1. Identification of the substance & the company

Chemical name: Bromo-chloro-5,5-dimethylhydantoin

Synonym(s): BCDMH, Halobrom

Chemical formula: $C_5 H_8 BrClN_2 O_2$

Chemical family: Halogenated hydantoin

Type of product and use: A biocide used to control bacteria, algae, yeast and fungi in industrial water systems

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 granular solid with faint halogenous odour
- Corrosive
- Causes irreversible eye damage and skin burns
- May be fatal if inhaled
- Irritating to nose and throat
- Harmful if absorbed through skin or swallowed
- Oxidizer

Potential Health Effects:
- **Eye Contact**
  Corrosive
  May cause temporary or permanent eye damage.

- **Skin contact**
  Exposure to wet skin may cause burns.
  May cause skin sensitization

- **Inhalation**
  Shortness of breath, headache and nausea.
  Irritant to upper respiratory tract.
MATERIAL SAFETY DATA SHEET

Product Name: Halogene G
Product id: 8424GU
Revision date: 05/10/2010
Supersedes: 20/12/2007

NFPA Ratings (Scale 0-4)
Health = 3, Fire = 0, Reactivity = 1.
Special Hazard Warning: OXIDIZER

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

3. Composition / information on ingredients

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS No.</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bromochloro-5,5-dimethylhydantoin</td>
<td>32718-18-6</td>
<td>96-99.5</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
Dry powder, carbon dioxide or water spray
In case of exothermic decomposition and appearance of smoke, water should be used to suppress it.

Fire fighting procedure
Cool containers with water spray. In closed stores, provide fire-fighters with self-contained breathing apparatus in positive pressure mode.

Unusual fire and explosion hazards
Oxidizing agent.
Dust may form a weak explosive mixture with air (class St1), but is not sensitive to ignition from electrostatic discharges.
Forms explosive mixtures with combustible, organic or other easily oxidizable materials. When heated to decomposition, may release poisonous and corrosive fumes.

6. Accidental release measures

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

Methods for cleaning up
Sweep up, place in a suitable container and hold for waste disposal.
Avoid raising dust.
Ventilate area and wash spill site after material pickup is complete.
Avoid access to streams, lakes or ponds.

7. Handling and storage

Handling
Keep containers tightly closed.

Storage
Keep away from all sources of ignition.
Recommended storage temperature below 30°C
For transportation purposes it is possible to store at temperature up to 50°C.
Store in a dry, cool, well-ventilated area away from incompatible materials (see "materials to avoid").
**MATERIAL SAFETY DATA SHEET**

**Product Name**  Halogene G  
**Product id**  8424GU  
**Revision date**  05/10/2010  
**Supersedes**  20/12/2007  

**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>Bromochloro-5,5-dimethylhydantoin 32718-18-6</td>
<td>Not determined</td>
<td>Not determined</td>
</tr>
</tbody>
</table>

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

**Ventilation requirements**  
Use local exhaust as necessary, especially under dusty conditions. Ventilation must be sufficient to maintain atmospheric concentration below recommended exposure limit.

**Personal protective equipment:**
- **Respiratory protection**  
  Respirator with combined filter (inorganic gas and dust).
- **Hand protection**  
PVC 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**

- **Appearance**  
  White to off-white granular solid with faint halogenous odour
- **Boiling point/range**  
  Not applicable
- **Melting point/range**  
  Not applicable (decomposes)
- **Flash point**  
  Not applicable
- **Flammable/Explosion limits**  
  Not available
- **Auto-ignition temperature**  
  Not available
- **Vapour pressure**  
  9.35x10(-3) Pa (25°C)
- **Evaporation rate (ether=1)**  
  Not applicable under standard conditions
- **Vapor density**  
  Not applicable under standard conditions
- **Viscosity**  
  Not applicable
- **Solubility:**
  - **Solubility in water**  
    0.22 g/100ml at 25°C
  - **Solubility in other solvents**  
    Benzene: 2.5 g/100g at 25°C
- **Bulk density**  
  1 g/ml
MATERIAL SAFETY DATA SHEET

Product Name: Halogene G
Product id: 8424GU
Revision date: 05/10/2010
Supersedes: 20/12/2007

9. Physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific gravity</td>
<td>1.8-2.0</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>160°C</td>
</tr>
<tr>
<td>Partition coefficient</td>
<td>Kow = &lt;1 (pH 5-9)</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>Dust may form a weak explosive mixture with air (class St1), but is not sensitive to ignition from electrostatic discharges.</td>
</tr>
<tr>
<td>Oxidising properties</td>
<td>Oxidizer</td>
</tr>
<tr>
<td>Particle size:</td>
<td>Not available</td>
</tr>
</tbody>
</table>

10. Stability and reactivity

- Stability: Stable under normal conditions.
- Materials to avoid: bases, COMBUSTIBLE ORGANIC MATERIALS, Oxidizing agents
- Conditions to avoid: Contact with combustible materials may initiate decomposition of the material and emission of smoke. Exposure to moisture. Heating above decomposition temperature
- Hazardous decomposition products: CO, HBr, Cl2, NOx, HCl, CO2
- Hazardous polymerization: Will not occur

11. Toxicological information

- Acute toxicity:
  - Rat oral LD50: 929 mg/kg
  - Rat inhalation LC50: 1.1 mg/l/4 hour (powder)
  - Dermal irritation (rabbit): Corrosive
- Dermal sensitization: Sensitizer
- Chronic toxicity: Not available
- Mutagenicity: Mutagenic by the Ames Test
- Non genotoxic in an in-vivo micronucleus test in mice
- Non genotoxic in an in-vivo liver unscheduled DNA synthesis (USD) assay
- Carcinogenicity: Not classified by IARC
- Not included in NTP 11th Report on Carcinogens
12. Ecological information

Aquatic toxicity:
- 96 Hour-LC50, Fish
  - 1.2 mg/l (Eastern oyster, Acute flow through)
  - 1.9 mg/l (Mysis shrimp, Acute flow through)
  - 0.4 mg/l (Rainbow trout, Static)
  - 0.46 mg/l (Bluegill sunfish, Static)
  - 1.6 mg/l (Sheepshead minnow, Acute flow through)

- 48 Hour-LC50, Daphnia magna
  - 0.75 mg/l (Static)

Avian toxicity:
- Oral LD50, Bobwhite quail
  - 1839 mg/kg

- Dietary LC50, Mallard duck
  - >5620 ppm

- Dietary LC50, Bobwhite quail
  - >5620 ppm

Bioaccumulative potential
Based on low Kow values, i.e less than one, BCDMH would not be predicted to significantly accumulate in aquatic organisms, or sorb to organic material in soil or sediment.

Germany, water endangering classes (WGK)
2

13. Disposal considerations

Waste disposal
Dispose of in approved landfill sites or an approved incinerator. Avoid access to streams, lakes or ponds. Observe all federal, state and local environmental regulations when disposing of this material. This material is classified as a RCRA hazardous waste with the characteristic of ignitability, hazardous waste number:D001.

Disposal of Packaging
Crush and bury empty containers. Do NOT throw into public waste disposal site. Avoid contact with organic materials and moisture. See conditions to avoid (Section 10)
MATERIAL SAFETY DATA SHEET

Product Name: Halogene G
Product id: 8424GU
Revision date: 05/10/2010
Supersedes: 20/12/2007

14. Transportation information

DOT

UN number 1479
Proper shipping name: Oxidising Solid, n.o.s. (Bromo-Chloro-5,5-DimethylHydantoin)
Class: 5.1 - Oxidizing substances
Label: OXIDIZER (5.1)
Packing Group II

15. Regulatory information

USA
This product is registered under FIFRA.
TSCA: EPA Number P-94-34
Subject to reporting under SNUR (Significant New Use Rule) -any use, 60 FR 11037

- SARA 313
This product does not contain a chemical listed at or above de minimis concentrations.

- SARA (311, 312)
This product is a hazardous chemical under 29CFR 1910.1200, and categorized as an immediate and delayed health, and reactivity physical hazard.

- Waste Classifications
Not listed under CERCLA
If this product becomes a waste,it meets the criteria of a hazardous waste as defined under 40 CFR 261 and would have the following EPA hazardous waste number:D001.

EU
EC No.: 251-171-5

Japanese METI
ENCS No.: 5-6368

China inventory
Listed

Philippines
Listed in PICCS

16. Other information

This data sheet contains changes from the previous version in section(s)
2, 3, 8, 9
MATERIAL SAFETY DATA SHEET

Product Name: Halogene G
Product id: 8424GU
Revision date: 05/10/2010
Supersedes: 20/12/2007

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. Information is supplied upon the condition that the persons receiving same will make their own determination as to its safety and suitability for their purposes prior to use. In no event will Clearon Corp. be responsible for damages of any nature whatsoever resulting from the use of or reliance upon information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, OF MERCHANT ABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE, ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH THE INFORMATION REFERS. 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