

# Isocil<sup>®</sup> PC

## Traditional Efficacious Preservation



INCI Name : Methyl Chloroisothiazolinone (and) Methylisothiazolinone

### Key Product Attributes

- MI/CMI blend
- Broad spectrum preservation
- Easy to use liquid product
- Compatible and soluble in most personal care raw materials
- Cost effective
- Clear liquid aqueous solution
- Has a wide range of global regulatory approval

### Recommended Use Level

0.05–0.1% (regional limitations apply)

### Description

Isocil<sup>®</sup> PC is a combination of two commonly used personal care preservatives, Methyl chloroisothiazolinone and Methylisothiazolinone (MI/CMI). These traditional preservatives have been used for years offering excellent broad spectrum efficacy at low use levels. With the added benefit of a strong safety profile as well as toxicological data, this chemistry is appealing amongst many formulators.

Product	Chemical Compound Breakdown	Cas No.	EINECS No.
Isocil® PC	5-Chloro-2-methyl-4-isothiazolin-3-one	26172-55-4	247-500-7
	2-Methyl-4-isothiazolin-3-one	2682-20-4	220-239-6
	Magnesium Chloride	7786-30-3	232-094-6
	Magnesium Nitrate	10377-60-3	233-826-7
	Water	7732-18-5	231-791-2

Chemical Compound Breakdown	%
5-Chloro-2-methyl-4-isothiazolin-3-one	1.15% min.
2-Methyl-4-isothiazolin-3-one	0.35% min.
Magnesium nitrate	21.0–25.0%
Magnesium chloride	0.4–0.8%
Water	73.8–78.2%

## Applications

- Anhydrous
- 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)
- Lotion
- Make up remover
- Mascara
- Oil in Water
- Powder
- Shampoo
- Suncare
- Toner
- Water in Oil

## Efficacy

### Microbiological Challenge Studies

Studies were run using different concentrations of Isocil® PC in various formulations to see efficacy against various bacteria, yeast and fungi compared to other commercial isothiazolinones. All samples were inoculated at the beginning of the study, sampled at 24 hours, 3, 7, 10, 14, 21 and 28 days.

## Shampoo Formula

Ingredient	% wt/wt
CARSONOL_SLES	35.0%
CARSONOL_TLS	25.0%
CARSAMIDE_CA	3.0%
Water (deionized)	36.0%
Polypro 5000	1.0%
Preservative	q.s.
Total	100.0%

## Isocil® PC vs. Competitive Isothiazolinone – Shampoo Mixed Inoculum-Bacteria\*

CFU – Contact Time (Days)								
Preservative %	0	1	3	7	10	14	28	
None	7.1x10 <sup>6</sup>	3.4x10 <sup>6</sup>	9.0x10 <sup>5</sup>	3.4x10 <sup>7</sup>	4.2x10 <sup>7</sup>	3.4x10 <sup>7</sup>	2.3x10 <sup>7</sup>	
Isocil® PC	0.05	5.5x10 <sup>6</sup>	3.1x10 <sup>4</sup>	3.0x10 <sup>3</sup>	<10	<10	<10	<10
Isocil® PC	0.10	7.8x10 <sup>6</sup>	7.8x10 <sup>4</sup>	3.0x10 <sup>3</sup>	<10	<10	<10	<10
Competitor	0.05	7.1x10 <sup>6</sup>	3.5x10 <sup>4</sup>	1.0x10 <sup>3</sup>	<10	<10	<10	<10
Competitor	0.10	6.1x10 <sup>6</sup>	5.0x10 <sup>4</sup>	2.0x10 <sup>3</sup>	<10	<10	<10	<10

\* Mixed Inoculum consists of *P. aeruginosa*, *S. aureus*, and *E. coli*

## Isocil® PC vs. Competitive Isothiazolinone – Shampoo Mixed Inoculum-Fungi\*\*

CFU - Contact Time (Days)								
Preservative %	0	1	3	7	10	14	28	
None	8.0x10 <sup>5</sup>	3.0x10 <sup>5</sup>	6.0x10 <sup>5</sup>	4.0x10 <sup>5</sup>	3.0x10 <sup>5</sup>	3.0x10 <sup>5</sup>	3.0x10 <sup>5</sup>	
Isocil® PC	0.05	1.0x10 <sup>6</sup>	2.2x10 <sup>4</sup>	3.0x10 <sup>3</sup>	<10	<10	<10	<10
Isocil® PC	0.10	9.0x10 <sup>5</sup>	3.3x10 <sup>4</sup>	3.0x10 <sup>3</sup>	<10	<10	<10	<10
Competitor	0.05	8.0x10 <sup>5</sup>	3.0x10 <sup>4</sup>	1.0x10 <sup>3</sup>	<10	<10	<10	<10
Competitor	0.10	8.0x10 <sup>5</sup>	1.3x10 <sup>4</sup>	2.0x10 <sup>3</sup>	<10	<10	<10	<10

## Formulation Recommendations

- Miscible in water, glycols, most personal care solvents
- Reducing agents, amines and strong nucleophiles will reduce activity of MCI/MI
- Surfactants should be checked for residual bisulfite before addition
- When used with amines, pH should be below 6 before addition
- Should be added during the cool down phase of processing, at temperature of 50°C or below
- Wide range pH: 3–9
- Product pH (as is) is 3.0; should be handled with care due to acidity

\*\* Mixed Inoculum consists of *C.albicans* and *A. niger*

## Global Regulatory

### Europe

- Listed in Annex V to Regulation EC/1223/2009
- Not permitted for leave-on products. Maximum use level of 0.0015 % CMI/MI for rinse-off applications

### Japan

- Listed in the positive list
- Max use level of 0.01% CMI/MI for rinse-off
- Not permitted in leave-on

### US

- Approved by PCPC for both rinse-off and leave-on applications
- Max level of 0.00075% CMI/MI (7.5 ppm active ingredients) in leave-on products
- Max level of 0.0015% CMI/MI (15 ppm active ingredients) in rinse-off products

### General

- Not allowed for oral hygiene and lip products or in preparations for children under the age of 3

Typical Properties	
Appearance	Liquid
Color	Clear
Odor	Mild, Characteristic

**USA**

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