

Advantages

ACCEP-TED ACCEP-TED UNDER THE FEDERAL INSECTICIDE FUNGICIDE AND RODENTICIDE ACT FOR ECONOMIC POISON REGISTERED UNDER NO. 2079-38

METASOL® TK-100 is a mildewcide with unique benefits for the paint formulator.

1. Effective

METASOL TK-100 is extremely active against a broad spectrum of fungi which attack surface coating films so that only low levels (1/10 - 1 lb./100 gal. for interior paints) (1/2 - 2 lb./100 gal. for exterior paints) are required.

2. Nonmetallic

The acute oral toxicity (LD_{50}) of METASOL TK-100 is reported for mice, 3600 mg./Kg.; rats, 3100 mg./Kg.; and rabbits at greater than 3800 mg./Kg. More extensive information on toxicity is given on a later page.

3. Economical

Mildewcide costs compare with those of phenylmercurials.

4. Compatible with oleoresinous and aqueous systems

METASOL TK-100 does not affect brushing, flow, leveling, grinding, viscosity, gloss, oven stability, tinting, drying, or freeze-thaw characteristics of oil and water systems.

METASOL TK-100 will not cause yellowing or pigment flocculation.

5. Sulfide-stain resistant

Exterior coatings containing METASOL TK-100 have been commercially tested along the Gulf Coast and southern petroleum fume areas without evidence of sulfide staining.

6. Thermally stable

METASOL TK-100 is thermally stable for extended periods at elevated temperatures without loss of antifungal properties. It melts at 300° C and sublimes. The unusual heat stability of METASOL TK-100 suggests its use for metal bake finishes and other high-temperature polymeric systems which are subject to fungal attack.

7. METASOL TK-100 is stable and active in both acid and alkaline pH ranges and does not decompose or hydrolyze on extended storage.

8. Easy to use

METASOL TK-100 should be incorporated with the TiO₂ in the pigment grind for all paint systems.

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Recommendations

METASOL TK-100 has been extensively tested in the laboratory under accelerated weathering conditions and panels have been exposed for periods up to three years at critical mildew locations in the United States. Hundreds of thousands of gallons of paints have been commercially produced and used on homes and industrial installations ranging from the eastern shore to the Gulf Coast for periods up to two years. Based on successful results from these investigations, the following recommendations are made:

Exteriors *

PAINT SYSTEM	METASOL TK-100 (LB./100 GAL.)
PVA	1/2 - 1 lb.
Acrylic	$\frac{1}{2} - 1$ lb.
Vinyl acrylic	$\frac{1}{2} - 1$ lb.
Alkyd-modified latex	1 - 1½ lb.
Zinc oxide pigmented latex	¼ - ¾ lb.
Oil house paint	$1 \cdot 1\frac{1}{2}$ lb.
Alkyd	1 - 2 lb.
Zinc oxide pigmented	
Alkyd and oil paint	$\frac{1}{2} \cdot 1$ lb.

Interiors*

The unique combination of low toxicity and high antifungal activity of METASOL TK-100 suggests its use as a mildewcide for interior coatings and masonry surface coatings in brewery, bakery, cannery, and food establishments as well as for other mold-resistant interior coatings. More extensive information on interior paints is given in product bulletin PL-86-02 968.

INTERIOR PAINT SYSTEMS

METASOL TK-100 (LB./100 GAL.)

TT-P-0029 latex flat TT-P-650 latex primer New York City Housing Authority coatings Sanitary latex semigloss Oleoresinous interiors $\frac{1}{10} - \frac{1}{4}$ lb. $\frac{1}{4} - \frac{1}{2}$ lb. $\frac{1}{4} - \frac{3}{4}$ lb. $\frac{1}{2} - 1$ lb. $\frac{1}{2} - 1$ lb.

***NOTE:** MERBAC-35** ($\frac{1}{2}$ lb to 1 lb/100 gal) should be incorporated into latex paint formulations to inhibit bacterial degradation during shelf storage.

**MERBAC-35 (benzyl bromoacetate) is a trademark of Merck & Co., Inc.

METASOL® TK-100 ACCEPTED

Specifications

A nonmetallic fungicide for the economical control of mildew on paint films.

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FOR ECONOMIC POISON REGISTERED

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Chemical name: 2-(4-thiazolyl)-benzimidazole.*

Structure:



Melting point: 300° C. (572° F.) Specific gravity: 1.44 Appearance: Off-white, free-flowing powder Bulk density: 25 lb./cu. ft.

Stable on Extended Shelf Storage-No Loss of Mildewcide Effectiveness

METASOL TK-100 does not decompose or hydrolyze in coatings systems, even after prolonged shelf storage. Laboratory tests and panel studies confirm that METASOL TK-100 retains complete activity as a mildewcide in coatings stored for periods in excess of two years. Paints evaluated include:

> PVA Acrylic Alkyd Vinyl acrylic Zinc oxide latex paints Polyurethane emulsion

Polyvinyl acetate maleate Zinc-free oil paints Zinc oxide oil paints Alkyd-modified PVA Alkyd-modified acrylic Styrene butadiene

*U.S. Patent No. 3,017,415

Toxicity

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Two of the many publications which discuss the toxicity of the active ingredient (reported as thiabendazole) in animals and man are:

- 1. Robinson, H. J. et al.: Studies on the toxicologic and pharmacologic properties of thiabendazole, *Toxicol. & Applied Pharmacol.* 7: No. 1, Jan. 1965.
- 2. Franz, K. H.: Clinical trials with thiabendazole against human strongyloidosis, *Am. J. Trop. Med. Hygiene* 12:211-214, 1963.

A review of the above publications reveals the following:

- 1. Tolerance studies showed that doses of 0.5 4.0 Gm. daily were well tolerated by man.
- 2. Acute, subacute and chronic oral toxicity studies proved the chemical to be well tolerated by a variety of laboratory animals. Thiabendazole appears to be inert insofar as acute pharmacologic effects are concerned.
- 3. The acute oral toxicity (LD₅₀) of thiabendazole is reported for mice, 3600 mg./Kg., rats 3100 mg./Kg., rabbits 3800 mg./Kg.
- 4. The treatment of dogs with 20, 100, or 200 mg./Kg. daily, seven days per week, over a two-year period resulted in no deaths or outward signs of toxicity.
- 5. Repeated applications of 50% material in a cold cream ointment to the skin of shaved rabbits caused no irritation.
- 6. No irritation to the eye sac of rabbits observed when treated with a 4% ophthalmic ointment, or a 10% saline suspension.

Service

Merck Chemical Division maintains fully equipped chemical and microbiologic laboratory facilities. These services in problems of preservation and mildew prevention in your formulation are at your disposal without charge.

The METASOL Simulated Field Performance Laboratory Test, published in Official Digest, Vol. 33: No. 9, September 1961, has been successfully used for more than 12 years by our microbiologists for a comparatively rapid evaluation of the efficacy of fungicides in paint formulations. Ladder series studies are performed on your paints to establish a level of fungicide for maximum protection at minimal cost.

Merck Chemical Division also maintains a test fence installation to carry out extended studies.

Spectrum of Activity AgaInst Fungi Associated with Coatings Deterioration

METASOL TK-100 VS. PHENYL MERCURY ACETATE

Inhibitory concentration in ppm

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Fungi	Culture no.	METASOL TK-100	PMA
Pullularia pullulans	ATCC 9348	0.2	25
Aspergillus niger	ATCC 6275	10.0	10
Penicillium luteum	ATCC 10466	1.0	10
Chaetomium globosum	ATCC 6205	10.0	10
Trichoderma viride	ATCC 8675	10.0	10
Penicillium expansum	IPC 126	1.0	10

The most significant fungi responsible for mildew growth on paint films are more readily inhibited by METASOL TK-100 than by standard mercury fungicide such as PMA, and lower levels of METASOL TK-100 are required to provide effective, economic mildew control.



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SOLUBILITY OF METASOL TK-100 IN VARIOUS SOLVENTS

Solvent	% Solubility at room temp.
Methanol	0.93
Ethanol	0.68
Ethylene glycol	0.77
Acetone	0.28
MEK	1.25
Benzene	0.23
Dioxane	0.45
Water	0.003
Mineral spirits	0.001
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NOTICE

Buyer assumes all risks of use and handling which are at variance in any way with the direction hereon. There are no warranties which extend beyond the description on the label.

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