

VANQUISH 100 Antimicrobial

FOR DIRECT INCORPORATION INTO PLASTIC AND RUBBER FOR FURTHER PROCESSING

PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS AND DOMESTIC ANIMALS

DANGER

CORROSIVE. CAUSES IRREVERSIBLE EYE AND SKIN BURNS. HARMFUL IF SWALLOWED OR ABSORBED THROUGH SKIN OR INHALED. DO NOT GET IN EYES, ON SKIN, OR ON CLOTHING. DO NOT BREATHE SPRAY MIST. WEAR GOGGLES OR FACE SHIELD AND RUBBER GLOVES WHEN HANDLING. MAY BE FATAL IF INHALED. DO NOT BREATHE VAPORS. USE WITH ADEQUATE VENTILATION. IF NEEDED, USE NIOSH CERTIFIED RESPIRATOR FOR ORGANIC VAPORS, MISTS AND FUMES. WASH THOROUGHLY AFTER HANDLING AND BEFORE EATING, DRINKING OR USING TOBACCO. REMOVE CONTAMINATED CLOTHING AND WASH BEFORE REUSE.

ENVIRONMENTAL HAZARDS: THIS PRODUCT IS TOXIC TO FISH. DO NOT DISCHARGE EFFLUENT CONTAINING THIS PRODUCT INTO LAKES, STREAMS, PONDS, ESTUARIES, OCEANS OR OTHER WATERS UNLESS IN ACCORDANCE WITH THE REQUIREMENTS OF A NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND THE PERMITTING AUTHORITY HAS BEEN NOTIFIED IN WRITING PRIOR TO DISCHARGE. DO NOT DISCHARGE EFFLUENT CONTAINING THIS PRODUCT TO SEWER SYSTEMS WITHOUT PREVIOUSLY NOTIFYING THE LOCAL SEWAGE TREATMENT PLANT AUTHORITY. FOR GUIDANCE CONTACT YOUR STATE WATER BOARD OR REGIONAL OFFICE OF THE EPA. DO NOT CONTAMINATE WATER BY CLEANING OF EQUIPMENT OR DISPOSAL OF WASTES

MANUFACTURED BY:

ACTIVE INGREDIENT:

N-BUTYL-1,2-BENZISOTHAZOLIN-3-ONE: 94.5%

INERT INGREDIENTS: 5.5%

TOTAL INGREDIENTS: 100.0%

KEEP OUT OF REACH OF CHILDREN.

DANGER

FIRST AID

IF IN EYES: HOLD EYE OPEN AND RINSE SLOWLY AND GENTLY WITH WATER FOR 15-20 MINUTES. REMOVE CONTACT LENSES, IF PRESENT, AFTER THE FIRST 5 MINUTES. THEN CONTINUE RINSING. CALL A POISON CONTROL CENTER OR DOCTOR FOR TREATMENT ADVICE.

IF SWALLOWED: CALL A POISON CONTROL CENTER OR DOCTOR IMMEDIATELY FOR TREATMENT ADVICE. HAVE PERSON SIP A GLASS OF WATER IF ABLE TO SWALLOW. DO NOT INDUCE VOMITING UNLESS TOLD TO BY A POISON CONTROL CENTER OR DOCTOR.

IF ON SKIN OR CLOTHING: TAKE OFF CONTAMINATED CLOTHING. RINSE SKIN IMMEDIATELY WITH PLENTY OF WATER FOR 15-20 MINUTES. CALL A POISON CONTROL CENTER OR DOCTOR FOR TREATMENT.

IF INHALED: MOVE PERSON TO FRESH AIR. IF PERSON IS NOT BREATHING, CALL 911 OR AN AMBULANCE THEN GIVE ARTIFICIAL RESPIRATION, PREFERABLY MOUTH-TO-MOUTH, IF POSSIBLE. CALL A POISON CONTROL CENTER OR DOCTOR FOR FURTHER TREATMENT ADVICE.

FOR ADDITIONAL INFORMATION IN CASE OF EMERGENCY CALL TOLL FREE 1-800-286-7850. HAVE THE PRODUCT CONTAINER OR LABEL WITH YOU WHEN CALLING A POISON CONTROL CENTER OR DOCTOR OR GOING TO TREATMENT.

NOTE TO PHYSICIAN

PROBABLE MUCOSAL DAMAGE MAY CONTRAINDICATE THE USE OF GASTRIC LAVAGE FOLLOWING INGESTION.

SEE ADDITIONAL PRECAUTIONARY
STATEMENTS ON SIDE PANEL

DIRECTIONS FOR USE

IT IS A VIOLATION OF FEDERAL LAW TO USE THIS PRODUCT IN A MANNER INCONSISTENT WITH ITS LABELING. SEE T. I. BULLETIN FOR DIRECTIONS FOR INCORPORATING THIS PRODUCT INTO PLASTIC FOR FURTHER PROCESSING.

STORAGE AND DISPOSAL: DO NOT CONTAMINATE WATER, FOOD OR FEED BY STORAGE OR DISPOSAL. OPEN DUMPING IS PROHIBITED.

PESTICIDE STORAGE: PROTECT FROM FROST. IF FROZEN, ALLOW TO THAW AND STIR WELL BEFORE USE.

PESTICIDE DISPOSAL: PESTICIDE WASTES ARE ACUTELY HAZARDOUS. IMPROPER DISPOSAL OF EXCESS PESTICIDE SPRAY MIXTURE OR RINSE IS A VIOLATION OF FEDERAL LAW. IF THESE WASTES CANNOT BE DISPOSED OF BY USE ACCORDING TO LABEL INSTRUCTIONS, CONTACT YOUR STATE PESTICIDE OR ENVIRONMENTAL CONTROL AGENCY, OR THE HAZARDOUS WASTE REPRESENTATIVE AT THE NEAREST EPA REGIONAL OFFICE.

CONTAINER DISPOSAL: TRIPLE RINSE (OR EQUIVALENT). THEN OFFER FOR RECYCLING OR RECONDITIONING, OR PUNCTURE AND DISPOSE OF IN A SANITARY LANDFILL, OR BY OTHER PROCEDURES APPROVED BY STATE AND LOCAL AUTHORITIES.

EPA REG. NO. 72674-2

EPA EST. NO. 74637-GBR-001

CONTENTS: 400 LBS. NET MINIMUM
(APPROX 50 U.S. GALLONS)

Avecia

Medical Emergency Information Center - 800-286-7850
Chemical Emergency Response Center - 800-424-2466

P.O. Box 15457
Wilmington
Delaware 19850-5457
USA
800-435-8679

REV. DATE: 04/28/03

LOT NUMBER:
9999999

PRODUCT CODE:
3229D

MADE IN UK

ACCEPTED

AUG 18 2003

Under the Federal Insecticide, Fungicide, and
Rodenticide Act as amended, for the
pesticide, registered under
EPA Reg. No. 72674-2

72674-2

8-18-2003

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AVECIA Biocides

VANQUISH 100 Antimicrobial

Technical Information Bulletin

An Antimicrobial / Antifungal Additive
for the Preservation of Plastic and Rubber

SUMMARY

Vanquish antimicrobials, effective for control of fungi and bacteria, are based on the active ingredient N-butyl-1,2-benzisothiazolin-3-one.

Vanquish 100 Antimicrobial is used for the protection of natural rubber and plastic products made from such polymers as polyvinylchloride, polyurethane, silicone, polyolefins, polyester (and others).

Vanquish 100 Antimicrobial is registered with the Environmental Protection Agency and has EPA registration No. 72674-2.

Vanquish 100 Antimicrobial may be used for the manufacture of liquid or solid antimicrobial formulations or for the direct incorporation into plastics or their precursors for the intent of preserving plastic articles from microbial degradation.

GENERAL

Listed below are some of the organisms, which Vanquish 100 Antimicrobial is effective against, and their minimum inhibitory concentrations (MIC):

Fungi

<i>Alternaria alternata</i>	2	ppm
<i>Aureobasidium pullulans</i>	4	ppm
<i>Chaetomium globosum</i>	<0.5	ppm
<i>Cladosporium cladosporoides</i>	<0.5	ppm
<i>Cladosporium herbarum</i>	2	ppm
<i>Gliocladium virens</i>	8	ppm
<i>Paecilomyces variotti</i>	4	ppm
<i>Penicillium funiculosum</i>	1	ppm
<i>Scopulariopsis brevicaulis</i>	1	ppm

Bacteria

<i>Alcaligenes faecalis</i>	31	ppm
<i>Flavobacterium capsulatum</i>	8	ppm

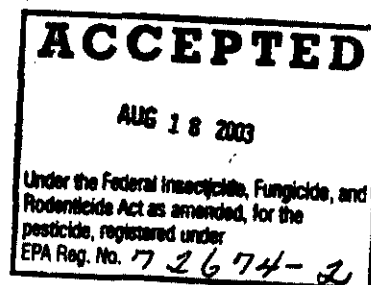
Streptomycetes

<i>Streptoverticillium waksmanii</i>	2	ppm
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Algae

<i>Chlorella vulgaris</i>	16	ppm
<i>Nostoc muscorum</i>	16	ppm
<i>Oscillatoria tenuis</i>	16	ppm
<i>Pleurococcus sp.</i>	16	ppm
<i>Trentepohlia aurea</i>	16	ppm

Vanquish 100 Antimicrobial provides effective control of a wide range of bacterial, fungal and algal organisms thereby preventing degradation of the product. It can protect the surface of substrates and prevents objectionable odors and aesthetic problems such as staining, or growth on or in the substrate. Vanquish 100 Antimicrobial is easy to use due to its liquid form and excellent compatibility in most systems.



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TYPICAL PROPERTIES OF VANQUISH 100 ANTIMICROBIAL

Active Agent (Content)	1.0%
Physical Form	brown liquid
Odor	Mild or none
Flash Point	178°F
Water Content, %	1.0 (approx.)

DIRECTIONS FOR USE IN PLASTICS

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

Many plastics are considered to be resistant to microbial attack, but there are significant exceptions that merit preventative action by the use of antimicrobial additive. Plasticized PVC, polyurethane and silicones are particularly susceptible. The biodeterioration of products based on these types of plastics can be a serious problem for manufacturers. Failure to add the proper amount of antimicrobial additive can lead to premature product failure due to loss of mechanical strength, flexibility or adhesive strength. Also, adverse aesthetic problems such as musty odor, permanent staining or microbial surface growth can lead to customer complaints.

Vanquish 100 Antimicrobial is effective against the microbes which degrade plastics (and plastic additives) or natural rubber and can increase the useful life of articles made from these materials.

Vanquish 100 Antimicrobial additive is effective in most plastic compositions and can be used to preservative natural rubber and such plastics as PVC, polyurethane, silicone, acrylics, and others to produce articles such as;

- coated fabric (e.g. ski wear, raincoats, tents, seat covers)
- floor coverings, underlay & mats
- vinyl wall coverings
- tarpaulins and awnings
- roofing membranes
- synthetic leather (e.g. sneakers and training shoe uppers)
- swimming pool liners, ornamental pond liners

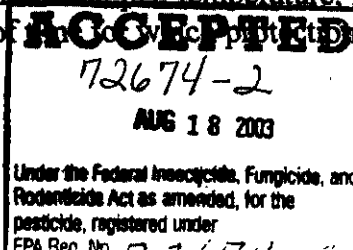
- appliance gaskets (e.g. washers, refrigerator)
- shoe soles, mid-soles & outers
- sealants, caulks, weather stripping & non-food contact adhesives
- pet toys & general household items (shower curtains, bath mats)
- auto parts (e.g. landau tops, door seals, shock absorbers)
- foam (e.g. seat cushions, gaskets, insulation)
- tubing (e.g., marine hose and sleeving)
- electrical & pipe wrap
- furniture (e.g. outdoor, leisure, water bed liners, cushions)

Do not use this product to treat food/feed or drinking water contact items or toys..

Vanquish 100 Antimicrobial additive has been found to be an effective polymer preservative at concentrations of 0.03% to 1.0% based on the total weight of the substrate. Typical range of concentrations on which trials can be based, are:

<u>Application</u>	% VANQUISH 100 Antimicrobial (based on total weight of final product)
Plasticized PVC	0.03 to 0.5
Polyurethane	0.05 to 0.5
Silicones	0.05 to 1.0
Polyesters	0.05 to 1.0
Polyolefins	0.05 to 1.0
Acrylics	0.05 to 1.0
Synthetic elastomers such as butadiene-styrene, styrene- isoprene and acrylonitrile- butadiene-styrene	0.03 to 1.0
Natural latex rubber	0.03 to 0.5

The concentration required to give protection depends on several factors. These include the susceptibility of the system to microbiological degradation, the extent to which micro-organisms can gain access, the species involved, pH, temperature, moisture and length of time for which protection is required.



INCORPORATION OF VANQUISH 100 ANTIMICROBIAL INTO POLYMERS

PVC plastisols: For addition to PVC plastisols Vanquish 100 Antimicrobial liquid may be added along with the other additives. Use levels should be calculated based upon the total weight of the formulation.

Cross Linked Polyurethane: For addition to cross linked polyurethane Vanquish 100 Antimicrobial liquid should be added to the polyol at a concentration that will yield the desired use level in the final product after reaction with the isocyanate component. Vanquish 100 Antimicrobial may also be incorporated at an injection port of a reaction injection molding (RIM) machine.

Melt Processed Polymers: For addition to melt processed polymers (PVC, thermoplastic polyurethane, synthetic elastomers and thermoplastic acrylics etc.) Vanquish 100 Antimicrobial liquid may be metered into the melt to yield the desired end use concentration. For example at the injection point in an extrusion system. Alternatively, Vanquish 100 Antimicrobial liquid may be made into a concentrated chip (as above at up to 20% Vanquish 100 Antimicrobial) and these chips blended with non preserved chips in the users plant to yield the desired end use concentration upon subsequent melt processing. For thermoplastic polyurethane, concentrated granules may also be produced by absorbing Vanquish 100 Antimicrobial liquid to granules through shear mixing (up to 20% Vanquish 100 Antimicrobial). These can be blended with non preserved polymer chips in the users plant to the desired use concentration and then further heat processed (i.e. via extrusion).

PVC: Vanquish 100 Antimicrobial liquid may be added to the mixed liquid components added to a blend of PVC resin and solids, shear mixed until a dry blend is achieved and then processed through extrusion, calendering, molding or other system.

Acrylics: In addition to the above, Vanquish 100 Antimicrobial liquid can be added to the liquid monomers before polymerization, at

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levels to yield the desired use level in the final product after polymerization.

Silicone: For silicone sealants, the Vanquish 100 Antimicrobial liquid may be added to the silicone oil before processing, or to the manufacturing vessel before packing off.

Natural Rubber: Vanquish 100 Antimicrobial can be added to the latex.

The Avecia Technical Service Group can provide additional guidance on the proper use of Vanquish 100 Antimicrobial.

KEEP OUT OF REACH OF CHILDREN DANGER

FIRST AID

IF IN EYES: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing. Call a poison control center or doctor for treatment advice.

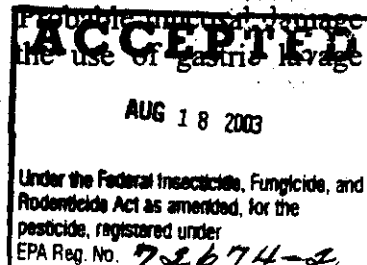
IF SWALLOWED: Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to by a poison control center or doctor.

IF ON SKIN OR CLOTHING: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment.

IF INHALED: Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice.

For additional information in case of emergency call toll free 1-800-286-7850. Have the product container or label with you when calling a poison control center or doctor or going for treatment.

Note to Physician: may contraindicate following ingestion.



Precautionary Statements

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

Corrosive. Causes irreversible eye and skin burns. Harmful if swallowed or absorbed through the skin or inhaled. Do not get in eyes, on skin, or on clothing. Do not breathe spray mist. Wear goggles or face shield and rubber gloves when handling. May be fatal if inhaled.

Do not breathe vapors. Use with adequate ventilation. If needed, use NIOSH certified respirator for organic vapors, mists and fumes.

Wash thoroughly after handling and before eating, drinking or using tobacco. Remove contaminated clothing and wash before reuse.

ENVIRONMENTAL HAZARDS

This product is toxic to fish. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans or other waters unless in accordance with the requirements of a National Pollution Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance, contact your State Water Board or Regional Office of the EPA. Do not contaminate water by cleaning of equipment or disposal of wastes.

STORAGE AND DISPOSAL

Do not contaminate water, food, or feed by storage or disposal. Open dumping is prohibited.

Pesticide Storage

Protect from frost. If frozen, allow to thaw and stir well before use.

Pesticide Disposal

Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law.

If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office.

Container Disposal

Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and

dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

SAFE HANDLING INFORMATION

Refer to the Material Safety Data Sheet

(MSDS) available from Avecia Biocides for information on the safe use, handling and disposal of this product.

For literature, samples and order information, please contact Customer Services: (800) 435-8679, ext. 8304.

For technical information, please contact Application Research and Technical Services at (800) 456-3669, ext. 8428.

FOR YOUR PROTECTION

Avecia Inc. ("AVECIA") warrants that this product conforms to the chemical description on the label and that it is reasonably fit for the purposes stated on the label when used in accordance with AVECIA's directions under normal conditions of use. This warranty does not extend to the use of this product contrary to label instructions, or under abnormal use conditions, or under conditions not reasonably foreseeable to AVECIA, and the buyer or user assumes the risk of any such use. AVECIA DISCLAIMS ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY. Statements herein, therefore, should not be construed as representations or warranties.

IN NO EVENT SHALL AVECIA BE LIABLE FOR ANY SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, INCLUDING LOST PROFITS, ON ANY THEORY WHATSOEVER, INCLUDING NEGLIGENCE, and AVECIA's sole liability and Buyer's and User's exclusive remedy shall be limited to the refund of the purchase price. Statements concerning the use of the products or the formulations described therein are not to be construed as recommending the infringement of any patent and no liability for infringement arising out of any such use is assumed.

ACCEPTED

AUG 18 2003

Under the Federal Insecticide, Fungicide, and Rodenticide Act as amended, for the pesticide, registered under EPA Reg. No. 72674-2