1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product Identifier
Product Name XTRABROM® 111 Biocide; XTRABROM® T

Other means of identification
Formula C5H6Br2N2O2

Recommended use of the chemical and restrictions on use.
General function Water treatment chemical.
Uses advised against No information available

Details of the supplier of the safety data sheet
Company Albemarle Corporation
451 Florida Street
Baton Rouge, LA 70801

For Non-Emergency 800-535-3030
'Competent Body for SDS’ HSE@Albemarle.com
Emergency telephone number
Emergency Telephone Numbers +1-225-344-7147

2. HAZARDS IDENTIFICATION

<table>
<thead>
<tr>
<th>Classification</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Toxicity - Oral</td>
<td>Category 4</td>
</tr>
<tr>
<td>Skin Corrosion/irritation</td>
<td>Category 1 Sub-category B</td>
</tr>
<tr>
<td>Serious eye damage/eye irritation</td>
<td>Category 1</td>
</tr>
<tr>
<td>Acute aquatic toxicity</td>
<td>Category 1</td>
</tr>
<tr>
<td>Chronic aquatic toxicity</td>
<td>Category 1</td>
</tr>
<tr>
<td>Oxidizing solids</td>
<td>Category 2</td>
</tr>
</tbody>
</table>

Label elements

Emergency Overview

Danger

Hazard Statements
Harmful if swallowed
Causes severe skin burns and eye damage
Very toxic to aquatic life with long lasting effects
May intensify fire; oxidizer
Prevention
Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product
Do not breathe dust/fume/gas/mist/vapors/spray
Wear protective gloves/protective clothing/eye protection/face protection
Avoid release to the environment
Keep away from heat/sparks/open flames/hot surfaces. — No smoking
Keep/Store away from clothing/combustible materials
Take any precaution to avoid mixing with combustibles - . ?

Response
Immediately call a POISON CENTER or doctor/physician
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
Immediately call a POISON CENTER or doctor/physician
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
Wash contaminated clothing before reuse
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/physician
IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
Rinse mouth Do not induce vomiting
In case of fire: Use CO2, dry chemical, or foam for extinction
Collect spillage

Storage
Store locked up

Disposal
Dispose of contents/container to an approved waste disposal plant

Hazards not otherwise classified (HNOC)
Not applicable

Other Information

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Pure substance/mixture</th>
<th>Substance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component</td>
<td>CAS-No</td>
</tr>
<tr>
<td>1,3-Dibromo-5,5-dimethyl hydantoin</td>
<td>77-48-5</td>
</tr>
</tbody>
</table>

Note: The exact concentrations of the above listed chemicals are being withheld as a trade secret.

4. FIRST AID MEASURES

First aid measures
Eye contact
If in eyes, 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 advice.
Skin Contact
If on skin or clothing, take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.

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

Ingestion
If swallowed, Call a physician or Poison Control Center immediately. Have person sip a glass of water if able to swallow. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed

Symptoms
No information available.

Indication of any immediate medical attention and special treatment needed

Notes to Physician
Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Extinguishing media

Suitable extinguishing media
Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

Unsuitable Extinguishing Media
No information available.

Specific Hazards Arising from the Chemical

Combustion/explosion hazards
No information available.

Hazardous Combustion Products
Oxides of carbon. Bromine.

Explosion Data

Sensitivity to mechanical impact
None.

Sensitivity to static discharge
None.

Protective Equipment and Precautions for Firefighters

Toxic fumes may be present; use of respirator suggested.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal precautions
Avoid contact with skin, eyes and clothing. Avoid dust formation. Ensure adequate ventilation.

Environmental Precautions

Environmental precautions
Prevent further leakage or spillage if safe to do so.

Methods and material for containment and cleaning up

Methods for Containment
Prevent further leakage or spillage if safe to do so.

Methods for Cleaning up
Sweep up and shovel into suitable containers for disposal.

7. HANDLING AND STORAGE

Precautions for safe handling

Handling
Avoid contact with skin, eyes and clothing. Wear personal protective equipment. Avoid dust formation.

Conditions for safe storage, including any incompatibilities
Storage

Store in well-ventilated, cool (<120°F), dry area, away from heat or flame. Store in containers made of HDPE, LDPE, or PP. Do not store in metal or fiberboard containers. Close container when not in use.

Incompatible Materials

None known based on information supplied.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines

Appropriate engineering controls

Use only in well-ventilated areas.

Individual protection measures, such as personal protective equipment

Eye/face Protection

Chemical goggles. Face-shield.

Skin Protection

Protective Clothing / Tyvek or Equivalent Protective Apron.

Respiratory protection

NIOSH approved dust/mist respirator under dusty or irritating conditions.

General Hygiene Considerations

Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance

Solid

Color

White/Off-white

Odor

Halogen

Odor Threshold

No information available

Molecular Weight

286

pH

6.0 - 6.5 (1% slurry in pH 7 water)

Melting point/freezing point

> 190 °C / 374 - °F (Decomposes)

Boiling Point/Range

Not applicable.

Flash Point

Not applicable.

Evaporation Rate

No information available

Flammability (solid, gas)

No information available

Flammability Limit in Air

Upper flammability limit: No information available

Lower flammability limit: No information available

Vapor Pressure

No information available

Vapor Density

No information available

Relative density

No information available

Solubility(ies)

Water Solubility

~0.1%

Solubility in other solvents

No information available

Partition coefficient

No information available

Autoignition temperature

No information available

Decomposition temperature

No information available

Viscosity, kinematic

No information available

Dynamic viscosity

No information available

Explosive Properties

No information available

Oxidizing Properties

Oxidizer

10. STABILITY AND REACTIVITY

Reactivity Hazard

No data available
Stability

Stable.

Hazardous Reactions

No hazardous reaction expected under normal handling.

Hazardous Polymerization

None under normal processing.

Conditions to Avoid

Avoid extremely high heat and flame.

Materials to avoid

This product is a strong oxidizing and brominating agent. Avoid contact with reducing agents, acids, ammonia-containing products, organic materials (such as aldehydes and alcohols) and other oxidizing agents (such as calcium hypochlorite). Avoid contact with common metals such as aluminum, iron, copper, brass and steel. Contact with incompatible materials can promote the exothermic decomposition of the product.

Hazardous decomposition products

Carbon oxides. Bromine.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Inhalation

Harmful by inhalation.

Eye contact

Possible risk of irreversible effects.

Skin Contact

Causes burns.

Ingestion

Not expected to be acutely toxic.

Potential Health Effects

Acute Effects

Skin Corrosion/irritation

Causes burns.

Serious eye damage/eye irritation

Risk of serious damage to eyes.

Respiratory irritation:

Irritating to respiratory system

Sensitization

Not expected to be a sensitizer.

Chronic Effects

Mutagenic Effects

No information available.

Carcinogenicity

The table below indicates whether each agency has listed any ingredient as a carcinogen.

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>ACGIH Carcinogens</th>
<th>IARC</th>
<th>NTP</th>
<th>OSHA Carcinogens</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,3-Dibromo-5,5-dimethyl hydantoin</td>
<td>77-48-5</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Reproductive Effects

None known.

STOT - single exposure

No information available.

STOT - repeated exposure

No information available.

Chronic Effects

None known

Aspiration hazard

No information available.

Numerical measures of toxicity

<table>
<thead>
<tr>
<th>Product Information</th>
<th>ATEmix (oral)</th>
<th>ATEmix (dermal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The following values are calculated based on chapter 3.1 of the GHS document</td>
<td>448 mg/kg</td>
<td>2001 mg/kg</td>
</tr>
</tbody>
</table>
LD50 Oral: 448 mg/kg of body weight (rat) (Albino Sprague-Dawley)
LD50 Dermal: > 2,000 mg/kg of body weight (rat) (Albino Sprague-Dawley)

Component Information

<table>
<thead>
<tr>
<th>Component</th>
<th>Rat Oral LD50</th>
<th>Rabbit Dermal LD50</th>
<th>Rat Inhalation LC50</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,3-Dibromo-5,5-dimethyl hydantoin 77-48-5</td>
<td>448 mg/kg bw</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Other data
SKIN IRRITATION, Rabbit (albino New Zealand): Product is considered corrosive to the skin.

12. ECOLOGICAL INFORMATION

Ecotoxicity
Very toxic to aquatic life with long lasting effects
EC50/48h/Daphnia: 0.7 mg/L
EC50/48h/Rainbow Trout = 0.4 mg/L

<table>
<thead>
<tr>
<th>Component</th>
<th>Freshwater Algae EC50/72h</th>
<th>Freshwater Fish LC50/96h</th>
<th>Water Flea EC50/48h</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,3-Dibromo-5,5-dimethyl hydantoin (CAS #: 77-48-5)</td>
<td>-</td>
<td>-</td>
<td>0.7 mg/L</td>
</tr>
</tbody>
</table>

Persistence/Degradability No information available.
Bioaccumulation/Accumulation No information available.
Mobility in Environmental Media No information available.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods
Waste Disposal Method Dispose of as hazardous waste in compliance with local and national regulations.
Contaminated Packaging Dispose of by incineration in accordance with local/national regulations, in a chemically secured landfill.
14. TRANSPORT INFORMATION

DOT
- **Proper Shipping Name**: Oxidizing Solid, N.O.S. (1,3-Dibromo-5,5-dimethylhydantoin)
- **Hazard Class**: 5.1
- **UN No.**: 1479
- **Packing Group**: II
- **Marine Pollutant**: Y.
- **Description**: UN 1479, Oxidizing solid, N.O.S. (1,3-Dibromo-5,5-dimethyl hydantoin), 5.1, II

IMDG/IMO
- **IMO Class**: 5.1
- **Packing Group**: II
- **UN-No**: 1479
- **IMO Labelling and Marking**: 5.1 + Marine Pollutant Marking
- **Proper Shipping Name**: Oxidizing solid, N.O.S. (1,3-Dibromo-5,5-dimethyl hydantoin)
- **EmS**: F-A, S-Q
- **Marpol - Annex II**: Not applicable
- **Marpol - Annex III**: Unregulated
- **Transport Description**: UN 1479 Oxidizing solid, N.O.S. (1,3-Dibromo-5,5-dimethyl hydantoin), 5.1, II, Marine pollutant

IATA/ICAO
- **IATA/ICAO Class**: 5.1
- **Packing Group**: II
- **UN-1479**: 1479
- **IATA/ICAO Labelling/Marking**: 5.1 + ‘Environmentally hazardous substance’ mark
- **Passenger Aircraft**: Maximum net quantity per package: 5 kg
- **Cargo aircraft only**: Maximum net quantity per package: 25 kg
- **Proper shipping name**: Oxidizing solid, N.O.S. (1,3-Dibromo-5,5-dimethyl hydantoin)
- **Transport Description**: UN 1479, Oxidizing solid, N.O.S. (1,3-Dibromo-5,5-dimethyl hydantoin), 5.1, II

15. REGULATORY INFORMATION

<table>
<thead>
<tr>
<th>International Inventories</th>
<th>TSCA</th>
<th>DSL</th>
<th>NDSL</th>
<th>AICS</th>
<th>EINECS</th>
<th>ELINCS</th>
<th>ENCS</th>
<th>KECL</th>
<th>PICCS</th>
<th>IECSC</th>
<th>NZIoC</th>
</tr>
</thead>
<tbody>
<tr>
<td>XTRABROM® 111 Biocide; XTRABROM® T</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

TSCA Statement
THIS MATERIAL IS EXEMPT FROM THE TOXIC SUBSTANCES CONTROL ACT (15 USC 2601-2629)

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

SARA 311/312 Hazardous Categorization
- **Acute Health Hazard**: Yes
- **Chronic Health Hazard**: No
- **Fire Hazard**: No
- **Sudden Release of Pressure Hazard**: No
- **Reactive Hazard**: Yes

Reportable and Threshold Planning Quantities
This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material.

State Right-to-Know
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

**WHMIS Hazards**
- E Corrosive material
- D2B Toxic materials
- C Oxidizing materials

### 16. OTHER INFORMATION

<table>
<thead>
<tr>
<th>NFPA</th>
<th>Health</th>
<th>Flammability</th>
<th>Instability</th>
<th>Physical Hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HMIS</th>
<th>Health</th>
<th>Flammability</th>
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</thead>
<tbody>
<tr>
<td></td>
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<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

**Prepared By**
Health & Environment Department
Albemarle Corporation

FOR ADDITIONAL NONEMERGENCY PRODUCT INFORMATION, CONTACT:

HEALTH AND ENVIRONMENT DEPARTMENT
ALBEMARLE CORPORATION
451 FLORIDA ST.
BATON ROUGE, LA.  70801
(800) 535-3030

**Preparation Date:** 21-Mar-2012
**Revision Date:** 10-Mar-2015

**Disclaimer:**
The information contained herein is accurate to the best of our knowledge. The Company makes no warranty of any kind, express or implied, concerning the safe use of this material in your process or in combination with other substances.

*End of Safety Data Sheet*