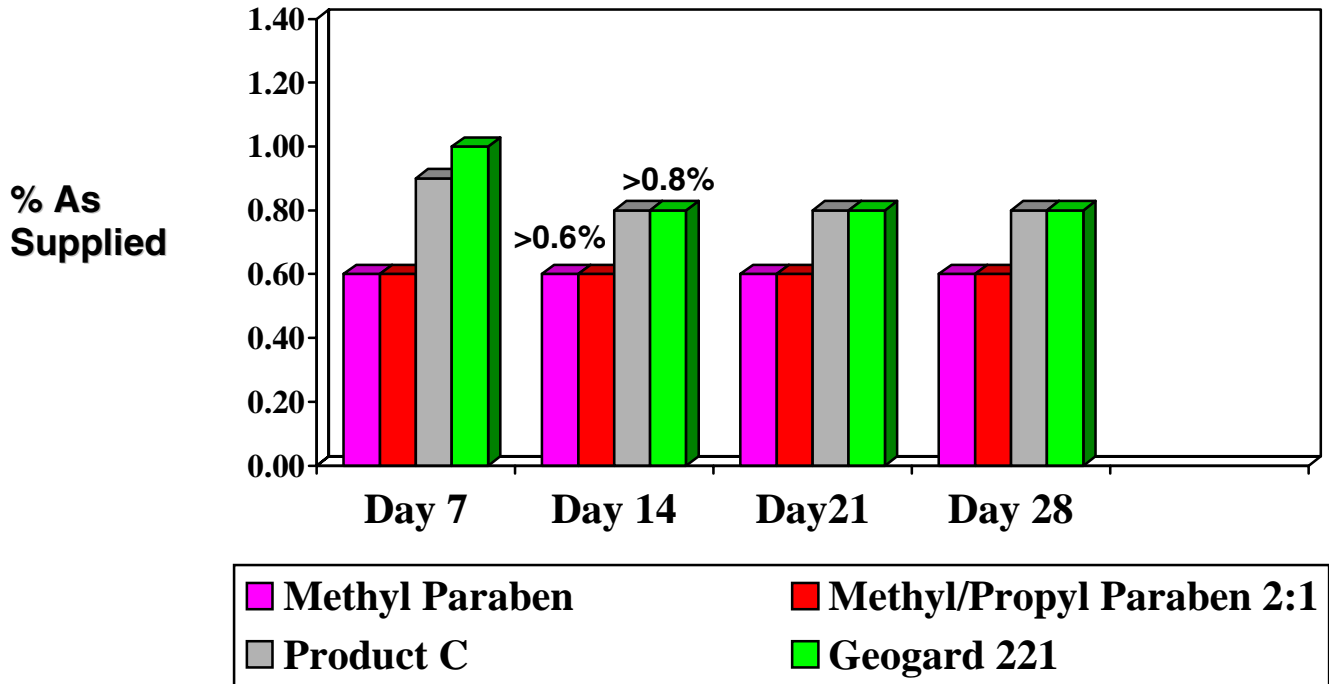
Broad Spectrum Activity

Geogard[®] 221 preservative provides effective formulation protection from both bacteria and fungi. For example, as illustrated below, Geogard[®] 221 provides excellent protection against various types of common organisms in a typical nonionic GMS cream at a pH of 6.5. Note excellent performance, particularly against bacteria, versus widely used parabens. The broad-spectrum activity of Geogard[®] 221 leads to greater efficacy and lower usage levels versus competitive chemistries. Geogard[®] 221 provides protection against both types of contaminants whereas the parabens and combination products tested were adequate against only one or the other, but not both.

**Challenge Results, % Preservative Required to Achieve <10 CFU/gram
Against Mixed Bacteria in a Nonionic Cream
(scale = % as product supplied)**



**Challenge Results, % Preservative Required to Achieve <10 CFU/gram
Against Mixed Fungi in a Nonionic Cream
(scale = % as product supplied)**



"Product C" is a commercial blend of phenoxyethanol, benzoic acid and DHA.

Toxicity Information

Due mainly to impending legislation in Europe, which will soon impose various marketing restrictions, Geogard[®] 221 preservative has not been tested on animals. Therefore, toxicity testing information regarding the blended material will not be generated. However, each of the Geogard[®] 221 ingredients has been tested extensively over the years and is described below. Overall, the ingredients in Geogard[®] 221 have been carefully chosen due to their global acceptance as well as excellent toxicity profiles.

Dehydroacetic Acid

Widely used as both a preservative and food ingredient, DHA has an excellent toxicity profile. Information regarding DHA has been extensively evaluated including the Cosmetic Ingredient Review, in which the panel concluded that, on the basis of animal and clinical data, both the DHA salt and acid forms are safe as cosmetic ingredients in the present practices of use and concentration. Additionally, DHA is permitted for certain food applications, glues, cleaning solutions and deodorants in the United States and many other countries worldwide. This is further evidence of the safe nature of DHA.

Benzyl Alcohol

Interestingly, benzyl alcohol is permitted up to a higher level—1% in many regions—than most other globally acceptable preservatives. This is indicative of its excellent toxicity profile. Commonly used as a component in flavors and fragrances, benzyl alcohol is a Generally Recognized as Safe ingredient in the United States and is also registered for many applications under the US EPA. A preservative for ophthalmic, injectable and oral drugs, this is also indicative of its relative safety.

Formulation Compatibility

Geogard[®] 221 preservative is fully compatible with a wide variety of formulations as well as most types of cationic, nonionic and anionic systems. Geogard[®] 221 can be used effectively over a wide pH range of 2 to 7 and can be added at both room and elevated temperatures. Enhanced compatibility allows for the addition of Geogard[®] 221 virtually anywhere in the manufacturing process.

Stability

Geogard[®] 221 preservative is very stable and shows no change in composition over long periods of time. It is also freeze/thaw/heat stable without phase separation or crystal formation through several cycles.

Packaging

Standard packaging for Geogard[®] 221 preservative includes the following. Other package sizes are available upon request.

- 200 kg net weight plastic drums
- 20 kg net weight plastic pails

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