KATHON™ LX Microbicide for Latex Preservation

Description

KATHON LX microbicide is an aqueous based preservative formulated specifically for latex emulsion manufacturers. It has a long history of successful use in this application due to its reliability and excellent cost performance.

Product Composition and Typical Properties

Active Ingredients

The active ingredients of KATHON LX are identified using the IUPAC nomenclature as 5-chloro-2-methyl-4-isothiazolin-3-one and 2-methyl-4-isothiazolin-3-one.

Structural Formula

![Structural Formula](image)

Physical and Chemical Properties

These properties are typical but do not constitute specifications.

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total active ingredient</td>
<td>14%</td>
</tr>
<tr>
<td>Appearance</td>
<td>Yellow, clear, solids-free liquid</td>
</tr>
<tr>
<td>Odor</td>
<td>Mild</td>
</tr>
<tr>
<td>pH (as produced)</td>
<td>1 to 3</td>
</tr>
<tr>
<td>Specific gravity (25°C)</td>
<td>1.3</td>
</tr>
<tr>
<td>Viscosity (25°C)</td>
<td>16 cps</td>
</tr>
<tr>
<td>Solubility in water</td>
<td>Infinite</td>
</tr>
<tr>
<td>Solubility in organic solvents</td>
<td>Soluble in a wide range</td>
</tr>
</tbody>
</table>

Performance Benefits

KATHON LX microbicide has been specially developed by Rohm and Haas for the preservation of latex emulsions and offers the following outstanding advantages:

- **Water based**

KATHON LX is water based and VOC free.
• **Broad spectrum activity**

Controls both bacteria (Gram-negative and Gram-positive) and fungi (molds and yeasts).

• **Rapid inhibition of microbial growth and enzyme synthesis**

KATHON LX microbicide causes immediate inhibition of growth on coming in contact with a microorganism. The growth inhibition rapidly becomes irreversible and results in cell death. Even before cell death occurs, the organism treated with KATHON LX microbicide is unable to synthesize enzymes.

• **Economical**

Use concentrations are more cost-effective than other commercial latex preservatives.

• **Formaldehyde-free**

Does not contain or generate formaldehyde.

• **Low toxicity**

Extensive toxicological testing has shown that the active ingredients of KATHON LX are safe at recommended use levels in your final formulation.

• **Low use levels**

The powerful active ingredients in KATHON LX make it effective at low use levels.

• **Biodegradable/Non persistent in the environment**

Readily dissipated in the environment by chemical, biological and physical means. Active ingredient breakdown does not lead to the presence of chlorinated organics in the environment.

• **Easy to incorporate into latex emulsions.**

• **Compatibility**

Compatible with surfactants and emulsifiers, regardless of their ionic nature.

**Efficacy: Minimum Inhibitory Concentration Data**

The following tables indicate the minimum concentrations in parts per million (ppm) of KATHON LX, as supplied, which inhibit the growth of various microorganisms in test tube cultures. These data demonstrate broad spectrum antimicrobial activity. The methods used to obtain the data are useful tools for screening antimicrobial materials under standardized laboratory conditions in nutrient-rich growth media. Concentrations will vary with changes in media and testing conditions.
Directions for Use

Freshly prepared latex emulsions can be reactive mixtures which make it difficult to predict accurately the stability and therefore efficacy of a biocide. It is therefore recommended that for each latex emulsion stability and efficacy testing is carried out to optimize biocide dosing.

Dosing Recommendations

Extensive laboratory testing and field experience with the product shows that optimal use levels are between 0.01% and 0.02% product as supplied (15 - 30 ppm active ingredient).

Pre-dilution: KATHON LX microbicide is a concentrate and before addition to latex emulsions, must be pre-diluted with water to a tested level of compatibility, normally in the range of 0.75 - 3.0% active ingredient.

Important: Pre-diluted product must be used within 1 - 2 weeks (depending on active ingredient level and storage temperature) or additional stabilization is required.

If you need engineering advice on biocide dosing systems, please contact your Rohm and Haas representative.

Regulatory Status of KATHON LX

The list below is intended to assist you in complying with prevailing regulatory controls. It lists the status of KATHON LX in those countries where specific approval is required.
<table>
<thead>
<tr>
<th>Country</th>
<th>Product</th>
<th>Regulatory Clearance</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>The active ingredients in KATHON LX</td>
<td>BgVV Rec. XIV</td>
<td>As a preservative of polymer emulsions for the coating of food contact articles and general articles, with a maximum of 0.004 mg/dm².</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BgVV Rec. XXXVI</td>
<td>As a slimicide in the manufacture of paper, carton and cardboard designated for food-contact with a maximum of 0.0004% relative to the dry fiber. In the extract of the final product the maximum detectable concentration must not exceed 0.0005 mg/dm².</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BgVV Rec. XXXVI/1</td>
<td>As a slimicide in the manufacture of cooking and hot filter papers and filter layers designated for: hot extraction e.g. cooking bags, teabags, hot filterpapers, and filter layers designated for extraction (filtration) at a maximum of 4 mg/kg relative to the dry fiber. In the hotwater extract of the final product the maximum detectable concentration must not exceed 0.0005 mg/dm².</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BgVV Rec. XXXVI/2</td>
<td>As a slimicide in the manufacture of paper, carton and cardboard for baking purposes designated for food-contact at a maximum of 0.0004% relative to the dry fiber. In the hotwater extract of the final product the maximum detectable concentration must not exceed 0.0005 mg/dm².</td>
</tr>
<tr>
<td>Italy</td>
<td>The active ingredients in KATHON LX</td>
<td>Decree No. 395 August 1987</td>
<td>Food Contact Paper</td>
</tr>
<tr>
<td>Belgium</td>
<td>The active ingredients in KATHON LX</td>
<td></td>
<td>The formulation containing these active ingredients can be used in food-contact applications provided the specific migration limit (SML) of 0.01 mg/kg for each active ingredient is respected.</td>
</tr>
<tr>
<td>Holland</td>
<td>The active ingredients in KATHON LX</td>
<td></td>
<td>The formulation containing these active ingredients with taking into account the specific migration limits of these active ingredients can be used in the process water during the manufacturing of paper and board as defined in the WARENWET.</td>
</tr>
<tr>
<td>USA</td>
<td>The active ingredients in KATHON LX</td>
<td>FDA21CFR-175.105 (Adhesives)</td>
<td>For use only as an antimicrobial agent in polymer latex emulsions.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FDA21CFR-175.300 (Resinous and Polymeric Coatings)</td>
<td>For use only as an antimicrobial agent in emulsion-based silicon coatings at a level not to exceed 50 mg active ingredient/kg in the coating formulation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FDA21CFR-175.320 (Resinous and Polymeric Coatings for Polyolefin films)</td>
<td>For use only as an antimicrobial agent in emulsion-based silicon coatings at a level not to exceed 50 mg active ingredient/kg in the coating formulation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FDA21CFR-176.170 (Components of paper and paperboard in contact with aqueous and fatty foods)</td>
<td>1. As an antimicrobial agent for finished coatings and for additives used in the manufacture of paper and paperboard including fillers, binders, pigment slurries and sizing solutions not exceeding 25 ppm active ingredient in coating formulations and additives.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. As an antimicrobial agent for polymer latex emulsions in paper coatings not exceeding 50 ppm active ingredient in the coating formulation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FDA21CFR-176.180 (Components of paper and paperboard in contact with dry foods)</td>
<td>1. As an antimicrobial agent for finished coatings and for additives used in the manufacture of paper and paperboard including fillers, binders, pigment slurries and sizing solutions not exceeding 25 ppm active ingredient in coating formulations and additives.</td>
</tr>
</tbody>
</table>
The preservation of latex emulsions should be achieved through a combination of an effective biocide and good quality control. Biocide addition should not be used to replace good hygiene; it is complementary to good manufacturing practice, not a substitute for it. Some of the key aspects of preventing microbial contamination are given below.

**Raw Materials**
- Is the material susceptible to microbial contamination?
- Regularly monitor their microbiological quality
- Set a microbiological specification for them

**Process Water**
- Monitor the microbial contamination level
- Regularly clean and sanitize water treatment units
- Treat stored water prior to use

**Storage and Handling**
- Flush and drain lines when not in use
- Clean and sanitize lines and equipment regularly
- Try to minimize dead or non-draining areas
- Clean and sanitize reused drums and containers
- Avoid entry of ambient air into storage tanks
- Minimize tank headspace and/or provide microbe-free headspace

**Cleaning and Sanitization**
- Establish protocols for cleaning and sanitizing of tanks and equipment

Detailed suggestions and guidance regarding plant hygiene are given in our bulletin "Preventing Microbial Contamination in Manufacturing" which is available from your local Rohm and Haas sales office.

**Toxicology and Environmental Fate**

Rohm and Haas Company takes every measure to ensure that its products are safe for both man and the environment.

**Toxicology**

In line with this policy, Rohm and Haas can provide comprehensive toxicological data for KATHON LX, which shows it is of low toxicity at recommended use levels. More detailed information on the toxicological profile of KATHON LX can be obtained from your local Rohm and Haas sales office.

**Environmental Fate**

There is no shortcut to environmental safety. Rohm and Haas has conducted extensive research into the environmental fate of the active ingredients of KATHON LX.

These studies demonstrate that at normal use/dilution levels KATHON LX has minimal environmental impact because of the following properties:
- High performance product used at very low use levels
- Rapid degradation to non toxic, non persistent substances
- Degradation does not produce chlorine or chlorinated organics
- Does not affect the performance of waste water treatment plants

This combination of properties makes KATHON LX the environmentally sound choice for the preservation of latex emulsions.

**Material Safety Data Sheets**

Rohm and Haas Company maintains Material Safety Data Sheet (MSDS) on all of its products. These contain important information that you may need to protect your employees and customers against any known health and safety hazards associated with our products. We recommend you obtain copies of MSDS for our products from your local Rohm and Haas technical representative. In addition, we recommend you obtain copies of MSDS from your suppliers of other raw materials used with our products.