



# Geogard® 221

## Broad Spectrum Preservation System

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### Preservation

INCI Name: Dehydroacetic Acid & Benzyl Alcohol & Water

Recommended Use Level: 0.2-1.1%



## Description

Geogard® 221 is a preservative blend featuring dehydroacetic acid and benzyl alcohol as the active ingredients. This product provides broad spectrum efficacy and low cost in use. Geogard® 221 has a wide range of global regulatory acceptance for many personal care and cosmetic applications. It is light in color, essentially odorless and compatible in a diverse range of product formulations. Tests comparing Geogard® 221 to parabens and paraben blends indicate higher efficacy and better performance in formulations with a low to neutral pH.

## Key Product Benefits

- Wide range of global regulatory approval
- Wide effective pH range
- Safe handling
- Chemically and physically stable
- Soil Association approved
- Vegan
- Non-GMO
- China compliant
- Cruelty- free [Not tested on animals]
- While not itself approved by ECOCERT or COSMOS, this preservative is allowed in COSMOS & ECOCERT final formulations

## Compositional Breakdown

Chemical Compound	CAS No.	EINECS No.	Percentage
Dehydroacetic Acid (DHA)	520-45-6	208-293-9	7.7-8.3%
Benzyl Alcohol	100-51-6	202-859-9	85-89%
Water	7732-18-5	231-791-2	4%

## Typical Properties

Appearance	Clear Liquid
Color (Gardner)	Pale Yellow, 10 Max
Odor	Characteristic

## Applications



Body Care



Hair Care



Baby Care



Makeup



Skin Care

## Efficacy

### Microbiological Challenge Studies

Studies were run using different concentrations of Geogard® 221 in various formulations to see efficacy against various bacteria, yeast and fungi. All samples were inoculated at the beginning of the study, sampled at 7, 14, 21 and 28 days.

Nonionic Cream

Ingredient	% wt/wt
Sterile DI Water	75%
Myristyl propionate	8%
Glyceryl stearate	6%
Glycerin	5%
PEG-20 glyceryl stearate	4%
Cetearyl alcohol	1.5%
Sodium hydroxide	<1%
Total	100%

Nonionic Cream Test Results

% Preservative Required to Achieve <10 CFU/gram Against Mixed Bacteria in a Nonionic Cream

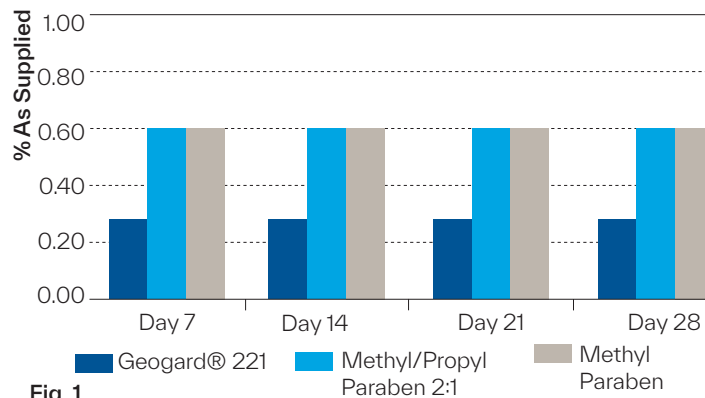


Fig. 1

% Preservative Required to Achieve <10 CFU/gram Against Mixed Fungi in a Nonionic Cream

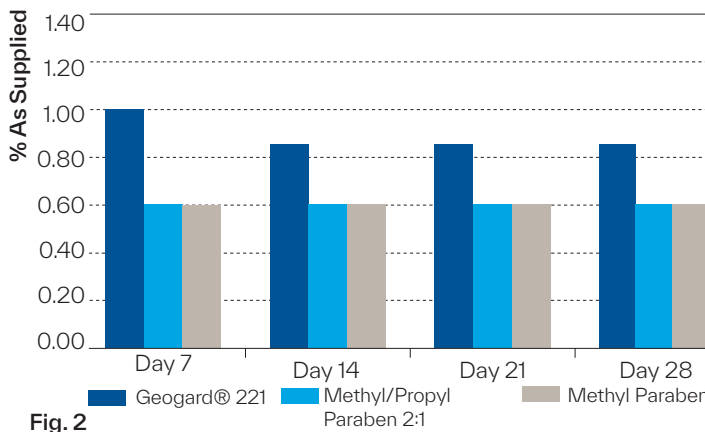


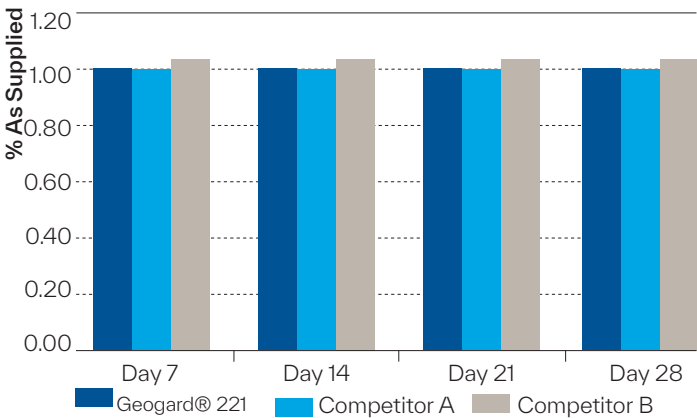
Fig. 2

Shampoo

Ingredient	% wt/wt
Sterile DI Water	36%
Sodium lauryl ether sulfate	35%
Triethanolamine lauryl sulfate	25%
Cocomide DEA	3%
Hydrolyzed collagen	1%
Citric acid	<1%
Total	100%

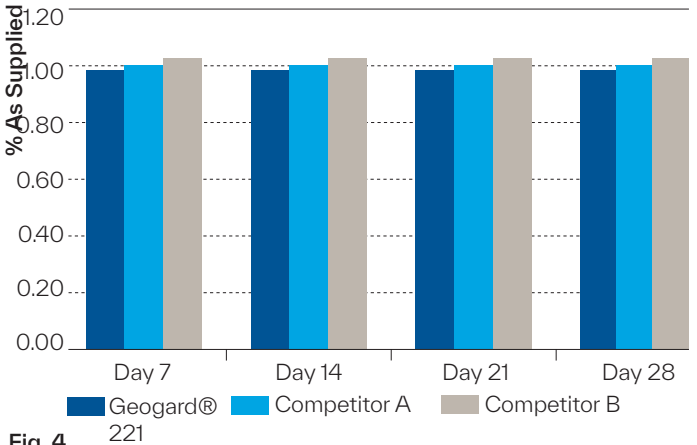
Shampoo Test Results

% Preservative (as supplied) Required to Achieve < 10 cfu/g of Mix Bacteria in the Shampoo



**Fig. 3**  
Competitor A : Phenoxyethanol; methylparaben; ethylparaben; propylparaben; butylparaben  
Competitor B : Phenoxyethanol; methylparaben; isopropylparaben; isobutylparaben; butylparaben

% Preservative (as supplied) Required to Achieve < 10 cfu/g of Mix Fungi in the Shampoo



**Fig. 4**  
Competitor A : Phenoxyethanol; methylparaben; ethylparaben; propylparaben; butylparaben  
Competitor B : Phenoxyethanol; methylparaben; isopropylparaben; isobutylparaben; butylparaben

## Cationic Cream Conditioner (pH 4.5)

Ingredient	% wt/wt
Sterile DI Water	90%
Laureth-4	3%
Cetyl alcohol	2%
Cetearyl alcohol	1.5%
Distearyldimonium chloride	1%
Hydrolyzed collagen	1%
Lecthin	1%
Polysorbate 80	0.5%
Sodium hydroxide	<1%
Total	100%

## Cationic Cream Conditioner Test Results

% Preservative (as supplied) Required to Achieve <10 cfu/g of Mix Bacteria in the Conditioner

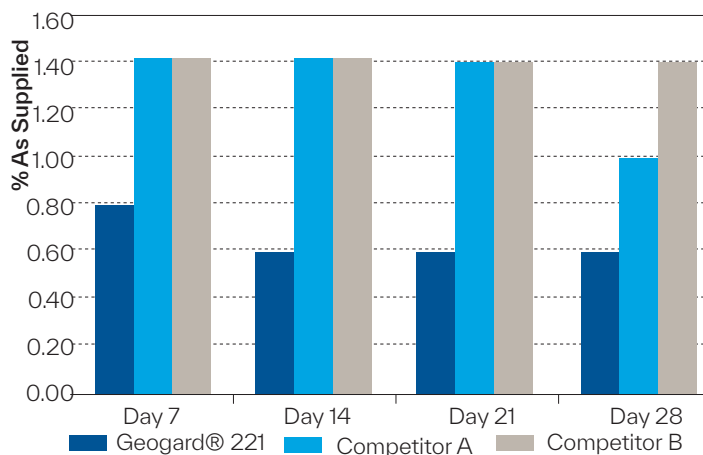


Fig. 5

Competitor A: Phenoxyethanol; methylparaben; ethylparaben; propylparaben; butylparaben; isobutylparaben

Competitor B: Phenoxyethanol; methylparaben; isopropylparaben; isobutylparaben; butylparaben

## % Preservative (as supplied) Required to Achieve <10 cfu/g of Mix Fungi in the Conditioner

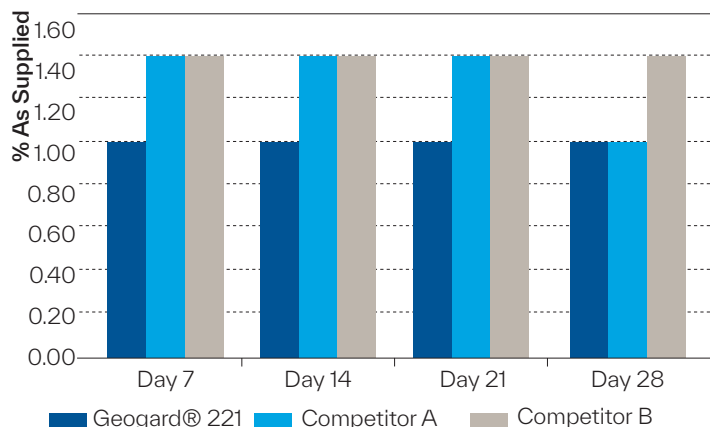


Fig. 6

Competitor A : Phenoxyethanol; methylparaben; ethylparaben; propylparaben; butylparaben; isobutylparaben

Competitor B : Phenoxyethanol; methylparaben; isopropylparaben; isobutylparaben; butylparaben



## Formulation Recommendations

- Use between pH 2-7
- Efficacy can be compromised above a pH of 7
- Recommended to be added below 45°C
- Enhanced compatibility allows for the addition of Geogard®221 virtually anywhere in the manufacturing process
- Anionics (carbomers and certain surfactants) can cause discoloration. This can be limited by the addition of reducing agents /antioxidants, in particular BHT or sodium metabisulfite or tocopherol (not tocopheryl acetate)
- Highly soluble in polar organic solvents

## Global Regulatory

### Europe

- Max use level for DHA is 0.6% DHA – rinse-off & leave-on
- Max use level for Benzyl Alcohol is 1% – rinse-off & leave-on

### Japan

- Benzyl alcohol is not permitted for use as a preservative in final cosmetic products placed on the Japanese market, however it can be used as a cosmetic ingredient.

### United States

- All ingredients allowed (CIR/PCPC)
- Refer to present practices of use and concentration

### China

- China compliant; listed on both the IECSC & IECIC inventories

