[redacted]

DOW CORNING® 5700

Antimicrobial Agent MUP

FOR MANUFACTURING USE ONLY

A SILICONE QUATERNARY AMMONIUM SALT

EPA Reg. No. 34292-5 EPA Est. 34292-MI-01

ACTIVE INGREDIENT: 3-(trimethoxysilyl) propyldimethyloctadecyl ammonium chloride 42%

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.

ACCEPTED
SEP 11 1992
Under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, for the pesticide registered under EPA Reg. No. 34292-5

DIRECTIONS FOR USE

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

FOR FORMULATING DISINFECTANTS; SANITIZERS; AND MICROBIOCIDES FOR USE IN LAUNDRY ADDITIVES, CARPET TREATMENT PRODUCTS, UPHOLSTERY AND DRAPERY TREATMENT PRODUCTS, AND BUILDING CLEANING AND TREATMENT PRODUCTS. These are uses for which USEPA has accepted the required data and/or citations of data that the formulator has submitted in support of registration; and uses for experimental purposes that are in compliance with USEPA requirements.

DOW CORNING® 5700 Antimicrobial Agent MUP 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.

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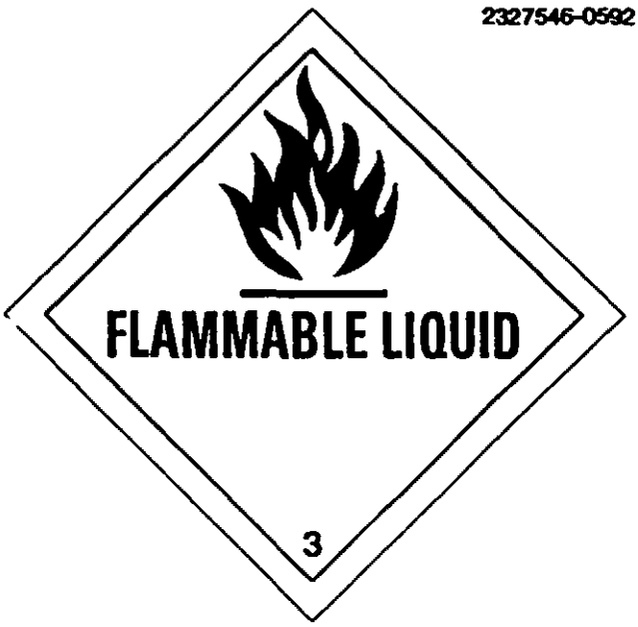

FLAMMABLE LIQUID, N.O.S. (METHANOL) UN1993

DOW CORNING

DOW CORNING CORPORATION
MIDLAND, MI 48686-0994, U.S.A.

MADE IN U.S.A. PRINTED IN U.S.A.
(517) 496-6000

THIS IS AN INITIAL PRINTING
SPECIMEN LABEL 2327546 DATE CODE 0592

3 7 6
52542A 7/22/92

Information About Antimicrobial Agents

DOW CORNING

DESCRIPTION

DOW CORNING® 5700 Antimicrobial Agent MUP is Dow Corning's designation for 3-(trimethoxysilyl) propyloctadecyldimethyl 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 MUP offers users the following features:

- Good durability – DOW CORNING 5700 Antimicrobial Agent MUP 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 MUP

BENEFITS

The following benefits are derived when a formulation containing the active ingredient is applied to a surface:

- Provides hygienic freshness and combats deterioration caused by fungi and bacteria
- Inhibits growth of bacteria and mildew on the treated article

DOW CORNING® 5700 ANTIMICROBIAL AGENT MUP – FOR MANUFACTURING USE ONLY

U.S. Environmental Protection Agency Registration Number ..... 34292-5 (EPA Est. 34292-MI-01)
Type ..... Silicone quaternary ammonium salt
Physical Form ..... Low-viscosity liquid
Special Properties ..... Surface bondability
Primary Uses ..... As an active ingredient for formulating disinfectants, sanitizers and microbiocides for use in laundry additives, carpet treatment products, upholstery and drapery treatment products, and building cleaning and treatment products to give a surface-durable antimicrobial treatment effective against a wide variety of bacteria, fungi, algae and yeasts

TYPICAL PROPERTIES

These values are not intended for use in preparing specifications.

	Structure	$[(CH_3O)_3Si(CH_2)_3\text{-}N\text{-}C_{18}H_{37}]^+Cl^-$ (CH₃ on N)
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

[1]In most cases, Corporate Test Methods (CTMs) correspond to ASTM standard tests. Copies of CTM procedures are available upon request.

[2]Cycles 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.

- Provides a durable, residual, antimicrobial treatment that is not destroyed by repeated cleaning
- Resists development of bacterial and fungal odors
- Retains freshness by resisting the growth of odor-causing bacteria and mildew (fungus)
- Provides a chemical treatment that enables fabrics to resist odors
- Provides a unique chemical treatment that resists mildew and bacteria growth and imparts odor resistance

Materials treated with formulations containing DOW CORNING 5700 Antimicrobial Agent MUP are preserved by the bacteriostatic, fungistatic and algistatic action imparted by the active ingredient. DOW CORNING 5700 Antimicrobial Agent MUP inhibits the growth of microorganisms that are responsible for causing odor, discoloration and deterioration. It also provides residual inhibition of microorganisms to aid in the control of these deleterious effects. DOW CORNING 5700 Antimicrobial Agent MUP forms a coating on a wide variety of substrates and antimicrobial action is exhibited on contact in the presence of moisture.

APPROVED USES

DOW CORNING 5700 Antimicrobial Agent MUP is approved for use in formulating disinfectants, sanitizers and microbiocides for use in laundry additives, carpet treatment products, upholstery and drapery treatment products, and building cleaning and treatment products.

HOW TO USE

DOW CORNING 5700 Antimicrobial Agent MUP can be mixed with water, alcohols, ketones, esters, hydrocarbons and chlorinated hydrocarbons to yield formulations containing the desired level of active ingredient.

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

The formulations can be applied to organic or inorganic substrates by brushing, dipping, padding, soaking, spraying, fogging or by using foam finishing techniques to give a final treatment of 0.1 to 1.0 percent by weight active ingredient.

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.

EPA REGISTRATION REQUIREMENTS

The applications for which this product are used require approval by the Environmental Protection Agency on an end-use basis in regard to claims made thereof. Formulators are responsible for satisfying registration requirements for their products.

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 MUP 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.

DOW CORNING 5700 Antimicrobial Agent MUP, 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 MUP 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 MUP 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 MUP 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 MUP 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 MUP

Every effort should be made to contain accidental spills of DOW CORNING 5700 Antimicrobial Agent MUP to the immediate area. This may be

FISH TOXICITY

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

	4-Day TL_{50} Values	
Species	DOW CORNING 5700 Antimicrobial Agent MUP	Toxaphene
Rainbow trout	0.56 ppm	0.036 ppm
Bluegill	0.51 ppm	0.024 ppm

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

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

Acute Skin Contact

Based on studies conducted on albino rabbits, undiluted DOW CORNING 5700 Antimicrobial Agent MUP 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 MUP has an extremely low acute dermal toxicity of LD_{50} >7.95 g/kg body weight in albino rats.

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 MUP 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.

Governmental Approvals or Clearances

The user is responsible for obtaining any governmental registrations, approvals or clearances that may be necessary for the intended use of the product.

Shipping Limitations

DOT Classification: Flammable.

Packaging

DOW CORNING 5700 Antimicrobial Agent MUP is supplied in 35- and 400-lb (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.

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Printed in U.S.A. Form No. 25-185A-92

DOW CORNING