

# Cosmocil® CQ

## Fast-Acting and Trusted Antibacterial



**INCI Name:** Polyaminopropyl Biguanide

### Key Product Benefits

- Clear, colorless, highly water-soluble
- Fast-acting and strong antibacterial efficacy
- High activity vs. tough Gram (negative) organisms e.g. Pseudomonas
- Chemically stable and non-volatile
- Zero VOC
- Effective and stable over a broad pH range (3-10)
- UV stable
- Odorless and non-foaming
- Broad global acceptance
- Non-sticky feel on the skin

### Recommended Use Level

0.2–1.5%

### Description

Cosmocil® CQ is a broad spectrum, fast-acting antibacterial. A 20% aqueous solution of poly(hexamethylenebiguanide) hydrochloride, also known as PHMB, Cosmocil® CQ is an effective preservative for personal care formulations, active against a wide range of both Gram-positive and Gram-negative bacteria.

## Compositional Breakdown

Chemical Compound Breakdown	CAS No.	EINECS
Water	7732-18-5	231-791-2
Polyaminopropyl Biguanide	133029-32-0 / 27083-27-8	Not assigned

Chemical Compound Breakdown	%
Water	79.0–81.0%
Polyaminopropyl Biguanide	19.0–21.0%

## Applications

- Baby care
- Baby wipes
- Body wash
- Conditioner
- Cream
- Deo/ Anti-perspirant
- Eye creams/gels
- Eye shadow
- Face lotion
- Face wipes
- Facial cream
- Foundation
- Hair gel
- Hand soap (non anti-bac)
- Lipstick/gloss
- Lotion
- Make-up remover
- Mascara
- Oil in Water
- Oral care (as preservative, not the active)
- Powder
- Shampoo
- Suncare
- Toner
- Water in Oil

## Efficacy

### Microbiological Challenge Studies

Studies were run on three formulas at two concentrations of Cosmocil® CQ. The protocols used were the CTFA challenge test (56-day study with reinoculation at Day 28) and the EP challenge test (28-day).

## Skin Cleanser

Ingredient	Identity	% (w/w)
Disodium EDTA	Disodium EDTA	0.1
Butylene glycol	Butylene glycol	3.0
Glycerin	Glycerin	4.0
Natrulon® H-6	Polyglycerin-6	5.0
Deionized water	Water	82.74
–	<i>Foeniculum vulgare</i> (Fennel) Seed Extract	1.0
NAB® Butterbur Extract	<i>Petasites japonicus</i> Root Extract	1.0
Polyaldo® 10-1-CC	Polyglyceryl-10 Caprylate/Caprates	3.0
Sodium hydroxide (10% solution) to pH 6.7	-	0.16

## Test Result

### pH 6.7 – 28-day EP protocol : 0.4% Cosmocil® CQ

Test Organism	0 days	2 days	7 days	14 days	28 days	EP Pass Criteria
<i>Pseudomonas aeruginosa</i>	3.60 x 10 <sup>6</sup>	<10	<10	NT	<10	A
<i>Staphylococcus aureus</i>	4.30 x 10 <sup>6</sup>	<10	<10	NT	<10	A
<i>Candida albicans</i>	1.70 x 10 <sup>5</sup>	NT	NT	<10	<10	A
<i>Aspergillus brasiliensis</i>	2.60 x 10 <sup>5</sup>	NT	NT	1.20 x 10 <sup>3</sup>	<10	A

NT = Not Tested

### 28-day EP protocol : Unpreserved control

Test Organism	0 days	2 days	7 days	14 days	28 days	EP Pass Criteria
<i>Pseudomonas aeruginosa</i>	1.90 x 10 <sup>6</sup>	3.40 x 10 <sup>6</sup>	3.80 x 10 <sup>6</sup>	NT	NT	Fail
<i>Staphylococcus aureus</i>	2.20 x 10 <sup>6</sup>	1.36 x 10 <sup>5</sup>	2.90 x 10 <sup>4</sup>	NT	NT	Fail
<i>Candida albicans</i>	1.65 x 10 <sup>5</sup>	NT	NT	NT	NT	Fail
<i>Aspergillus brasiliensis</i>	2.30 x 10 <sup>5</sup>	NT	NT	NT	NT	Fail

NT = Not Tested

# Lotion

Ingredient	Identity	% (w/w)
Urea	Urea	5.00
Sorbitan Monostearate	Sorbitan Monostearate	2.00
Aldo® MCT	Caprylic/Capric Triglyceride	20.00
PEG-1750 Monostearate	PEG-1750 Monostearate	1.50
Lonzest® MSA	Glyceryl Monostearate	2.00
Polyaldo® 10-10-0	Decaglycerol Decaoleate	5.00
Natrosol 250HHR	Hydroxyethylcellulose	0.75
Cosmocil® CQ	Polyaminopropyl biguanide	0.50
DI water	Water	To 100%

## Test Results

### pH 5.4 – 56-day CTFA protocol : 0.5% Cosmocil® CQ

Test Organism CFU/g counts	Challenge 1			Challenge 2		
	24 hours	7 days	28 days	24 hours	7 days	28 days
<i>Staphylococcus aureus</i>	<10	<10	<10	<10	<10	<10
<i>Pseudomonas aeruginosa + Burkholderia cepacia</i>	9.0 x 10 <sup>2</sup>	7.0 x 10 <sup>2</sup>	<10	<10	<10	<10
<i>Klebsiella pneumoniae + Enterobacter gergoviae</i>	7.0 x 10 <sup>2</sup>	3.0 x 10 <sup>2</sup>	<10	<10	<10	<10
<i>Candida albicans</i>	<10	<10	<10	<10	<10	<10
<i>Aspergillus brasiliensis + Penicillium sp</i>	5.0 x 10 <sup>2</sup>	1.3 x 10 <sup>3</sup>	1.8 x 10 <sup>2</sup>	6.0 x 10 <sup>1</sup>	<10	1.9 x 10 <sup>2</sup>

### pH 7.6 – 56-day CTFA protocol : 0.5% Cosmocil® CQ

Test Organism CFU/g counts	Challenge 1			Challenge 2		
	24 hours	7 days	28 days	24 hours	7 days	28 days
<i>Staphylococcus aureus</i>	5.0 x 10 <sup>2</sup>	3.0 x 10 <sup>2</sup>	<10	<10	<10	<10
<i>Pseudomonas aeruginosa + Burkholderia cepacia</i>	<10	<10	<10	<10	<10	<10
<i>Klebsiella pneumoniae + Enterobacter gergoviae</i>	<10	<10	<10	<10	<10	<10
<i>Candida albicans</i>	3.0 x 10 <sup>1</sup>	<10	<10	<10	<10	<10
<i>Aspergillus brasiliensis + Penicillium sp</i>	1.1 x 10 <sup>4</sup>	8.0 x 10 <sup>2</sup>	4.0 x 10 <sup>1</sup>	2.3 x 10 <sup>4</sup>	5.0 x 10 <sup>1</sup>	<10

### 56-day CTFA protocol : Unpreserved control

Test Organism CFU/g counts	Challenge 1				Challenge 2			
	0 hours	24 hours	7 days	28 days	0 hours	24 hours	7 days	28 days
<i>Staphylococcus aureus</i>	3.3 x 10 <sup>6</sup>	2.2 x 10 <sup>6</sup>	7.7 x 10 <sup>5</sup>	<10	3.2 x 10 <sup>6</sup>	4.0 x 10 <sup>6</sup>	1.5 x 10 <sup>6</sup>	1.0 x 10 <sup>1</sup>
<i>Pseudomonas aeruginosa + Burkholderia cepacia</i>	1.2 x 10 <sup>6</sup>	3.9 x 10 <sup>5</sup>	3.4 x 10 <sup>4</sup>	<10	3.1 x 10 <sup>6</sup>	1.4 x 10 <sup>6</sup>	4.9 x 10 <sup>4</sup>	1.5 x 10 <sup>4</sup>
<i>Klebsiella pneumoniae + Enterobacter gergoviae</i>	3.8 x 10 <sup>6</sup>	8.3 x 10 <sup>5</sup>	1.5 x 10 <sup>4</sup>	<10	7.4 x 10 <sup>6</sup>	2.0 x 10 <sup>6</sup>	1.5 x 10 <sup>4</sup>	<10
<i>Candida albicans</i>	1.1 x 10 <sup>5</sup>	1.1 x 10 <sup>5</sup>	1.4 x 10 <sup>3</sup>	2.1 x 10 <sup>1</sup>	2.0 x 10 <sup>3</sup>	7.6 x 10 <sup>2</sup>	<10	<10
<i>Aspergillus brasiliensis + Penicillium sp</i>	6.0 x 10 <sup>4</sup>	8.0 x 10 <sup>4</sup>	8.0 x 10 <sup>4</sup>	1.9 x 10 <sup>4</sup>	6.4 x 10 <sup>4</sup>	6.7 x 10 <sup>4</sup>	<10	<10

# Make-Up Remover

Ingredient	Identity	% (w/w)
Propylene Glycol	Propylene Glycol	2.0
Glycerin	Glycerin	2.0
PEG-8 Monooleate	PEG-8 Monooleate	2.0
Plantaren 2000 N UP	Decyl Glucoside	25.0
Cosmocil® CQ	Polyaminopropyl biguanide	0.50
DI water	Water	To 100%

## Test Results

### pH 5.5 – 56-day CTFA protocol : 0.5% Cosmocil® CQ

Test Organism CFU/g counts	Challenge 1			Challenge 2		
	24 hours	7 days	28 days	24 hours	7 days	28 days
<i>Staphylococcus aureus</i>	<10	<10	<10	<10	<10	<10
<i>Pseudomonas aeruginosa + Burkholderia cepacia</i>	4.5 x 10 <sup>3</sup>	<10	<10	3.0 x 10 <sup>4</sup>	<10	<10
<i>Klebsiella pneumoniae + Enterobacter gergoviae</i>	<10	<10	<10	<10	<10	<10
<i>Candida albicans</i>	6.9 x 10 <sup>3</sup>	2.0 x 10 <sup>1</sup>	<10	9.0 x 10 <sup>1</sup>	<10	<10
<i>Aspergillus brasiliensis + Penicillium sp</i>	9.8 x 10 <sup>3</sup>	2.7 x 10 <sup>3</sup>	<10	3.2 x 10 <sup>2</sup>	4.0 x 10 <sup>1</sup>	4.0 x 10 <sup>2</sup>

### pH 7.8 – 56-day CTFA protocol : 0.5% Cosmocil® CQ

Test Organism CFU/g counts	Challenge 1			Challenge 2		
	24 hours	7 days	28 days	24 hours	7 days	28 days
<i>Staphylococcus aureus</i>	<10	<10	<10	<10	<10	<10
<i>Pseudomonas aeruginosa + Burkholderia cepacia</i>	<10	1.0 x 10 <sup>2</sup>	<10	<10	<10	<10
<i>Klebsiella pneumoniae + Enterobacter gergoviae</i>	<10	<10	<10	<10	<10	<10
<i>Candida albicans</i>	<10	<10	<10	<10	<10	<10
<i>Aspergillus brasiliensis + Penicillium sp</i>	4.0 x 10 <sup>3</sup>	3.0 x 10 <sup>3</sup>	2.4 x 10 <sup>2</sup>	3.1 x 10 <sup>2</sup>	1.1 x 10 <sup>2</sup>	2.1 x 10 <sup>3</sup>

### 56-day CTFA protocol : Unpreserved control

Test Organism CFU/g counts	Challenge 1				Challenge 2			
	0 hours	24 hours	7 days	28 days	0 hours	24 hours	7 days	28 days
<i>Staphylococcus aureus</i>	4.5 x 10 <sup>4</sup>	<10	<10	<10	1.4 x 10 <sup>6</sup>	2.0 x 10 <sup>1</sup>	<10	<10
<i>Pseudomonas aeruginosa + Burkholderia cepacia</i>	3.6 x 10 <sup>6</sup>	1.3 x 10 <sup>5</sup>	2.1 x 10 <sup>6</sup>	1.2 x 10 <sup>7</sup>	9.1 x 10 <sup>6</sup>	4.2 x 10 <sup>6</sup>	9.2 x 10 <sup>6</sup>	2.3 x 10 <sup>6</sup>
<i>Klebsiella pneumoniae + Enterobacter gergoviae</i>	1.2 x 10 <sup>6</sup>	7.0 x 10 <sup>3</sup>	5.0 x 10 <sup>4</sup>	8.5 x 10 <sup>5</sup>	3.8 x 10 <sup>6</sup>	2.1 x 10 <sup>6</sup>	2.2 x 10 <sup>6</sup>	<10
<i>Candida albicans</i>	8.7 x 10 <sup>4</sup>	6.3 x 10 <sup>4</sup>	1.6 x 10 <sup>4</sup>	1.7 x 10 <sup>4</sup>	2.0 x 10 <sup>3</sup>	1.5 x 10 <sup>3</sup>	1.2 x 10 <sup>2</sup>	<10
<i>Aspergillus brasiliensis + Penicillium sp</i>	5.5 x 10 <sup>4</sup>	5.1 x 10 <sup>4</sup>	1.6 x 10 <sup>4</sup>	1.7 x 10 <sup>4</sup>	5.4 x 10 <sup>4</sup>	8.8 x 10 <sup>4</sup>	4.0 x 10 <sup>4</sup>	2.1 x 10 <sup>4</sup>

# Global Regulatory

## Europe

- Polyaminopropyl biguanide is listed on the Annex V to Regulation EC/1223/2009 – formerly Annex VI to Council Directive 76/768/EEC relating to preservatives for use in cosmetic products
- Max authorized use level of 0.5% Cosmocil® CQ (0.1% PHMB) as a preservative

## Japan

- Approved for all categories of cosmetic products (leave-on, rinse-off and mucous contact) at a maximum dosage of 0.5% of Cosmocil® CQ

## United States

- Allowed for Personal Care Products

# Formulation Recommendations

- If additional antifungal activity is required, Cosmocil® CQ can be formulated alongside the likes of sorbic acid, benzoic acid or IPBC
- Since the active agent PHMB is cationic, the compatibility and efficacy in anionic systems may be impacted

Typical Properties	
Appearance	Clear to slightly opalescent liquid
Color (Gardner)	Colorless to slightly pale yellow
Odor	Characteristic

## USA

Lonza Consumer Care  
70 Tyler Place  
South Plainfield, NJ 07080  
Tel +1 908 561 5200

## Switzerland

Lonza Ltd  
Muenchensteinerstrasse 38  
4002 Basel  
Tel +41 61 316 81 11

[ccpreservation@lonza.com](mailto:ccpreservation@lonza.com)

Review and follow all product safety instructions. All product information corresponds to Lonza's knowledge on the subject at the date of publication, but Lonza makes no warranty as to its accuracy or completeness and Lonza assumes no obligation to update it. Product information is intended for use by recipients experienced and knowledgeable in the field, who are capable of and responsible for independently determining the suitability of ingredients for intended uses and to ensure their compliance with applicable law. Proper use of this information is the sole responsibility of the recipient. This information relates solely to the product as an ingredient. It may not be applicable, complete or suitable for the recipient's finished product or application; therefore republication of such information or related statements is prohibited. Information provided by Lonza is not intended and should not be construed as a license to operate under any patent or a recommendation to infringe any patent or other intellectual property right. No claims are made herein for any specific intermediate or end-use application.

Recipient is solely responsible for conducting safety testing, including but not limited to human repeat insult patch testing, and assessing whether the manufacture or commercialization of this formulation may infringe any existing IP rights.

All trademarks belong to Lonza or its affiliates or to their respective third party owners and are used here only for informational purposes.

© 2017 Lonza

[www.lonza.com](http://www.lonza.com)

[www.lonzapreservation.com](http://www.lonzapreservation.com)