



JEECIDE® CAP-5

Globally Compliant Broad Spectrum Preservative

Introduction

Jeecide® CAP-5 is a synergistic preservative blend comprised of Phenoxyethanol, Caprylyl Glycol, Potassium Sorbate, Water, and Hexylene Glycol. It is an easy-to-use clear liquid preservative that is both free of parabens and formaldehyde donors. With broad spectrum capabilities, **Jeecide® CAP-5** is effective against bacteria, yeast, and mold. **Jeecide® CAP-5** is compatible with anionic, cationic, and non-ionic surfactants and emulsifiers. It is toxicologically safe for use.

Jeecide® CAP-5 is equally suitable for use in both rinse-off and leave-on products. It is effective in difficult to preserve water/silicone emulsions. It is also approved for use in the United States, Europe, and restricted in Japan.

Jeecide® CAP-5 is the most powerful preservative in the **Jeecide® CAP product line** and it is a preferred preservative among multinational organizations worldwide.



PRODUCT APPLICATIONS:

- Skin creams and lotions
- Liquid foundations
- Lip products
- Hair styling lotions
- Pomades
- Sun care



KEY BENEFITS:

- Broad spectrum
- Globally Approved
- Easy-to-use liquid
- Compatible with non-ionics, cationics, and anionics
- Non-toxic



FORMULATING GUIDELINES:

We recommend not to add this blend to a product at a temperature exceeding 70 - 75°C for extended time periods. For emulsion products, because of the excellent compatibility of this blend with most ingredients, incorporation of it during the cool-down phase of processing is preferred.

Jeecide® CAP-5 is soluble or dispersible in most non-polar materials, however, it is not water soluble for highly aqueous systems. The addition of a co-solvent, coupling agent, or surfactant (eg. Polysorbate 20) in a 1:1 ratio will make it water soluble to obtain a clear system.

Typical Properties	
INCI Name	Phenoxyethanol (and) Caprylyl Glycol (and) Potassium Sorbate (and) Water (and) Hexylene Glycol
Preservative Compositional Breakdown	Phenoxyethanol: 35 - 45% Potassium Sorbate: 8 - 15%
Appearance @ 25°C	Clear to amber liquid
Odor	Slight, Characteristic
Specific Gravity	1.015 - 1.065
Free Phenol, %	0.05 Maximum
Recommended Use Level	0.5 - 1.5%

Solubility Data	
Ingredient	Compatibility
Butylene Glycol	Soluble
C12-15 Alkyl Benzoate	Soluble
Caprylic/Capric Triglycerides	Soluble
Cyclomethicone	Insoluble
Dimethicone 200/100 cst	Dispersible
Ethanol 190 Proof	Soluble
Isododecane	Soluble
Isopropyl Myristate	Soluble
Mineral Oil	Dispersible
Phenyltrimethicone	Soluble
Propylene Glycol	Soluble
Water	Dispersible

Microbiological Challenge Studies

A study was conducted using 2 formulations: an oil-in-water emulsion and a water-in-oil emulsion using 0.5% and 1.0% **Jeecide® CAP-5**. The protocol used was a modification of the CTFA Challenge Test using a 3 week re-challenge time period instead of a 4 week period. All samples were inoculated at the start of the study and sampled at 24 hours, 48 hours, 7 days, 14 days and 21 days. After 21 days, all samples were re-inoculated and subjected to a second challenge.

Oil-in-Water Emulsion.

Ingredient	Control	0.5% Jeecide® CAP-5	1.0% Jeecide® CAP-5
Water	70.50	70.00	69.50
Glycerin	4.00	4.00	4.00
Apricot Kernel Oil	17.00	17.00	17.00
Cetearyl Alcohol & Cetearth-20	4.50	4.50	4.50
Glyceryl Stearate & PEG-100 Stearate	4.00	4.00	4.00
Jeecide® CAP-5	X	0.50	1.00

Test Organism	Unpreserved Control Initial Challenge			Unpreserved Control Re-Challenge		
	24 hrs.	7 days	21 days	24 hrs.	7 days	21 days
<i>S. aureus</i> ATCC 6538	7.4 x 10 ⁴	<10 ³	<10	1.4 x 10 ⁶	4.3 x 10 ²	<10
<i>P. aeruginosa</i> ATCC 9027	2.5 x 10 ⁴	1.6 x 10 ⁷	1.9 x 10 ⁷	1.5 x 10 ⁷	2.0 x 10 ⁷	1.9 x 10 ⁷
<i>K. pneumoniae</i> ATCC 4352	1.6 x 10 ⁵	7.6 x 10 ⁴	4.0 x 10 ³	1.1 x 10 ⁶	1.6 x 10 ⁶	4.0 x 10 ⁵
<i>C. albicans</i> ATCC 10231	4.1 x 10 ⁴	8.3 x 10 ⁴	5.3 x 10 ⁴	4.0 x 10 ⁵	4.4 x 10 ⁵	8.0 x 10 ⁵
<i>A. niger</i> ATCC 9642 + <i>Penicillium sp.</i> isolate	3.4 x 10 ⁴	2.5 x 10 ⁴	1.4 x 10 ⁴	5.1 x 10 ⁴	3.0 x 10 ⁴	2.9 x 10 ⁴

Test Organism	0.5% Jeecide® CAP-5 Initial Challenge			0.5% Jeecide® CAP-5 Re-Challenge		
	24 hrs.	7 days	21 days	24 hrs.	7 days	21 days
<i>S. aureus</i> ATCC 6538	<10	<10	<10	<10	<10	<10
<i>P. aeruginosa</i> ATCC 9027	<10	<10	<10	<10	<10	<10
<i>K. pneumoniae</i> ATCC 4352	<10	<10	<10	<10	<10	<10
<i>C. albicans</i> ATCC 10231	1.2 x 10 ⁴	<10	<10	<10	<10	<10
<i>A. niger</i> ATCC 9642 + <i>Penicillium sp.</i> isolate	2.3 x 10 ³	<10	<10	<10	<10	<10

Test Organism	1% Jeecide® CAP-5 Initial Challenge			1% Jeecide® CAP-5 Re-Challenge		
	24 hrs.	7 days	21 days	24 hrs.	7 days	21 days
<i>S. aureus</i> ATCC 6538	<10	<10	<10	<10	<10	<10
<i>P. aeruginosa</i> ATCC 9027	<10	<10	<10	<10	<10	<10
<i>K. pneumoniae</i> ATCC 4352	<10	<10	<10	<10	<10	<10
<i>C. albicans</i> ATCC 10231	<10	<10	<10	<10	<10	<10
<i>A. niger</i> ATCC 9642 + <i>Penicillium sp.</i> isolate	<10	<10	<10	<10	<10	<10

Water-In-Oil Emulsion.

Ingredient	Control	0.5% Jeecide® CAP-5	1.0% Jeecide® CAP-5
Water	59.70	59.20	59.20
Glycerin	4.00	4.00	4.00
Butylene Glycol	3.00	3.00	3.00
Sodium Chloride	0.30	0.30	0.30
Cyclomethicone	7.00	7.00	7.00
Dimethicone	2.00	2.00	2.00
Isostearyl Palmitate	4.00	4.00	4.00
Isododecane & Dimethicone Crosspolymer-3	10.00	10.00	10.00
Cyclomethicone & PEG/PPG-18/18 Dimethicone	10.00	10.00	10.00
Jeecide® CAP-5	X	0.50	1.00

Test Organism	Unpreserved Control Initial Challenge			Unpreserved Control Re-Challenge		
	24 hrs.	7 days	21 days	24 hrs.	7 days	21 days
<i>S. aureus</i> ATCC 6538	2.0 x 10 ⁴	4.0 x 10 ³	<10	9.5 x 10 ²	<10	<10
<i>P. aeruginosa</i> ATCC 9027	4.4 x 10 ⁴	7.1 x 10 ⁴	7.2 x 10 ³	3.6 x 10 ⁴	3.5 x 10 ⁴	1.1 x 10 ⁵
<i>K. pneumoniae</i> ATCC 4352	1.1 x 10 ⁵	1.1 x 10 ⁵	<10	8.0 x 10 ³	3.4 x 10 ³	<10
<i>C. albicans</i> ATCC 10231	1.1 x 10 ⁴	8.5 x 10 ³	8.7 x 10 ³	1.5 x 10 ³	4.8 x 10 ³	1.7 x 10 ³
<i>A. niger</i> ATCC 9642 + <i>Penicillium sp.</i> isolate	2.0 x 10 ³	1.2 x 10 ⁴	2.2 x 10 ³	2.0 x 10 ³	1.7 x 10 ³	2.2 x 10 ³

Test Organism	0.5% Jeecide® CAP-5 Initial Challenge			0.5% Jeecide® CAP-5 Re-Challenge		
	24 hrs.	7 days	21 days	24 hrs.	7 days	21 days
<i>S. aureus</i> ATCC 6538	<10	<10	<10	<10	<10	<10
<i>P. aeruginosa</i> ATCC 9027	<10	<10	<10	<10	<10	<10
<i>K. pneumoniae</i> ATCC 4352	<10	<10	<10	<10	<10	<10
<i>C. albicans</i> ATCC 10231	1.1 x 10 ²	<10	<10	<10	<10	<10
<i>A. niger</i> ATCC 9642 + <i>Penicillium sp.</i> isolate	3.0 x 10 ¹	<10	<10	<10	<10	<10

Test Organism	1% Jeecide® CAP-5 Initial Challenge			1% Jeecide® CAP-5 Re-Challenge		
	24 hrs.	7 days	21 days	24 hrs.	7 days	21 days
<i>S. aureus</i> ATCC 6538	<10	<10	<10	<10	<10	<10
<i>P. aeruginosa</i> ATCC 9027	<10	<10	<10	<10	<10	<10
<i>K. pneumoniae</i> ATCC 4352	<10	<10	<10	<10	<10	<10
<i>C. albicans</i> ATCC 10231	<10	<10	<10	<10	<10	<10
<i>A. niger</i> ATCC 9642 + <i>Penicillium sp.</i> isolate	2.0 x 10 ¹	<10	<10	<10	<10	<10

Kill Test Data

Jeecide® CAP-5 has been tested using the tube testing method. The results are in Table 1.

Table 1. Jeecide® CAP-5 @ 1%

Organism		Results
Bacteria	Pool 1	3
	Pool 2	3
	Pool 3	3
Yeast	Pool 4	3
Mold	Pool 5	3

Key:

0 = No Kill

1 = Slight Kill

2 = Moderate Kill

3 = Kill

Microbiological Challenge Studies Results

Oil-in-Water

The **Jeecide® CAP-5** at 1.0% killed all the challenge organisms within 24 hours after each challenge. At 0.5%, activity was slower versus yeast and mold than against bacteria after the first challenge, but molds were reduced to less than 10 per gram within 48 hours (results not shown). After the second challenge, 0.5% was effective against all organisms within 24 hours.

Water-in-Oil

The **Jeecide® CAP-5** was effective against bacteria within 24 hours after each challenge. At 1.0%, the **Jeecide® CAP-5** was faster against yeast and mold than at 0.5% after the first challenge but no organisms were detected 24 hours after the second challenge in the presence of 0.5% or 1.0% **Jeecide® CAP-5**.



Please contact your JEEN Representative or visit our website at www.JEEN.com to learn more about our products, our technologies, and how we can help you reduce your carbon footprint and produce a greener product.

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