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DOW CORNING® 5700 Antimicrobial Agent

A SILICONE QUATERNARY AMMONIUM SALT

EPA Reg. No. 34292-1

EPA Est. 34292-MI-01

ACTIVE INGREDIENT: 3-(trimethoxysilyl) propyldimethyloctadecyl ammonium chloride42%

INERT INGREDIENTS:58%

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.

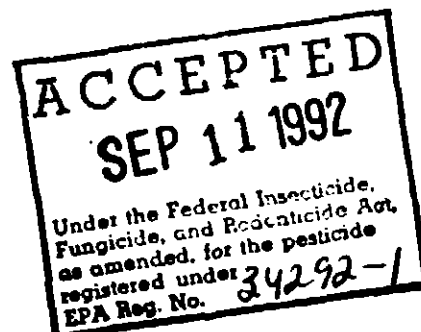
Harmful or fatal if swallowed. Avoid contamination of food. Methanol may cause blindness.

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.



DIRECTIONS FOR USE

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

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

DOW CORNING® 5700 Antimicrobial Agent 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 dispose of 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 the 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.

1582976-0592



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

DOW CORNING

DOW CORNING CORPORATION

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

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MADE IN U.S.A.

(517) 496-6000

PRINTED IN U.S.A.

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SPECIMEN LABEL 1582976 DATE CODE 0592

Information About Antimicrobial Agents

ACCEPTED
SEP 11 1992
 Under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, for the pesticide registered under EPA Reg. No. 34292-1

DOW CORNING

DESCRIPTION

DOW CORNING® 5700 Antimicrobial Agent 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).

DOW CORNING 5700 Antimicrobial Agent offers users the following features:

- Good durability – DOW CORNING 5700 Antimicrobial Agent 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 DOW CORNING 5700 Antimicrobial Agent

BENEFITS

DOW CORNING 5700 Antimicrobial Agent offers users the following benefits:

- Prevents deterioration and discoloration caused by bacteria, fungi, algae and yeasts
- Retains the "freshness" of an article by inhibiting or resisting the growth of odor-causing bacteria and mildew (fungus)

DOW CORNING® 5700 ANTIMICROBIAL AGENT

U.S. Environmental Protection Agency Registration Number 34292-1 (EPA Est. 34292-MI-01)

Type Silicone quaternary ammonium salt

Physical Form Low-viscosity liquid

Special Properties Surface bondability

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

- 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	$\begin{matrix} \text{CH}_3 \\ \\ (\text{CH}_3\text{O})_3\text{Si}(\text{CH}_2)_3\text{-N}(\text{C}_{18}\text{H}_{37})_2\text{Cl} \\ \\ \text{CH}_3 \end{matrix}$
CTM ¹ 0208 Concentration	42 percent active ingredient in methanol
CTM 0176 Appearance	Light to dark amber liquid
CTM 0002 Refractive Index, at 26 C (78.8 F)	1.390
CTM 0090A 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.

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APPROVED USES

DOW CORNING 5700 Antimicrobial Agent can be used to impart durable, broad-spectrum, antimicrobial protection to substrates for the following applications:

- Air filters for furnaces, air-conditioners, air purification devices, automobiles, recirculating air handling systems
- Air filters/materials
- Aquarium filter material
- Bed sheets, blankets and bedspreads
- Buffer pads (abrasive and polishing)
- Carpet and draperies
- Fiberfill for upholstery, sleeping bags, apparel, etc., where the fiber is cotton, natural down, nylon, polyester, rayon or wool
- Fiberglass ductboard
- Fire hose fabric
- Humidifier belts
- Mattress pads and ticking
- Men's underwear and outerwear
- Nonwoven disposable diapers
- Nonwoven polyester
- Outerwear apparel
- Disposable polyurethane foam cushions for Lapidus Airfloat Systems
- Polyurethane foam for household, industrial and institutional sponges and mops
- Polyurethane and polyethylene foam, when covered
- Polyurethane foam for packaging and cushioning in non-food contact applications
- Polyurethane foam used as a growth medium for non-food crops and plants
- Premoistened towelettes and tissue wipes (these do not impart pesticidal properties)
- Roofing materials - defined as shingles, roofing granules, wood shakes, felt, stone and synthetic overcoats
- Sand bags, tents, tarpaulins, sails and ropes
- Athletic and casual shoes

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- Shoe insoles
- Shower curtains
- Socks composed of nylon, nylon/orlon, cotton/nylon, linen/Lycra®, acrylic/polypropylene/nylon/Lycra, wool/silk/nylon/Lycra and wool/acrylic/nylon/Lycra; provides residual self-sanitizing activity against athlete's foot fungus (*trichophyton mentagrophytes*) on the sock, durable for up to 10 repeated washings; prevents 99.9 percent of the growth of athlete's foot fungus on the sock
- Throw rugs
- Toweling made of 100 percent cotton, 100 percent polyester, and blends of the two fibers
- Toilet tank and seat covers
- Umbrellas
- Upholstery made of acetate, acrylics, cotton, fiberglass, nylon, polyester, polyethylene, polyolefins, polypropylene, rayon, spandex, vinyl and wool
- Vacuum cleaner bags and filters
- Vinyl paper-wallpaper for non-food contact surfaces
- Disposal wiping cloths that can be used for multiple purposes such as dusting or washing furniture, cars, walls, windows, floors, appliances, dishes, counter tops, etc.; the wiping cloths do not impart pesticide properties
- Women's hosiery
- Women's intimate apparel

HOW TO USE

DOW CORNING 5700 Antimicrobial Agent can be incorporated directly into formulations used to make the end-use products listed in this bulletin. For example, it can be incorporated into a polyurethane foam formulation during the manufacturing process. Protection is attained because the active

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	
	DOW CORNING 5700 Antimicrobial Agent	Toxaphene
Rainbow trout	0.56 ppm	~0.036 ppm
Bluegills	0.51 ppm	0.024 ppm

Under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, for the pesticide registered under EPA Reg. No. 24292-1

ingredient orients on the surface of the cured foam.

DOW CORNING 5700 Antimicrobial Agent can also be diluted with water or with organic solvents such as alcohols, ketones, esters, hydrocarbons and chlorinated hydrocarbons and then applied to organic and inorganic surfaces to give 0.1 to 1.0 percent by weight of active ingredient. Solutions can be prepared by simply adding the antimicrobial agent to solvent with stirring.

CAUTION: Poor agitation when adding this silane to water can result in locally high concentrations, which may form gel particles.

Substrates can be treated by brushing, dipping, padding, soaking, spraying, fogging or by using foam finishing techniques.

After applying the antimicrobial agent, the substrate can then be dried at temperatures from ambient to a maximum of 160 C (320 F) to effect complete condensation of silanol groups and to remove water, solvents and/or traces of methanol from hydrolysis. Optimum application and drying conditions, such as time and temperature, should be determined for each application before use in a commercial process.

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), DOW CORNING 5700 Antimicrobial Agent 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.

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Handling (Danger)

Wear goggles or face shield and rubber gloves when handling.

DOW CORNING 5700 Antimicrobial Agent, 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 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. Contact over several days may cause blistering and a superficial burn. Precautions should be taken to avoid prolonged or repeated skin contact.

DOW CORNING 5700 Antimicrobial Agent 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

DOW CORNING 5700 Antimicrobial Agent 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 solutions containing DOW CORNING 5700 Antimicrobial Agent may be accomplished by one of the following methods:

- Addition of an anionic surfactant or detergent in quantity equivalent to that of DOW CORNING 5700 Antimicrobial Agent 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 DOW CORNING 5700 Antimicrobial Agent

Every effort should be made to contain accidental spills of DOW CORNING 5700 Antimicrobial Agent 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 into 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

DOW CORNING 5700 Antimicrobial Agent has an extremely low acute oral toxicity of $LD_{50} = 12.27 \pm 0.16$ g/kg body weight in albino rats.

Acute Skin Contact

Based on studies conducted on albino rabbits, undiluted DOW CORNING 5700 Antimicrobial Agent 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

DOW CORNING 5700 Antimicrobial Agent has an extremely low acute dermal toxicity of $LD_{50} > 7.95$ 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

DOW CORNING 5700 Antimicrobial Agent 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

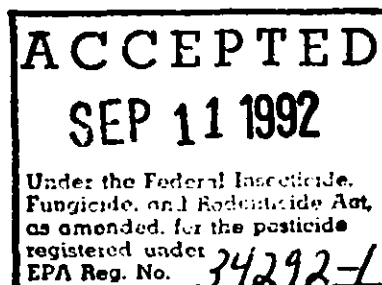
DOT Classification: Flammable.

Packaging

DOW CORNING 5700 Antimicrobial Agent is supplied in 1-, 35- and 400-lb (0.454-, 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.



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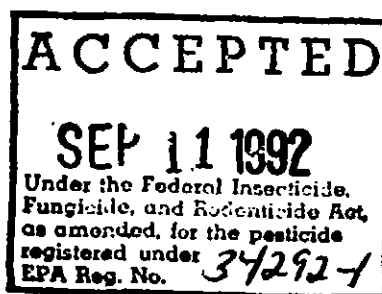
DOW CORNING SPECIFICALLY
DISCLAIMS ANY OTHER EXPRESS
OR IMPLIED WARRANTY, IN-
CLUDING THE WARRANTY OF
MERCHANTABILITY.

**PATENT INFRINGEMENT NOT
INTENDED**

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

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