MATERIAL SAFETY DATA SHEET
DIDECYL DIMETHYLAMMONIUM CHLORIDE

Product Name
Zodiac – Algae Destroyer

1. PRODUCT & COMPANY IDENTIFICATION

Chemical Abstracts No: 7647-01-0
NIOSH No:

Chemical Family:
Chemical Name: (Active) N,N-Didecyl – N,N-dimethylammonium chloride
Synonyms:

2. HAZARDOUS IDENTIFICATION

Main Hazard:- Causes burns

OSHA Hazards ;- CORROSIVE , FLAMMABLE

Chemical Hazard:-

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS No.</th>
<th>Approx Wt%</th>
<th>Exposure limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>N,N-Didecyl-N,N-dimethyl-ammonium chloride</td>
<td>7173-51-5</td>
<td>30.0 %</td>
<td>None established</td>
</tr>
<tr>
<td>Water</td>
<td>7732-18-5</td>
<td>70.0 %</td>
<td>None established</td>
</tr>
</tbody>
</table>

Biological Hazard:- May cause long-term adverse effects in the environment.

Reproduction Hazard:-

Eye Effects- Eye:- Direct eye contact may produce severe irritation and/or burns and possible irreversible damage.

Health Effects- skin:- Direct skin contact may produce severe irritation and/or burns and possible irreversible damage.

Health Effects- ingestion:- Ingestion can cause immediate burning pain in the mouth, throat and abdomen; severe swelling of the larynx. Ingestion can cause skeletal muscle paralysis affecting the ability to breathe; circulatory shock; and/or convulsions. May be fatal if ingested.
Health Effects - inhalation: Solvent vapours or mists of product may cause irritation of mucous membranes. Prolonged inhalation may produce drowsiness, lassitude, and inability to concentrate.

Carcinogenicity: Material listed as carcinogen

Mutagenicity:

Neurotoxicity:

Effects of overexposure:
Based on animal test data for this material, the following effect(s) can be anticipated:

3. COMPOSITION

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Weight percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Didecyldimethylammonium chloride</td>
<td>7173-51-5</td>
<td>80,00</td>
</tr>
<tr>
<td>Ethanol</td>
<td>64-17-5</td>
<td>10,00</td>
</tr>
<tr>
<td>Water</td>
<td>7732-18-5</td>
<td>10,00</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

Eye contact: For eye contact, immediately flush eyes with running water for at least 15 minutes. Hold eyelids apart to ensure rinsing of the entire surface of the eyes and lids with water. If physician is not available, flush for an additional 15 minutes. Get immediate medical attention.

Skin contact: For skin contact, wash with plenty of running water, and soap if available, for 15 minutes. Remove and clean contaminated clothing and shoes. Get immediate medical attention. Wash clothing and decontaminate shoes before reuse.

Ingestion: Get immediate medical attention. If swallowed, give 3-4 glasses of milk (if unavailable, water). DO NOT induce vomiting. If vomiting does occur, give fluids again. Get medical attention to determine if vomiting or evacuation of stomach is necessary. Do not give anything by mouth to an unconscious or convulsing person.

Inhalation: If inhaled, remove from area to fresh air. Get immediate medical attention. If not breathing, clear airway and start artificial respiration. If victim is having trouble breathing, give supplemental oxygen, if available.

Medical treatment:
Probable mucosal damage may contraindicate the use of gastric lavage. Measures against circulatory shock, oxygen, and measures to support breathing manually or mechanically may be needed. If persistent, convulsions may be controlled by the cautious intravenous injection of a short acting barbiturate drug.

5. FIRE AND EXPLOSION INFORMATION

Extinguishing media to be used: Carbon dioxide
                                Dry chemical
                                Alcohol foam
                                Water
Flash point : 107 °F Setaflash Closed Tester

Protective Clothing:
Must wear NIOSH / MSHA approved self-contained breathing apparatus and protective clothing. Cool fire-exposed containers with water spray.

Unusual fire and explosion hazards:
Products of combustion are toxic. Heated solvent vapours can travel to an ignition source and flash back.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions:-
Use respirator when performing operations involving potential exposure to vapour of the product.

Environmental Precautions:-
Do not flush into surface water or sanitary system

Methods for Containment
Dike and control spill with inert material (sand, earth, etc.). Transfer the solid and liquid to separate containers for recovery or disposal.

7. HANDLING AND STORAGE

Handling
Avoid contact with skin and eyes. Provide sufficient air exchange and/or exhaust in work rooms.
Advice on protection against fire and explosion: Highly flammable.
Keep away from sources of ignition - No smoking.
Take precautionary measures against static discharges.

Storage
Requirements for storage areas and containers: Keep container tightly closed. To maintain product quality, do not store in heat or direct sunlight. Keep in a dry, cool and well-ventilated place.
Further information on storage conditions: Store containers in compliance with the most recent NFPA Code (NFPA 30). Ground all containers prior to pouring. Advice on common storage: Keep away from food, drink and animal feedingstuffs. Storage temperature: < 140 °F (< 60 °C)

Precautions for storage and handling:
Maximum storage temperature: 140 °F. Store containers in compliance with the most recent NFPA Code (NFPA 30). Ground all containers prior to pouring. Keep containers closed until used. Do not contaminate drinking water, food or feed by storage or disposal.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational Exposure Limits:-

Engineering control measures:-

Personal protection- Respiratory
In processes where mists or vapours are generated, a NIOSH / MSHA approved respirator is advised in the absence of proper environmental controls or if TWA / TLV is exceeded.

Personal protection-skin /hand:
Use rubber or neoprene gloves, when needed, to prevent skin contact.

Personal Protection- Eye
Wear chemical splash goggles where there is a potential for eye contact. Use safety glasses with side shields under normal use conditions.

Other protection- Ventilation:
If mists or vapours may be generated, proper ventilation must be provided in accordance with good ventilation practices.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Liquid- Colourless to pale yellow
Odour: Ethanol-like
pH: 6.5 – 9 at 10%
Boiling point: Not known
Melting point: 10 °C
Flash point:
Flammability:
Auto flammability: Max. percent volatile: 20%
Explosive properties:
Oxidizing properties:
Vapour pressure: Not known
Density: 0.89 g / cm3 at 25 °C
Solubility - water: Soluble
Solubility - solvent:
Solubility - coefficient:
Neurotoxicity:
Evaporation rate (Butyl acetates = 1): Not known
Viscosity < 100 cps at 25 °C

10. STABILITY AND REACTIVITY

Stability: Stable
Incompatibility with: Strong oxidising agents
Conditions to avoid: None known

11. TOXICOLOGY INFORMATION

Acute oral toxicity (LD50):
rat ; 450 mg / kg
(80% active)
Acute oral toxicity (LD50):
rat (male) ; 412 mg / kg
(50% active)
Acute oral toxicity (LD50):
rat (female) ; 292 mg / kg
Acute dermal toxicity (LD50):
rabbit ; 3342 mg / kg
4300 mg / kg (two tests) (80% active)
Skin irritation:
rabbit: severe irritant extreme irritation that did not clear by day 7, post dose (primary irritation index = 110).

Chronic toxicity:
Oral dog:
Test period: 1 year
For Didecyldimethylammonium chloride: no target organ effects.

LC 50 oral: Bobwhite quail: < 5620 ppm
(and mallard duck); oral dietary

Pharmacokinetic: dog:
For Didecyldimethylammonium chloride: this material does not accumulate in body tissues.

Sensitisation:
guinea pig: not sensitising
For a 0.2% active solution.

Mutagenicity:
Salmonella: not mutagenic with or without metabolic activation (50% active). not mutagenic
For Didecyldimethylammonium chloride: (Ames, CHO/HGPRT, CHO, DNA Syntheses).
rat:
No evidence of chromosomal damage in the bone marrow of rats treated with 600 mg / kg 950% active).

Reproductive toxicity:
rat: not teratogenic
Treatment with 10 to 50 mg / kg on days 6 to 15 gestation (50% active) not teratogenic
For Didecyldimethylammonium chloride: (rat and rabbit) treatment at or below mild toxic effect levels.
rat:
For Didecyldimethylammonium chloride: no reproductive effect for treatment at or below mild toxic effects level.
Not clastogenic in Chinese hamster ovary cells with or without metabolic activation (50% active).

Subchronic toxicity:
Dermal
rat:
Test period: 90 days
For Didecyldimethylammonium chloride: no systemic toxicity:

Fish toxicity (LC50):
bluegill sunfish:
Test period: 96 hours
For Didecyldimethylammonium chloride: 0.32 mg / l

Fish toxicity (LC50):
Test period: 96 hours
For Didecyldimethylammonium chloride: (salmon) 1.0 mg / l

Toxicity for Daphnia (EC50)
daphnia magna:
Test period: 48 hours
For Didecyldimethylammonium chloride: 0.94 mg / l
Dietary Toxicity Test:
LC 50 oral: > 5620 ppm
For Didecyldimethylammonium chloride: (bobwhite quail and mallard duck).

Acute toxicity:
LD 50 oral:
Bobwhite quail: 229 mg / kg
For Didecyldimethylammonium chloride:

13. DISPOSAL CONSIDERATIONS
Disposal Methods Product:
Dispose of in compliance with all Federal, state and local laws and regulations. Incineration is the preferred method.

Disposal Methods Packaging:
CONTAINER DISPOSAL: Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

14. TRANSPORTATION
UN No. UN 2920
Substance Identity No.
ADR/RID Class 8
ADR/RID Item No. Not available
ADR/RID Hazard Identity No. 83
IMDG – Shipping Name Corrosive Liquid, Flammable N.O.S.
IMDG – Class 8
IMDG – Packaging Group II
IMDG – Marine Pollutant Yes
IMDG – EMS No. F-E
IMDG – MFAG Table No.
IATA – Shipping Name Corrosive Liquid, Flammable N.O.S.
IATA – Class 8
IATA – Subsidiary Risk(s) CORROSIVE No.8
ADNR – Class Not available
UK – Description Not available
UK – Emergency Action Class Not available
UK – Classification Not available
Tremcard No.

15. REGULATORY INFORMATION

EEC hazard classification:
Risk phases:
Safety phases:
National legislation:
FEDERAL LEVEL REGULATIONS
Toxic Substances Control Act (TSCA) Inventory
This product is currently listed on the EPA TSCA 8 (b) inventory list.
US EPA Regulation on Pesticides;
This product is not an EPA registered pesticide. It cannot be used in the United States as a commercial antimicrobial agents without first obtaining an EPA FIFRA registration. It can be used commercially in non-antimicrobial applications, and for all research and development (R&D) applications including as a potential antimicrobial agent.

CERCLA
(Comprehensive Environmental Response, Compensation, and Liability Act of 1980). Requires notification of the National Response Centre (1-800-424-8802) of release of quantities of Hazardous Substances equal to or greater than the Reportable Quantities (RQs) in 40 CFR 302.4. The following components could require reporting:
***None***

SARA Title III ; Sections 302 / 304
(Superfund Amendments and Reauthorisation Act of 1986). Requires emergency planning based on Threshold Planning Quantities (TPQs) and release reporting based on Reportable Quantities (RQs) in 40 CFR 355. Components present in this product at a level which could require reporting under that statute are:
***None***

SARA Title III : Sections 311 / 312
(Superfund Amendments and Reauthorisation Act of 1986). Requires reporting under the Community Right-to-know provisions due to their inclusion in one of the five hazard categories listed in 40 CFR 370. Components present in this product which could require reporting under the statute are:
IMMEDIATE (ACUTE) HEALTH HAZARD:

<table>
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<tr>
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<th>Concentration (max/typ)</th>
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<td>7173-51-5</td>
<td>80%</td>
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DELAYED (CHRONIC) HEALTH HAZARD:
***None***

FIRE HAZARD

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<tr>
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<td>Ethyl alcohol</td>
<td>64-17-5</td>
<td>10%</td>
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REACTIVITY HAZARD:
***None***

SARA Title III : Section 313
(Superfund Amendments and Reauthorisation Act of 1986). Requires submission of annual reports of release of toxic chemicals that appear in 40 CFR 372. This information must be included in all MSDSs that are copied and distributed for this material. Components present in this product at a level which could require reporting under the statute are:
***None***

TSCA Section 12 (b) Export Notification
Components present in this product which, if exported, could require either annual or one-time reporting under this regulation are as follows:
***None***

STATE RIGHT-TO-KNOW REGULATIONS:

CALIFORNIA Proposition 65
Substance, which are known to the State of California to cause cancer and/or birth defects or other reproductive harm, must be identified when present in products. Components present in this product at a level which could require reporting under the statute in either or both hazard categories are:

AS A CANCER HAZARD:

### AS A CANCER HAZARD:

### IMMEDIATE (ACUTE) HEALTH HAZARD:

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***None***

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AS A CANCER HAZARD:
### Chemical Name, CAS No., Concentration (max/typ)

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<tr>
<th>Chemical name</th>
<th>CAS No.</th>
<th>Concentration (max/typ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetaldehyde</td>
<td>75-07-0</td>
<td>1 ppm</td>
</tr>
<tr>
<td>N-Nitrosodimethylamine</td>
<td>62-75-9</td>
<td>100 ppb</td>
</tr>
</tbody>
</table>

**MASSACHUSETTS RIGHT-TO-KNOW Substance List (MSL)**

Hazardous and Extraordinarily Hazardous Substances on the MSL must be identified when present in products. Components present in this product at a level which could require reporting under the statute are:

**EXTRAORD. HAZARDOUS SUBSTANCES (< = 1 ppm or 0.0001%) :**

<table>
<thead>
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<th>CAS No.</th>
<th>Concentration (max/typ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetaldehyde</td>
<td>75-07-0</td>
<td>1 ppm</td>
</tr>
</tbody>
</table>

**HAZARDOUS SUBSTANCES (< = 1.0%) :**

<table>
<thead>
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<td>10%</td>
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**MICHIGAN CRITICAL MATERIALS**

This product contains the following substances identified on the Michigan Critical Materials Register: ***None***

**NEW JERSEY RIGHT-TO-KNOW Substance List**

Requires Hazardous Substances and Specially Hazardous Substances on the list to be identified when present in products. Components present in this product at a level which could require reporting under the statute are:

**HAZARDOUS SUBSTANCES (< = 1.0 %) :**

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**PENNSYLVANIA RIGHT-TO-KNOW Hazardous Substance List**

Hazardous Substances and Special Hazardous Substances on the List must be identified when present in products. Components present in this product at a level which could require reporting under the statute are:

**HAZARDOUS SUBSTANCES (<= 1.0%) :**

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### 16. FURTHER INFORMATION

**DISCLAIMER**

Zodiac Pool Care SA (Pty) Limited believes that this information is correct at date of publication but does not warrant the accuracy thereof. The use of the product designated herein will be at the sole risk of the user and Zodiac Pool Care SA (Pty) Limited will not accept any liability for any loss or damage, including consequential loss, howsoever caused by or arising from the use of this information of the use, application, adaption or processing of the product described herein or its use in combination with any other product, material or in any process.

**Date of General Update- 20 June 2014**