



SYLGARD®

ANTIMICROBIAL TREATMENT

A SILICONE QUATERNARY AMMONIUM SALT

EPA Reg. No. 34292-3
ACTIVE INGREDIENT: 3-(trimethoxysilyl) propyldimethyloctadecyl ammonium chloride12%
INERT INGREDIENTS:58%

EPA Est. 34292-MI-01

CONTAINS OVER 49% METHANOL

KEEP OUT OF REACH OF CHILDREN

DANGER! ☠ **POISON** ☠

- CAUSES EYE DAMAGE
- METHANOL MAY CAUSE BLINDNESS • HARMFUL OR FATAL IF SWALLOWED • VAPOR HARMFUL
- AVOID BREATHING SPRAY MIST OR VAPORS • AVOID CONTACT WITH SKIN • FLAMMABLE

STATEMENT OF PRACTICAL TREATMENT
 IF SWALLOWED: Drink large quantity of water. Have patient lie down and keep warm. Cover eyes to exclude light, call a physician and/or poison control center.
 IF INHALED: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.
 IF ON SKIN: Flush with copious amounts of water for at least 15 minutes. IF IN EYES: Flush with copious amounts of water for at least 15 minutes and get immediate medical attention.

PRECAUTIONARY STATEMENTS
 HAZARD TO HUMANS (& DOMESTIC ANIMALS)
DANGER! CORROSIVE. CAUSES EYE DAMAGE AND SKIN IRRITATION.

Keep out of reach of children. Do not get in eyes, on skin, or on clothing. Wear goggles or face shield and rubber gloves when handling. Use with adequate ventilation. Vapor harmful. Avoid breathing of vapor. Harmful or

fatal if swallowed. Avoid contamination of food. Methanol may cause blindness.

ENVIRONMENTAL HAZARDS:
 This pesticide is toxic to fish. Do not discharge into lakes, streams, ponds, or public waters unless in accordance with NPDES permit. For guidance, contact your regional office of the EPA.

PHYSICAL OR CHEMICAL HAZARDS
 Flammable. Keep away from heat and open flame.

ACCEPTED
SEP 11 1992
 Under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, for the pesticide registered under EPA Reg. No. 34292-3

SYLGARD® ANTIMICROBIAL TREATMENT

DIRECTIONS FOR USE

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

FOR COMMERCIAL USE ONLY, AS A FINAL BACTERIOSTATIC, FUNGISTATIC, PRESERVATIVE FINISH IN THE PRESENCE OF MOISTURE.

SYLGARD® Antimicrobial Treatment is to be used as directed in Dow Corning's Technical Bulletins.

STORAGE AND DISPOSAL

STORAGE: Moisture sensitive. Keep tightly closed until ready to use. Reclose tightly after each use.

DISPOSAL: Do not contaminate water, food, or feed by storage or disposal. Pesticide wastes are toxic. 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 for guidance.

Do not reuse containers. Do not cut or weld containers. Triple rinse (or equivalent) empty containers. Then offer for recycling or reconditioning, or puncture and dump in a sanitary landfill, or by other procedures approved by state and local authorities.

NOTICE:

Seller warrants that the product conforms to its chemical description and is reasonably fit for the purposes stated on this bulletin when used in accordance with directions under normal conditions of use; but neither this warranty of MERCHANTABILITY nor FITNESS FOR A PARTICULAR PURPOSE, expressed or implied, extends to the use of this product contrary to bulletin instructions, or under abnormal conditions, or under conditions not reasonably foreseeable to seller, and buyer assumes the risk of any such use.

ATTENTION! This container will have vapor and/or product residues when emptied. All hazard precautions on label must be observed when handling emptied container.

1804324-0592



**FLAMMABLE LIQUID, N.O.S.
(METHANOL) UN1993**



DOW CORNING CORPORATION

MIDLAND, MI 48686-0994, U.S.A.

© 1992 Dow Corning Corporation. All rights reserved.

SYLGARD® is a trademark of Dow Corning Corporation, U.S.A.

MADE IN U.S.A.

PRINTED IN U.S.A.

THIS IS AN INITIAL PRINTING

SPECIMEN LABEL 1804324 DATE CODE 0592

3 of 6

ACCEPTED
SEP 11 1992
Under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, for the pesticide registered under EPA Reg. No. 34292-3

DOW CORNING

Information About Antimicrobial Agents

DESCRIPTION

SYLGARD® Antimicrobial Treatment is Dow Corning's designation for 3-(trimethoxysilyl) propyloctadecyl-dimethyl ammonium chloride containing 42 percent active ingredient by weight in methanol. Alkoxysilanes of this nature have been shown to form durable bonded coatings to a number of materials (see "References" section).

SYLGARD Antimicrobial Treatment - In the presence of moisture, offers users the following features:

- Good durability - SYLGARD Antimicrobial Treatment imparts durable, broad-spectrum, biostatic activity to the surface of a wide variety of substrates; it is leach-resistant and nonmigrating and is not consumed by microorganisms
- Broad-spectrum activity - effective against gram positive and gram negative bacteria, fungi, algae and yeasts; antimicrobial action is exhibited on contact in the presence of moisture
- Increased efficiency - through proper application, durable bacteriostatic, fungistatic and algistatic surfaces can be attained with a minimum amount of SYLGARD Antimicrobial Treatment

BENEFITS

SYLGARD Antimicrobial Treatment offers users the following benefits:

- Provides preservation for many types of fibers, fabrics, threads and surfaces against a wide variety of bacteria, fungi, yeasts and algae
- Prevents deterioration and discoloration caused by bacteria and fungi
- Retains the "freshness" of an article by inhibiting or resisting the growth

SYLGARD® ANTIMICROBIAL TREATMENT

U.S. Environmental Protection Agency Registration Number 3-4292-3 (EPA Est. 34292-MI-01)

Type Silicone quaternary ammonium salt

Physical Form Low-viscosity liquid

Special Properties Surface bondability

Primary Uses As a surface-durable antimicrobial agent that is active against a wide variety of bacteria, fungi, algae and yeasts

- of odor-causing bacteria and mildew (fungus)
- Prolongs the life of an article by inhibiting the growth of bacteria and mildew
- Provides hygienic freshness
- Provides a treatment that is not destroyed by repeated cleaning/washing
- Resists odors through chemical protection
- Compatible with substrates and processes listed under approved uses

TYPICAL PROPERTIES

These values are not intended for use in preparing specifications.

Structure	$\begin{array}{c} \text{CH}_3 \\ \\ \text{---}[(\text{CH}_2\text{O})_3\text{Si}(\text{CH}_2)_3\text{N}^+\text{C}_{18}\text{H}_{37}]^-\text{Cl}^- \\ \\ \text{CH}_3 \end{array}$
CTM 0208 Concentration	42 percent active ingredient in methanol
CTM 0176 Appearance	Light to dark amber liquid
CTM 0002 Refractive Index, at 26 C (78 F)	1.356
CTM C090A Flash Point, °C (°F)	11 (52)
Cloud Point, °C (°F)	-3 (26)
Solubility	Miscible in all proportions with water, alcohols, ketones, esters, hydrocarbons and chlorinated hydrocarbons
Thermal Stability, °C (°F)	Stable to 125 (257)
Specific Gravity, at 25 C (77 F)	0.87
Freeze-Thaw Stability ²	Stable through 10 cycles

¹In most cases, Corporate Test Methods (CTMs) correspond to ASTM standard tests. Copies of CTM procedures are available upon request.
²Cycles from -17.7 to 50 C (0 to 122 F)

Specification Writers: Please obtain a copy of the Dow Corning Sales Specification for this product, and use it as a basis for your specifications. It may be obtained from any Dow Corning Sales Office, or from Dow Corning Product Information in Midland, MI. Call (517) 496-6000.

APPROVED USES

- Carpet, draperies and upholstery
- Interior non-food contact hard surfaces including: floors, walls, ceilings, ceramic tile, concrete, chrome, stainless steel, fiberglass, vinyl, porcelain, paper wall covering, wood and glass fixtures, marble, aluminum, book covers, pictures and furniture

HOW TO USE

SYLGARD Antimicrobial Treatment can be applied to organic and inorganic surfaces as a dilute aqueous solution to give 0.1 to 1.0 percent by weight of active ingredients. Aqueous solutions can be prepared by simply adding the antimicrobial agent to water with stirring.

Surfaces can be treated with the aqueous solution by dipping, padding or spraying until adequately wet, or applying by foaming techniques.

After applying the antimicrobial treatment, the surface should be allowed to dry. Open windows and use a fan or other active means of ventilation to remove the methanol vapors from the room.

STORAGE, HANDLING AND PRECAUTIONARY INFORMATION

This product is "flammable" and "poisonous." Keep away from heat and open flame.

Storage and Shelf Life

When stored in original, unopened containers at or below 25 C (77 F), SYLGARD Antimicrobial Treatment has a minimum shelf life of 12 months from date of shipment from Dow Corning. Since this material is moisture-sensitive, keep containers tightly closed after each use.

Handling (Danger)

Wear goggles or face shield and rubber gloves when handling the concentrated material.

SYLGARD Antimicrobial Treatment, if ingested in amounts incidental to industrial handling, should pose no significant adverse health hazard. Direct contact of the undiluted material with eyes may cause serious injury or even blindness. Particular care must be taken to prevent eye contact. In case of contact with eyes, immediately flush eyes with large amounts of water

for at least 15 minutes and get prompt medical attention.

Single, short-term skin exposure may cause slight irritation. Repeated or prolonged contact over several days may cause blistering and a superficial burn. Precautions should be taken to avoid prolonged or repeated skin contact.

SYLGARD Antimicrobial Treatment contains 50 percent methanol. Keep away from heat and open flame. Appropriate measures should be taken to prevent the accumulation of hazardous concentrations of methanol vapors in the work area. Avoid breathing vapors.

Neutralization and Environmental Protection

SYLGARD Antimicrobial Treatment is toxic to fish (see "Fish Toxicity" table). This antimicrobial agent, by standard BOD (biological oxygen demand) and TOD (total oxygen demand) determination, does not appear to be biodegradable. Potential harm to the environment is minimized, however, because of the minimal amount of chemical applied and its durable coupling to surfaces.

Inactivation of aqueous solutions of SYLGARD Antimicrobial Treatment may be accomplished by one of the following methods:

- Addition of an anionic surfactant or detergent in quantity equivalent to that of SYLGARD Antimicrobial Treatment in solution
- Addition of Triton X-100 nonionic detergent at a final concentration of 10,000 ppm (1.0 percent volume/volume) or greater to bath solutions up to 1.0 percent volume/volume of SYLGARD Antimicrobial Treatment

Every effort should be made to contain accidental spills of SYLGARD Antimicrobial Treatment to the

immediate area. This may be accomplished by the use of sandbags to confine the spill to facilitate cleanup and disposal. Contaminated sand may then be disposed of by burial in an approved landfill. Many spills may be cleaned up with rags by wiping and/or mopping and allowing the liquid to absorb onto the fabric. The rags may then be disposed of by incineration.

Floor drains in areas of material use should be protected with sandbags to contain accidental spills.

Acute Oral Toxicity

SYLGARD Antimicrobial Treatment has an extremely low acute oral toxicity of LD₅₀ = 12.27 ± 0.16 g/kg body weight in albino rats.

Acute Skin Contact

Based on studies conducted on albino rabbits, undiluted SYLGARD Antimicrobial Treatment has a slight to moderate effect upon intact and abraded skin. A single exposure for several hours may cause slight erythema and edema. Prolonged or repeated contact over a period of several days may cause blistering and a superficial burn.

Repeated Skin Contact

A human repeated insult patch test has been conducted with a 0.84 percent aqueous solution of active ingredient on nonwoven polyester. The results of this study showed an overall incidence of skin irritation reactions to be 2/450 or 0.4 percent. Two subjects each reacted once to the applications of the test material: one with a very slight erythema and the other with very slight erythema and edema. There was no evidence of skin sensitization noted with any of the subjects.

Acute Dermal Absorption

SYLGARD Antimicrobial Treatment has an extremely low acute dermal

FISH TOXICITY

The results of a 4-day static fish toxicity study (using rainbow trout and bluegills) are summarized below.

Species	4-Day TL ₅₀ Values	
	SYLGARD Antimicrobial Treatment	Toxaphene
Rainbow trout	0.56 ppm	~0.036 ppm
Bluegill	0.51 ppm	0.024 ppm

ACCEPTED
SEP 11 1992
 Under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, for the pesticide registered under EPA Reg. No. 34292-3

toxicity of LD₅₀ >7.95 g/kg body weight in albino rabbits.

Therefore, this material does not appear to present a hazard from skin absorption under ordinary industrial handling conditions when good care and cleanliness are practiced.

Percutaneous Absorption

SYLGARD Antimicrobial Treatment is not absorbed through the skin of rabbits. Any potential hazard from contact with the skin by this product during use is therefore considered to be insignificant.

MSDS INFORMATION

BEFORE HANDLING, READ PRODUCT AND MATERIAL SAFETY DATA SHEETS AND CONTAINER LABELS FOR SAFE USE, PHYSICAL AND HEALTH HAZARD INFORMATION. THE MATERIAL SAFETY DATA SHEET CAN BE OBTAINED BY WRITING TO DOW CORNING CUSTOMER SERVICE, OR BY CALLING (517) 496-6000.

Shipping Limitations

DOT Classification: Flammable.

Packaging

SYLGARD Antimicrobial Treatment is supplied in 7-, 35- and 400-lb (3.2-, 15.9- and 181.4-kg) containers, net weight.

IMPORTANT: WARRANTY AND DISCLAIMER INFORMATION

Dow Corning warrants that the product conforms to its chemical description and is reasonably fit for the purposes stated in this bulletin when used in accordance with directions under normal conditions of use; but this warranty of fitness for a particular purpose does not extend to the use of this product contrary to bulletin instructions, or under abnormal conditions, or under conditions not reasonably foreseeable to seller, and

buyer assumes the risk of any such use.

DOW CORNING SPECIFICALLY DISCLAIMS ANY OTHER EXPRESS OR IMPLIED WARRANTY, INCLUDING THE WARRANTY OF MERCHANTABILITY.

PATENT INFRINGEMENT NOT INTENDED

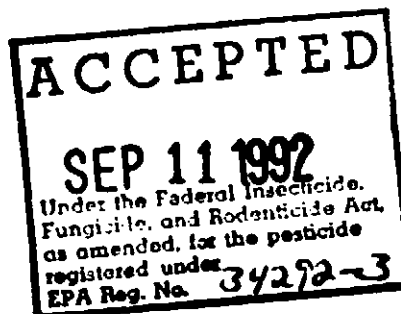
Recommendations or suggestions for use should not be interpreted as inducements to infringe any patents.

REFERENCES

1. Hough, J.S. and T.P. Lyons. "Coupling of Enzymes Onto Microorganisms." *Nature*, London, 1972, 235-389.
2. Johannsen, O.K., F.O. Stark, G.E. Vogel and R.M. Fleischmann. "Evidence for Chemical Bond Formation at Silane Coupling Agent Interfaces." *J. Compos. Mater.*, 1967, 1:278-292.
3. Plueddemann, E.P. "Adhesion Through Silane Coupling Agents." *J. Adhesion*, 1970, 2:184-201.
4. Venter, J.E., J.E. Dixon, P.R. Maroko and N.O. Kaplan. "Biologically Active Catecholamine Covalently Bound to Glass Bead." *Proc. Nat. Acad. Sci. (U.S.A.)*, 1972, 69:1141-1145.
5. Weetall, H.H. "Trypsin and Papain Covalently Coupling to Porous Glass." *Science*, 1969, 166:615-617.
6. Isquith, A.J., E.A. Abbott and P.A. Walters. "Surface-Bonded Antimicrobial Activity of an Organosilicon Ammonium Chloride." *Appl. Microbiol.*, 1972, 24:859-863.
7. Gettings, R.L. and B.L. Triplett. "New Durable Antimicrobial Finish for Textiles." *AATCC Book of*

Papers - 1978 Nat. Tech. Conf., 1978, 259-261.

8. Isquith, A.J. and C.J. McCallum. "Surface Kinetic Test Method for Determining Rate of Kill by an Antimicrobial Solid." *Appl. & Environ. Microbiol.*, 1978, 36:700-704.
9. Malek, J.R. and J.L. Speier. "Development of an Organosilicone Antimicrobial Agent for the Treatment of Surfaces." *J. Coated Fabrics*, 1982, 12:38-45.
10. Speier, J.L. and J.R. Malek. "Destruction of Microorganisms by Contact With Solid Surfaces." *J. Colloid Interface Science*, 1982, 89:68-76.
11. Siddiqui, W.H., J.R. Malek, E. Stanton and E.J. Hobbs. "Percutaneous Absorption of an Antimicrobial Organosilicon Quaternary Ammonium Chloride in Rabbits." *J. Appl. Toxicol.*, 1983, 3:3:146-149.
12. McGee, J.B., J.R. Malek and W.C. White. "New Antimicrobial Treatment for Carpet Applications." *Am. Dyestuff Rep.*, 1983, 6:56-59.
13. Hales, M.G., M.E. Sorkin and W.C. White. "Antimicrobial Treatments, Part I: What They Are and Why They Are Used." *Cleaning and Restoration*, 1986, March, 14-15.
14. Hales, M.G., M.E. Sorkin and W.C. White. "Antimicrobial Treatments, Part II: Types and Considerations for Use." *Cleaning and Restoration*, 1986, Vol. 24, Num. 4, 13-15.
15. Hales, M.G. and W.C. White. "Antimicrobial Treatments, Part III: Methods for Determining Their Effectiveness." *Cleaning and Restoration*, 1986, May, 18-20.



6 7 6

ACCEPTED
SEP 11 1992
Under the Federal Insecticide,
Fungicide, and Rodenticide Act,
as amended, for the pesticide
registered under EPA Reg. No. **34292-3**

DOW CORNING CORPORATION
MIDLAND, MICHIGAN 48686-0994

"Sylgard" is a registered trademark of Dow Corning Corporation.
Printed in U.S.A. Form No. 25-183A-92

