

SKANE™ M-8 Mildewcide Fungicide for Paints and Coatings

Description

High quality, mildew-resistant house and trim paints, both latex and some solvent-based, can be produced using SKANE M-8 mildewcide. Several years of testing exterior paints by exposure in the mildew-prone areas of the Southern and Northern areas of the U.S. have demonstrated the high level of protection obtained. SKANE M-8 mildewcide has been tested against various mildewcides in actual paint exposures and has been found to offer superior resistance to mildew growth on latex and some solvent-based paints.

In addition to being a superior mildewcide, SKANE M-8 mildewcide does not compromise the long-term performance of the applied paint film. SKANE M-8 mildewcide has been used in millions of gallons of paint for more than twenty years and has never been associated with adverse side effects such as yellowing, discoloration, chalking or cracking of the paint film.

SKANE M-8 mildewcide does not contain lead or mercury and, therefore, will not discolor or sulfide stain in areas with high atmospheric sulfide content. SKANE M-8 mildewcide is also formaldehyde-free.

The information presented in this bulletin is intended to help you evaluate SKANE M-8 mildewcide in your paint formulations. Rohm and Haas also offers technical assistance in formulating with SKANE M-8. For further information on our products, please contact your local technical representative.

Features and Benefits

SKANE M-8 mildewcide exhibits the following performance advantages over other commercially available mildewcides.

Effective Against Mildew

Primers and trim paints formulated with SKANE M-8 mildewcide have demonstrated effective mildew resistance when applied to bare wood, previously painted surfaces, or other substrates used for exterior siding, such as vinyl siding and masonry.

Universal Paint Mildewcide

SKANE M-8 can be used in all types of paints made by paint manufacturers. It has been proven effective in latex paint based on acrylic, polyvinyl acetate, and other latex vehicles. It has also been proven effective in some solvent-based or alkyd paints.

No Side Effects on the Paint Film

Many competitive products yellow or discolor the paint film. Some even cause poor tint retention or cracking. SKANE M-8, in over 20 years of usage in paints, has never caused these unwanted side effects on the paint film.

Economical

SKANE M-8 use concentrations in final formulations are cost effective compared to other competitive mildewcides.

Low Use Levels

SKANE M-8 provides excellent resistance against mildew at very low use levels. The typical use levels are in the range of 1 to 3 lb/100 gal on an as-supplied basis, or 450 to 1350 ppm on an active ingredient (AI) basis. EPA registration allows use levels up to 4 lb/100 gal (1800 ppm).

Rohm and Haas recommends a WARNING LABEL when SKANE M-8 is used at levels between 3 and 4 lb/gal (> 1350 ppm active ingredient) indicating a potential risk of allergic skin reaction upon repeated skin contact.

Low Toxicity

Extensive testing has shown that the toxicity of SKANE M-8 is low at recommended use levels in the final paint formulation.

Compatible

SKANE M-8 is compatible with common paint ingredients.

Easy to Formulate

SKANE M-8 mildewcide is supplied in liquid form and is therefore easily formulated into latex or solvent-based paint formulations.

Does Not Contain Formaldehyde

SKANE M-8 does not contain or release formaldehyde.

EPA Registered

SKANE M-8 mildewcide (EPA Reg No. 707-100) is registered for use in paint and coatings, as well as in a variety of other applications.

Paint manufacturers who want to make mildewcide label claims on their paint labels should contact the EPA for the appropriate wording allowed by FIFRA regulations. These regulations govern the use of pesticides, which includes mildewcides. The EPA has developed specific guidelines for labeling coatings and includes specific labeling statements for a paint product which does NOT subject a paint product to registration as a mildewcide. Also included in these guidelines are label statements that the paint manufacturer will want to avoid, as these statements will subject their paint to registration as a pesticide under FIFRA.

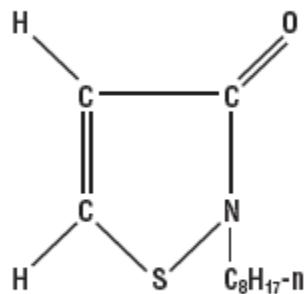
Environmentally Friendly

SKANE M-8 does not persist in the environment.

Chemical Identification

Under the IUPAC system of nomenclature the SKANE M-8 mildewcide active ingredient is identified as 2-n-octyl-4-isothiazolin-3-one, and has the following chemical structure:

Molecular Weight = 213.34
 $C_{11}H_{19}NOS$



C.A.S Number 26530-20-1
EPA-Registered.
(EPA Number 707-100)

Physical and Chemical Properties

Listed below are typical properties of SKANE M-8 mildewcide. They should not be considered purchase specifications.

Physical and Chemical Properties

These properties are typical but do not constitute specifications.

Appearance	Amber liquid
Active ingredient (AI)	2-n-octyl-4-isothiazolin-3-one
Concentration	45% minimum
Carrier solvent	Propylene glycol
Viscosity, Brookfield	40 cP
Density	8.5-8.7 lb/gal
Specific gravity	1.034
Bulking value	0.116 gal/lb
Storage stability	Excellent
Color (VCS)	15 maximum

Analytical Procedures for SKANE M-8 Mildewcide

Rohm and Haas Company has developed a number of techniques for the quantitative analysis of SKANE M-8 mildewcide both in solution and on a number of solid substrates using high-performance liquid chromatography (HPLC) and gas (GLC) chromatography equipment. A qualitative colorimetric technique is also available. Details of these procedures can be obtained by contacting your local Rohm and Haas Technical Representative.

Solubility of SKANE M-8 Mildewcide

SKANE M-8 mildewcide exhibits a range of solubilities as indicated below.

- a. Infinite solubility of the AI is achieved in:

METHANOL
ETHANOL
PROPYLENE GLYCOL
ACETONE
ETHYL ETHER
ETHYL ACETATE
CHLOROFORM
BUTYL CELLOSOLVE¹
CORN OIL
MINERAL OIL

- b. Solubility in TOLUENE is approximately 25% w/v.
- c. Solubility in WATER at 25°C is negligible.
- d. Insoluble in HEPTANE.

These solubilities were determined at typical ambient temperatures (20-25°C). Both the SOLUBILITY and STABILITY of the AI may change when the temperature is lowered to 0°C or increased to 60°C.

¹Union Carbide Corp., Danbury CT

Chemical Compatibility

SKANE M-8 mildewcide typically has biological and physical compatibility with anionic, nonionic and cationic surfactants, halogens at use dilutions, and most organic and inorganic compounds commonly used in paints, latices and pigment slurries.

SKANE M-8 mildewcide may be deactivated, under certain conditions, by the presence of ammonia (ammonium hydroxide) and primary/secondary amines. Strong reducing or oxidizing agents, such as hypochlorites, bisulfites, metabisulfites, and H₂S, may also affect the efficacy of the AI, although a number of techniques for stabilizing the AI in the presence of these deactivating compounds are known and can be applied to paint systems as indicated below.

Chemical Stability

The excellent stability of SKANE M-8 mildewcide has been demonstrated in a variety of paint systems.

The addition of ten to fifty pounds of zinc oxide per hundred gallons of paint will stabilize SKANE M-8 in the presence of ammonia and primary or secondary amines.

In latex paints where zinc oxide cannot be used, SKANE M-8 mildewcide can be stabilized by the addition of 15 ppm copper metal on total formulation weight as copper nitrate. SKANE M-8 can also be stabilized with formaldehyde generating preservatives.

Vapor Pressure

Using a gas saturation technique, the following vapor pressures have been determined for SKANE M-8 mildewcide AI:

Temperature	Vapor Pressure
25°C	3.68×10^{-5} Torr
35°C	1.20×10^{-4} Torr
45°C	3.60×10^{-4} Torr

Efficacy

Anti-Microbial Properties of SKANE M-8 Mildewcide

Initial determinations of the efficacy of any mildewcidal product are made via minimum inhibitory concentration (MIC) measurements. The MIC test yields valuable information about the product's activity profile.

The MIC for any product is the lowest level at which the AI inhibits the growth of various microorganisms *in vitro*. This rapid test method is a useful tool for screening antimicrobial agents under standardized laboratory conditions, in nutrient-rich growth conditions. In interpreting the data, remember that low values correspond to high activity.

The data are intended only to indicate the activity of SKANE M-8 mildewcide in an aqueous solution; they do not represent recommended use levels. Moreover, the microorganisms on the list are not all the ones involved in the deterioration of coatings.

Fungistatic Activity

Table 1 indicates that SKANE M-8 mildewcide possesses outstanding activity against fungi. Several of the fungal species listed play key roles in the disfigurement of paint films, such as *Aureobasidium pullulans* and *Aspergillus niger*. SKANE M-8 has very low MIC values for these and many other fungi.

Table 1
Fungistatic Activity of SKANE M-8 Mildewcide

Organism	ATCC Number (Strain)	MIC* in PPM of AI
<i>Alternaria dianthicola</i>	11782	1
<i>Aspergillus niger</i>	9642	8
<i>Aspergillus oryzae</i>	10196	2
<i>Aspergillus repens</i>	9294	2
<i>Aureobasidium pullulans</i>	9348	0.3
<i>Candida albicans</i> (yeast)	11651	2
<i>Chaetomium globisum</i>	6205	4
<i>Cladosporium resinae</i>	11274	0.5
<i>Lenzites lepideus</i>	12653	2
<i>Lenzites trabea</i>	11539	2
<i>Penicillium funiculosum</i>	9644	1
<i>Phoma glomerata</i>	6735	<1.0
<i>Phoma pigmentivora</i>	12569	2
<i>Rhizopus stolonifer</i>	10404	4
<i>Rhodotorula rubra</i> (yeast)	9449	4
<i>Saccharomyces cerevisiae</i> (yeast)	2601	1
<i>Trichophyton interdigitale</i> (mentagrophytes)	9533	<1.0

*Fungistatic minimum inhibitory concentration (MIC) are based on active ingredient (AI) as determined in twofold broth serial dilution tests.

Bacteriostatic Activity

Table 2 shows the effectiveness of SKANE M-8 mildewcide in inhibiting the growth of a variety of bacteria. SKANE M-8 contributes to in-can protection of paints where bacterial spoilage is a problem. Best protection is afforded, however, by using a combination of SKANE M-8 and an in-can preservative such as KATHON™ LX 1.5% biocide or ROCIMA™ 550 biocide.

Table 2
Bacteriostatic Activity of SKANE M-8 Mildewcide

Organism	ATCC Number (Strain)	MIC* in PPM of AI
Gram Positive		
<i>Bacillus subtilis</i>	6651	8
<i>Brevibacterium ammoniagenes</i>	2398	4
<i>Staphylococcus aureus</i>	6538	8
<i>Staphylococcus epidermidis</i>	155	16
Gram Negative		
<i>Enterobacter aerogenes</i>	13048	250
<i>Escherichia coli</i>	11229	125
<i>Proteus mirabilis</i>	9921	63
<i>Proteus vulgaris</i>	8427	125
<i>Pseudomonas aeruginosa</i>	15442	500
<i>Salmonella typhosa</i>	6539	63

*Bacteriostatic minimum inhibitory concentration (MIC) are based on active ingredient (AI) as determined in twofold broth serial dilution tests.

Algaestatic Activity

The algaestatic control of SKANE M-8 mildewcide's AI is reported in Table 3. SKANE M-8 contributes to control of algae growth on paint films, but in severe conditions, such as high humidity climates, an algaecide may be required for full protection.

Table 3
Algaestatic Activity of SKANE M-8 Mildewcide

Organism	Type (Strain)	MIC* in PPM of AI
Chlorophyta (Green Algae)		
<i>Ankistrodesmus falcatus</i>	R. C. Starr	5
<i>Chlorella pyrenoldosa</i>	G. P. Fitzgerald (1)	5
<i>Cocomyxa elongata</i>	R. C. Starr/Jagg	1
<i>Scenedesmus obliquus</i>	R. C. Starr/Turp-Kruger	5
Cyanophyta/Cyanobacteria (Blue-Green Algae/Bacteria)		
<i>Nostoc sp.</i>	R. C. Starr	<0.5
<i>Phormidium sp.</i>	G. P. Fitzgerald (2)	5
<i>Phormidium retzii</i>	G. P. Fitzgerald (3)	2

(1) Deason and Bold, Wisconsin 2005

(2) "Black Algae", Wisconsin 1093

(3) "Square D", strain

*Algaestatic minimum inhibitory concentrations (MIC) are based on active ingredients (AI) as determined in twofold broth serial dilution tests.

Performance Results — SKANE M-8 Mildewcide for Exterior Paint

Exposure Test Results

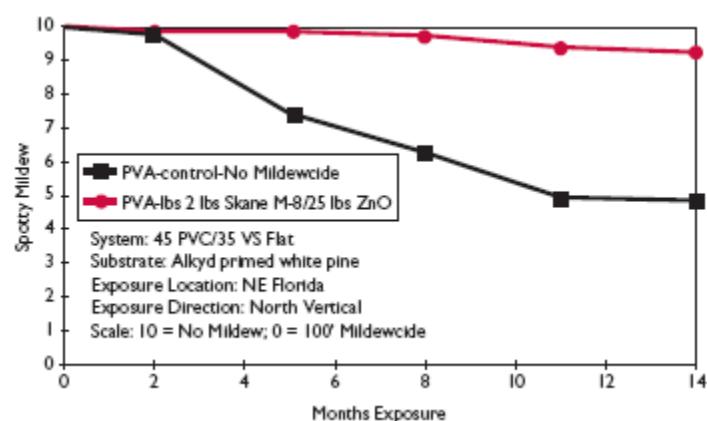
Rohm and Haas has exposed SKANE M-8 mildewcide at various exposure sites across the United States, as well as in other regions of the world.

Generally speaking, SKANE M-8 mildewcide, when used with zinc oxide, provides excellent protection against the growth of mildew at the most competitive use cost with no side effects on dry paint films. SKANE M-8 alone also provides very good mildew resistance.

Latex Paint Exposure - PVA System

The graph below is based on the results of a 14 month North Vertical exposure in Northeast Florida on a substrate of alkyd primed white pine. The graph demonstrates the excellent mildewcide protection offered in a PVA system using SKANE M-8 mildewcide with zinc oxide vs a PVA control system with no mildewcide.

PVA Latex Paint Exposure With and without SKANE M-8



Directions for Use

The usage level required to obtain the desired degree of protection with SKANE M-8 mildewcide depends on several factors. These include the level of zinc oxide in the formulation, the climatic conditions where the paint will be applied and the type of paint produced. The condition of the surface and number of coats applied are also significant.

The mildew protection obtained is proportional to the amount of SKANE M-8 mildewcide used and the performance desired as determined by the paint manufacturer. As a rule of thumb, substitution of SKANE M-8 and zinc oxide for a previously used mercurial or non-mercurial mildewcide on a cost per gallon basis will result in equal or improved mildew resistance.

The final selection of levels of SKANE M-8 mildewcide and zinc oxide will depend on the level of protection needed as well as formulation cost. In select areas, depending on climatic and paint surface conditions, some coatings manufacturers may elect to use SKANE M-8 without zinc oxide. Other regions may require higher levels of SKANE M-8. For maximum protection in mildew prone areas (e.g., Southeastern U.S.), the formulation may require the use of zinc oxide, along with higher levels of SKANE M-8.

SKANE M-8 Mildewcide Use Levels

Up to three pounds of SKANE M-8 mildewcide per hundred gallons are suggested for paints used in mildew-prone areas where humid weather conditions prevail. Lower levels—such as two pounds in a primer and one pound in a topcoat—provide satisfactory performance in dryer or cooler climates.

When SKANE M-8 mildewcide is used with stabilizers other than zinc oxide, it provides mildew protection in cooler/dry climates where mildew is not severe, especially where surfaces are frequently painted. The use of SKANE M-8 mildewcide will provide the level of protection needed, and will not cause unwanted side effects on the paint film like yellowing, discoloration or tint loss.

Zinc Oxide Levels

When SKANE M-8 mildewcide is used in conjunction with zinc oxide, which is a mildewstat, a unique performance enhancement effect on the mildew resistance of the paint occurs. Typical treatment levels are shown in Table 4.

Advantage should be taken of this synergism to attain the best possible cost/performance relationship in a paint formulation. Ten pounds of zinc oxide per hundred gallons is the minimum level recommended to stabilize SKANE M-8 mildewcide in the presence of amines in latex formulations.

Zinc oxide is not needed for stability in solvent-based paint formulations; however, it provides increased mildewcide protection.

Table 4
Typical Treatment Levels for SKANE M-8 Mildewcide in Latex or Solvent Paints

Paint Type	SKANE M-8 Level (lbs/100 gal)	ZnO Level (lbs/100 gal)
Latex	1-3*	10-50
Solvent	1-3*	0-50

Note: SKANE M-8 mildewcide may require an alternative stabilizer when used in latex paints without ZnO.
A stabilizer is not needed in solvent based formulations.

* SKANE M-8 can be used up to 4 lb/100 gal per EPA registration. Due to a possible increased risk of allergic skin reaction at levels greater than 3 lb/100 gal, Rohm and Haas recommends that a precautionary statement, such as shown below, be added to the paint label at usage of SKANE M-8 between 3 to 4 lb/100 gal:

May Cause Allergic Skin Reaction Upon Repeated Skin Contact.

This recommendation is based on Rohm and Haas Risk Management Program.

Formulating Techniques with SKANE M-8 Mildewcide

Latex Paints

SKANE M-8 mildewcide should be incorporated in the letdown stage during manufacture of the paint. It is normally premixed with propylene glycol and coalescent, and then added slowly with good agitation just prior to addition of the thickener.

SKANE M-8 mildewcide functions as a coalescent and plasticizer for acrylic emulsion polymers. Accordingly, some adjustment in existing coalescent levels should be made. For example, in the case of tributyl phosphate or Texanol², a reduction of one-quarter pound per pound of SKANE M-8 mildewcide added is recommended. A reduction of one pound of propylene glycol for each two pounds of SKANE M-8 is also suggested. Zinc oxide can be readily incorporated in latex paints through the proper choice of pigment dispersants.

For more information on dispersant choice as well as further details on formulating techniques with zinc oxide, please contact your local Rohm and Haas technical representative.

Solvent-Based Paints

Some solvent-based paints benefit from the use of SKANE M-8 mildewcide. Similar levels to those used in latex paints are recommended. Zinc oxide, while not necessary for stabilization, is recommended to enhance the performance of the mildewcide. The use of lithopone or other sulfide-type pigments should be avoided, since they affect the stability of SKANE M-8 mildewcide. A coupling solvent such as Butyl Cellosolve³ can be used to assist in formulating SKANE M-8 mildewcide into solvent-based paints.

Guidelines to Optimize Performance of SKANE M-8 Mildewcide

The following guidelines are based on field trial experience with paints containing SKANE M-8 mildewcide:

- Add zinc oxide where appropriate to enhance performance.
- Formulate at a pH of 9.5 or lower.
- Keep within recommended base levels (e.g., ammonia) to ensure good SKANE M-8 mildewcide stability. Avoid introducing sulfides (e.g., lithopone or Busan⁴ 11-M-2).
- Avoid high PVC in formulations where high mildew resistance is needed.
- Avoid too little or too much coalescent.
- Avoid high levels of surfactants, thickeners (especially cellulosics) or other ingredients which retain moisture.
- Maximize film build through increased volume solids or paint rheology.
- Use higher levels of mildewcide in the primer for best protection.
- Enhance dirt resistance properties of the paint to help resist mildew development.

Risk Management/Responsible Care

Toxicological Properties

ALL Biocides are dangerous and need to be handled with great care. This section is designed to make the user of SKANE M-8 mildewcide aware of the effects of exposure. The supporting toxicological data are shown in Table 5.

Skin Irritation

Skin contact with SKANE M-8 mildewcide can result in severe irritation/corrosivity. The severity depends partly on the amount of material contacted, the area of skin exposed, and the delay between the occurrence of contact and thorough washing of the exposed area. The reaction is delayed and prompt washing of the affected area will reduce the effects. However, it is best to avoid these effects by wearing protective clothing when working with SKANE M-8, as supplied.

Contact with the paint containing SKANE M-8 mildewcide, at recommended use levels (less than 4 lb/100 gal product), is expected to have minimal irritation effects.

²Eastman Chemical Co.

³Dow Chemical

⁴Buckman Laboratories International, Inc.

Skin Sensitization

Single or repeated exposure to SKANE M-8 mildewcide as supplied may cause allergic contact dermatitis (skin rash). Formulations containing SKANE M-8 mildewcide at recommended use levels (up to 3 lb SKANE M-8/100 gal paint; up to AI levels of 1350 ppm or less; less than 0.3% by weight) do not present a predicted risk of skin sensitization greater than 1 in 100 for professional painters who are repeatedly exposed.

Eye Irritation

SKANE M-8 mildewcide is corrosive to the eyes. The damage is irreversible. It is important to prevent exposure to the eye by wearing adequate eye protection at all times when working with these products. In the case of accidental contact, immediate flushing of the eyes with copious amounts of water can reduce the severity of damage. Immediate medical attention should be sought.

Inhalation

In well-ventilated work environments, it is unlikely that high enough concentrations of SKANE M-8 mildewcide would build up in the air to present any adverse health effects. However, large spills in poorly ventilated areas could result in airborne levels above the established 8-hour time-weighted average (TWA) of 0.2 mg/m³ or the 15-minute short-term exposure limit (STEL) of 0.6 mg/m³. Overexposure to mists or vapors can result in irritation of the mucous membranes of the nose and throat.

Ingestion

Ingestion of large amounts of SKANE M-8 mildewcide can be harmful. This is because of the acidic nature of these products which is severely irritating to the internal mucous membranes.

Carcinogenicity/Mutagenicity

Extensive testing has shown that SKANE M-8 mildewcide does not pose a mutagenic or carcinogenic risk to humans when used in accordance with Rohm and Haas Company recommendations.

Conclusions

Based on these data, SKANE M-8 mildewcide is judged to pose no toxicological hazard under recommended use conditions.

Table 5 - Summary of Toxicity Testing

Acute Toxicity	Concentration/Dosage	Effect
Oral Toxicity		
Male rats	355 mg/kg AI	LD ₅₀
Female rats	358 mg/kg AI	LD ₅₀
Dermal Toxicity - Male rabbits	311 mg/kg AI	LD ₅₀
Primary Eye Irritation - Rabbits	45% AI in propylene glycol 5.0% AI in propylene glycol 0.5% AI in propylene glycol	Corrosive Corrosive Non-irritating
Primary Skin Irritation	45% AI in propylene glycol 2.5 - 5.0% AI in propylene glycol	Corrosive Moderate-severe irritant
Skin Sensitization - Guinea Pigs	EC ₅₀ * induction = 132 ppm AI EC ₅₀ elicitation = 399 ppm AI	Sensitizer Sensitizer
Inhalation, 4 hr aerosol - Rats (M/F)	0.58 mg/L AI	LC ₅₀

*Note: EC₅₀ = effective concentration in 50% of the population

Subchronic Toxicity

Subchronic Toxicity	Concentration/Dosage	Effect
3-Month Repeated Dermal, Rats (M/F)	2.97, 5.95 & 14.87 mg/kg/day AI	No mortalities; dose-related skin irritation, NOEL* for systemic effects = 5.95 mg/kg.
13-Week Nose Only Aerosol Inhalation, Rats (M/F)	0.05, 0.64 & 6.39 mg/m ³ AI	Histopathologic changes consistent with an irritant/inflammatory effect. NOEL = 0.64 mg/m ³ .

*NOEL = No observed effect level

Genotoxicity

Genotoxicity	Concentration/Dosage	Effect
Ames Microbial	0.1 - 7500 ug/plate	Non-mutagenic
CHO-Gene Mutation	0.5 - 5.0 ug/ml	Non-mutagenic
UDS-Unscheduled DNA	0.05 - 100 ug/ml	No DNA damage
In vivo Cytogenetics (Chromosome effects)	215 mg/kg AI	No chromosomal damage
In vitro Cytogenetics (Chromosome effects)	2.0 - 20.0 ug/ml	No chromosomal damage at non-cytotoxic concentrations

Wildlife Toxicity-Aquatic

Acute Studies	Concentration/Dosage	Effect
Fathead Minnow	0.14 ppm AI	LC ₅₀
Rainbow Trout	0.047 ppm AI	LC ₅₀
Sheepshead Minnow	0.16 ppm AI	LC ₅₀
Daphnia Magna	0.32 ppm AI	EC ₅₀
Chronic Studies	Concentration/Dosage	Effect
Daphnia Magna, 21 day chronic	MATC* > 74 < 340 ppb	NOEL 74 ppb
Fathead Minnow, Early Life Stage	MATC* > 8.5 < 18 ppb	NOEL 8.5 ppb

*MATC = Maximum acceptable toxicant concentration

Wildlife Toxicity-Avian

Acute Studies	Concentration/Dosage	Effect
Bobwhite Quail Oral LD ₅₀	307 mg/kg AI	LD ₅₀
Mallard Duck Oral LD ₅₀	>887 mg/kg AI	LD ₅₀
Bobwhite Quail 8-Day Dietary Feeding	>5000 ppm AI	LC ₅₀
Mallard Duck 8-Day Dietary Feeding	1160 ppm AI	LC ₅₀

Ecotoxicology Studies

SKANE M-8 mildewcide was tested in a variety of aquatic organisms including freshwater and marine fish and invertebrates such as daphnia magna. Both acute and chronic/early life stage tests were conducted. Results of these tests show that SKANE M-8 is highly toxic to aquatic organisms both by single and multiple exposure.

SKANE M-8 mildewcide is considered to be no more than moderately toxic by a single oral dose and no more than slightly toxic by subacute dietary exposure to Bobwhite Quail and Mallard Ducks.

Biodegradation Studies

SKANE M-8 mildewcide does not persist in the environment. Studies have been carried out using Carbon 14 isotope-labeled SKANE M-8 mildewcide. In both river and pond water at an active level of 0.1 ppm, 90% of the Carbon 14 was eliminated after seven days. At higher concentrations of 0.5 ppm and 1.0 ppm, 14 days were required to reach the 90% degraded level.

Safe Handling Information

Storage Procedures

SKANE M-8 mildewcide is packaged in polyethylene or polyethylene-lined containers. Avoid storage in unlined metal containers. Normal recommended storage temperatures of SKANE M-8, as supplied, are in the range of 32 to 100°F. Shelf life at ambient temperatures is one year. Storage at > 120°F for extended periods of time can result in degradation of the AI.

Handling and Transfer Recommendations

These recommendations are provided as guidelines to help the customer use SKANE M-8 mildewcide safely. The procedures used for handling biocide solutions are similar to those used for handling concentrated acids and alkalis. The purpose is to prevent all eye and skin contact, including inhalation of mists, and thereby prevent possible injury and sensitization.

SKANE M-8 mildewcide, as supplied, is severely irritating to the skin and eyes (see the Toxicological Properties Section for more information). To avoid accidental skin or eye contact and the associated effects, we recommend the following procedures when handling these products:

1. Prevent exposure by wearing adequate protective clothing. The degree of protection depends on the risk of exposure:
 - a. **Closed System Addition**
The use of a completely closed, piped-in system is the recommended method for addition of SKANE M-8 mildewcide. This approach minimizes the potential for exposure. When handling SKANE M-8 in a closed system, wear impervious gloves and splash goggles in the event that accidental leaks occur. For more information on a closed system for SKANE M-8 mildewcide, such as the Intermediate Bulk Container and an in-plant dosing system, contact your Rohm and Haas Technical Representative.
 - b. **Open System Addition**
When handling SKANE M-8 mildewcide in an open system (i.e., dispensing SKANE M-8 directly from an open container), more protective equipment is appropriate since the potential for contact is higher. For this situation, we recommend the use of the following equipment:
Chemical apron
Chemical goggles and face shield
Impervious gloves (butyl rubber or neoprene)
Impervious boots or over shoes
 - c. **Other Operations**
When performing other operations (maintenance of equipment, changing drums of SKANE M-8 mildewcide, etc. the operator should wear an appropriate amount of protective clothing to avoid skin and eye contact during these operations. As a minimum, this would include chemical goggles and impervious gloves (butyl rubber or neoprene).
2. Handle SKANE M-8 mildewcide in a work area equipped with a safety shower/eye wash station. This will be necessary should First Aid procedures need to be administered (see General Medical Procedures).
3. Follow good housekeeping practices as with any chemical. Small spills or drips of SKANE M-8 mildewcide should be promptly deactivated (see Cleaning and Decontamination) and cleaned to avoid inadvertent contact by those entering the work area.
4. Follow good industrial hygiene practices as with any chemical. For example, wash hands thoroughly after handling SKANE M-8 mildewcide.

After working with these materials, and especially before eating, drinking or smoking, personnel should wash thoroughly with soap and water. All clothing that may have been contaminated with SKANE M-8 mildewcide should be decontaminated and then laundered with detergent before reuse. Special care should be taken to avoid contamination of surfaces or materials that may later be handled by unprotected personnel (for example, door handles and tap handles).

No unusual handling or use restrictions need be applied to paints containing SKANE M-8 mildewcide at recommended use levels.

Composition of Transfer Equipment

This product is supplied at a low pH and, as such, is corrosive to some materials. Table 6 includes information on the compatibility of various materials of construction with SKANE M-8 mildewcide.

Table 6
SKANE M-8 Microbicide Materials of Construction Compatibility Chart

Metals	Plastics	Elastomers	FRP	Coatings
Monel ¹ 400 – NG	HDPE – OK @ RT	Kalrez ² 4079 Viton ² , Buna-S ³ EPT, NOrdel ² Hypalon ²	Polyester (Atlac ⁴ 382) – OK @ RT	PL 4300 – OK @ 50°C
Hast ⁵ C276 – OK @ 40°C	LDPE – OK @ RT	Butyl rubber – OK @ 35°C	Furan (Hetron ⁶ 800) – OK @ RT	Ceil. 6650 – OK @ 50°C
Carbon St. – NG	FEP – OK @ RT	Natural rubber, Buna-N ³	Vinyl Ester (Derakane ⁷ 411) – OK @ RT	
304 SS – NG	Teflon ² – OK @ RT	Neoprene ² – all NG		
304L SS – NG	Polypropylene – OK @ RT			
316 SS – NG	Ryton ⁸ – OK @ RT			
316L SS – NG				
Alloy 20 – NG				

Note: "OK" indicates the material is compatible with SKANE M-8 up to temperature specified.

"NG" indicates the material is not compatible with SKANE M-8.

"RT" = Room Temperature.

¹ Inco Alloys International, Inc., Huntington, WV

² DuPont Polymer Products, Wilmington, DE

³ Miles Inc., Polymers Div., Pittsburgh, PA

⁴ Reichhold Chemicals, Inc., Research Triangle Park, NC

⁵ Haynes International, Inc., Kokomo, IN

⁶ Ashland Chemical, Inc., Columbus, OH

⁷ Dow Chemical USA, Midland, MI

⁸ Phillips Petroleum Co., Houston, TX

Cleaning and Decontamination of Equipment and Spills

Decontamination Solution

Procedures for personnel protection set forth in the section "Safe Handling Information", should be followed STRICTLY while cleaning equipment contaminated with, and spills of, solutions of SKANE M-8 mildewcide. SKANE M-8 mildewcide is readily deactivated with 5% solutions of sodium or calcium hypochlorite (NaOCl , Ca(OCl)_2) mixed with a 5% solution of sodium bicarbonate (NaHCO_3). These solutions should be freshly prepared by personnel wearing suitable protective clothing, e.g., goggles or face shield, rubber apron, and full-length rubber gloves.

Decontamination of Equipment

Equipment used in the handling of SKANE M-8 mildewcide such as mixing vessels, lines, pumps, etc., must be decontaminated before carrying out maintenance work or being used for other service.

Drips, minor spills and exposed wet areas should be cleaned up promptly with a hypochlorite/bicarbonate mixture. Contaminated surfaces should be swabbed with decontamination solutions and allowed to stand for 30 minutes before rinsing thoroughly with water. Decontaminated solutions should be drained to a chemical or municipal sewer depending on local regulations for disposal of such wastes.

NOTE: Because of the high level of activity of SKANE M-8 mildewcide, a relatively small quantity can have a detrimental effect on the operation of biological waste treatment systems, such as percolating filters or activated sludge plants; therefore, it is essential that laboratory or plant spills are decontaminated before release to a biological treatment plant.

Cleanup of Spills

Personnel cleaning up spills should wear impervious overshoes, in addition to the usual protective clothing. The spilled material should be diked and absorbed into an inert material such as earth, sand or vermiculite. The absorbent (add surface soil to a depth sufficient to remove all of the microbicide) should then be shoveled into a pail/drum or suitable vessel and treated with enough hypochlorite/bicarbonate mixture to wet the solid thoroughly.

Let these containers stand open for 48 hours, then seal and dispose of them according to local authority regulations.

DO NOT discharge spills and cleaning runoffs into open, natural water courses.

Decontamination procedures are not required when disposing of paint formulations containing recommended use levels of SKANE M-8 mildewcide.

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 their workplace.

Rohm and Haas Company sends MSDS for all its products, whether or not they are considered OSHA-hazardous, to both the "bill to" and/or "ship to" locations of all its customers upon initial shipment, including samples. If you do not have access to one of these MSDS, please contact your local Rohm and Haas representative for an additional copy.

Updated MSDS are sent upon revision to all customers of record. In addition, MSDS are sent annually to all customers receiving products deemed hazardous under the Superfund Amendments and Reauthorization Act.

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

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

General Medical Procedures First Aid Measures

These measures are intended to minimize further injury and NOT to reverse injury previously sustained.

After Eye Contact

FLUSH IMMEDIATELY with copious amounts of water for at least 15 minutes with the eyes held open. Get prompt medical attention, but FLUSH FIRST!

After Skin Contact

FLUSH IMMEDIATELY with plenty of water for at least 15 minutes. Remove and launder contaminated clothing. Wash skin thoroughly with soap and water.

After Inhalation of Vapor

Remove victim to fresh air. If breathing becomes difficult administer oxygen and obtain medical attention.

After Swallowing

Dilute by giving water to drink. Call a physician at once. Never give anything by mouth to an unconscious person.

NOTE TO PHYSICIAN

SKANE M-8 mildewcide is corrosive. To induce vomiting after swallowing may not be advisable. Possible mucosal damage may contraindicate the use of gastric lavage.

There is no specific antidote for SKANE M-8 mildewcide. Medical treatment, therefore, is symptomatic and supportive and should follow the principles for treating any exposure to a chemical that is strongly irritating or even corrosive (depending on the concentration, amount, and duration of contact), and a potential skin sensitizer.

Skin and Eye Contact

In applying first aid measures, prompt and complete removal of remaining material from the eyes or skin by thorough flushing with large volumes of water is essential. Washing the skin thoroughly with an alkaline soap and light scrubbing enhances decontamination. The severity of "burn" of the eye or skin will vary with the duration of contact and strength of the solution.

In treating the eyes, first aid measures should be followed by appropriate medical evaluation and treatment, if irritation persists or vision is impaired. In the case of severe eye damage symptoms, evaluation by an ophthalmologist is recommended.

In case of emergency, please call either of the following two numbers:

CHEMTRAC
800-424-9300

Rohm and Haas Company
215-592-3000

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