



DOWICIDE A Antimicrobial

Excellent Aqueous and Polar Organic Solvent Solubility for Preservative Applications

General

DOWICIDE* A Antimicrobial is **readily soluble in water** and in many polar organic solvents. It is usually incorporated directly into the product being preserved as a water or solvent concentrate, or as the flake material.

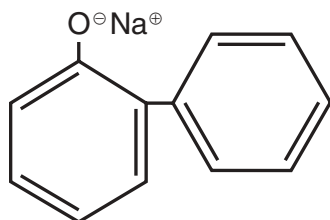
DOWICIDE A Antimicrobial is Dow's brand of the sodium salt o-phenylphenate.

Adhesive manufacturers incorporate this antimicrobial into adhesives based on starch, protein, natural and synthetic gums, and latexes to protect the adhesives against attack by bacteria and mold during manufacture and storage, and throughout their service life.

The leather industry utilizes DOWICIDE A Antimicrobial in the paste used in hide-parting operations; and in sizing, finishing, and dressing materials. Metalworking fluid manufacturers employ this antimicrobial to protect the finished fluid against spoilage. Pulp and paper producers protect 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.

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

Structure



Physical Properties

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

Formula	C ₆ H ₄ (C ₆ H ₅) O Na
Molecular weight	192.30
Specific gravity, 25/25°C	1.3
pH of saturated water solution, 25°C	12.0-13.5
Bulk density, lb/ft ³	38-43

Solubility, approx g/100 solvent at 25°C

Acetone	330
DOWANOL* PM glycol ether	230
Ethanol (95%, F30)	372
Methanol	468
Ethylene glycol	>300
Propylene glycol	>200
Polyglycol P400	<1.0
Water	120

Formulating with DOWICIDE A Antimicrobial

When formulating DOWICIDE A Antimicrobial into your product, it may be added directly as the flake or as an aqueous solution. The addition of DOWICIDE A Antimicrobial to water or a water-based formulation will increase the pH due to the presence of residual amounts of sodium hydroxide. The solubility of DOWICIDE A is affected by pH; therefore, measures should be taken to keep the pH of the formulation at 9 or above. The addition of organic solvents or anionic emulsifiers may aid in solubilizing DOWICIDE A. However, DOWICIDE A is usually incompatible with most other types of surfactants or emulsifiers. Once DOWICIDE A is solubilized, its activity is independent of pH up to 12.8.

Packages

DOWICIDE A Antimicrobial is sold in multiwall bags having a net weight of 25 kg (55.12 lb).

Status of DOWICIDE A Antimicrobial Under Federal Laws

E.P.A. Registration No. 464-78

DOWICIDE A can be found in the "List of Chemical Compounds Authorized for Use Under USDA Poultry, Meat, Rabbit, and Egg Products Inspection Programs."

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

- 21CFR 175.300(b) (3) (xxxi) – Resinous and Polymeric Coatings: Can end cements
- 21CFR 175.105(c) (5) – Adhesives.
- 21CFR 176.170(b) (2) – Components of Paper and Paperboard in Contact with Aqueous and Fatty Foods.
- 21CFR 178.3120(d) (3) – Animal Glue.
- 21CFR 175.390(b) (2) – Zinc Silicon Dioxide Matrix Coatings.
- 21CFR 177.1210(b) (5) – Closures with Sealing Gaskets for Food Containers.
- 21CFR 176.180(b) (1) – Components of Paper and Paperboard in Contact with Dry Foods.
- 40CFR 180.1001(d) – DOWICIDE A Antimicrobial 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 only.
- 40CFR 180.129 – Tolerances have been established to allow the use of DOWICIDE A in post-harvest preservation applications for pears and citrus fruits (as raw agricultural commodities).

DOWICIDE A Antimicrobial Toxicological Data

Test	Animal	Results
Acute Oral	Rat-male	LD ₅₀ – 924 mg/kg body wt.
	Rat – female	LD ₅₀ – 731 mg/kg body wt.
Chronic Oral	Rat	Rats maintained for 2 years on diets with more than 0.5% DOWICIDE A Antimicrobial developed toxicity of the urinary tract, including bladder tumors. This toxicity was demonstrated to be associated with the overloading of normal detoxification pathways, and rats maintained on diets with lower levels of DOWICIDE A for the same period showed no ill effects.
Eye Irritation	Rabbit	Severe redness and swelling of the eyelids accompanied by severe necrosis of cornea and severe iritis.
Skin Irritation	Rabbit	24-Hour contact with intact and abraded skin caused severe erythema, slight to moderate edema, and severe necrosis.
	Rabbit	DOWICIDE A Antimicrobial caused no acneform dermatitis.
Skin Corrosivity (49CFR 173.240)	Rabbit	Application of the product to the clipped backs of rabbits resulted in moderate redness, moderate swelling, and a moderate burn which was observed within 4 hours of application.
Inhalation	Human	Experience shows that dusts of DOWICIDE A Antimicrobial, if inhaled, are irritating to the upper respiratory tract.

Industrial Applications

Applications	Purpose	Suggested Concentration of DOWICIDE A	How to Apply
Adhesives	To protect adhesives based on starch, protein, natural and synthetic gums, and natural and synthetic rubber latex from deterioration during manufacture, storage and service life.	0.05-1.0% by wt. of DOWICIDE A.	Add as a concentrated aqueous solution to the formulation.
Ceramic Glazes and Clay Slips	To prevent bacterial decomposition.	0.05-19% by wt. of formulation.	Add to ingredients of formulation as they are charged into ball 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 Preservation	To control growth of fungi and bacteria in building materials such as mastics, caulk, joint cements, spackling, grouting and concrete admixtures.	0.025-0.4% by wt. of formulation.	Add at a suitable point during manufacture.
Fire Extinguisher Solutions	To preserve foam-type solutions.	0.25-0.5% by wt. of solution.	Add antimicrobial to solution.
Floor Wax Emulsions	For shelf preservation.	0.1-0.5% by wt. of emulsion.	Add to water phase of emulsion during formulating process.
Ink	For shelf preservation of dextrin-based watercolor printing inks.	0.025-0.5% by wt. of formulation	Add as a concentrated aqueous solution to the formulation.
Laundry Starch	To preserve liquid starch during shelf and use life.	0.025-0.2% by wt. of formulation	Add as a concentrated aqueous solution to the formulation.
Leather	To prevent slippage of hair on furs in soaking liquors; to prevent deterioration of treating and finishing formulations.	One part per 15 parts of water for soaking liquors, 0.05-0.1% by wt. for pastes, dressings and finishes.	Add as a concentrated aqueous solution to the formulation.
Metalworking Fluids	To prevent decomposition of emulsifying agents and other components.	0.05-0.5% by wt. of formulation.	Add as a concentrated aqueous solution to the use dilution of the metalworking fluid.
Mineral Slurries	To control the growth of unwanted microorganisms in aqueous-based slurries.	0.015%-0.6% by wt. of slurry.	Add at a suitable point during manufacture, loading, or shipment of the slurry. Premixing with water may reduce incorporation time into slurry.
Paint	For preservation of decomposable raw material solutions or dispersions during storage.	Minimum of 0.6% by wt. of DOWICIDE A.	Add as a concentrated aqueous solution to the formulation.
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 a concentrated aqueous solution.
Textiles	To preserve processing materials and finished yarns and cloth during storage.	0.1-0.75% by wt. of materials treated.	Add as a concentrated aqueous solution.

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 general in nature. Refer to the product Material Safety Data Sheet. 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 severe conjunctival irritation and corneal injury. A single short exposure may cause a burn to the skin. Dust is irritating to the throat and nose.

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

Eyes – Wear goggles or face shield when handling.

Skin – Avoid skin contact. Wear protective clothing as required by circumstances to prevent skin contact.

Inhalation – Avoid breathing dusts. If dusty atmospheres are encountered, wear a NIOSH-approved dust/mist respirator. Airborne concentrations should be maintained to levels below the recommended Dow Industrial Hygiene Guide of 1 mg/m³.

First Aid Measures

Eye Contact – Contaminated eye(s) should be flushed promptly and thoroughly with flowing water for at least 30 minutes. Prompt medical attention is essential.

Skin Contact – Immediately wash thoroughly any size exposure with non-abrasive soap and large quantities of water for 30 minutes, while removing contaminated clothing and shoes. Items that cannot be decontaminated, such as shoes, should be destroyed.

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

Ingestion – Call poison control center or doctor immediately. Do not induce vomiting. Give sips of water if person is able to drink. Do not give anything by mouth to an unconscious person.

Product Stewardship

Dow encourages its customers to review their applications of Dow products from the standpoint of human health and environmental safety. 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. Dow literature, including Safety Data Sheets, should be consulted prior to use of Dow products. Contact your Dow representative if you need any assistance or information.

For further information visit our website: www.dowbiocides.com or call...

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and Canada: 1-989-832-1560 (phone)
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