KATHON™ CF1400 MICROBICIDE
KATHON™ CF150 MICROBICIDE

Water Dilutable and Copper-Free Isothiazolone Technology for Water Treatment and Pulp and Paper Applications

Description

KATHON CF1400 microbicide and KATHON CF150 microbicide have been developed for use in a variety of water treatment and pulp and paper applications to prevent the growth of bacteria, fungi, and algae. The active ingredient found in both products is the same as the active ingredient in KATHON WT microbicide.

Formulating KATHON CF1400 is as simple as adding the appropriate amount of water to create a formulation that will remain stable for at least one year.

Neither product requires the use of nor contains copper salts as a stabilizer. This means that they avoid a potentially adverse impact on the environment.

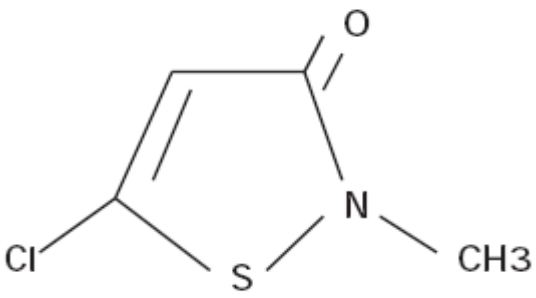
Composition of KATHON CF1400 and KATHON CF150 as Supplies*

These properties are typical but do not constitute specifications.

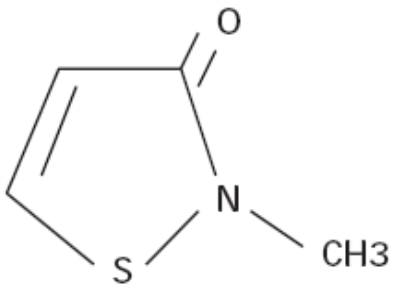
	KATHON CF1400	KATHON CF150
5-chloro-2methyl-4-isothiazolin-3-one 2-methyl-4-isothiazolin-3-one Typical value active ingredients	14.0%	1.50%
Insert Ingredients	26.0%	2.80%
Water	Balance	Balance

Figure 1. Chemical Structure

5-chloro-2-methyl-4-isothiazolin-3-one
CAS Registry Number 26172-55-4



2-methyl-4-isothiazolin-3-one
CAS Registry Number 2682-20-4



Typical Properties of KATHON CF1400 and KATHON CF150 Microbicides*

These properties are typical but do not constitute specifications.

	KATHON CF1400	KATHON CF150
Appearance	Yellow liquid	Colorless to pale yellow liquid
Odour	Pungent	Pungent
Specific gravity	1.30	~1.0
pH	2.0-3.5	2.0-4.0
Solubility in water	Completely soluble	Completely soluble

Product Features and Benefits

Features	Benefits
Water dilutable	Simplified manufacturing
	Greater formulation flexibility
Copper-free	Satisfies environmental concerns
Superior stability	Long shelf life for the concentrate as well as its dilutions
Broad-spectrum antimicrobial efficacy	Excellent general-purpose microbicide

KATHON CF1400 and KATHON CF150 possess a number of other useful features for water treatment applications. They are supplied as easy-to-use liquids. They are compatible with most types of water treatment polymers. They produce no gelling, discoloration, or odor. They are compatible with other oxidizing and non- xidizing biocides at use concentrations. They are safe at normal use levels. They break down into non-toxic compounds, and they do not contain or release formaldehyde.

Antimicrobial Efficacy

Using Minimum Inhibitory Concentration (MIC) evaluations, our testing shows in the table below that KATHON CF150 has the same antimicrobial activity against microorganisms commonly encountered in water treatment environments as KATHON WTE/WT 1.5% (Table 1).

Table 1 Microstatic Activity of KATHON Water Treatment Biocides

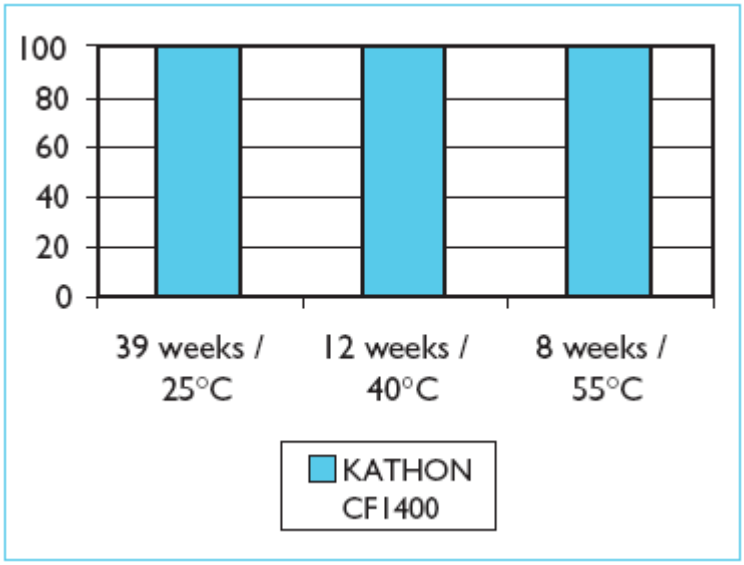
Test Organisms (ATCC #)	KATHON CF150	KATHON WTE/WT 1.5
Pseudomonas aeruginosa (15442)	0.7	0.8
Klebsiella pneumoniae (13883)	0.4	0.4
Enterobacter aerogenes (13048)	0.4	0.4
Aspergillus niger (52172)	2.0	2.0

*Minimum inhibitory concentrations (MIC) are based on active ingredient (AI) as determined in twofold nutrient broth serial dilution tests.

Product Stability

KATHON CF1400 exhibits an excellent storage stability (Figure 2 below) compared to KATHON WT.

Figure 2. Stability of KATHON CF1400 (% CMI remaining)

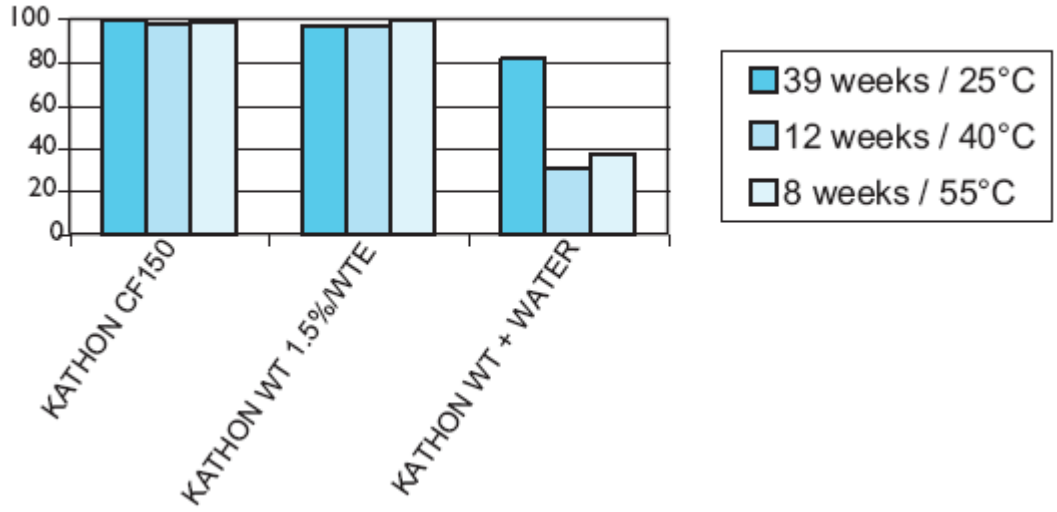


KATHON CF150 is at least as stable as KATHON WT 1.5%/WTE which contains 0.15% copper nitrate (Figure 3 below). KATHON CF150 is formulated by simply diluting KATHON CF1400 with deionized or soft water. By comparison a copper free formulation obtained by diluting KATHON WT with water (1.5% dilution not stabilized with copper nitrate) is unstable.

Formulating KATHON CF150

KATHON CF150 can be made from KATHON CF1400 (14% A.I. product) by a dilution with water to 1.5% minimum A.I., without having to add any stabilizer (see details below).

Figure 3. Stability of KATHON CF150 (% CMI remaining)



A.I. Specifications

	KATHON CF1400	KATHON CF150
5-chloro-2methyl-4-isothiazolin-3-one,%	10.1 % min.	1.15 % min.
2-methyl-4-isothiazolin-3-one, %	3.0 % min.	0.35 % min.
TOTAL A.I. %	13.9 % min.	1.50 % min.

Procedure:

1. Charge 11.5 parts of KATHON CF1400 to a mixing vessel at ambient temperature.
2. Charge 88.5 parts of either deionized or soft water with agitation.
3. Take a sample for A.I. analysis.
4. Pack out the batch after determining it meets A.I. specifications.

Directions For Use of KATHON CF150

In Cooling Towers

Add KATHON CF150 to the basin, to the distribution box, or to any point where it can be dispersed rapidly and uniformly throughout the system to control the growth of bacteria, fungi and algae. Dosing may be intermittent (slug) or continuous.

When the system is noticeably fouled, add 148 to 883 ppm KATHON CF150 (2.2 to 13 ppm active ingredient). Repeat until control is achieved. Heavily fouled systems should be cleaned before treatment is begun.

When microbial control is evident, add 35 to 219 ppm KATHON CF150 (0.5 to 3.5 ppm active ingredient) weekly or as needed to maintain control.

Air Washer Systems

Add KATHON CF150 to the air washer sump or chill water sump, to insure uniform mixing for control of bacteria, fungi and algae that cause fouling. Dosing may be intermittent (slug) or continuous.

When the system is noticeably fouled, add 148 to 883 ppm KATHON CF150 (2.2 to 13 ppm active ingredient). Repeat until control is achieved. Heavily fouled systems should be cleaned before treatment is begun.

When microbial control is evident, add 35 to 219 ppm KATHON CF150 (0.5 to 3.5 ppm active ingredient) weekly or as needed to maintain control.

NOTE: For use only in industrial air washing systems that maintain effective mist eliminating components.

Papermills

KATHON CF150 microbicide is recommended for the control of bacterial and fungal slime in the production of paper. KATHON CF150 should be added to a point in the system to insure uniform mixing such as the beater, hydropulper, or fan or broke storage pumps. Apply 0.44 to 1.5 lbs (0.20 to 0.70 kg) of KATHON CF150 per ton (dry basis) of pulp or paper produced as a slug dose. If needed repeat daily. Badly fouled systems should be cleaned before initial treatment.

Regulatory Status of KATHON CF1400 and KATHON CF150 Microbicides

Both products comply with the Food and Drug Administration (FDA) and BgVV clearances listed in the table below.

Please contact your local Rohm and Haas representative for more detailed information on how these FDA and BgVV clearances pertain to your intended use.

Regulatory Clearance	Application
21 CFR 175.105	Adhesives
21 CFR 175.300	Resinous and Polymeric Coatings
21 CFR 176.170	Components of paper and paperboard in contact with aqueous and fatty foods
21 CFR 176.180	Components of paper and paperboard in contact with dry food
21 CFR 176.300	Slimicides
BgVV Rec. XIV-A	Emulsions
BgVV Rec. XXXVI	Paper/Paperboard
BgVV Rec. XXXVI/1	Cooking and hot filter papers and filter layers

Safe Handling

ALWAYS WEAR PROTECTIVE EQUIPMENT WHEN HANDLING CONCENTRATED BIOCIDE

KATHON CF1400 and KATHON CF150 microbicides are potential sensitizers and are labeled TOXIC and CORROSIVE as supplied; they should be handled accordingly. Users should avoid any direct contact with the products as supplied. The Material Safety Data Sheets (MSDS) for KATHON CF1400 and KATHON CF150 contain safe handling information on the products. Please contact your local Rohm and Haas representative for additional safe handling materials.

Empty Containers

After the shipping containers of KATHON CF1400 and KATHON CF150 have been emptied, they may still contain considerable amounts of concentrated microbicide. To minimize the effect of accidental exposure, the non returnable containers should be rinsed at least three times with water before they are discarded. The best way to handle the rinse water (and the biocide it contains) is to charge it to a water treatment location; otherwise, the rinse liquids and empty containers should be disposed of as specified by local regulations.

Spills

The list below describes the proper deactivation and cleanup steps to take when handling spills of KATHON biocides.

1. Protective clothing, including chemical splash goggles, butyl rubber gloves, rubber overshoes, chemical resistant apron and a NIOSH approved (or equivalent) respirator (with organic vapor/acid gas cartridge and a prefilter) must be worn during any clean-up of spilled KATHON biocide.

2. Dike and adsorb as much of the spill as possible with spill control pillows or inert solids such as clay or vermiculite. Scoop the adsorbed material into a waste pail (preferably five gallon or 20 liters plastic) and cover the pail immediately. Do NOT add deactivation solution to the waste pail to deactivate the adsorbed KATHON product.

3. Estimate the volume of remaining spilled material on the floor and prepare 10 times as much deactivation solution as in the next step.

4. An aqueous solution consisting of 3 to 5% sodium bicarbonate (or potassium bicarbonate) and 5% sodium hypochlorite (household bleach) is prepared away from the immediate area of the spill in a screwcap polyethylene gallon (or 5 liters) container. Depending on the estimate of deactivation solution required as in step 3 above, add to this container the sodium bicarbonate (or potassium bicarbonate) followed by the household bleach. Close the container securely and shake well for one minute.

5. Apply the deactivation solution to the residual spill on the floor. Wait approximately 30 minutes and flush the solution on the floor into a chemical sewer (if in accordance with local, state and national procedures, permits and regulations).

6. Rinse the one gallon (or 5 liters) container used to make up the deactivation solution with water and dispose of the empty container in the trash or store the empty container for future use.

7. Before removing gloves, rinse them with water. Carefully peel the contaminated gloves off by pulling on the

outside of the glove sleeve, turning the gloves inside out as they are removed, and place the used gloves into the waste pail. Close and seal the waste pail again. Again, do NOT add deactivation solution to the waste pail.

8. Dispose of the sealed waste pail as hazardous waste in compliance with local, state, and federal laws; our recommended method of disposal is incineration.

Materials Compatibility

The Rohm and Haas Corrosion laboratory has tested both KATHON CF1400 and KATHON CF150 with many different materials (Table 2). However, before a material is selected, its mechanical strength and the construction techniques must be carefully evaluated.

Table 2 Materials Compatible With KATHON CF1400 and KATHON CF150 Microbicides[a]

Equipment	Material	Supplier/Grade
Tanks	Stainless steel (316L)	
	Reinforced glass fiber plastic	
	- Epoxy	Cellicote/DURACOR E
	- Polyester	Hooker-Durez/HETRON 197
	- Vinyl ester	Dow/DEREKANE 411
	Furan[b]	Hooker-Durez/HETRON 800
	Polyethylene	
	Polypropylene	
	Glass-lined steel	
Process pipe	Stainless steel (316L)	
	Polypropylene	
	Teflon-lined steel	
Flexible process hose lines	Nordel	Dupont
	Polypropylene	
	Viton	
Valve gaskets	Teflon TFE	Dupont
	Teflon FEP	Dupont
Pump seals[c]	Ryton	Phillips Petroleum
	Polypropylene	
	Polyethylene	
Valve seats	Teflon PFA	Dupont

(a) @ 25°C or 77°F
(b) Material recommended by Rohm and Haas Company
(c) Rohm and Haas uses Gould Teflon FEP-lined pumps

Toxicology/Environmental Fate

KATHON CF1400 and KATHON CF150 are considered safe at recommended use levels. Toxicology studies have confirmed that the active ingredients in these products are not mutagenic, teratogenic, or carcinogenic. In addition, they degrade rapidly to non toxic, non persistent substances. KATHON CF1400 and KATHON CF150 do not bioaccumulate.

Material Safety Data Sheets

Rohm and Haas Material Safety Data Sheets (MSDS) contain pertinent information that you may need to protect your employees and customers against any known health or safety hazards associated with our products. Under the OSHA Hazard Communication Standard, workers must have access to and understand MSDS on all hazardous substances to which they are exposed. Thus, it is important that you provide appropriate training and information to your employees and make sure they have available to them MSDS on any hazardous products in the workplace.

Upon initial shipment of non-OSHA-hazardous and OSHA-hazardous products (including samples), Rohm and Haas Company sends the appropriate MSDS to the recipient. If you do not have access to one of these MSDS, please contact your local Rohm and Haas representative for a copy. Updated MSDS are sent upon revision to all customers of record. MSDS are also sent annually to all customers receiving products deemed hazardous under the Superfund Amendments and Reauthorization Act (SARA).

MSDS should be obtained from suppliers of other materials recommended in this bulletin.

Rohm and Haas Company is a member of the American Chemistry Council (ACC) and is committed to the ACC's Responsible Care Program.

Use biocides safely. Always read the label and product information before use.

These suggestions and data are based on information we believe to be reliable. They are offered in good faith, but without guarantee, as conditions and methods of use of our products are beyond our control.

We recommend that the prospective user determines the suitability of our materials and suggestions before adopting them on a commercial scale.

Suggestions for uses of our products or the inclusion of descriptive material from patents and the citation of specific patents in this publication should not be understood as recommending the use of our products in violation of any patent or as permission or license to use any patents of the Rohm and Haas Company.

For further details, please contact your local Account Manager or local Business Representative.

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 September 2006