MATERIAL SAFETY DATA SHEET

Product Name: Halogene T-30
Product Id: 8424TU
Revision date: 25/07/2004
Supercedes: 17/11/2002

1. Identification of the substance & the company

Chemical name: Bromochloro-5,5-dimethylhydantoin
Synonym(s): BCDMH, Halobrom
Chemical formula: C₅H₁₀BrCIN₂O₂
Chemical family: Halogenated hydantoin
Molecular weight: 241.5
Type of product and use: A biocide used to control bacteria, algae, yeast and fungi in industrial water systems
Company: Clearon Corp.
95 MacCorkle Ave. SW, South Charleston, WV 25303, USA
Tel: (304) 746-3000

Emergency telephone number:
- For UK and Ireland: (01865)407333
- For Europe: (+31) 115 689000
- For USA: Chemtrec (800) 424-9300

2. Composition / information on ingredients

<table>
<thead>
<tr>
<th>Components CAS</th>
<th>Weight %</th>
<th>Annex No.</th>
<th>- EEC No.</th>
<th>EU Classification</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bromochloro-5,5-dimethylhydantoin</td>
<td>98</td>
<td></td>
<td>2511715</td>
<td>C; R34, Xn; R22, Xi; R43, O; R8, R31, N; R60</td>
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<tr>
<td>32710-18-9</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

3. Hazards identification

Important hazards: Oxidizer
Adverse human health effects: Causes burns. Halogene may cause skin sensitization.
Environmental effects: Very toxic to aquatic environment
NFPA Ratings (Scale 0-4): Health = 3, Fire = 0, Reactivity = 1. Special Hazard Warning: OXIDIZER
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Revision: 4

4. First-aid measures

Eye contact
- Holding the eyelids apart, flush eyes promptly with copious flowing water for at least 20 minutes. Get medical attention immediately.

Skin contact
- Remove contaminated clothing. Wash skin thoroughly with mild soap and plenty of water for at least 15 minutes. Wash clothing before re-use. Get medical attention immediately.

Inhalation
- In case of dust inhalation or breathing fumes released from heated material, remove person to fresh air. Keep him quiet and warm. Apply artificial respiration if necessary and get medical attention immediately.

Ingestion
- If swallowed, wash mouth thoroughly with plenty of water and give water to drink. Get medical attention immediately.

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NOTE: Never give an unconscious person anything to drink.
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Notes to the physician
- No specific antidote. Treat symptomatically and supportively. In case of ingestion DO NOT induce vomiting.

5. Fire-fighting measures

Flash point
- None

Flammable/Explosion limits
- Not flammable

Auto-ignition temperature
- Not applicable

Suitable extinguishing media
- Dry powder, carbon dioxide or water spray

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
- Strong oxidizing agent.
- 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
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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
Store in a dry, well-ventilated area 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>Bromochloro-5,5-</td>
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<td>Not determined</td>
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<tr>
<td>dimethylhydantoin</td>
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<td></td>
</tr>
<tr>
<td>32718-18-6</td>
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</tbody>
</table>

Manufacturer's 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 exposure limit.

Personal protective equipment:
- Respiratory protection: Approved respirator
- 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.
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9. Physical and chemical properties

Appearance: White to off-white tablet with faint halogenous odour
Melting point/range: Not applicable (decomposes)
Boiling point/range: Not applicable
Vapour pressure: 9.35x10^-3 Pa (25°C)
Vapor density: Not applicable under standard conditions
Evaporation rate (ether=1): Not applicable under standard conditions
Solubility:
  - Solubility in water: 0.22 mg/l at 25°C
  - Solubility in other solvents: Benzene: 2.5 g/100g at 25°C
Specific gravity: 1.8-2.0
Decomposition temperature: >160°C

10. Stability and reactivity

Stability: Stable under normal conditions
Materials to avoid: Oxidising agents, Bases, Combustible organic materials
Conditions to avoid: 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 (guinea pig): Sensitizer

Effects of overexposure:
  - Ocular: Corrosive
    May cause temporary or permanent eye damage.
  - Dermal: Exposure to wet skin may cause severe irritation.
  - Sensitization: Prolonged skin contact may cause sensitization
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- Inhalation
  Irritant to upper respiratory tract
  Shortness of breath, headache and nausea.

Chronic toxicity
Not available

Mutagenicity
Mutagenic by the Ames Test
Mutagenic in the mouse lymphoma L5178Y test system.
Non genotoxic in micronucleous test in mice
Non genotoxic in in-vivo liver unscheduled DNA synthesis (USD) assay

Carcinogenicity
Not known to be a carcinogen.
Not classified by IARC.
Not included in NTP 10th 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 (Mysid shrimp, Acute flow through)
  0.4 mg/l (Rainbow trout, Static)
  0.46 mg/l (Bluegill sunfish, Static)
  1.5 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

13. Disposal considerations

Waste disposal
Dispose of in approved landfill sites or an approved incinerator.
Observe all federal, state and local environmental regulations when disposing of this material. Avoid access to streams, lakes or ponds.

Disposal of Packaging
Crush and bury empty containers.
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14. Transportation information

UN No. 1479
IMO
Proper shipping name: Oxidizing solid, n.o.s
(Bromo, Chloro-5,5-Dimethyl-Hydantoin)
Class: 5.1 - Oxidizing substances
Label: OXIDIZING AGENT (5.1)
Marking: MARINE POLLUTANT
Packing Group: II

ADR/RID
Class: 5.1 - Oxidizing substances
Classification Code: O2
Label: OXIDIZING AGENT (5.1)
Packing group: II
Hazard identification No. 50

ICAO/IATA
Label: OXIDIZER (5.1)
Class: 5.1
Packing group: II

DOT
Proper shipping name: Oxidizing solid, n.o.s
(Bromo, Chloro-5,5-Dimethyl-Hydantoin)
Class: 5.1 - Oxidizing substances
Label: OXIDIZER (5.1)
Packing Group: II

15. Regulatory information

- EEC No. 251-171-5

- Indication of danger Corrosive (C) and Oxidizer (O) symbols required
  N - Dangerous For The Environment.

- R Phrases
  R 8: Contact with combustible material may cause fire.
  R 31: Contact with acids liberates toxic gas.
  R 34: Causes burns.
  R 22: Harmful if swallowed.
  R 43: May cause sensitization by skin contact.
  R 50: Very toxic to aquatic organisms.
16. Other information

This data sheet contains changes from the previous version in section(s)
2 (EU), 3, 4 (ANSI), 7, 8, 10, 11, 15

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.
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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
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CLEARON CORPORATION
95 MacCorkle Ave., S.W.
South Charleston, WV 25303
USA
Phone number (304) 746-3000

End of safety data sheet