



DOWICIDE 1 Antimicrobial

Excellent Organic Solubility for Preservative and Disinfectant Applications (U.S. Only)

General

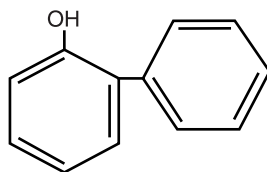
DOWICIDE* 1 Antimicrobial is readily soluble in most organic solvents and oils, and is only slightly soluble in water. It is added to formulation concentrates which are subsequently diluted with water during use.

DOWICIDE 1 Antimicrobial can be formulated with the aid of anionic emulsifiers. However, it is usually incompatible with most other types of surfactants and emulsifiers.

DOWICIDE 1 Antimicrobial is Dow's brand of o-phenylphenol.

This product is uniquely effective against a wide variety of organisms, including *Pseudomonas* spp. and *Mycobacterium tuberculosis*. Typically, DOWICIDE 1 Antimicrobial is used in combination with other substituted phenolics in the manufacture of disinfectant formulations used in homes, schools, hospitals, nursing homes. It is also used in the manufacture of formulations used for the post-harvest treatment of pears and citrus fruits.

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)OH
Molecular weight	170.2
Freezing point, °C	57
Boiling point, °C	286
Flash point, °F, C.O.C	255
Fire point, °F, C.O.C	300
Specific gravity, 25/25°C	1.2
Bulk density, lb/ft ³	35-41
Vapor pressure, mm Hg	
20°C	0.0017
50°C	0.0326
100°C	1.13
140°C	7

Solubility, approx g/100 g solvent at 25°C

DOWANOL* PM glycol ether	420
Methanol	870
Ethanol (95%, F2B)	580
Ethylene glycol	140
Isopropanol	460
Polyglycol E400	180
Polyglycol P400	180
Polyglycol P1200	140
Propylene glycol	280
Water	
25°C	0.08
60°C	0.16

Sales Specifications

Description: White to light buff to pink free-flowing flakes and powder

Active ingredient,	
o-phenylphenol	99%
Inert ingredients	1%

Methods of analyses for these items may be obtained from The Dow Chemical Company, Antimicrobials Group, Larkin Lab, Midland, Michigan 48674.

Packages

DOWICIDE 1 Antimicrobial is sold in multiwall bags having a net weight of 25 kg (55.12 lb).

*Trademark of The Dow Chemical Company

¹Estrin, N.F., P.A. Crosley, and C.R. Haynes. 1982. CTFA Cosmetic Ingredient Dictionary—V. Monographs. The Cosmetic, Toiletry and Fragrance Assoc., Inc., Washington, D.C., p. 232.

Antifungal and Antibacterial Efficacies

Test Organism	% for Inhibition
FUNGI	
<i>Rhizopus nigricans</i>	0.015 – 0.02
<i>Rhizoctonia solani</i>	0.001 – 0.002
<i>Chaetomium globosum</i> (ATCC #6205)	0.0025 – 0.005
<i>Hormiscus gelatinosum</i>	0.005 – 0.01
<i>Aspergillus niger</i>	0.025 – 0.05
<i>Polyporus tulipiferae</i> (F.P.L. No. 517, ATCC #11245)	0.005 – 0.01
<i>Aspergillus flavus</i> (ATCC #9643)	0.005 – 0.01
<i>Lenzites trabea</i> (ATCC #11539)	0.0025 – 0.005
<i>Ceratostomella pilifera</i>	0.005 – 0.01
<i>Trichophyton interdigitale</i>	0.002 – 0.0035
<i>Trichophyton rosaceum</i>	0.0035 – 0.005
BACTERIA	
<i>Staphylococcus aureus</i> (ATCC #6538)	0.01 – 0.015
<i>Bacillus subtilis</i> (ATCC #8473)	0.01 – 0.015
<i>Enterobacter aerogenes</i> (ATCC #13048)	0.01 – 0.015
<i>Klebsiella pneumoniae</i> (ATCC #8308)	0.01 – 0.015
<i>Pseudomonas aeruginosa</i> (ATCC #10145)	0.02 – 0.025
<i>Pseudomonas aeruginosa</i> (ATCC #15442)	0.045 – 0.05
<i>Proteus vulgaris</i> (ATCC #881)	0.005 – 0.01
<i>Escherichia coli</i> (ATCC #11229)	0.01 – 0.015
<i>Salmonella choleraesuis</i> (ATCC #10708)	0.01 – 0.015

Applications

Industry	Reason for Addition	Suggested Concentration	Application Method
Disinfectants	Used as the active ingredient in the formulation; makes formulations effective against a wide variety of pathogenic organisms.	Will vary depending upon the use-dilution of the product. Typically formulations contain a minimum of 0.1% by wt. phenolic component after dilution.	Add to organic portion of the disinfectant concentrate during the formulation process.
Post-Harvest Preservative of Pears & Citrus Fruits	To prevent spoilage of stored fruits.	Varies depending upon application method & desired residue.	Applied from formulations by dip, wash or spray; can also be applied from wax formulations.

DOWICIDE 1 Antimicrobial – Toxicological Data

Test	Subject	Results
Acute Oral	Rat	LD ₅₀ –2700 mg/kg body weight.
	Guinea Pig	LD ₅₀ –3500 mg/kg body weight.
Chronic Oral	Rabbit	Doses up to 1000 mg/kg were administered daily, 5 days a week for 4 weeks, with no apparent ill effects.
	Rat	Doses up to 200 mg/kg were administered daily, 5 days/week for 6 months, with no ill effects; 500 mg/kg produced only minimal changes of questionable significance.
	Rat	Rats were maintained on diets containing 0.02 and 0.2% of DOWICIDE 1 for 2 years with no ill effects. 2.0% level inhibited growth slightly and showed slight changes in the kidneys.
	Dog	Dogs were maintained on diets containing 0.02, 0.2 and 0.5 g/kg/day for 6 months with no ill effects.
Eye Irritation	Rabbit	Diffuse-crimson or beefy red conjunctival redness, moderate to severe conjunctival chemosis causing the eyelids to be half or more than half closed, moderate circum-corneal injection of the iris, and slight to moderate corneal injury.
Skin Irritation	Rabbit	The concentrated material was nonirritating. Solutions of the material, depending upon vehicle and concentration, caused mild irritation.
	Human	No skin irritation produced by a 5% sesame oil solution of the material.
Skin Sensitization	Human	Not a skin sensitizer.
Skin Absorption	Rabbit and Guinea Pig	Not absorbed through the skin in toxic amounts.
Mutagenicity		At a dose range of 0.025-25 µg per plate, the product did not demonstrate mutagenic activity in a series of <i>in vitro</i> microbial assays employing <i>Salmonella</i> and <i>Saccharomyces</i> indicator organisms. The product was tested directly and in the presence of liver microsomal enzyme preparations from Aroclor-induced rats.
Teratogenicity, Embryotoxicity	Rat	The product was not teratogenic or embryotoxic at dose levels up to 700 mg/kg body weight per day, a level which produced some evidence of maternal toxicity.
Immunotoxicity	Female Rat	Exposure to relatively high doses (up to 200 mg/kg body weight per day) for 10 days failed to alter immune functions or to impair host resistance to bacterial challenge or transplantable tumor cells.
Fish Toxicity	Bluegill	96-hour LC ₅₀ = 4.6 mg/L
	Fathead Minnow	96-hour LC ₅₀ = 5.1 mg/L
	Rainbow Trout	96-hour LC ₅₀ = 4.0 mg/L
	Daphnid	48-hour LC ₅₀ = 2.7 mg/L
Biodegradability		Uniformly ¹⁴ C-labeled o-phenylphenol (OPP), labeled on the phenol ring, was tested by OECD Method 301B. The rate and extent of mineralization of [¹⁴ C]OPP to ¹⁴ CO ₂ , indicative of rapid biodegradation of the phenolic ring, was consistent with a classification of "Ready Biodegradability".

NOTE: The World Health Organization (1982) has classified o-phenylphenol as unlikely to present any acute hazard in normal use. The classification is based primarily on the acute oral and dermal toxicity to the rat since these determinations are standard procedures in toxicology. The hazard referred to in this recommendation is the acute risk to health, that is, the risk of single or multiple exposures over a relatively short period of time.

Hazards Due to Toxicity and Precautions for Handling and Use

The following statements on health hazards summarize our laboratory and application data. The precautions for handling and use are general in nature. Assistance in evaluating particular plant conditions may be obtained from consulting laboratories, State Departments of Health or Department of Labor.

Toxicological Properties

DOWICIDE 1 Antimicrobial is an eye irritant. The product is capable of causing moderate to severe conjunctival redness, moderate to severe swelling, slight to moderate iritis and slight to moderate corneal injury. It is neither a primary skin irritant nor a skin sensitizer. It is not absorbed through the skin in toxic amounts. The dusts are irritating to the upper respiratory tract.

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

Refer to product MSDS for more information.

Eye Contact—Contaminated eyes should be washed promptly and thoroughly with flowing water for at least 15 minutes. Medical attention should be obtained.

Skin Contact—Contaminated clothing and shoes should be removed and washed before reuse. Contaminated skin should be washed with soap and plenty of water. Any irritation which develops should receive medical attention.

Inhalation—Anyone experiencing any noticeable ill effects from breathing the dust of this material should be removed to fresh air. Consult a physician.

This product only available in the U.S.

For more information call 1-800-447-4369

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