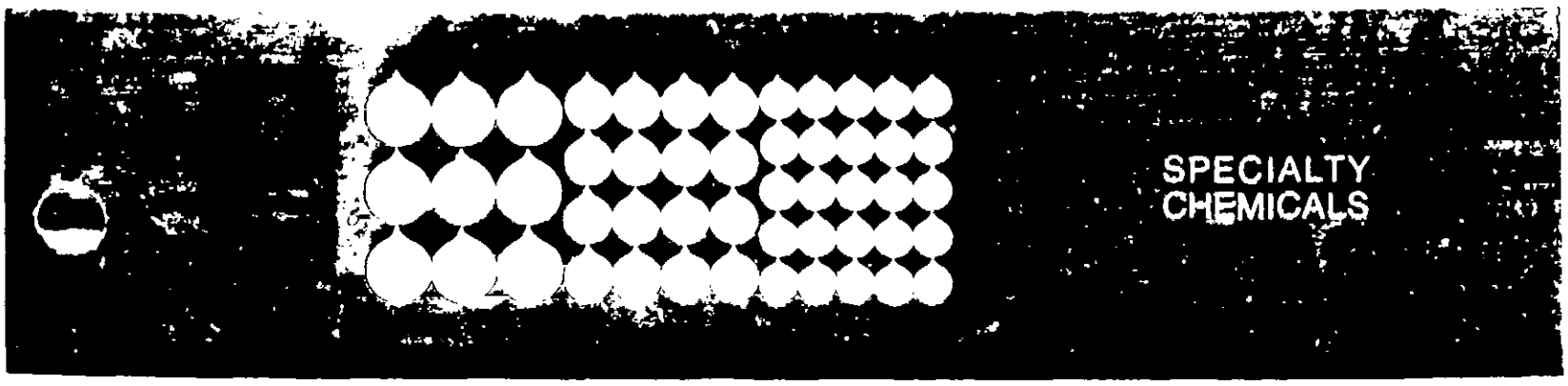


KATHON® 4200
Fabric Mildewcide
EPA REG. NO. 707-120

KATHON 4200 is a chemical developed for use in fabric mildewcide products. Fabrics treated with a solution containing 5 to 10 ppm active ingredient are mildew-resistant for at least 4 weeks.

PHYSICAL PROPERTIES *(These do not constitute specifications)*

Appearance:	Clear amber liquid
Active Ingredient:	25% 2-n-Octyl-4-isothiazolin-3-one
Solvent Carrier:	Propylene glycol
Weight per Gallon:	8.6 lb.
Viscosity:	40 cps (Brookfield #1 spindle at 60 rpm, 25°C.)
Flash Point:	> 200°F (Pennsky-Martens Closed Tester)
Solubility:	The maximum solubility of the active ingredient in water is 800 ppm (0.08% on a weight basis), a level adequate for the preparation of completely soluble fabric treatment solutions. To prepare concentrates of KATHON 4200, add propylene glycol to assure homogeneity. Concentrates may be then diluted in water to prepare a fabric treatment solution containing 5.0 to 10.0 ppm of the active ingredient.

STABILITY

KATHON 4200 as supplied appears to be stable indefinitely at room temperature. More dilute solutions in propylene glycol and aqueous treatment solutions are also considered completely stable. The material is *not* stable in the presence of *ammonia, primary* and *secondary amines, or salts of these compounds.*

BIOLOGICAL PERFORMANCE

Relatively low concentrations of KATHON 4200 inhibit the growth of a wide variety of fungi, as Table I indicates.

CS-402
(Supersedes CS-402 1/80)

April 1981

TABLE I	
FUNGISTATIC ACTIVITY OF KATHON 4200 BY SERIAL DILUTION TESTS	
Test Fungus	**Minimum Inhibiting Concentration in ppm of Active Ingredient**
Alternaria dianthicola (11782)	1
Aspergillus niger (9642)	8
Aspergillus oryzae (10196-QM #12[illegible]8)	2
Aspergillus repens (9294)	2
Candida albicans, yeast (11651)	2
Chaetomium globosum (6205)	4
Cladosporium resinae (11274)	0.5
Mucor rouxii (Rohm and Haas #82)	8
Penicillium funiculosum (9644)	1
Phoma glomerata (6735)	1 or less
Phoma pigmentivora (12569)	2
Pullularia pullulans (9348)	0.3
Rhizopus stolonifer (10404)	4
Rhodotorula rubra, yeast (9449)	4
Saccharomyces cerevisiae, yeast (2601)	1

The effectiveness of KATHON 4200 as a fabric mildew inhibitor was demonstrated by the Fabric Mildew Fungistatic Test Method described in Appendix A. According to this test, fabrics treated in a solution containing 5.0 ppm *active* ingredient resisted the growth of mildew for at least four weeks.

DIRECTIONS FOR USE

KATHON 4200 is for formulation use only. Use according to directions supplied by the manufacturer.

FEDERAL REGISTRATION

Mildewcide formulations must be registered with the Environmental Protection Agency (EPA). Manufacturers of mildewcide formulations should consult with EPA for information on the procedures required to obtain registration. Rohm and Haas Company will be pleased to advise applicants on the status of our own materials with respect to registration procedure.

TOXICOLOGY

ANIMAL TESTS

Acute Toxicity as Supplied

Acute oral toxicity (LD_{50}) to rats 2740 mg/kg.
Acute dermal toxicity (LD_{50}) on rabbits 1250 mg/kg (abraded skin), > 5000 mg/kg (intact skin).

Eye Irritation: KATHON 4200 as supplied is a severe irritant to the eyes of rabbits. Corneal damage may occur.

Skin Irritation: KATHON 4200 as supplied is a primary skin irritant (Primary Irritation Index 6.5) on rabbits when tested according to the standard procedure of the Federal Hazardous Substances Act.

Acute Inhalation: Exposure of rats for one hour to a nominal concentration of 7.18 mg KATHON 4200 (vapors) as supplied per liter of air produced no immediate or subsequent signs of toxicity.

TESTS ON HUMANS

Repeated insult patch tests were run on 93 volunteers to monitor irritation and sensitization from contact of skin with fabrics treated with KATHON 4200. The fabrics were treated with 50 or 150 ppm active ingredient based on the weight of substrate. Patches were applied 24 hours per day 3 days per week for 3 weeks (9 exposures). After a rest period of 2 weeks, a fresh patch was applied for 24 hours, and the sites were examined 24 and 72 hours after removal of the fabric. No clinically significant evidence of primary or cumulative irritation and contact sensitization was observed on any subject.

Repeated exposure to KATHON 4200 as supplied may result in skin sensitization of susceptible individuals.

SAFE HANDLING INFORMATION

KATHON 4200 as supplied causes severe eye and skin irritation and may be harmful if swallowed or inhaled. Repeated exposure may result in sensitizing susceptible individuals. Rigorous precautions should be taken to avoid personal contact and contamination of clothing or inhalation of mists or vapors. Wear goggles and rubber gloves. Keep containers closed when not in use. Use only with adequate ventilation. Do not take internally. Wash thoroughly after handling. Remove contaminated clothing immediately and launder before rewearing. Decontaminate surfaces that have been splashed with KATHON 4200 by washing with a solution containing 5% sodium bicarbonate and 5% sodium hypochlorite in water and rinsing with clean water after 15 minutes.

FIRST AID

In case of contact, immediately flush the eyes with plenty of water for at least 15 minutes; call in a physician. Wash the skin with soap and plenty of water. Remove and launder contaminated clothing.

If swallowed and the victim is conscious, dilute by giving water to drink and get prompt medical attention. Never give anything my mouth to an unconscious person.

MATERIAL SAFETY DATA SHEETS

The Rohm and Haas Company maintains comprehensive and up-to-date material safety data sheets (MSDS) on all of its products. These sheets contain pertinent information that you may need to protect your employees and customers against any known health or safety hazards associated with our products.

We recommend that you obtain copies of our material safety data sheets from your local Rohm and Haas representative on each of our products prior to using them in your facilities. We also suggest that you contact your suppliers of other materials recommended for use with our products for appropriate health and safety precautions prior to their use in your facilities.

WASTE DISPOSAL

Do not reuse empty drums. Return them to a drum reconditioner or destroy them by crushing and burying them in a safe landfill.

This product is toxic to fish. Treated effluents should not be discharged where they can drain into lakes streams, ponds, and public water supplies.

APPENDIX A

Environmental Protection Agency
Pesticides Regulation Division
Fungicides Evaluation Staff

FABRIC MILDEW FUNGISTATIC TEST METHOD
(Revised 12 1-70)

1. **Introduction**: Products which are shipped interstate and are intended for use to control, prevent or inhibit the growth of fungi which cause mildew on various articles or surfaces must be tested to demonstrate *fungistatic* effectiveness. This test method is applicable in connection with registration and enforcement procedures under the Federal Insecticide, Fungicide, and Rodenticide Act. It is designed to determine effectiveness of products (applied according to instructions on the labeling) to control mildew and nonpathogenic fungal growth on articles or surfaces composed of fabric. It also indicates the duration of protection afforded, thereby providing a basis for recommending when to repeat applications. Its use will expedite registration and minimize enforcement actions.

2. **Reagents: (a) Test Organisms**: 1. *Aspergillus niger* (ATCC 6275). Maintain stock cultures on one percent neopeptone - two percent dextrose agar. Incubate new stock cultures 7–10 days at 25°C, then store at 2–10°C. Conidia of required resistance survive 10-minute exposure at 20°C to a phenol dilution of 1:80 (2 parts of 5 percent phenol, 6 parts of water) but not to a 1:70 dilution (2 parts of 5 percent phenol, 5 parts of water). The Use Dilution Mildew Fungicidal Test Method is used for this determination. 2. *Penicillium variabile*. Maintained and store same as *A. niger*. **(b) Fabric**: 8- to 20-ounce cotton duck cut into 1- by 3-inch strips. Ten strips are needed per treatment. A hole punched near one end of each strip facilitates its suspension on a wire hook.

3. **Preparation of Conidial Suspension**: Place approximately one-half inch of neopeptone-dextrose agar into a 250 ml Erlenmeyer flask, plug with cotton and autoclave at 15 PSI for 20 minutes. Seed the desired organism (*A. niger* or *P. variabile*) at the center of each flask and incubate for 7–10 days at 25°C. Prepare a diluent which contains 0.85 percent NaCl and 0.2 percent Triton® X-100 in distilled water. Autoclave at 15 PSI for 20 minutes. Pour approximately 100 ml of the cooled sterile diluent over the culture surface and shake vigorously to dislodge the spores. Pour this spore suspension into a tissue grinder which has been heat-sterilized and reciprocate the piston several times to break up spore chains. Filter suspension through one-half inch layer sterile absorbent cotton to remove spore chains and hyphal elements. Conidial suspensions may be stored at 2–10°C for not longer than four weeks. Standardize test conidial suspensions to contain five million conidia per ml (determine by spore counts with a hemocytometer) by adding sterile diluent.

4. **Apparatus: (a) Glassware**: Two 1000 ml Erlenmeyer flasks or other flasks with cotton plugs suitable for preparing agar and for preparing the diluent. Four 250 ml Erlenmeyer flasks with cotton plugs, heat-sterilized for use in preparing suspension of conidia (for 2 fungi). Twenty 16-ounce French square jars (10 for the treated replications, 10 for the untreated). These are prepared by center drilling the caps and inserting 1/8 inch brass bolts approximately 1/2-inch long for attaching a 2-1/2-inch piece of #22 nickel chromium wire. The wire is bent to form a hook on the end and is used for suspending the test samples in the jar. **(b) Tissue grinder** (Homogenizer) No. 4288B Arthur H. Thomas. **(c) Atomizer** DeVilbiss #152 (or other suitable atomizer) operated at 10 PSI.

5. **Operating Technique**: **(a) Treatment:** Fabric strips are placed in the use dilution of the product for three minutes. With pressurized products, fabric strips are placed on a perforated rubber mat where they are sprayed according to label directions on both sides with the product. Where label directions do not specify duration of spray, fabric strips should be sprayed until wet, being careful to obtain equal wetting on both sides of the test specimen. This is best done by spraying several light applications alternately to each side of the specimen. All samples are allowed to dry before proceeding to the next step. **(b) Inoculation:** Inoculum of *A. niger* and *P. variabile* prepared as previously described, is placed in the DeVilbiss sprayer on a 50:50 basis and thoroughly agitated, then sprayed lightly on both surfaces of the fabric test samples. **(c) Incubation:** The fabric samples are then suspended in individual 16-ounce jars containing approximately one inch of water, and incubated at approximately 28°C. The caps are tightened, then backed off 1/8 turn to allow for some ventilation. **(d) Evaluation:** Observations are recorded weekly for four weeks or until abundant growth occurs on treated fabric. Visual observation of mold or absence of mold on any of the specimens is the criterion for determining the results of the test. A low powered microscope is used in settling doubtful cases. **(e) Interpretation:** The results of this test must be correlated to claims to be made on the label or labeling. The directions for use must specify retreatment every 7, 14, or 21 days, as necessary, depending on the length of time that all of the test strips remained free from mildew growth. Products which do not permit growth after four weeks incubation may specify retreatment "as necessary".

Note: Cultures of *P. variabile* NRRL 3765 (formerly classed as *P. glaucum*) are available from: ARS Culture Collection Investigations Fermentation Laboratory, Northern Utilization Research and Development Division, 1815 North University Street, Peoria, Illinois 61604.

KATHON 4200

ROHM AND HAAS
PHILADELPHIA, PA 19105

FABRIC MILDEWCIDE

ACTIVE INGREDIENT	
2-n Octyl-4-isothiazolin-3-one	25%
INERT INGREDIENTS	75%
EPA Reg. No. 707-120	100%
EPA Est. No. 707-PA-1	

FOR FORMULATION USE ONLY

NET CONTENTS

_____
GALLONS

DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

Kathon 4200 is for formulation use only. Use according to directions furnished by the manufacturer.

STORAGE AND DISPOSAL

For plastic containers: Do not reuse container. Destroy when empty. For cans or drums: Do not reuse empty container. Bury or discard in a safe place away from water supplies.

This product is toxic to fish. Do not contaminate water by cleaning of equipment or disposal of wastes.

DANGER

KEEP OUT OF REACH OF CHILDREN

THIS CONCENTRATE:

CAUSES EYE AND SKIN BURNS
MAY CAUSE ALLERGIC SKIN REACTION
IS HARMFUL IF INHALED
IS HARMFUL IF SWALLOWED

Do not get in eyes, on skin, on clothing. Wear goggles and rubber gloves. Avoid breathing vapor or mist. Keep container closed. Use with adequate ventilation. Do not take internally. Wash thoroughly after handling.

FIRST AID

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and call a physician. Wash skin with soap and plenty of water. Remove and wash contaminated clothing before reuse.

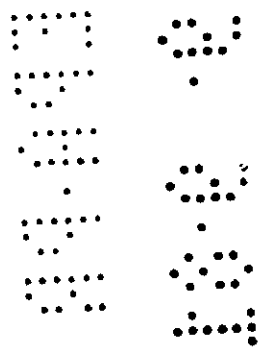
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

If swallowed, dilute by giving water to drink and call a physician. Never give anything by mouth to an unconscious person.

NOTE TO PHYSICIAN:

Probable mucosal damage may contraindicate the use of gastric lavage. Measures against circulatory shock, respiratory depression and convulsions may be needed.

NOTICE: Seller warrants that the product conforms to its chemical description and is reasonably fit for the purpose stated on the label when used in accordance with directions under normal conditions of use, but neither this warranty nor any other warranty of merchantability or fitness for a particular purpose express or implied, extends to the use, storage or handling of this product in a manner other than as directed by label instructions or under abnormal conditions or under conditions not reasonably foreseeable to seller, and Buyer assumes the risk of any such use.



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