...easures

[illegible]

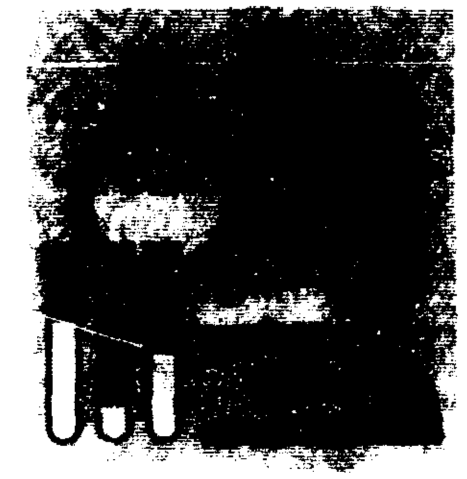
...A Antimicrobial — Toxicological Data

Animal	Results
Rat — male	LD_{50} —924 mg/kg body wt
Rat — female	LD_{50} —730 mg/kg body wt
Rabbit	Mild pain upon exposure. Severe redness and swelling of the eyelids accompanied by severe necrosis of cornea and severe iritis
Rabbit	24-hr contact with intact and abraded skin caused severe erythema, slight to moderate edema, and severe necrosis
Rabbit	1-3 hr exposure — slight erythema and very slight to slight edema.
Rabbit	3½-5½ hr exposure — slight necrosis, slight erythema and slight edema.
Rabbit	DOWICIDE A caused no acneform dermatitis.
Humans	Experience shows that dusts of DOWICIDE A, if breathed, are irritating

...ormation

[illegible]

ANTIMICROBIAL AGENTS



SECTION
I-9 REVISED
DOWICIDE A Antimicrobial

DOWICIDE® A Antimicrobial

General

DOWICIDE A Antimicrobial is ... Dow ... designation for the ... of o-phenylphenol

Adhesive manufacturers incorporate this antimicrobial into adhesives based on starch, protein, natural and synthetic gums, and natural latexes to protect them against attack by bacteria and mold during manufacture and storage and throughout their service life. Agriculturally, aqueous solutions or wax emulsion formulations of DOWICIDE A are used for the post harvest preservation of fruits and vegetables such as apples, bananas, cantaloups, carrots, cherries, citrus fruits, cucumbers, nectarines, peaches, pears, peppers, pineapples, plums, sweet potatoes, and tomatoes.

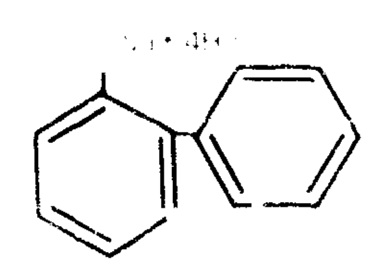
The leather industry utilizes DOWICIDE A in soaking liquors to prevent the slippage of hair or furs and sheepskins, in the paste used in hide pasting operations, and in sizing, finishing, and dressing materials. Metal workers who prepare their own emulsion cutting fluids employ this antimicrobial alone or in a 50-50 mixture with DOWICIDE B Antimicrobial to protect the finished fluid against bacterial breakdown. Mixtures of DOWICIDE A and DOWICIDE G-ST antimicrobials, or DOWICIDE A alone, are used by the paint industry for the preservation of decomposable raw materials or protein based latex paints. Pulp and paper producers treat processing materials with DOWICIDE A, and textile producers utilize it to protect processing materials as well as finished yarns and cloth against the ravages of microorganisms. Bulletins on the use of Dow antimicrobials in many of these industries are available on request.

Additionally, DOWICIDE A is used to control mold growth on construction materials and to preserve many products such as automotive polishes, ceramic glazes and clay slips, foam type fire extinguisher solutions, hair shampoos, laundry starch, plastic gaskets, polishing compounds, polyvinyl alcohol, proteinaceous ... mixtures, and floor wax emulsions.

Physical Properties

These are laboratory or literature data typical of the product and are not to be considered as, or confused with, specifications.

Structure



Physical Properties — continued

Formula	$C_6H_4(C_6H_5)$ O NA · $4H_2O$
Molecular weight	264.3
Specific gravity, 25/25 C	1.3
pH of saturated water solution, 25 C	12.0-13.5
Bulk density, lb/ft³	38-43
Solubility, approx g/100 g solvent at 25 C	
Acetone	330
DOWANOL™ EM glycol ether	360
DOWANOL PM glycol ether	230
DOWANOL TPM glycol ether	50
Ethanol (95% 3A)	372
Methanol	468
Ethylene glycol	300
Propylene glycol	200
Polyglycol P400	10
Water	120

™Trademark of the Dow Chemical Company

Sales Specifications

Description	White flakes and fines or powder
Active ingredient:	
Sodium-o-phenylphenate tetrahydrate	97%
Inert Ingredients	3%

Methods of analyses for these items may be obtained from Dow Chemical U.S.A., Designed Products Department, 2040 Dow Center, Midland, Michigan 48640.

Packages

DOWICIDE A is sold in fiber drums having a net weight of 100 lb.

Status of DOWICIDE A under federal laws

U.S.A. Registration No. 464-78.

DOWICIDE A Antimicrobial is listed in the "EPA Summary of Registered Pesticide Chemical Uses" for post-harvest application to a variety of raw agricultural products. It can also be found in the "List of Chemical Compounds Authorized for Use Under USDA Poultry, Meat, Rabbit, and Egg Products Inspection Programs" as a sanitizer and sanitizing cleaner.

DOWICIDE A Antimicrobial meets the requirements of the Food Additive Regulations administered by the Food and Drug Administration as follows:

CFR 120.129 — o-Phenylphenol and Its Sodium Salt; Tolerances for Residues. For post-harvest application to a variety of raw agricultural products.
CFR 121.2514 — Resinous and Polymeric Coatings. Par. (b) (3) (xxxi), Can end cements.
CFR 121.2520 — Adhesives.
CFR 121.2526 — Components of Paper and Paperboard in Contact with Aqueous and Fatty Foods.
CFR 121.2534 — Animal Glue.
CFR 121.2548 — Zinc-Silicon Dioxide Matrix Coatings.
CFR 121.2550 — Closures with Sealing Gaskets for Food Containers.
CFR 121.2571 — Components of Paper and Paperboard in Contact with Dry Foods.

CFR §180.1001 (d) — It is exempt from the requirements of a tolerance when used at a maximum level of 0.1% for the preservation of pesticide formulations applied to growing crops.

Antifungal Efficacies

Test Organism
Rhizopus nigricans
Rhizoctonia solani
Chaetomium globosum
Humicola grisea
Aspergillus niger
Penicillium funiculosum
Aspergillus terreus
Lenzites trabea
Ceratostomella pilifera
Trichophyton interdigitale
Trichophyton rosaceum

Applications

Product or Material Protected	Reason for Treatment	Suggested Concentration[1]	
Adhesives	To protect adhesives based on starch, protein, natural and synthetic gums, and natural rubber latex from deterioration during manufacture, storage and service life.	0.05-1.0% by wt of DOWICIDE A or a 50-50 mixture of DOWICIDE A and DOWICIDE G-ST	Ad aq
Agricultural Products	For post-harvest preservation of fruits and vegetables.	0.05-3.09% by wt in water or wax emulsion formulation.	Di fru wi sic an
Ceramic Glazes and Clay Slips	To prevent bacterial decomposition.	0.05-0.19% by wt of formulation.	Ad tio wh ch
Chemical Toilets	To control odors in chemical toilets on buses, trains and airplanes.	1.0-1.5 oz per quart of water	Dis mi wa
Construction Materials	To control mold growth on inert surfaces such as asbestos shingles, tile roofs, brick walls, and concrete blocks.	1.0% by wt in water.	Rin cle wi an

[1] Refers to concentrations of DOWICIDE A, or to mixtures of DOWICIDE A and other Dow a

Antifungal Efficacies

Test Organism	% DOWICIDE A for Inhibition
Rhizopus nigricans	0.023 —0.03
Rhizoctonia solani	0.0016—0.003
Chaetomium globosum	0.004 —0.008
Hormiscium gelatinosum	0.008 —0.016
Aspergillus No. 29	0.004 —0.008
Polyporus tulipiferae (FPL No. [illegible])	0.008 —0.016
Aspergillus flavus	0.008 —0.016
Lenzites trabea	0.004 —0.008
Ceratostomella pilifera	0.008 —0.016
Trichlphyton interdigitale	0.003 —0.0054
Trichophyton rosaceum	0.0054—0.008

Applications

Product or Material Protected	Reason for Treatment	Suggested Concentration[1]	How to Apply
Adhesives	To protect adhesives based on starch, protein, natural and synthetic gums, and natural rubber latex from deterioration during manufacture, storage and service life.	0.05-1.0% by wt of DOWICIDE A or a 50-50 mixture of DOWICIDE A and DOWICIDE G-ST	Add as concentrated aqueous solution.
Agricultural Products	For post harvest preservation of fruits and vegetables.	0.05-3.0% by wt in water or wax emulsion formulation.	Dip, flood or spray fruit or vegetable with water or emulsion containing antimicrobial.
Ceramic Glazes and Clay Slips	To prevent bacterial decomposition.	0.05-0.19% by wt of formulation	Add to formulation ingredients when they are charged into mill.
Chemical Toilets	To control odors in chemical toilets on buses, trains and airplanes.	1.0-1.5 oz per quart of water	Dissolve antimicrobial in water.
Construction Materials	To control mold growth on inert surfaces such as asbestos shingles, tile roofs, brick walls, and concrete blocks.	1.0% by wt in water	Rinse previously cleaned surface with solution of antimicrobial.

Applications continued

Product or Material Protected	Reason for Treatment	Suggested Concentration
Feathers	[illegible]	[illegible]
Fire Extinguisher Solutions	To preserve [illegible] solutions.	[illegible] of solu[illegible]
Floor Wax Emulsions	For shelf preservation	[illegible]
Graphite	To preserve protein colloidal graphite formulations	50-50 [illegible] DOWIC[illegible] DOWIC[illegible]
Ink	For shelf preservation of dextrin base water color printing inks	[illegible] formul[illegible]
Laundry Starch	To preserve liquid starch during shelf life and after container is opened	[illegible] formul[illegible]
Leather	To prevent slippage of hair or furs in soaking liquors; to prevent deterioration of [illegible] and finishing formulations	[illegible]
Metalworking Fluids	To prevent [illegible] oils, emulsifying agents, and other components	[illegible]
Paint	[illegible]	[illegible]

cacies

	% DOWICIDE A for Inhibition
ns	0.023 — 0.03
i	0.0016 — 0.003
bosa	0.004 — 0.008
nosa	0.008 — 0.016
9	0.004 — 0.008
era	0.008 — 0.016
s	0.008 — 0.016
	0.004 — 0.008
ilifera	0.008 — 0.016
rdigita	0.003 — 0.0054
aceum	0.0054 — 0.008

Reason for Treatment	Suggested Concentration[1]	How to Apply
To protect adhesives based on starch, protein, natural and synthetic gums, and natural rubber latex from deterioration during manufacture, storage and service life	0.05-1.0% by wt of DOWICIDE A or a 50-50 mixture of DOWICIDE A and DOWICIDE G-ST	Add as concentrated aqueous solution.
For post harvest preservation of fruits and vegetables	0.05-3.09% by wt in water or wax emulsion formulation	Dip, flood or spray fruit or vegetable with water or emulsion containing antimicrobial
To prevent bacterial decomposition	0.05-0.19% by wt of formulation.	Add to formulation ingredients when they are charged into mill
To control odors in chemical toilets on buses, trains and airplanes	[illegible] oz per quart of water	Dissolve antimicrobial in water
To control mold growth on inert surfaces such as [illegible]	1.0 [illegible] by wt in water	Rinse previously cleaned surface with solution of antimicrobial

Continued

Applications — continued

Product or Material Protected	Reason for Treatment	Suggested Concentration[1]	How to Apply
Feathers	To prevent deterioration of stored feathers	50-50 mixture of DOWICIDE A and DOWICIDE G-ST at [illegible] by wt of [illegible] feathers	Spray feathers with [illegible]
Fire Extinguisher Solutions	To preserve [illegible] type solutions	[illegible] by wt of solution	Add [illegible] to solution
Floor Wax Emulsions	For shelf preservation	0.1-0.5% by wt of emulsion	Incorporate in water phase of emulsion.
Graphite	To preserve protein colloidal graphite formulations	50-50 mixture of DOWICIDE A and DOWICIDE G-ST at 1.0% by wt of graphite	Add as concentrated aqueous solution
Ink	For shelf preservation of dextrin base water color printing inks.	0.5% by wt of formulation	Add as concentrated aqueous solution
Laundry Starch	To preserve liquid starch during shelf life and after container is opened	0.2% by wt of formulation.	Add as concentrated aqueous solution
Leather	To prevent slippage of hair or furs in soaking liquors, to prevent deterioration of treating and finishing formulations	One part per 15 parts water for soaking liquors. 0.05-1.0% by wt for pastes, dressings and finishes	Add as concentrated aqueous solution
Metalworking Fluids	To prevent breakdown of oils, emulsifying agents, and other components	0.1 to 1.0% by wt of DOWICIDE A or a 50-50 mixture of DOWICIDE A and DOWICIDE B	Add as concentrated aqueous solution
Paint	For storage preservation of decomposable raw material solutions or dispersions and shelf preservation of [illegible] latex paint	Minimum of 0.[illegible] by wt of DOWICIDE A or a 50-50 mixture of DOWICIDE A and DOWICIDE [illegible]	Add as concentrated aqueous solution

Applications — continued

Product or Material Protected	Reason for Treatment	Suggested Concentration[1]	How to Apply
Polyvinyl Alcohol	To preserve solutions of the alcohol.	0.6-0.8% by wt of solution.	Add antimicrobial to solution.
Pulp and Paper	To preserve coatings, sizings, and printing colors based on starch, animal and vegetable protein, and latex.	0.1-1.0% by wt of material preserved.	Add as concentrated aqueous solution.
Textiles	To preserve processing materials and finished yarns and cloth during storage.	0.1-0.75% by wt of material treated.	Add as concentrated aqueous solution.

[1] Refer to concentrations of DOWICIDE A, or to mixtures of DOWICIDE A and other DOW antimicrobials, as noted.

Hazards Due to Toxicity and Precautions for Safe Handling and Use

The following statements on health hazards summarize our laboratory and application data. The precautions for safe handling and use are necessarily general in nature, since the circumstances associated with each customer's use of the material are unknown and beyond our control. Suggestions with regard to the hazards likely to be encountered in specific operations will be made upon request whenever possible. Inquiries about such specific operations and uses may be addressed to The Dow Chemical Company. Assistance in evaluating particular plant conditions may be obtained from certain consulting laboratories and from state Departments of Health or of Labor, many of which have an Industrial Hygiene Service.

Toxicological Properties

DOWICIDE A Antimicrobial is capable of producing considerable conjunctival irritation and corneal injury which might persist for a week or two. Single short exposure may cause considerable irritation to the skin, and single prolonged or frequently repeated exposures may cause a burn. Dust is irritating to the throat and nose.

Handling Precautions for Cleaning Up Spills or When Gross Contact is Likely

Eyes — Wear safety glasses with sideshields.
Skin — Avoid skin contact. Wear protective clothing as required by circumstances to prevent skin contact.
Dust — Avoid breathing dusts. If dusty atmospheres are encountered, wear a suitable dust respirator as recommended by the U.S. Bureau of Mines for toxic dusts.

— Continued

First Aid Measures

Eye Contact — Contaminated eye(s) should be flushed promptly and thoroughly with co
water for at least 15 minutes. Medical attention should be obtained.

Skin Contact — Contaminated clothing and shoes should be removed and not reused
cleaned. Contaminated skin should be washed with soap and plenty of water. Any
develops should receive medical attention.

Inhalation — Persons experiencing any ill effects from breathing the dust of this ma
removed to fresh air. Medical attention should be obtained.

DOWICIDE A Antimicrobial — Toxicological Data

Test	Animal	Results
Acute Oral	Rat — male Rat — female	LD_{50} — 924 mg/kg body wt LD_{50} — 730 mg/kg body wt
Eye Irritation	Rabbit	Mild pain upon exposure. Severe and swelling of the eyelid accom by severe necrosis of cornea and iritis.
Skin Irritation	Rabbit	24-hr contact with intact and abra skin caused severe erythema, slig moderate edema, and severe nec
	Rabbit	1-3 hr exposure — slight erythem slight to slight edema.
	Rabbit	3½-5½ hr exposure — slight necr erythema and slight edema.
	Rabbit	DOWICIDE A caused no acneform
Inhalation	Humans	Experience shows that dusts of D A, if breathed, are irritating.

Further Information

If more specific information or information on toxicity of antimicrobials in a speci
needed, contact The Dow Chemical Company, Designed Products Department, 2
Midland, Michigan 48640

Customer Notice

Dow encourages its customers to review their applications of Dow products from t
human health and environmental quality. To help ensure that Dow products are not
which they are not intended or tested, Dow personnel are willing to assist customer
ecological and product safety considerations. Your Dow salesman can arrange the

NOTICE: The information is presented in good faith but no warranty, express or [illegible]
[illegible] The Dow Chemical Company [illegible]
[illegible] and disposal of its products [illegible]

First Aid Measures

Eye Contact Contaminated eye(s) should be flushed promptly and thoroughly with copious amounts of water for at least 15 minutes. Medical attention should be obtained.

Skin Contact – Contaminated clothing and shoes should be removed and not reused until thoroughly cleaned. Contaminated skin should be washed with soap and plenty of water. Any irritation which develops should receive medical attention.

Inhalation Persons experiencing any ill effects from breathing the dust of this material should be removed to fresh air. Medical attention should be obtained.

DOWICIDE A Antimicrobial — Toxicological Data

Test	Animal	Results
Acute Oral	Rat — male Rat — female	LD_{50} — 924 mg/kg body wt LD_{50} — 730 mg/kg body wt
Eye Irritation	Rabbit	Mild pain upon exposure. Severe redness and swelling of the eyelids accompanied by severe necrosis of cornea and severe iritis.
Skin Irritation	Rabbit	24-hr contact with intact and abraded skin caused severe erythema, slight to moderate edema, and severe necrosis.
	Rabbit	1-3 hr exposure — slight erythema and very slight to slight edema.
	Rabbit	3½-5½ hr exposure — slight necrosis, slight erythema and slight edema.
	Rabbit	DOWICIDE A caused no acneform dermatitis.
Inhalation	Humans	Experience shows that dusts of DOWICIDE A, if breathed, are irritating.

Further Information

If more specific information or information on toxicity of antimicrobials in a specific application is needed, contact The Dow Chemical Company, Designed Products Department, 2040 Dow Center, Midland, Michigan 48640.

Customer Notice

Dow encourages its customers to review their applications of Dow products from the standpoint of human health and environmental quality. To help ensure that Dow products are not used in ways for which they are not intended or tested, Dow personnel are willing to assist customers in dealing with ecological and product safety considerations. Your Dow salesman can arrange the proper contacts.

AGENTS

DOWICIDE* A Antimicrobial

General

DOWICIDE A Antimicrobial is Dow's designation for the sodium salt o

Adhesive manufacturers incorporate this antimicrobial into adhesives l
and synthetic gums, and natural latexes to protect them against atta
manufacture and storage, and throughout their service life. Agricultu
emulsion formulations of DOWICIDE A are used for the post harv
vegetables such as apples, bananas, cantaloups, carrots, cherries, citru
peaches, pears, peppers, pineapples, plums, sweet potatoes, and em

The leather industry utilizes DOWICIDE A in soaking liquors to preven
sheepskins; in the paste used in hide parting operations; and in sizing, f
Metal workers who prepare their own emulsion-cutting fluids employ
50-50 mixture with DOWICIDE B Antimicrobial to protect the finished fl
Mixtures of DOWICIDE A and DOWICIDE G ST antimicrobials, or DOV
paint industry for the preservation of decomposable raw materials or
and paper producers treat processing materials with DOWICIDE A, a
protect processing materials as well as finished yarns and cloth against
Bulletins on the use of Dow antimicrobials in many of these industries

Additionally, DOWICIDE A is used to control mold growth on constru
many products such as: automotive polishes, ceramic glazes and clay s
solutions, hair shampoos, laundry starch, plastic gaskets, polishing
proteinaceous colloidal graphite mixtures, and floor wax emulsions.

Physical Properties

(These are laboratory or literature data typical of the product and are not
with, specifications)

Structure

THE DOW CHEMICAL COMPANY • MIDL
DESIGNED PRODUCTS DEPARTMENT