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## PRODUCT STEWARDSHIP SUMMARY

CAS No. 77-48-5  
EINECS No. 201-030-9  
FORMULA No. C<sub>5</sub>H<sub>6</sub>Br<sub>2</sub>N<sub>2</sub>O<sub>2</sub>

# XtraBrom<sup>®</sup> 111 Biocide, XtraBrom<sup>®</sup> T, ALBROM<sup>®</sup> 100PC Disinfectant and ALBROM<sup>®</sup> 100PF Disinfectant DBDMH 1,3-dibromo-5,5-dimethylhydantoin

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### Introduction

Albemarle Corporation markets 1,3-dibromo-5,5-dimethylhydantoin (DBDMH) as a biocide for use in various recreational, commercial and industrial water treatment applications. DBDMH can also be used as a brominating agent in various manufacturing processes.

These products are used as fungicides, algicides, slimicides and microbiocides for industrial water applications. In addition, this chemistry is used to disinfect swimming pools, spas, hot tubs and to control microbial growth in fountains.

DBDMH is sold under the brand names XtraBrom<sup>®</sup> 111 Biocide, XtraBrom<sup>®</sup> T, ALBROM<sup>®</sup> 100PC Disinfectant and ALBROM<sup>®</sup> 100PF Disinfectant.

### Description and Properties

DBDMH is a white to off-white solid with

a mild halogen odor. This molecule has less halogen odor than chlorine based chemistries. The active ingredient in Albemarle's DBDMH-based products provides approximately 111% available bromine. These products are available in powder, nugget, and tablet forms.

DBDMH-based products have long shelf lives: at least three years at normal ambient conditions when properly stored in the original container and exposure to moisture is avoided.

This unique chlorine-free molecule undergoes hydrolysis to form two molecules of hypobromous acid (HOBr) and one molecule of dimethylhydantoin



(DMH). The oxidizing action of HOBr kills the bacteria. After undergoing chemical reduction during use, the HOBr converts to an inactive bromide ion (Br<sup>-</sup>). The DMH by-product remains in the water, serves no function and does not react further.

## Uses

DBDMH products are used in industrial water systems. Products in this line are registered with the US EPA for use in the following systems:

- commercial and industrial recirculating cooling water systems
- air and gas scrubber systems
- industrial once-through cooling water systems
- air washer systems
- pulp and paper mill systems
- brewery pasteurizers
- decorative fountains
- wastewater treatment systems.

DBDMH is cleared by the FDA for use as a slimicide in the manufacture of paper and paperboard that contact food (21 CFR 176.300).



Additionally, this line of products control biofilm deposits in pumps, pipework, heat exchangers and filters associated with industrial water treatment systems.

DBDMH products also effectively disinfect pool, spa and hot tub water.

## Health Information

DBDMH is corrosive and can cause irreversible eye damage and skin burns. It is harmful by inhalation and through skin absorption, and may be fatal if swallowed.

Neither OSHA nor ACGIH have established exposure limits for DBDMH.

## Exposure Potential

Avoid dusting conditions. Chemical goggles or safety glasses, protective clothing and rubber gloves that are resistant to chemical permeation are advisable to prevent contact with eyes, skin or clothing. Users should wash their hands thoroughly with soap and water after handling and before eating, drinking or using tobacco. Contaminated clothing should be removed and washed separately before reuse.

DBDMH should be used in a well-ventilated area while wearing appropriate personal protective equipment, including a NIOSH-approved dust/mist respirator under dusty or irritating conditions.



## Environmental Information

DBDMH is toxic to fish and aquatic organisms.

Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans or public waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System permit and the permitting authority has been notified in writing before discharge.

Do not discharge effluent containing this product into sewer systems without previously notifying the sewage treatment plant authority. For guidance, please contact your state water board or regional office of the United States Environmental Protection Agency (EPA).

Wear appropriate protective clothing and use clean equipment to sweep up spilled material and place it in a clean, dry container for disposal. Wash the spill area with copious amounts of water.

Dispose of in a safe manner in accordance with local and national regulations.

## Physical and Chemical Hazards

DBDMH is a stable solid product. All products should be stored in a dry, well-ventilated area.



DBDMH is a strong oxidizing and brominating agent. It should not come into contact with reducing agents, acids, ammonia-containing products, organic materials such as aldehydes and alcohols, other oxidizing agents such as calcium hypochlorite, and common metals such as aluminum, iron, copper, brass and steel. Contact with incompatible materials may promote the exothermic decomposition of DBDMH, possibly leading to the release of carbon oxides and bromine.

DBDMH can be stored in high-density polyethylene (HDPE), low-density polyethylene (LDPE) and polypropylene (PP) containers. It is likely to be compatible with Teflon®, polyvinyl chloride (PVC), Viton®, Kynar®, chlorobutyl rubber and Hypalon®.

In its neat form, DBDMH is incompatible with nylon. This product should not be stored in metal or in fiberboard containers.



### Regulatory Information

DBDMH powder complies with the Toxic Substances Control Act, 1976 although the products ALBROM and XtraBrom®

are exempt from the act. The Emergency Planning and Community Right-to-Know Act (also known as SARA Title III or EPCRA) classifies DBDMH as an acute health hazard and a reactive hazard.

DBDMH products do not contain any chemicals that are subject to the reporting requirements of the act and Title 40 of the Code of Federal Regulations, Part 372. No ingredients have reportable quantities or threshold planning quantities under SARA or the Comprehensive Environmental Response, Compensation, and Liability Act. No components are subject to “right-to-know” legislation in the following states: California, Massachusetts, New Jersey and Pennsylvania.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the material safety data sheet contains all the information required by the CPR.

EPA registrations:

- XtraBrom® 111 Biocide and XtraBrom® T: U.S. EPA Pesticide Registration number: 3377-62
- ALBROM® 100PC Disinfectant and ALBROM® 100PF Disinfectant: U.S. EPA registration number: 3377-61



- XtraBrom® 111 Biocide, XtraBrom® T and ALBROM® 100PC Disinfectant are registered with California Department of Pesticide Regulation (CDPR).

DBDMH has been pre-registered under the European Community Regulation “REACH”.

### Product Stewardship

Albemarle Corporation is committed to managing all DBDMH products so that its customers can use them safely. Our relationships with our customers encourage communication about safety and environmental stewardship, and we work with them to minimize the risks of personnel exposure and spills.

Albemarle is staffed and organized to investigate and provide advice regarding appropriate corrective actions if such incidents should occur.

### Conclusion

XtraBrom® 111 Biocide, XtraBrom® T, ALBROM® 100PF and ALBROM® 100PC are well-established and environmentally sound products that offer customers a range of benefits through a range of water treatment applications.

## Note

This document provides general information about DBDMH and its trade names XtraBrom® and ALBROM®. It does not supplant or replace required regulatory and/or legal communication documents, nor is it intended to provide an in-depth discussion of health and safety information. Always consult the product's material safety data sheet, product label and technical data sheet before using it.

## References

**1,3-Dibromo-5,5-Dimethylhydantoin,  
Material Safety Data Sheet**  
Albemarle Corporation, March 21, 2012

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Albemarle Corporation is a member of the American Chemistry Council and, through ACC's participation with the International Council of Chemical Associations (ICCA), has prepared this document to improve product stewardship within the chemical industry and with suppliers and customers.

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