

JEEQUAT® MCA-1

Microbial Control Alternative

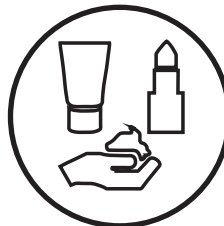
Introduction

Jeequat® MCA-1 (Microbial Control Alternative) is mild, yet effective, and imparts little odor and color to a wide range of leave-on and rinse-off personal care and cosmetic products. This ingredient is a cost-effective alternative to traditional preservative technologies by utilizing long-accepted organic acids and antioxidants. It offers broad spectrum protection to a wide range of formulations. **Jeequat® MCA-1** is a proprietary, easy-to-use, clear liquid blend that is free of parabens, isothiazolinones, phenoxyethanol, and formaldehyde releasers.



KEY BENEFITS:

- Organic acid-based, alternative microbial control blend in a mild glycerin carrier
- Broad-spectrum microbial control
- Organic acids provide both chelating and antioxidant effects
- Effective alternative to traditional preservatives
- Easy to use liquid



PRODUCT APPLICATIONS:

- Skin Creams and Lotions
- Sunscreen Products
- Hair Care Styling Products
- Hair Conditioning Products

Typical Properties	
INCI Name	Glycerin (and) Citric Acid (and) Lactic Acid (and) L-Ascorbic Acid (and) Didecyldimonium Chloride
Appearance @ 25°C	Light Yellow, Viscous Liquid Suspension
Odor	Slight citric odor
pH (10% suspension)	1.5 – 3.0 (10% suspension)
Solubility in water	Complete
Recommended Use Level	0.75 - 1.5%

Challenge Testing

Jeequat® MCA-1 has been challenge-tested in several types of formulations for antimicrobial control. The information below provides results from two different types of formulations over a wide pH range, both of which outline the successful challenge testing results of **Jeequat® MCA-1** in typical cosmetic formulations.

Test Method and Acceptance Criteria

The method employed for the testing was USP <51>, Antimicrobial Effectiveness Testing and Preservative Neutralization Validation. This method was chosen to determine if the alternative microbial control blend in **Jeequat® MCA-1** could provide the protection against typical strains of bacteria, yeast, and mold found in cosmetic and personal care products.

For Category 2 products, the preservative is effective in the sample tested if:

1. the concentration of viable bacteria demonstrates no less than a 2.0 log reduction from the initial count at 14 days and no increase from day 14 to day 28 and;
2. the concentration of viable yeast and molds demonstrates no increase from the initial calculated count at day 14 and day 28.

Challenge Test Formulation #1.

Formulation J4-35A: Cosmetic Cream, pH 4.2

Ingredient	Supplier	INCI Name	Percent (%)
Water		Deionized Water	69.5
Apricot Kernel Oil	JEEN	Prunus Armeniaca (Apricot) Kernel Oil	17.0
Jeecol® CS-20-D	JEEN	Cetearyl Alcohol, Ceteareth-20	4.5
Jeechem® GMS-165	JEEN	Glyceryl Stearate and PEG-100 Stearate	4.0
Jeequat® MCA-1	JEEN	Glycerin, Citric Acid, Lactic Acid, L-Ascorbic Acid, Didecyldimonium Chloride	1.0

Challenge Test Results

Results of Challenge Testing with 1% Jeequat® MCA-1: Recovery CFU/Gram

	<i>Staphylococcus aureus</i> (ATCC #6538)	<i>Escherichia coli</i> (ATCC #8739)	<i>Pseudomonas aeruginosa</i> (ATCC #9027)	<i>Candida albicans</i> (ATCC #10231)	<i>Aspergillus brasiliensis</i> (ATCC #16404)
Log Inoculum Level	5.90	6.20	6.01	5.33	4.70
Day 14	<1.00	<1.00	<1.00	3.62	4.20
Day 28	<1.00	<1.00	<1.00	<1.00	2.80
Validation*	+	+	+	+	+

*indicates the antimicrobial control system was neutralized by a 1:10 dilution and chemical means

Conclusion

The test material, **Jeequat® MCA-1**, in the cosmetic cream formulation J4-35A conforms to the acceptance criteria for USP <51>, Category 2 products.

Challenge Test Formulation #2

Formulation J27-14DB: Daily Replenishing Lotion, pH 7.9

Ingredient	Supplier	INCI Name	Percent (%)
Water		Deionized Water	74.4
Jeesperse® ICE-T EUC-DRL	JEEN	Glyceryl Stearate, PEG-100 Stearate, Stearic Acid, Cetearyl Alcohol, Lanolin Alcohol, Carbomer	2.80
Sunflower Oil	JEEN	Helianthus Annus (Sunflower) Seed Oil	4.50
Petrolatum		Petrolatum	5.50
Glycerin 99.7%	JEEN	Glycerin	2.50
Titanium Dioxide		Titanium Dioxide	0.20
Jeechol® ODD	JEEN	Octyldodecanol	3.00
Jeechem® CTG	JEEN	Caprylic/Capric Triglyceride	1.30
Jeesilc® PDS-350	JEEN	Dimethicone	3.50
DL-Panthenol CG	JEEN	DL-Panthenol	0.30
Disodium EDTA		Disodium EDTA	0.30
Vitamin E USP	JEEN	Tocopheryl Acetate	0.30
Sodium Hydroxide 18%		Sodium Hydroxide	0.80
Jeequat® MCA-1	JEEN	Glycerin, Citric Acid, Lactic Acid, L-Ascorbic Acid, Didecyldimonium Chloride	1.00

Challenge Test Results

Results of Challenge Testing with 1% Jeequat® MCA-1: Log CFU/Gram

	<i>Staphylococcus aureus</i> (ATCC #6538)	<i>Escherichia coli</i> (ATCC #8739)	<i>Pseudomonas aeruginosa</i> (ATCC #9027)	<i>Candida albicans</i> (ATCC #10231)	<i>Aspergillus brasiliensis</i> (ATCC #16404)
Log Inoculum Level (grams)	6.04	6.02	6.04	6.04	6.02
Day 14	<1.00	<1.00	<1.00	<1.00	<1.00
Day 28	<1.00	<1.00	<1.00	<1.00	<1.00
Validation*	+	+	+	+	+

Conclusion

The test material, **Jeequat® MCA-1**, in the cosmetic cream formulation J27-14DB conforms to the acceptance criteria for USP <51>, Category 2 products.



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.