



# Material Safety Data Sheet

The Dow Chemical Company

**Product Name:** Antimicrobial 8536

**Issue Date:** 08/04/2009  
**Print Date:** 04 Jan 2010

The Dow Chemical Company encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

## 1. Product and Company Identification

**Product Name**

Antimicrobial 8536

**COMPANY IDENTIFICATION**

The Dow Chemical Company  
2030 Willard H. Dow Center  
Midland, MI 48674  
USA

Customer Information Number: 800-258-2436

**EMERGENCY TELEPHONE NUMBER**

**24-Hour Emergency Contact:** 989-636-4400  
**Local Emergency Contact:** 989-636-4400

## 2. Hazards Identification

**Emergency Overview**

**Color:** Colorless to yellow

**Physical State:** Liquid.

**Odor:** Mild

**Hazards of product:**

**DANGER!** Keep out of reach of children. Causes severe eye burns. May cause allergic skin reaction. May cause skin irritation. Harmful if swallowed. Toxic fumes may be released in fire situations. Highly toxic to fish and/or other aquatic organisms.

**OSHA Hazard Communication Standard**

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

**Potential Health Effects**

**Eye Contact:** May cause pain disproportionate to the level of irritation to eye tissues. May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. Chemical burns may occur.

**Skin Contact:** Prolonged contact may cause moderate skin irritation with local redness. Repeated exposure may cause irritation, even a burn. May cause more severe response if skin is abraded (scratched or cut).

**Skin Absorption:** Prolonged skin contact is unlikely to result in absorption of harmful amounts.

**Skin Sensitization:** Has caused allergic skin reactions when tested in guinea pigs.

**Inhalation:** Mist may cause irritation of upper respiratory tract (nose and throat).

**Ingestion:** Harmful if swallowed.

**Effects of Repeated Exposure:** Excessive exposure may increase the blood and tissue levels of bromine. Observations in animals include kidney effects following repeated ingestion of active ingredient, but no evidence of systemic toxicity following repeated dermal exposure at maximum attainable doses

**Birth Defects/Developmental Effects:** Bromism has been reported in offspring of mothers who also had bromide poisoning as a result of ingestion of bromides during pregnancy. For the active ingredient(s): Has been toxic to the fetus in laboratory animals at doses toxic to the mother.

**Reproductive Effects:** For the minor component(s): In animal studies, has been shown to interfere with fertility.

### 3. Composition Information

Component	CAS #	Amount
Polyethylene glycol	25322-68-3	> 54.7 - < 65.2 %
2,2-Dibromo-3-nitrilopropionamide	10222-01-2	5.0 %
Sodium bromide	7647-15-6	<= 1.5 %
Dibromoacetonitrile	3252-43-5	<= 0.5 %

### 4. First-aid measures

**Eye Contact:** Wash immediately and continuously with flowing water for at least 30 minutes. Remove contact lenses after the first 5 minutes and continue washing. Obtain prompt medical consultation, preferably from an ophthalmologist.

**Skin Contact:** Take off contaminated clothing. Wash skin with soap and plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice. Wash clothing before reuse. Shoes and other leather items which cannot be decontaminated should be disposed of properly.

**Inhalation:** Move person to fresh air. If person is not breathing, call an emergency responder or ambulance, then give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask etc). Call a poison control center or doctor for treatment advice.

**Ingestion:** 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 do so by the poison control center or doctor. Never give anything by mouth to an unconscious person.

**Notes to Physician:** If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. Chemical eye burns may require extended irrigation. Obtain prompt consultation, preferably from an ophthalmologist. If burn is present, treat as any thermal burn, after decontamination. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

### 5. Fire Fighting Measures

**Extinguishing Media:** To extinguish combustible residues of this product use water fog, carbon dioxide, dry chemical or foam. Do not use direct water stream.

**Fire Fighting Procedures:** Keep people away. Isolate fire and deny unnecessary entry. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Fight fire from protected location or safe distance. Consider the use of unmanned hose

holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Move container from fire area if this is possible without hazard. To extinguish combustible residues of this product use water fog, carbon dioxide, dry chemical or foam. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

**Special Protective Equipment for Firefighters:** Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

**Unusual Fire and Explosion Hazards:** This material will not burn until the water has evaporated. Residue can burn. Container may rupture from gas generation in a fire situation.

**Hazardous Combustion Products:** Under fire conditions some components of this product may decompose. The smoke may contain unidentified toxic and/or irritating compounds. Combustion products may include and are not limited to: Nitrogen oxides. Hydrogen bromide. Carbon monoxide. Carbon dioxide.

## 6. Accidental Release Measures

**Steps to be Taken if Material is Released or Spilled:** Contain spilled material if possible. Attempt to neutralize by adding materials such as Sodium bisulphite. Sodium metabisulfite. Neutralize with approximately 4.3 grams sodium bisulfite (NaHSO<sub>3</sub>) or 4.0 g sodium meta bisulphite (Na<sub>2</sub>S<sub>2</sub>O<sub>5</sub>) for every 100 grams biocidal product. Absorb with materials such as: Dirt. Sand. Vermiculite. Zorb-all®. Hazorb®. Collect in suitable and properly labeled containers.

**Personal Precautions:** Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection. Isolate area. Keep unnecessary and unprotected personnel from entering the area. Refer to Section 7, Handling, for additional precautionary measures.

**Environmental Precautions:** Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information. Spills or discharge to natural waterways is likely to kill aquatic organisms.

## 7. Handling and Storage

### Handling

**General Handling:** Do not get in eyes. Avoid contact with skin and clothing. Avoid prolonged or repeated contact with skin. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling. Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperatures possibly resulting in spontaneous combustion. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

### Storage

Store in original container. Keep container tightly closed. Do not store in: Aluminum.

**Shelf life: Use within** 12 Months

**Storage temperature:** <= 35 °C

## 8. Exposure Controls / Personal Protection

### Exposure Limits

Component	List	Type	Value
2,2-Dibromo-3-nitrilopropionamide	Dow IHG	Ceiling	2 mg/m <sup>3</sup>
Dibromoacetonitrile	Dow IHG	Ceiling	0.1 ppm SKIN
Polyethylene glycol	WEEL	TWA Aerosol	10 mg/m <sup>3</sup>

**Sodium bromide**                      Dow IHG              TWA              10 mg/m3

A reaction or decomposition product may be formed during handling or processing which may exceed the Occupational Exposure Limit (OEL).

A "skin" notation following the inhalation exposure guideline refers to the potential for dermal absorption of the material including mucous membranes and the eyes either by contact with vapors or by direct skin contact.

It is intended to alert the reader that inhalation may not be the only route of exposure and that measures to minimize dermal exposures should be considered.

### Personal Protection

**Eye/Face Protection:** Use chemical goggles. Eye wash fountain should be located in immediate work area.

**Skin Protection:** When prolonged or frequently repeated contact could occur, use protective clothing chemically resistant to this material. Selection of specific items such as faceshield, boots, apron, or full-body suit will depend on the task. Remove contaminated clothing immediately, wash skin area with soap and water, and launder clothing before reuse or dispose of properly. Items which cannot be decontaminated, such as shoes, belts and watchbands, should be removed and disposed of properly.

**Hand protection:** Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Butyl rubber. Chlorinated polyethylene. Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Examples of acceptable glove barrier materials include: Nitrile/butadiene rubber ("nitrile" or "NBR"). Neoprene. Polyvinyl chloride ("PVC" or "vinyl"). Viton. NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

**Respiratory Protection:** Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. In misty atmospheres, use an approved particulate respirator. The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.

**Ingestion:** Avoid ingestion of even very small amounts; do not consume or store food or tobacco in the work area; wash hands and face before smoking or eating.

### Engineering Controls

**Ventilation:** Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

## 9. Physical and Chemical Properties

<b>Physical State</b>	Liquid.
<b>Color</b>	Colorless to yellow
<b>Odor</b>	Mild
<b>Flash Point - Closed Cup</b>	93 °C (199 °F) <i>Literature</i>
<b>Flammable Limits In Air</b>	<b>Lower:</b> No test data available <b>Upper:</b> No test data available
<b>Autoignition Temperature</b>	No test data available
<b>Vapor Pressure</b>	20 hPa @ 25 °C <i>Literature</i>
<b>Boiling Point (760 mmHg)</b>	> 70 °C (> 158 °F) <i>Literature</i> Decomposes.
<b>Vapor Density (air = 1)</b>	No test data available
<b>Specific Gravity (H2O = 1)</b>	1.134 <i>Literature</i>
<b>Bulk Density</b>	9.0 - 9.7 kg/m3 <i>Literature</i>
<b>Freezing Point</b>	No test data available
<b>Melting Point</b>	No test data available

<b>Solubility in water (by weight)</b>	30 % @ 20 °C <i>Literature</i>
<b>pH</b>	1.5 - 5 <i>ASTM E70</i>
<b>Decomposition Temperature</b>	No test data available
<b>Dynamic Viscosity</b>	76 cps @ 25 °C (Brookfield Viscosity - @ 100 rpm, #3 spindle)
<b>Kinematic Viscosity</b>	No test data available

## 10. Stability and Reactivity

### Stability/Instability

Unstable at elevated temperatures.

**Conditions to Avoid:** Avoid temperatures above 70 °C (158 °F) Exposure to elevated temperatures can cause product to decompose. Generation of gas during decomposition can cause pressure in closed systems.

**Incompatible Materials:** Avoid contact with oxidizing materials. Avoid contact with: Strong bases. Avoid contact with metals such as: Aluminum.

### Hazardous Polymerization

Will not occur.

### Thermal Decomposition

Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Carbon monoxide. Bromine. Cyanogen bromide. Dibromoacetonitrile. Toxic gases are released during decomposition.

## 11. Toxicological Information

### Acute Toxicity

#### Ingestion

LD50, Rat 3,115 mg/kg

#### Skin Absorption

LD50, Rabbit > 2,000 mg/kg

### Sensitization

#### Skin

Has caused allergic skin reactions when tested in guinea pigs. A similar formulation did not produce a sensitization response in human volunteers.

### Repeated Dose Toxicity

Excessive exposure may increase the blood and tissue levels of bromine. Observations in animals include kidney effects following repeated ingestion of active ingredient, but no evidence of systemic toxicity following repeated dermal exposure at maximum attainable doses

### Developmental Toxicity

Bromism has been reported in offspring of mothers who also had bromide poisoning as a result of ingestion of bromides during pregnancy. For the active ingredient(s): Has been toxic to the fetus in laboratory animals at doses toxic to the mother. Contains component(s) which did not cause birth defects in laboratory animals.

### Reproductive Toxicity

For the minor component(s): In animal studies, has been shown to interfere with fertility. In animal studies, active ingredient did not interfere with reproduction. For the major component(s): In animal studies, did not interfere with reproduction.

### Genetic Toxicology

In vitro genetic toxicity studies were negative for component(s) tested. Genetic toxicity studies in animals were negative for component(s) tested.

## 12. Ecological Information

### ENVIRONMENTAL FATE

Data for Component: **Polyethylene glycol**

#### Movement & Partitioning

For this family of materials: No bioconcentration is expected because of the relatively high water solubility.

#### Persistence and Degradability

For this family of materials: Biodegradation under aerobic static laboratory conditions is high (BOD20 or BOD28/ThOD > 40%).

For this family of materials: Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions.

**OECD Biodegradation Tests:** For this family of materials:

Biodegradation	Exposure Time	Method
48 %	28 d	OECD 301D Test

**Biological oxygen demand (BOD):** For this family of materials:

BOD 5	BOD 10	BOD 20	BOD 28
0 - 17 %	3 - 56 %	39 - 77 %	

**Theoretical Oxygen Demand:** 1.67 - 1.77 mg/mg

Data for Component: **2,2-Dibromo-3-nitrilopropionamide**

#### Movement & Partitioning

Bioconcentration potential is low (BCF less than 100 or log Pow less than 3). Potential for mobility in soil is very high (Koc between 0 and 50). Movement of DBNPA in soil is expected to be reduced by rapid degradation (within minutes to hours).

**Henry's Law Constant (H):** 4.67E-10 atm\*m3/mole; 25 °C Estimated.

**Partition coefficient, n-octanol/water (log Pow):** 0.79 Measured

**Partition coefficient, soil organic carbon/water (Koc):** 15 Estimated.

**Bioconcentration Factor (BCF):** 13; fish; Measured

#### Persistence and Degradability

Degradation is expected in the soil environment within minutes to hours. Chemical degradation (hydrolysis) is expected in the environment. Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions.

#### Indirect Photodegradation with OH Radicals

Rate Constant	Atmospheric Half-life	Method
2.00E-12 cm3/s	5.3 d	

**OECD Biodegradation Tests:**

Biodegradation	Exposure Time	Method
35 - 78 %	28 d	OECD 301B Test
83.3 %	28 d	OECD 303A Test
17 - 22 %	28 d	OECD 306 Test

**Chemical Oxygen Demand:** 0.26 mg/mg

**Theoretical Oxygen Demand:** 0.59 mg/mg

Data for Component: **Sodium bromide**

#### Movement & Partitioning

Bioconcentration potential is low (BCF less than 100 or log Pow less than 3).

**Bioconcentration Factor (BCF):** < 40; fish; Measured

#### Persistence and Degradability

Biodegradation is not applicable.

**ECOTOXICITY****Data for Component: Polyethylene glycol**

For this family of materials: Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

**Data for Component: 2,2-Dibromo-3-nitropropionamide**

Material is highly toxic to aquatic organisms on an acute basis (LC50/EC50 between 0.1 and 1 mg/L in the most sensitive species tested). Material is practically non-toxic to birds on a dietary basis (LC50 > 5000 ppm).

**Fish Acute & Prolonged Toxicity**

LC50, rainbow trout (*Oncorhynchus mykiss*): 0.71 - 2.0 mg/l

**Aquatic Invertebrate Acute Toxicity**

LC50, water flea *Daphnia magna*: 0.66 mg/l

**Aquatic Plant Toxicity**

EC50, green alga *Pseudokirchneriella subcapitata* (formerly known as *Selenastrum capricornutum*), biomass growth inhibition: 0.30 mg/l

**Toxicity to Micro-organisms**

EC50; activated sludge, respiration inhibition: 3.1 mg/l

**Aquatic Invertebrates Chronic Toxicity Value:**

ChV Value mg/l	Species	Test Type	Endpoint	Exposure Time
0.092 mg/l	water flea <i>Daphnia magna</i>	static renewal	number of offspring	21 d

**Toxicity to Non-mammalian Terrestrial Species**

dietary LC50, bobwhite (*Colinus virginianus*): > 10,000 ppm

dietary LC50, mallard (*Anas platyrhynchos*): > 10,000 ppm

**Data for Component: Sodium bromide**

Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

**Fish Acute & Prolonged Toxicity**

LC50, fathead minnow (*Pimephales promelas*): 16,479 mg/l

**Aquatic Invertebrate Acute Toxicity**

LC50, water flea *Daphnia magna*: 9,313 mg/l

**Aquatic Plant Toxicity**

EC50, alga *Scenedesmus* sp., biomass growth inhibition, 96 h: 6,000 mg/l

## 13. Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Incinerator or other thermal destruction device. As a service to its customers, Dow can provide names of information resources to help identify waste management companies and other facilities which recycle, reprocess or manage chemicals or plastics, and that manage used drums. Telephone Dow's Customer Information Group at 1-800-258-2436 or 1-989-832-1556 (U.S.), or 1-800-331-6451 (Canada) for further details.

## 14. Transport Information

**DOT Non-Bulk**  
NOT REGULATED

**DOT Bulk**  
NOT REGULATED

### IMDG

**Proper Shipping Name:** CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.

**Technical Name:** 2,2-DIBROMO-3-NITRILOPROPIONAMIDE

**Hazard Class:** 8 **ID Number:** UN3265 **Packing Group:** PG III

**EMS Number:** F-A,S-B

**Marine pollutant.:** No

### ICAO/IATA

**Proper Shipping Name:** CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.

**Technical Name:** 2,2-DIBROMO-3-NITRILOPROPIONAMIDE

**Hazard Class:** 8 **ID Number:** UN3265 **Packing Group:** PG III

**Cargo Packing Instruction:** 820

**Passenger Packing Instruction:** 818

*This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.*

## 15. Regulatory Information

### OSHA Hazard Communication Standard

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

### Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Immediate (Acute) Health Hazard	Yes
Delayed (Chronic) Health Hazard	Yes
Fire Hazard	No
Reactive Hazard	No
Sudden Release of Pressure Hazard	No

### Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313

This product contains the following substances which are subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and which are listed in 40 CFR 372.

Component	CAS #	Amount
2,2-Dibromo-3-nitripropionamide	10222-01-2	5.0 %

### Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

### Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Special Hazardous Substances List:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

**California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)**

This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

**US. Toxic Substances Control Act**

This product contains chemical substance(s) exempt from TSCA Inventory requirements. It is sold solely for use as a pesticide subject to Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) requirements.

**CEPA - Domestic Substances List (DSL)**

This product contains chemical substance(s) exempt from CEPA DSL requirements. It is sold solely for use as a pesticide subject to Pest Control Products Act (PCPA) requirements.

## 16. Other Information

**Product Literature**

Additional information on this product may be obtained by calling your sales or customer service contact.

**Hazard Rating System**

<b>NFPA</b>	<b>Health</b>	<b>Fire</b>	<b>Reactivity</b>
	3	1	1

**Recommended Uses and Restrictions**

For biocidal applications. For industrial use.

**Revision**

Identification Number: 1002225 / 1001 / Issue Date 08/04/2009 / Version: 4.0

Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

**Legend**

N/A	Not available
W/W	Weight/Weight
OEL	Occupational Exposure Limit
STEL	Short Term Exposure Limit
TWA	Time Weighted Average
ACGIH	American Conference of Governmental Industrial Hygienists, Inc.
DOW IHG	Dow Industrial Hygiene Guideline
WEEL	Workplace Environmental Exposure Level
HAZ_DES	Hazard Designation
Action Level	A value set by OSHA that is lower than the PEL which will trigger the need for activities such as exposure monitoring and medical surveillance if exceeded.

*The Dow Chemical Company urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.*

