MATERIAL SAFETY DATA SHEET

Product Name: Biobrom C - 100G
Product id: 8341G-US
Revision date: 28/09/2010
Supersedes: 13/02/2008

1. Identification of the substance & the company

Chemical name: 2,2-Dibromo-3-nitrilopropionamide
Synonym(s): DBNPA
Chemical formula: C₃H₂ON₂Br₂
Chemical family: Halogenated cyanoacetamide
Molecular weight: 241.84
Type of product and use: A microbiocidal bactericide, fungicide, algicide and slimicide, in treating industrial cooling water systems and pulp & paper mills.

Supplier: Clearon Corp.
95 MacCorkle Ave. SW, South Charleston, WV 25303, USA
Tel: (304) 746-3000

Emergency Telephone: Chemtrec (800)424-9300

2. Hazards identification

Emergency overview:
White to off-white granules
Corrosive
Causes severe burns of eyes
Irritating to nose and throat
May be fatal if swallowed
May burn the skin

Potential Health Effects:
- Eye Contact: Corrosive
- Skin contact: Irritant
  May cause skin sensitization
- Inhalation: Irritant to upper respiratory tract. In severe cases pulmonary oedema may be developed
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- Ingestion
  Corrosive by ingestion
  Abdominal pain, nausea, vomiting and diarrhea

NFPA Ratings (Scale 0-4)
  Health = 3, Fire = 0, Reactivity = 1.

HMIS Ratings (Scale 0-4)
  Health = 3, Fire = 0, Reactivity = 0

3. Composition / information on ingredients

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS No.</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,2-Dibromo-3-nitrilopropionamide</td>
<td>10222-01-2</td>
<td>98</td>
</tr>
</tbody>
</table>

4. First-aid measures

Eye contact
  Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advise.

Skin contact
  Take off contaminated clothing.
  Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advise.

Inhalation
  Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advise.

Ingestion
  Call poison control center, or doctor immediately for treatment advise.
  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. Do not give anything by mouth to an unconscious person.

Note to physician
  Probable mucosal damage may contraindicate the use of gastric lavage.
5. Fire - fighting measures

Suitable extinguishing media  Material is not combustible. Use extinguishing media appropriate to surrounding fire conditions.

Fire fighting procedure  Cool containers with water spray. Fire fighters should wear full protective clothing and self-contained breathing apparatus (SCBA) in positive pressure mode.

Unusual fire and explosion hazards  When heated to decomposition, may release poisonous and corrosive fumes.

6. Accidental release measures

Personal precautions  Use dust respirator, rubber gloves and chemical safety goggles

Methods for cleaning up  Sweep up, place in a bag and hold for waste disposal or possible re-use. Ventilate area and wash spill site after material pickup is complete.

7. Handling and storage

Handling  Keep containers tightly closed. Avoid producing or diffusing dust into the air.

Storage  Store in a dry, cool, well-ventilated and shaded area, away from heat sources and away from incompatible materials (see "materials to avoid").

8. Exposure controls / personal protection

Exposure Limits :

<table>
<thead>
<tr>
<th>Components</th>
<th>ACGIH-TLV Data</th>
<th>OSHA (PEL) Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,2-Dibromo-3-nitrilopropion amide 10222-01-2</td>
<td>Not determined</td>
<td>Not determined</td>
</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
<th>Product Name</th>
<th>Biobrom C - 100G</th>
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</tr>
</tbody>
</table>

**Revision:** 6

**Note**
The product was tested for "Particle size distribution". Results showed that it is non-inhalable.

**Manufacturer's TLV-TWA**
**Recommendation**
0.25 mg/m³

**Ventilation requirements**
Ventilation must be sufficient to maintain atmospheric concentration below recommended exposure limit.

**Personal protective equipment:**
- **Respiratory protection**
  Approved respirator
- **Hand protection**
  Protective gloves
- **Eye protection**
  Chemical safety goggles
- **Skin and body protection**
  Body covering clothes and boots

**Hygiene measures**
Do not eat, smoke or drink where material is handled, processed or stored. Wash hands carefully before eating or smoking. Safety shower and eye bath should be provided.

**9. Physical and chemical properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>White to off-white granules</td>
</tr>
<tr>
<td>Boiling point/range</td>
<td>Not applicable (decomposes)</td>
</tr>
<tr>
<td>Melting point/range</td>
<td>123 - 125°C</td>
</tr>
<tr>
<td>Flash point</td>
<td>None</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>8.25x10(-4) mmHg (25°C)</td>
</tr>
<tr>
<td>Evaporation rate (ether=1)</td>
<td>Not applicable under standard conditions</td>
</tr>
<tr>
<td>Vapor density</td>
<td>Not applicable under standard conditions</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Solubility:</td>
<td></td>
</tr>
<tr>
<td>Solubility in water</td>
<td>17±0.05 g/l at 25.7°C</td>
</tr>
<tr>
<td>Solubility in other solvents</td>
<td>acetone - 35 g/100g</td>
</tr>
<tr>
<td></td>
<td>ethanol - 25 g/100g</td>
</tr>
<tr>
<td></td>
<td>dimethyl formamide - 120 g/100g</td>
</tr>
<tr>
<td></td>
<td>polyethylene glycol (Mw 200) - 120 g/100g</td>
</tr>
<tr>
<td>Specific gravity</td>
<td>2.375 (21°C)</td>
</tr>
<tr>
<td>pH</td>
<td>Not determined</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>190°C</td>
</tr>
<tr>
<td>Partition coefficient (n-octanol/water)</td>
<td>Log Kow - 6.3</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>Not explosive</td>
</tr>
<tr>
<td>Oxidising properties</td>
<td>Not oxidising</td>
</tr>
<tr>
<td>Particle size:</td>
<td>Non- inhalable</td>
</tr>
</tbody>
</table>
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10. Stability and reactivity

Stability: Stable under normal conditions.
Materials to avoid: Oxidizing agents, reducing agents
Conditions to avoid: Keep away from light and heat
Heating above decomposition temperature
Hazardous decomposition products: Br2, HBr, CNBr, NOx, C2H5Br, CH3Br
Hazardous polymerization: Will not occur

11. Toxicological information

Acute toxicity:
- Rat oral LD50: 308 mg/kg
- Rat dermal LD50: >2000 mg/kg
- Rat inhalation LC50: 0.32 mg/l/4 hour (powder)
- Eye irritation (rabbit): Corrosive
- Dermal irritation (rabbit): Moderate irritant
Dermal sensitization: Sensitizer
Sub-chronic toxicity:
- NOEL: 5 mg/kg/day (13 weeks oral, rat)
Chronic toxicity: Not available

Mutagenicity: Not mutagenic by the Ames Test
Genotoxicity: Not clastogenic in chromosome aberration test with Chinese hamster cells.
Not clastogenic in chromosome aberration test with Human lymphocytes.
Did not induce DNA repair synthesis in the hepatocytes of male rats in vitro.
Carcinogenicity: Not classified by IARC
Not included in NTP 11th Report on Carcinogens
Reproductive toxicity: In a 2-generation study in rats, the NOEL for reproduction parameters was >=30 mg/kg/day.
Teratogenicity: Not teratogenic. The NOAEL (for fetal toxicity in rabbits) = 10 mg/kg/day.
12. Ecological information

Aquatic toxicity:
- 96 Hour-LC50, Fish
  - 2.3 mg/l (Rainbow trout)
  - 3.4 mg/l (Sheepshead minnow)
  - 2.3 mg/l (Bluegill sunfish)

- 48 Hour-EC50, Daphnia magna
  - 0.86 mg/l

Marine Invertebrate
  - 0.72 mg/l (Mysid shrimp, 96h)
  - 0.37 mg/l (Eastern oyster, 96h)

Avian toxicity:
- Oral LD50, Bobwhite quail
  - 354 mg/kg

- Dietary LC50, Mallard duck
  - > 5620 ppm

- Dietary LC50, Bobwhite quail
  - > 5620 ppm

Germany, water endangering classes (WGK)
  - 3

13. Disposal considerations

Waste disposal
Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state and local environmental regulations when disposing of this material.

14. Transportation information

UN No.
  - 3077

DOT
Proper shipping name: Environmentally hazardous substance, solid, n.o.s (2,2-dibromo-3-nitrilopropionamide)
Class: 9 - Miscellaneous Hazardous Material
Label: 9
Packing Group: III
Marking: Marine Pollutant
## 15. Regulatory information

### USA

This product is registered under FIFRA. Reported in the EPA TSCA Inventory (Acetamide, 2,2-dibromo-2-cyano-)

#### - SARA 313

On October 27, 1995, EPA published an administrative stay of the EPCRA section 313 reporting requirements for this chemical. Therefore, no Toxics Release Inventory reports are required for 2,2-dibromo-3-nitrilopropionamide until the stay is removed.

#### - SARA (311, 312)

This product is categorized as an immediate and delayed health hazard.

#### - Workplace Classification

This product is considered hazardous under the OSHA Hazard Communication Standard (29CFR 1910.1200).

### Canada

Listed in NDSL

#### - Cepa

Listed

#### EU

EC No. 233-539-7

### Japan

ENCS No. 2-2795

ISHL No. 2-2795

### Australia

Listed in AICS

### New Zealand Inventory

Listed in NZIoC

### China inventory

Listed

### Korea

Listed in the Korea Existing Chemicals Inventory (KECI), number KE-09944
MATERIAL SAFETY DATA SHEET

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Philippines: Listed in PICCS

16. Other information

This data sheet contains changes from the previous version in section(s)
2&3 (ROW), 5, 9

The information in this Material Safety Data Sheet should be provided to all who will use, handle, store, transport, or otherwise be exposed to this product.
This information has been prepared for the guidance of plant engineering, operations and management and for persons working with or handling this product.
Additionally, if this Material Safety Data Sheet is more than three years old, you should contact Clearon at the phone number listed below to make certain that this sheet is current.

Although the information and recommendations set forth herein (herinafter "information") are presented in good faith and believed to be correct as of the date hereof, Clearon Corp. makes no representations as to the completeness or accuracy thereof.
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In an event of discrepancy between the contents of this MSDS and the English version of it, the English version shall prevail.

Prepared by
HEALTH, SAFETY & ENVIRONMENT DEPARTMENT
CLEARON CORPORATION
95 MacCorkle Ave., S.W.
South Charleston, WV 25303
USA
Phone number: (304) 746-3000

End of safety data sheet