

## Geogard® LSA Preservative Blend

A highly efficacious broad spectrum antimicrobial



**INCI Name:** Butylene Glycol, Benzyl Alcohol, Sorbic Acid, Caprylic/Capric Triglyceride, Lauryl Alcohol, Myristyl Alcohol  
**SAP Code:** 141240

### Key Product Attributes

- Broad spectrum antimicrobial
- Effective pH range of 3–6
- Non-GMO
- Compatible with key raw materials
- Wide global acceptance

### Recommended Use Level

1 – 2 %

### Description

Geogard® LSA preservative is a highly efficacious broad spectrum antimicrobial which was designed to protect the integrity of personal care products. It is comprised of several non-traditional ingredients which have wide global approvals and are easy to use within formulation. Geogard® LSA blend is compatible with most raw materials used in personal care and has also been shown to be effective in wipes formulations. Its efficacy can be seen at pH's ranging from 3-6 with a low use level between 1 -2%.

# Compositional Breakdown

Chemical Compound Breakdown	Cas No.	EINECS No.
Benzyl Alcohol	100-51-6	202-859-9
Sorbic Acid	110-44-1	203-768-7
Myristyl Alcohol	112-72-1	204-000-3
Lauryl Alcohol	112-53-8	203-982-0
Butylene Glycol	107-88-0	203-529-7
Caprylic/Capric Triglyceride	65381-09-1/73398-61-5	265-724-3/277-452-2

## Efficacy

### Microbiological Challenge Studies

Preservative Efficacy Testing (CTFA) studies were run using different concentrations of the Geogard® LSA blend in various formulations to assess efficacy against various bacteria, yeast and fungi. All samples were inoculated at the beginning of the study, and then sampled at 24 hours, 7, 14, 21 and 28 days. Four weeks after challenge, samples were challenged again and the same sampling regime followed. Below is a summary of the results.

Oil in Water Lotion (5985-179) pH 6	
<b>A</b>	
Water, de-ionized	61.00
Urea	5.00
Sorbitan Monostearate (Lonzest™ SMS)	2.00
Caprylic/capric triglyceride (Aldo™ MCT)	20.00
PEG 1750 Monostearate (Pegosperse™ 1750)	1.50
Glyceryl Monostearate (Lonzest™ MSA)	2.00
Decaglyceryl Monostearate (Polyaldo™ 10-1-S)	5.00
<b>B</b>	
Hydroxyethylcellulose	1.50
<b>C</b>	
Preservative	2.00

### Test Results

Colony Forming Units per Gram (CFU/g)

	Unpreserved Control				Test –Geogard™ LSA (2.0%)			
	Initial Challenge		Rechallenge		Initial Challenge		Rechallenge	
	24 Hrs	1 week	28 Days	28 Days	24 Hrs	1 week	28 Days	28 Days
<i>S. aureus</i>	10 <sup>6</sup>	10 <sup>6</sup>	10 <sup>5</sup>	10 <sup>6</sup>	130	<10	<10	<10
<i>P.aeruginosa</i> <i>B. cepacia</i>	10 <sup>6</sup>	10 <sup>6</sup>	10 <sup>6</sup>	10 <sup>6</sup>	330	<10	<10	<10
<i>K.pneumoniae</i> <i>E. gergoviae</i>	10 <sup>6</sup>	10 <sup>6</sup>	10 <sup>6</sup>	10 <sup>6</sup>	<10	<10	<10	<10
<i>C. albicans</i>	10 <sup>5</sup>	10 <sup>5</sup>	<10	10 <sup>5</sup>	1.5x10 <sup>3</sup>	<10	<10	<10
Mixed Molds	10 <sup>5</sup>	10 <sup>5</sup>	10 <sup>4</sup>	10 <sup>5</sup>	10 <sup>4</sup>	<10	<10	<10

Hair Conditioner (5985-052B) pH 3.9 – 4.2		%
<b>A</b>		
Water, de-ionized		71.70
Hydroxyethylcellulose		0.30
Cetrimonium Bromide & Cetearyl Alcohol (Lonza CT-100)		1.00
Stearyl Alcohol		1.00
Steareth 21		2.50
<b>B</b>		
Glycosperse 0-20		0.50
Soy Lecithin		1.00
Water, de-ionized		20.00
<b>C</b>		
Preservative		1.50

### Test Results

Colony Forming Units per Gram (CFU/g)

	Unpreserved Control				Test –Geogard™ LSA (1.5%)			
	Initial Challenge		Rechallenge		Initial Challenge		Rechallenge	
	24 Hrs	1 week	28 Days	28 Days	24 Hrs	1 week	28 Days	28 Days
<i>S. aureus</i>	<10	<10	<10	10 <sup>6</sup>	20	<10	<10	<10
<i>P.aeruginosa</i> <i>B. cepacia</i>	10 <sup>6</sup>	10 <sup>6</sup>	10 <sup>6</sup>	10 <sup>6</sup>	<10	<10	<10	<10
<i>K.pneumoniae</i> <i>E. gergoviae</i>	10 <sup>6</sup>	10 <sup>6</sup>	10 <sup>6</sup>	10 <sup>6</sup>	<10	<10	<10	<10
<i>C. albicans</i>	10 <sup>5</sup>	10 <sup>5</sup>	10 <sup>5</sup>	10 <sup>5</sup>	<10	<10	<10	<10
Mixed Molds	10 <sup>4</sup>	9.2x10 <sup>2</sup>	6x10 <sup>3</sup>	10 <sup>4</sup>	1.2x10 <sup>2</sup>	<10	<10	<10

Water in Oil Lotion (5985-055B) pH N/A		%
<b>A</b>		
Water, de-ionized		73.00
Glycerin		3.00
Sodium Chloride		1.00
<b>B</b>		
Cyclopentasiloxane and PEG/PPG-20/15 Dimethicone		10.00
Cyclomethicone		8.50
DC9040 Elastomer Base		2.50
<b>C</b>		
Preservative		2.0

## Test Results

Colony Forming Units per Gram (CFU/g)

	Unpreserved Control			Test –Geogard™ LSA (2.0%)				
	Initial Challenge			Rechallenge	Initial Challenge			Rechallenge
	24 Hrs	1 week	28 Days	28 Days	24 Hrs	1 week	28 Days	28 Days
<i>S. aureus</i>	10 <sup>6</sup>	5x10 <sup>3</sup>	<10	<10	<10	<10	<10	<10
<i>P. aeruginosa</i> <i>B. cepacia</i>	10 <sup>6</sup>	10	<10	<10	<10	<10	<10	<10
<i>K. pneumoniae</i> <i>E. gergoviae</i>	10 <sup>6</sup>	5x10 <sup>2</sup>	<10	<10	<10	<10	<10	<10
<i>C. albicans</i>	10 <sup>5</sup>	10 <sup>5</sup>	10 <sup>4</sup>	10 <sup>4</sup>	<10	<10	<10	<10
Mixed Molds	10 <sup>4</sup>	<10	<10	10 <sup>4</sup>	<10	<10	<10	<10

Wet Wipe pH 5.2	%
DI Water	94.35
Decyl Glucoside (Plantaren™ 2000)	0.25
Polysorbate 20 (Glycosperse™ L-20)	0.30
Disodium EDTA	0.10
Preservative	2.00
pH adjust and water	q.s.

Wet Wipe Liquid preserved with 2% Geogard® LSA was dosed to two types of wipe substrates.

## Test Results

Colony Forming Units per Gram (CFU/g)

Substrate: Lyocel and Pulp

Contact time		Unpreserved			Geogard™ LSA 2.0%		
		0 h	1 week	4 weeks	0 h	1 week	4 weeks
Mixed Bacteria	<i>Staphylococcus aureus</i> , <i>Pseudomonas aeruginosa</i> , <i>Escherichia coli</i>	1.2x10 <sup>6</sup>	1.3x10 <sup>5</sup>	<100	1.1x10 <sup>6</sup>	1.0x10 <sup>2</sup>	<100
Mixed Fungi	<i>Candida albicans</i> , Mixed Molds	2.2x10 <sup>4</sup>	3.9x10 <sup>4</sup>	9.1x10 <sup>3</sup>	2.5x10 <sup>4</sup>	<100	<100

Substrate: Pulp, Polyester and Spunbound

Contact time		Unpreserved			Geogard™ LSA 2.0%		
		0 h	1 week	4 weeks	0 h	1 week	4 weeks
Mixed Bacteria	<i>Staphylococcus aureus</i> , <i>Pseudomonas aeruginosa</i> , <i>Escherichia coli</i>	1.2x10 <sup>6</sup>	1.0x10 <sup>5</sup>	8.0x10 <sup>3</sup>	1x10 <sup>6</sup>	<100	<100
Mixed Fungi	<i>Candida albicans</i> , Mixed Molds	3.0x10 <sup>4</sup>	1.4x10 <sup>5</sup>	2.1x10 <sup>6</sup>	2.6x10 <sup>4</sup>	<100	<100

## Applications

- Baby care
- Body butter
- Body wash
- Conditioner
- Cream
- Eye creams/gels
- Face lotion
- Facial cream
- Foundation
- Hair gel
- Hand soap
- Lotion
- Make up remover
- Mascara
- Oil in water products
- Shampoo
- Suncare
- Toner
- Water in oil products

## Formulation Tips

- Liquid – no dissolving needed
- Superior performance at low pH; good for hair conditioners
- Preferred addition at cool down 45°C
- For cold formulations, may need to heat to around 45°C in order to solubilize preservative
- For clear and/or highly aqueous formulations, may need an addition of additional emulsifier; i.e. Lonzest™ SML-20

## Global Regulatory

### Europe

Both preservative ingredients approved, Annex V to Regulation EC/1223/2009.

- Max concentration of 1% Benzyl Alcohol, and 0.6% Sorbic Acid

### Japan

All ingredients approved (JNCI)

- Max concentration of 0.5% Sorbic Acid
- Benzyl Alcohol is not approved as a preservative but can be used as a general cosmetic ingredient

### United States

All ingredients allowed (CIR/PCPC)

- CIR review concluded maximum concentration of 5% Benzyl Alcohol, with Sorbic Acid safe at current use levels as given in the review (< 3% based on 2006 formulation information)

### China

All ingredients included in 2014 Chinese IECIC list

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Typical Properties	
Spec	Parameter
Appearance	Clear white to light yellow liquid
pH [ 1% in water @25 °C]	3.0 - 4.0
Spec. Gravity [as is @25 °C]	0.99-1.04
Odor	Characteristic
Gardner	7 max
Visc [BF RVT#3@50rpm]	20-50 cps
Solubility	Miscible

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