



Material Safety Data Sheet

The Dow Chemical Company

Product Name: AQUICAR(TM) DB 100 Water Treatment
Microbiocide with Smart Release Technology

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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

AQUICAR™ DB 100 Water Treatment Microbiocide with Smart Release Technology

COMPANY IDENTIFICATION

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

Customer Information Number:

800-258-2436
SDSQuestion@dow.com

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact:

989-636-4400

Local Emergency Contact:

989-636-4400

2. Hazards Identification

Emergency Overview

Color: White to yellow

Physical State: Powder

Odor: Mild pungent

Hazards of product:

DANGER! Keep out of reach of children. Causes severe eye burns. Causes skin burns. May be fatal if inhaled. Causes fluid in the lungs. May cause allergic skin reaction. Causes respiratory tract irritation. Harmful if swallowed. Evacuate area. Keep upwind of spill. Slipping hazard. Avoid temperatures above 70°C (158°F). 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.

®(TM)*Trademark

Potential Health Effects

Eye Contact: May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. Chemical burns may occur.

Skin Contact: Brief contact may cause skin burns. Symptoms may include pain, severe local redness and tissue damage.

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

Skin Sensitization: Skin contact may cause an allergic skin reaction.

Inhalation: Vapors are unlikely due to physical properties. Prolonged excessive exposure to dust may cause serious adverse effects, even death. Excessive exposure may cause severe irritation to upper respiratory tract (nose and throat) and lungs. May cause severe pulmonary edema (fluid in the lungs). Prolonged and excessive exposure to fine dusts may cause lung injury. For narcotic effects: No specific, relevant data available for assessment.

Ingestion: Moderate toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause serious injury, even death.

Aspiration hazard: Based on physical properties, not likely to be an aspiration hazard.

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: Has been toxic to the fetus in laboratory animals at doses toxic to the mother.

3. Composition Information

Component	CAS #	Amount
2,2-Dibromo-3-nitropropionamide	10222-01-2	> 97.0 %
2,2-Dibromomalonamide	73003-80-2	<= 0.2 %

4. First-aid measures

Description of first aid measures

General advice: First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

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. If breathing is difficult, oxygen should be administered by qualified personnel.

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. Suitable emergency safety shower facility should be immediately available.

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. Suitable emergency eye wash facility should be immediately available.

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.

Most important symptoms and effects, both acute and delayed

Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), no additional symptoms and effects are anticipated.

Indication of immediate medical attention and special treatment needed

Maintain adequate ventilation and oxygenation of the patient. Material may cause severe pulmonary edema. For persons receiving significant exposure to this material, consider chest x-ray and keep under observation for 48 - 72 hr. for delayed onset of pulmonary edema. Humidified oxygen, intermittent positive pressure breathing, assisted respiration/CPAP and steroid therapy should be considered in treatment. Physical exertion may potentiate exposure effects during the first 24 - 72 hours. May cause respiratory sensitization or asthma-like symptoms. Bronchodilators, expectorants and antitussives may be of help. Treat bronchospasm with inhaled beta2 agonist and oral or parenteral corticosteroids. 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. Have the Safety Data Sheet, and if available, the product container or label with you when calling a poison control center or doctor, or going for treatment.

Excessive exposure may aggravate preexisting asthma and other respiratory disorders (e.g. emphysema, bronchitis, reactive airways dysfunction syndrome).

5. Fire Fighting Measures

Suitable extinguishing media

This material does not burn. If exposed to fire from another source, use suitable extinguishing agent for that fire.

Special hazards arising from the substance or mixture

Hazardous Combustion Products: Fire conditions may cause this product to decompose. Refer to section 10 - Thermal Decomposition.

Unusual Fire and Explosion Hazards: Container may vent and/or rupture due to fire.

Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. This material does not burn. Fight fire for other material that is burning. 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). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures: Evacuate area. Refer to Section 7, Handling, for additional precautionary measures. Keep upwind of spill. Ventilate area of leak or spill. Only trained and properly protected personnel must be involved in clean-up operations. Spilled material may cause a slipping hazard. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

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.

Methods and materials for containment and cleaning up: Contain spilled material if possible. Collect in suitable and properly labeled containers. See Section 13, Disposal Considerations, for additional information.

7. Handling and Storage

Handling

General Handling: Keep out of reach of children. Do not get in eyes, on skin, on clothing. Do not breathe dust. Avoid prolonged or repeated contact with skin. Do not swallow. Wash thoroughly after handling. Keep container closed. Use only with adequate ventilation. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Storage

Store in original container. Keep container tightly closed. Do not store in: Aluminum. Brass. Copper. Copper alloys. Mild steel. Stainless steel.

Shelf life: Use within 36 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 ³

Personal Protection

Eye/Face Protection: Use chemical goggles.

Skin Protection: Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task.

Hand protection: Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Neoprene. Polyvinyl chloride ("PVC" or "vinyl"). Nitrile/butadiene rubber ("nitrile" or "NBR"). 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, use an approved respirator. Selection of air-purifying or positive-pressure supplied-air will depend on the specific operation and the potential airborne concentration of the material. For emergency conditions, use an approved positive-pressure self-contained breathing apparatus. 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 engineering controls to maintain airborne level below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use only with adequate ventilation. Local exhaust ventilation may be necessary for some operations.

9. Physical and Chemical Properties

Appearance

Physical State	Powder
Color	White to yellow
Odor	Mild pungent

Odor Threshold	No test data available
pH	4.8 <i>pH Electrode</i>
Melting Point	125 °C (257 °F) <i>Literature</i> (with decomposition)
Freezing Point	No test data available
Boiling Point (760 mmHg)	Decomposes before boiling.
Flash Point - Closed Cup	No test data available
Evaporation Rate (Butyl Acetate = 1)	No test data available
Flammability (solid, gas)	No
Flammable Limits In Air	Lower: No test data available Upper: No test data available
Vapor Pressure	0.000022 mmHg @ 25 °C <i>Literature</i>
Vapor Density (air = 1)	No test data available
Specific Gravity (H ₂ O = 1)	2.21 <i>Literature</i>
Solubility in water (by weight)	1.54 % @ 22.5 °C <i>Literature</i>
Partition coefficient, n-octanol/water (log Pow)	0.79 <i>Measured</i>
Autoignition Temperature	No test data available
Decomposition Temperature	No test data available
Kinematic Viscosity	Not applicable
Explosive properties	no data available
Oxidizing properties	no data available
Molecular Weight	242 g/mol <i>Literature</i>
Henry's Law Constant (H)	4.67E-10 atm*m ³ /mole; 25 °C Estimated.

10. Stability and Reactivity

Reactivity

No dangerous reaction known under conditions of normal use.

Chemical stability

Stable under recommended storage conditions. See Storage, Section 7. Unstable at elevated temperatures.

Possibility of hazardous reactions

Polymerization will not occur.

Conditions to Avoid: Avoid temperatures above 70°C (158°F) Product decomposes above melting temperature. Generation of gas during decomposition can cause pressure in closed systems.

Incompatible Materials: Avoid contact with: Amines. Strong bases. Strong oxidizers. Strong reducing agents. Avoid contact with metals such as: Aluminum.

Hazardous decomposition products

Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Carbon dioxide. Dibromoacetonitrile. Hydrogen bromide. Nitrogen oxides. Decomposition products can include trace amounts of: Cyanogen bromide.

11. Toxicological Information

Acute Toxicity

Ingestion

LD50, rat, female 167 mg/kg

LD50, rat, male 224 mg/kg

Dermal

LD50, rabbit > 2,000 mg/kg

Inhalation

LC50, 4 h, Dust, rat, female 0.24 mg/l

LC50, 4 h, Dust, rat, male 0.31 mg/l

Eye damage/eye irritation

May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. Chemical burns may occur.

Skin corrosion/irritation

Brief contact may cause skin burns. Symptoms may include pain, severe local redness and tissue damage.

Sensitization

Skin

Skin contact may cause an allergic skin reaction.

Respiratory

No relevant data found.

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.

Chronic Toxicity and Carcinogenicity

Did not cause cancer in laboratory animals.

Developmental Toxicity

Has been toxic to the fetus in laboratory animals at doses toxic to the mother. Did not cause birth defects in laboratory animals.

Reproductive Toxicity

In animal studies, did not interfere with reproduction.

Genetic Toxicology

In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

12. Ecological Information

Toxicity

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, *Oncorhynchus mykiss* (rainbow trout), 96 h: 1 mg/l

Aquatic Invertebrate Acute Toxicity

LC50, *Daphnia magna* (Water flea), 48 h: 0.66 mg/l

EC50, water flea *Daphnia magna*, flow-through test, 21 d: > 0.25 mg/l

Aquatic Plant Toxicity

EbC50, *Pseudokirchneriella subcapitata* (green algae), biomass growth inhibition, 72 h: 0.30 mg/l

Toxicity to Micro-organisms

EC50; activated sludge: 3.1 mg/l

Aquatic Invertebrates Chronic Toxicity Value

Daphnia magna (Water flea), flow-through test, 21 d, NOEC: 0.25 mg/l, LOEC: 0.5 mg/l

Toxicity to Above Ground Organisms

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

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

Persistence and Degradability

Abiotic degradation: The material is rapidly degradable by abiotic means.

Stability in Water (1/2-life):

65 h; 25 °C; pH 7

OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method	10 Day Window
35 - 78 %	28 d	OECD 301B Test	fail
83.3 %	28 d	OECD 303A Test	Not applicable

17 - 22 %	28 d	OECD 306 Test	Not applicable
Indirect Photodegradation with OH Radicals			
Rate Constant	Atmospheric Half-life	Method	
2.00E-12 cm ³ /s	5.3 d	Estimated.	

Chemical Oxygen Demand: 0.26 mg/mg
Theoretical Oxygen Demand: 0.59 mg/mg

Bioaccumulative potential

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient, n-octanol/water (log Pow): 0.79 Measured
Bioconcentration Factor (BCF): 13; Fish; Measured

Mobility in soil

Mobility in soil: Potential for mobility in soil is very high (Koc between 0 and 50).
Partition coefficient, soil organic carbon/water (Koc): 15 Estimated.
Henry's Law Constant (H): 4.67E-10 atm*m³/mole; 25 °C Estimated.

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.

14. Transport Information

DOT Non-Bulk

Proper Shipping Name: CORROSIVE SOLID, TOXIC, N.O.S.
Technical Name: 2,2-DIBROMO-3-NITRILOPROPIONAMIDE
Hazard Class: 8 (6.1) ID Number: UN2923 Packing Group: PG III

DOT Bulk

Proper Shipping Name: CORROSIVE SOLID, TOXIC, N.O.S.
Technical Name: 2,2-DIBROMO-3-NITRILOPROPIONAMIDE
Hazard Class: 8 (6.1) ID Number: UN2923 Packing Group: PG III

IMDG

Proper Shipping Name: CORROSIVE SOLID, TOXIC, N.O.S.
Technical Name: 2,2-DIBROMO-3-NITRILOPROPIONAMIDE
Hazard Class: 8 (6.1) ID Number: UN2923 Packing Group: PG III
EMS Number: F-A,S-B
Marine pollutant.: Yes

ICAO/IATA

Proper Shipping Name: CORROSIVE SOLID, TOXIC, N.O.S.
Technical Name: 2,2-DIBROMO-3-NITRILOPROPIONAMIDE
Hazard Class: 8 (6.1) ID Number: UN2923 Packing Group: PG III
Cargo Packing Instruction: 864

Passenger Packing Instruction: 860
Additional Information

MARINE POLLUTANT

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	No
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

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 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

Hazard Rating System

NFPA Health Fire Reactivity

3 0 0

Recommended Uses and Restrictions

Identified uses

For biocidal applications. For industrial use. We recommend that you use this product in a manner consistent with the listed use. If your intended use is not consistent with the stated use, please contact your sales or technical service representative.

Revision

Identification Number: 1006576 / 1001 / Issue Date 02/28/2013 / Version: 10.0

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.