



KATHON™ LXE

MICROBICIDE

KATHON™ LXE Microbicide for Latex Preservation

INTRODUCTION

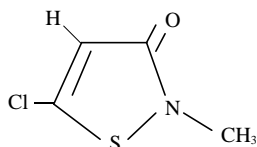
KATHON™ LXE microbicide is an aqueous based preservative formulated specifically for latex emulsion manufacturers. It has a long history of successful use in this application due to its reliability and excellent cost performance.

PRODUCT COMPOSITION AND TYPICAL PROPERTIES

Active Ingredients:

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

Structural formulae:

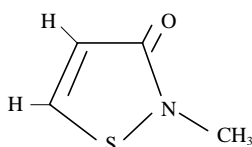


RH-651

5-chloro-2-methyl-4-isothiazolin-3-one

CAS Registry No. 26172-55-4

EINECS No. 2475007



RH-573

2-methyl-4-isothiazolin-3-one

CAS Registry No. 2682-20-4

EINECS No. 2202396

PHYSICAL AND CHEMICAL PROPERTIES

(these do not constitute specifications)

Total active ingredient	1.5%
Appearance	Clear, blue-green liquid
Odour	Mild
pH (as produced)	3-5
Specific gravity (25°C)	1
Viscosity (25°C)	3 cps
Solubility in water	Infinite
Solubility in organic solvents	Soluble in a wide range

PERFORMANCE BENEFITS

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

- **Water based**

KATHON™ LXE is water based and VOC free.

- **Broad spectrum activity**

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

- **Rapid Inhibition of microbial growth and enzyme synthesis**

KATHON™ LXE 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™ LXE 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™ LXE are safe at recommended use levels in your final formulation.

- **Low use levels**

The powerful active ingredients in KATHON™ LXE 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 indicates the minimum concentrations in parts per million (ppm) of KATHON™ LXE, 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 anti-microbial materials under standardized laboratory conditions, in nutrient-rich growth media. Concentrations will vary with changes in media and testing conditions.

Test Organism	ATCC Number	Product (ppm)	Active Ingredient (ppm)
Gram positive bacteria*			
<i>Bacillus cereus var.mycoides</i>	R&H#L5	14	2.0
<i>Bacillus subtilis</i>	R&H#B2	14	2.0
<i>Brevibacterium ammoniagenes</i>	6871	14	2.0
<i>Staphylococcus aureus</i>	6538	14	2.0
Gram negative bacteria*			
<i>Alcaligenes faecalis</i>	8750	14	2.0
<i>Enterobacter aerogenes</i>	3906	36	5.0
<i>Escherichia coli</i>	11229	57	7.9
<i>Flavobacterium suaveolens</i>	958	64	8.9
<i>Proteus vulgaris</i>	8427	36	5.0
<i>Pseudomonas aeruginosa</i>	15442	36	5.0
<i>Pseudomonas fluorescens</i>	13525	14	2.0
Yeasts*			
<i>Candida albicans</i>	11651	36	5.0
<i>Rhodotorula rubra</i>	9449	14	2.0
<i>Saccharomyces cerevisiae</i>	2601	14	2.0
Fungi			
<i>Alternaria dianthicola</i>	11782	21	2.9
<i>Aspergillus foetidus</i>	16878	57	7.9
<i>Aspergillus oryzae</i>	10196	36	5.0
<i>Aureobasidium pullulans</i>	9294	43	6.0
<i>Cladosporium resinae</i>	11274	36	5.0
<i>Fusarium oxysporum</i>	R&H-EL-1	29	4.0
<i>Penicillium funiculosum</i>	9644	36	5.0
<i>Penicillium variable</i>	USDA	14	2.0
<i>Trichosporon sp.</i>	R&H-SH-2	14	2.0

* The organisms in these categories have been isolated from contaminated latex emulsions

DIRECTIONS FOR USE

Freshly prepared latex emulsions can be reactive mixtures which makes 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 optimise biocide dosing.

Dosing Recommendations

Extensive laboratory testing and field experience with the product shows that optimal use levels are between 0.1% and 0.2% product as supplied (15 - 30 ppm active ingredient).

Pre-dilution: KATHON™ LXE may be used directly in the majority of latex emulsions. In materials prone to gelling, KATHON™ LXE may be pre-diluted between 3 and 5 times, that is, down to 0.3% to 0.5% active ingredient.

REGULATORY STATUS OF KATHON™ LXE

The list below is intended to assist you in complying with prevailing regulatory controls. It lists the status of KATHON™ LXE in those countries where specific approval is required.

COUNTRY	PRODUCT	REGULATORY CLEARANCE	APPLICATION
Germany	The active ingredients in KATHON™ LXE	BgVV Rec. XIV	<ul style="list-style-type: none"> • As a preservative of polymer emulsions for the coating of food contact articles and general articles, with a maximum of 0.004 mg/dm². • 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 fibre. In the extract of the final product the maximum detectable concentration must not exceed of 0.0005 mg/dm². • 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 fibre. In the hotwater extract of the final product the maximum detectable concentration must not exceed 0.0005 mg/dm². • 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 fibre. In the hotwater extract of the final product the maximum detectable concentration must not exceed 0.0005 mg/dm².
		BgVV Rec. XXXVI	
		BgVV Rec. XXXVI/1	
		BgVV Rec. XXXVI/2	

These clearances apply only to KATHON™ LXE as submitted by Rohm and Haas Company. Formulations containing other ingredients may need to be resubmitted for approval.

COUNTRY	PRODUCT	REGULATORY CLEARANCE	APPLICATION
Italy	The active ingredients in KATHON™ LXE	Decree No. 395 August 1987	Food Contact Paper
Belgium	The active ingredients in KATHON™ LXE		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.
Holland	The active ingredients in KATHON™ LXE		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.
USA	The active ingredients in KATHON™ LXE	FDA21CFR-175.105	<ul style="list-style-type: none"> • Adhesives: Limitations - for use only as an antimicrobial agent in polymer latex emulsions. • Component of Paper and paperboard in Contact with Aqueous and Fatty Foods Limitations - for use only: <ol style="list-style-type: none"> 1. As an antimicrobial agent for polymer latex emulsions in paper coatings at a level not to exceed 50 ppm (active ingredient) in the coating formulation. 2. As an antimicrobial agent for finished coating formulations and for additives used in the manufacture of paper and paperboard including fillers, binders, pigment slurries and sizing solutions at a level not to exceed 25 ppm (based on active ingredient) in the coating formulation and additives.
		FDA21CFR-176.170	
		FDA21CFR-176.180	Components of Paper and paperboard in Contact with Dry Food. Limitations - same as specified under 21CFR-176.170.

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PLANT HYGIENE

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

- are they 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 sanitise water treatment units
- treat stored water prior to use

• Storage and Handling

- flush and drain lines when not in use
- clean and sanitise lines and equipment regularly
- try to minimise dead or non draining areas
- clean and sanitise reused drums and containers
- avoid entry of ambient air into storage tanks
- minimise tank headspace and/or provide microbe free headspace

- **Cleaning and Sanitisation**

- establish protocols for cleaning and sanitising 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™ LXE, which shows it is of low toxicity at recommended use levels. More detailed information on the toxicological profile of KATHON™ LXE can be obtained from your local Rohm and Haas sales office.

Environmental Fate

There is no short cut to environmental safety: Rohm and Haas has conducted extensive research into the environmental fate of the active ingredients of kathon™ lxee.

These studies demonstrate that at normal use/dilution levels KATHON™ LXE 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™ LXE 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 or the Rohm and Haas company. In addition, we recommend you obtain copies of MSDS from your suppliers of other raw materials used with our products.

**More information on the web about our products and services
and all our worldwide addresses:**

www.rhcis.com



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