Section 1. Identification

GHS product identifier : BCDMH Granules
Product code : 000388
Chemical name : 1-bromo-3-chloro-5,5-dimethylhydantoin
Other means of identification : Hydantoin, 1-bromo-3-chloro-5,5-dimethyl-; 2,4-Imidazolidinedione, 1-bromo-3-chloro-5,5-dimethyl-; 1-Bromo-3-chloro-5,5-dimethylhydantoin
Product type : Solid.

Relevant identified uses of the substance or mixture and uses advised against

Product use : Biocide for Circulating Water Systems
Supplier/Manufacturer : Dober
11230 Katherine's Crossing
Woodridge, IL 60517-5075

e-mail address of person responsible for this SDS : regulatory@dober-group.com
Emergency telephone number (with hours of operation) : Chem Tel: 1-813-248-0585 / 1-800-255-3924

Section 2. Hazards identification

Classification of the substance or mixture : OXIDIZING SOLIDS - Category 2
ACUTE TOXICITY: ORAL - Category 4
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1
AQUATIC TOXICITY (ACUTE) - Category 1

GHS label elements

Hazard pictograms :

Signal word : Danger
Hazard statements : May intensify fire; oxidiser. Harmful if swallowed. Causes serious eye damage. Very toxic to aquatic life.

Precautionary statements

Prevention : Wear protective gloves. Wear eye or face protection. Keep away from heat. - No smoking. Keep away from clothing, incompatible materials and combustible materials. Avoid release to the environment.
Response : IF SWALLOWED: Call a POISON CENTER or physician if you feel unwell. IF IN EYES: Immediately call a POISON CENTER or physician.
Storage : Not applicable.
Disposal : Not applicable.

Other hazards which do not result in classification : Contact with acids liberates toxic gas.

Version : 1 Date of issue/Date of revision : 01/03/2012.
Section 3. Composition/information on ingredients

**Substance/mixture** : Substance

**Chemical name** : 1-bromo-3-chloro-5,5-dimethylhydantoin

**Other means of identification** : Hydantoin, 1-bromo-3-chloro-5,5-dimethyl-; 2,4-Imidazolidinedione, 1-bromo-3-chloro-5,5-dimethyl-; 1-Bromo-3-chloro-5,5-dimethylhydantoin

**CAS number/other identifiers**

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>%</th>
<th>CAS number</th>
</tr>
</thead>
</table>
| 1-bromo-3-chloro-5,5-dimethylhydantoin | >60   | 16079-88-2  

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

**Occupational exposure limits, if available, are listed in Section 8.**

**Chemical formula** : C5-H6-Br-Cl-N2-O2

Section 4. First-aid measures

**Description of necessary first aid measures**

**Eye contact** : Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician.

**Inhalation** : Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

**Skin contact** : Get medical attention immediately. Call a poison center or physician. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.

**Ingestion** : Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

**Most important symptoms/effects, acute and delayed**

**Potential acute health effects**

**Eye contact** : Causes serious eye damage.

**Version** : 1  
**Date of issue/Date of revision** : 01/03/2012.
Section 4. First-aid measures

**Inhalation**
- May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

**Skin contact**
- May cause skin irritation.

**Ingestion**
- Harmful if swallowed. May cause burns to mouth, throat and stomach.

**Over-exposure signs/symptoms**

- **Eye contact**: Adverse symptoms may include the following:
  - pain
  - watering
  - redness

- **Inhalation**: No specific data.

- **Skin contact**: Adverse symptoms may include the following:
  - pain or irritation
  - redness
  - blistering may occur

- **Ingestion**: Adverse symptoms may include the following:
  - stomach pains

**Indication of immediate medical attention and special treatment needed, if necessary**

**Notes to physician**: In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

**Specific treatments**: No specific treatment.

**Protection of first-aiders**: No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

**Section 5. Fire-fighting measures**

**Extinguishing media**

**Suitable extinguishing media**: In case of fire, use alcohol-resistant foam.

**Unsuitable extinguishing media**: Do not use dry chemical, CO₂ or halon.

**Specific hazards arising from the chemical**
- Oxidising material. May intensify fire. This material is very toxic to aquatic life. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

**Hazardous thermal decomposition products**: Decomposition products may include the following materials:
  - carbon dioxide
  - carbon monoxide
  - nitrogen oxides
  - halogenated compounds

**Special protective actions for fire-fighters**: Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

**Special protective equipment for fire-fighters**: Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

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Section 6. Accidental release measures

**Personal precautions, protective equipment and emergency procedures**

For non-emergency personnel: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders: If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions: Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.

Methods and materials for containment and cleaning up

Small spill: Move containers from spill area. Vacuum or sweep up material and place in a designated, labelled waste container. Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor.

Large spill: Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Vacuum or sweep up material and place in a designated, labelled waste container. Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor. Note: see section 1 for emergency contact information and section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling: Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. Do not get in eyes or on skin or clothing. Do not ingest. Avoid release to the environment. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Keep away from clothing, incompatible materials and combustible materials. Keep away from heat. Empty containers retain product residue and can be hazardous. Do not reuse container.

Conditions for storage, including any incompatibilities: Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Store locked up. Separate from reducing agents and combustible materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

**Control parameters**

**Occupational exposure limits**

None.

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Date of issue/Date of revision : 01/03/2012
Section 8. Exposure controls/personal protection

**Recommended monitoring procedures**: If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

**Appropriate engineering controls**: If user operations generate dust, fumes, gas, vapour or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

**Environmental exposure controls**: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

**Individual protection measures**

- **Hygiene measures**: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

- **Eye/face protection**: Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts.

- **Skin protection**
  - **Hand protection**: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
  - **Body protection**: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
  - **Other skin protection**: Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
  - **Respiratory protection**: Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

- **Thermal hazards**: Not available.

Section 9. Physical and chemical properties

**Appearance**

- **Physical state**: Solid. [Granular solid.]
- **Colour**: White.
- **Odour**: Halogens [Slight]
- **Odour threshold**: Not available.
- **pH**: 3.5 [Conc. (% w/w): 0.15%]
- **Melting point**: Not available.
- **Boiling point**: Not available.
- **Flash point**: Not available.
- **Burning time**: Not available.
- **Burning rate**: Not available.
- **Evaporation rate**: Not available.
- **Flammability (solid, gas)**: Not available.
- **Lower and upper explosive (flammable) limits**: Not available.

**Version**: 1  
**Date of issue/Date of revision**: 01/03/2012.
Section 9. Physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vapour pressure</td>
<td>Not available.</td>
</tr>
<tr>
<td>Vapour density</td>
<td>Not available.</td>
</tr>
<tr>
<td>Relative density</td>
<td>0.96</td>
</tr>
<tr>
<td>Solubility</td>
<td>Not available.</td>
</tr>
<tr>
<td>Vapour density</td>
<td>Not available.</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>Not available.</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>Not available.</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>Not available.</td>
</tr>
<tr>
<td>SADT</td>
<td>Not available.</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Not available.</td>
</tr>
</tbody>
</table>

Section 10. Stability and reactivity

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reactivity</td>
<td>No specific test data related to reactivity available for this product or its ingredients.</td>
</tr>
<tr>
<td>Chemical stability</td>
<td>The product is stable.</td>
</tr>
</tbody>
</table>
| Possibility of hazardous reactions | Hazardous reactions or instability may occur under certain conditions of storage or use.  
Conditions may include the following:  
contact with combustible materials  
Reactions may include the following:  
risk of causing or intensifying fire. |
| Conditions to avoid             | No specific data.      |
| Incompatible materials          | Reactive or incompatible with the following materials: oxidizing materials, reducing materials, combustible materials, acids and alkalis.  
Contact with acids liberates toxic gas. |

Section 11. Toxicological information

Information on toxicological effects

**Acute toxicity**

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-bromo-3-chloro-5,5-dimethylhydantoin</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>578 mg/kg</td>
<td>-</td>
</tr>
</tbody>
</table>

**Irritation/Corrosion**

Not available.

**Sensitisation**

Not available.

**Mutagenicity**

Not available.

**Carcinogenicity**

Not available.

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Section 11. Toxicological information

Reproductive toxicity
Not available.

Teratogenicity
Not available.

Specific target organ toxicity (single exposure)
Not available.

Specific target organ toxicity (repeated exposure)
Not available.

Aspiration hazard
Not available.

Information on the likely routes of exposure

Potential acute health effects

Eye contact
Causes serious eye damage.

Inhalation
May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

Skin contact
May cause skin irritation.

Ingestion
Harmful if swallowed. May cause burns to mouth, throat and stomach.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact
Adverse symptoms may include the following:
- pain
- watering
- redness

Inhalation
No specific data.

Skin contact
Adverse symptoms may include the following:
- pain or irritation
- redness
- blistering may occur

Ingestion
Adverse symptoms may include the following:
- stomach pains

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects
Not available.

Potential delayed effects
Not available.

Long term exposure

Potential immediate effects
Not available.

Potential delayed effects
Not available.

Potential chronic health effects
Not available.

General
No known significant effects or critical hazards.

Carcinogenicity
No known significant effects or critical hazards.

Mutagenicity
No known significant effects or critical hazards.

Teratogenicity
No known significant effects or critical hazards.

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Section 11. Toxicological information

Developmental effects: No known significant effects or critical hazards.
Fertility effects: No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates
Not available.

Section 12. Ecological information

Toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-bromo-3-chloro-5,5-dimethylhydantoin</td>
<td>Acute EC50 0.4 ppm Fresh water</td>
<td>Daphnia - Daphnia magna - &lt;24 hours</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 0.14 ppm Fresh water</td>
<td>Fish - Oncorhynchus mykiss</td>
<td>96 hours</td>
</tr>
</tbody>
</table>

Persistence/degradability
Not available.

Bioaccumulative potential
Not available.

Mobility in soil
Soil/water partition coefficient (Koc): Not available.

Other adverse effects: No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods: The generation of waste should be avoided or minimised wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information
Section 14. Transport information

<table>
<thead>
<tr>
<th>UN number</th>
<th>UN3085</th>
<th>UN3085</th>
<th>UN3085</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN proper shipping name</td>
<td>OXIDIZING SOLID, CORROSIVE, N.O.S. (Bromo-chloro-dimethylhydantoin)</td>
<td>OXIDIZING SOLID, CORROSIVE, N.O.S. (Bromo-chloro-dimethylhydantoin). Marine pollutant (Bromo-chloro-dimethylhydantoin)</td>
<td>Oxidizing solid, corrosive, n.o.s. (Bromo-chloro-dimethylhydantoin)</td>
</tr>
<tr>
<td>Transport hazard class(es)</td>
<td>5.1 (8)</td>
<td>5.1 (8)</td>
<td>5.1 (8)</td>
</tr>
<tr>
<td>Packing group</td>
<td>III</td>
<td>III</td>
<td>III</td>
</tr>
<tr>
<td>Environmental hazards</td>
<td>Yes.</td>
<td>Yes.</td>
<td>Yes.</td>
</tr>
<tr>
<td>Special precautions for user</td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td>Additional information</td>
<td>-</td>
<td>Emergency schedules (EmS) F-A, S-Q</td>
<td>Passenger and Cargo Aircraft Quantity limitation: 25 kg Packaging instructions: 559 Cargo Aircraft Only Quantity limitation: 100 kg Packaging instructions: 563 Limited Quantities - Passenger Aircraft Quantity limitation: 5 kg Packaging instructions: Y545</td>
</tr>
</tbody>
</table>

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not available.

Section 15. Regulatory information

Safety, health and environmental regulations specific for the product: No known specific national and/or regional regulations applicable to this product (including its ingredients).

Singapore - hazardous chemicals under government control: Not listed

Section 16. Other information

History
- Date of issue/Date of revision: 01/03/2012.
- Date of previous issue: No previous validation.
- Version: 1
- Prepared by: Atrion Regulatory Services, Inc.

Version: 1 Date of issue/Date of revision: 01/03/2012.
Section 16. Other information

Key to abbreviations

- ADN/ADNR = European Provisions concerning the International Carriage of Dangerous Goods by Inland Waterway
- ADR = The European Agreement concerning the International Carriage of Dangerous Goods by Road
- ATE = Acute Toxicity Estimate
- BCF = Bioconcentration Factor
- GHS = Globally Harmonized System of Classification and Labelling of Chemicals
- IATA = International Air Transport Association
- IBC = Intermediate Bulk Container
- IMDG = International Maritime Dangerous Goods
- LogPow = logarithm of the octanol/water partition coefficient
- RID = The Regulations concerning the International Carriage of Dangerous Goods by Rail
- UN = United Nations

References : Not available.

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Version : 1

Date of issue/Date of revision : 01/03/2012.