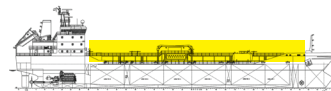


BROMINE TABLETS



AQUABROME: STRONG, EFFECTIVE DISINFECTANT FOR THE WATER TREATMENT OF SWIMMING POOLS, SPECIALLY INDICATED FOR JACUZZI POOL WATER TREATMENT

PHYSICAL DATA

Appearance: Solid 20 grs. tablets
Colour: White
pH (saturated solution): 4,8
Solubility: (25° C.) 0,15 grs./100 c.c. water
Available bromine content: 61%
Available chlorine content: 26%

WHY BROMINE SHOULD BE USED FOR HOT TUBS, SPAS AND JACUZZI BATHS

BROMINE, like the CHLORINE is an halogen that is very efficient for the disinfection of the swimming pool water, hot tubs and Jacuzzis. It is very efficient against bacteria, virus, fungi and organic particles in water through the oxidation. BROMINE TABLETS are normally composed of BROMINE for 70% and CHLORINE for 30% so combining the good disinfection qualities of both chemical. While the BROMINE acts like a disinfectant, the CHLORINE acts like an oxidiser and re-activates the bromine already consumed. Moreover the BROMINE is also a strong antifoulant and more than the CHLORINE stops the growth of algae in the water.

BROMINE IS A POWERFUL VIROCID AND BACTERIOCIDE, but another good quality of BROMINE is its superior tolerance to the pH of the water and this quality is really valuable with the JACUZZI BUBBLE BATHS. There is no way to correct the water for the pH, when using CHLORINE. The pH in this case must be kept between 7.2 to 7.6 and when Jacuzzi Baths are overcrowded, are nearly impossible to be maintained inspite of very frequent adjustment to keep the correct pH.

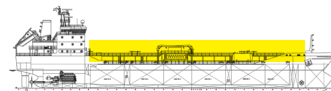
This is not necessary, using BROMINE, because for above normal pH level, around 7.8, we still have the 87% of disinfectant power of bromine available. If we compare this with CHLORINE where for a pH of 7.8 the available disinfectant power is only 33%, the difference in efficiency between BROMINE and CHLORINE is very significant.

We also should consider that the TABLETS of BROMINE do not affect the pH of water and therefore can be considered neutral. BROMINE TABLETS, furthermore do not cause irritation to the skin, as does chlorine, decoloration of hair etc. They are slow dissolving tablets and can be easily used in the brominator tank feeder. BROMINE is stable under warm conditions, CHLORINE IS NOT, it disappears quickly. The difference between the two Chemicals is in the price, BROMINE costs more and the technology is often not very well known. But the difference in price is recovered by the superior efficiency of BROMINE compared to CHLORINE. UNIservice has this technology and it is available for any further clarification.

ANALYZER AND RECORDERS installed by UNIservice can be used also as a BROMINATOR ANALYSER but we should keep in mind that the BROMINE LEVELS must be kept higher than CHLORINE LEVELS between 3 PPM and 5 PPM range. Other attention must be kept when BROMINE LEVEL drops down to 1.0 PPM. In this case a SHOCK treatment with CHLORINE is advisable bringing the PPM level up to 8. In conclusion, BROMINE IS THE IDEAL SANITIZER TO USE IN JACUZZIS WHERE THE BATHING LOAD IS GENERALLY HIGHER THAN IN A POOL.

Contact UNIservice for any further clarification on the matter.

BROMINE TABLETS



COMPOSITION

Active ingredients (per 1.000 grs.): Bromine - Chlorine - Dimethylhydantoin.

CHARACTERISTICS

BROMINE TABLETS is an effective disinfectant against bacteria, algae and fungi; its disinfecting capacity does not depend on pH as long as it is between 7 and 8. Its high oxidising power allows it to destroy all organic material present in the water. The combination of bromine with organic amines results in compounds called bromamines (NHBr), which unlike chloramines (the combination of chlorine with organic amines) do not diminish the disinfectant efficiency of the bromine. The bromamines do not produce eye irritation or unpleasant smell.

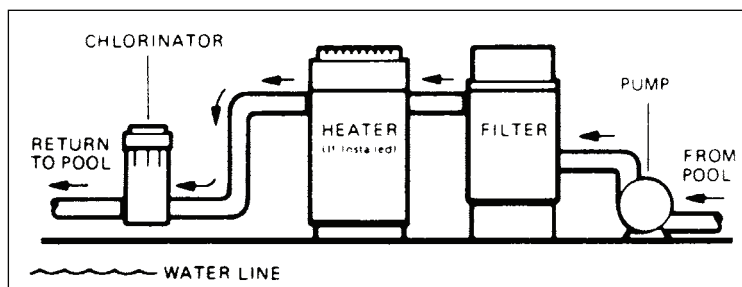
Therefore BROMINE TABLETS is an ideal product for heating water in spas and indoor swimming-pools. The dosage system, using the bromine tablets dispenser, provides the correct level of disinfectant; so that the swimmers are protected and excessive use of the product is avoided.

REACTION OF BROMINE TABLETS IN WATER

The reaction of BROMINE TABLETS in the water is as follows: BROMINE TABLETS + water = DMH + hypochlorous acid + hypobromous acid. When Bromine Tablets dissolves in water hypochlorous acid and hypobromous acid are formed. Hypobromous acid destroys bacteria, algae and fungae and transforms into bromide ion. Thus the disinfecting agent resulting from the reaction al BROMINE

AUTOMATIC ON LINE CHLORINATOR/BROMINATOR AND ONLINE INSTALLATION

NOTE: Never install chlorine feeder directly into copper plumbing as pipe damage may occur. If you have brass or bronze backwash valves, or other sensitive metallic components, consult your dealer for recommendations for your particular system.



DOSAGE AND INSTRUCTIONS FOR USE

Once the pH of the water has been balanced between 7,2 and 7,6 fill the dosing apparatus (Brominator) with BROMINE TABLETS; regulate the dosing apparatus to obtain the desired level of Residual Bromine. See table.

TYPE OF SWIMMING JACUZZI POOL	RECOMMENDED BROMINE LEVEL
Private	1,0 - 3,0 ppm
Private spa	2,0 - 4,0 ppm
Public	3,0 - 5,0 ppm
Public spa	4,0 - 6,0 ppm

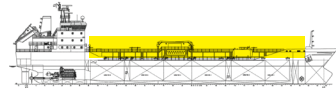
These amounts can be measured easily with a bromine and pH test kit see Buletin 7/30.

PRESENTATION: In 3 or 5 Kgs. drums.

SAFETY MEASURES

- Keep the container sealed, in a dry place away from heat and out of the reach of children.
- Should the product be swallowed or brought into contact with the eyes, consult a doctor immediately. Do not mix with other chemical products. IN CASE OF AN ACCIDENT OR DISCOMFORT CONSULT A DOCTOR IMMEDIATELY (showing him the label if possible).

BROMINE TABLETS



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MSDS Document

Product BROMINE TABLETS

1. Chemical Product and Company Identification

Trade Name of this Product **BROMINE TABLETS**

MSDS ID **MSDS2388**

Manufacturer

Haviland Consumer Products, Inc.
421 Ann Street N.W.
Grand Rapids, MI 49504

Phone Number

(616) 361-6691

Emergency Phone

CHEMTREC (800) 424-9300

CHEMTREC International (703) 527-3887

Revision Date 4/28/2008

Health:	2
Fire:	1
Reactivity:	1
Specific	

2. Composition and Information on Ingredients

Ingredient	CAS Number	Weight %	ACGIH TLV	PEL	STEL
Bromochloro-5,5-dimethylhydantoin	32718-18-6	98 %	Not Established	Not Established	

3. Hazard Identification

Emergency Overview

Corrosive and Strong Oxidizer. Causes irreversible eye damage and skin burns. Eye contact may cause loss of vision. Irritating to nose and throat. May be fatal if inhaled. Harmful if absorbed through skin or swallowed.

Health Effects

Eye contact may cause severe irritation. Corneal burns on prolonged contact with dust or concentrated suspension. Prolonged skin contact may cause reddening and superficial necrosis. Burns may be severe if skin is wet or damp. Inhalation irritates mucous membranes. Dust will burn respiratory tissues severely. Ingestion will burn digestive tract tissues severely.

Carcinogenicity

None of the components present in this material are listed by IARC or NTP as a carcinogen.

Reproductive Effects

None known

Routes of Entry

Inhalation, Ingestion, Skin or Eye Contact

4. First Aid Information

Ingestion

Call a physician immediately. Do not induce vomiting. Dilute by drinking water or milk. Never give anything by mouth to an unconscious person.

Skin Contact

Flush with plenty of water for at least 15 minutes while removing contaminated clothing. Wash material off with soap and water. Get medical attention.

Inhalation

Remove to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

Eye Contact

Flush immediately with plenty of water for at least 15 minutes, get medical attention.

5. Fire Fighting Measures

Flash Point N/A

Extinguishing Media

Use water only. Do not use dry chemicals, carbon dioxide, or foam.

Special Fire Fighting Procedures

Fire fighters and subjected personnel should wear full protective clothing and self-contained breathing apparatus. Hydrogen bromide or bromine may be released in fires. Dense black smoke upon burning.

Unusual Fire Hazard

Oxidizing material. Forms explosive mixtures with combustible, organic or other easily oxidizable materials. Combustion generates toxic fumes of hydrogen bromide, bromine gas, nitrogen oxides and hydrogen chloride.

6. Accidental Release Measures

Spill and Leak Procedures

Use protective goggles with side-shield, dust respirator and rubber gloves. Prevent dusting either shovel/sweep into clean, intact packaging for possible re-use or hose down concentrated spills. Keep away from surface water and ground contact. Toxic to fish and aquatic organisms.

7. Handling and Storage

Handling Procedures

Do not breathe dust or spray mist. Do not get in eyes, on skin, or on clothing. Wear goggles with side shields, face shield or safety glasses; protective clothing and rubber gloves. Wear a MSHA/NIOSH mask or pesticide respirator. Wash thoroughly with soap and water after handling.

Storage Procedures

Handle containers with care and keep them well closed. Containers retain product residue. Store in dark, well-ventilated, cool, dry location away from energy sources and incompatible materials. Store away from foodstuffs.

8. Exposure Controls and Personal Protection

Engineering Controls

Use local exhaust ventilation with a minimum capture velocity of 150 ft./min. at the point of dust or mist evolution.

Eye Protection

Chemical safety goggles

Protective Gloves

Rubber or other impervious materials.

Respiratory Protection

If ventilation is not sufficient to effectively prevent buildup of dust, appropriate NIOSH/MSHA respiratory protection must be provided.

Other Protective Equipment

Wear appropriate clothing to prevent skin exposure. A safety shower and eye bath should be available.

9. Physical and Chemical Properties

Physical State	Solid
Color/Appearance	White tablets
Odor	Halogen odor
pH	4.0 (0.1% soln in DI water)
Boiling/Cond. Point	Undetermined
Melting/Freezing Point	Undetermined
Solubility	0.2 g/100ml at 25°C
Vapor Density	Not Applicable
Vapor Pressure	Not Applicable

10. Stability and Reactivity

Chemical Stability

Stable under normal conditions

Conditions to Avoid

Mixing with anything but water. Heating above 160°C.

Incompatible Materials

Paints, petroleum and organic chemicals, oxidizing agents, and bases.

Hazardous Decomposition Products

Bromine and chlorine containing gases, hydrogen bromide and hydrogen chloride.

Hazardous Polymerization

Will not occur.

11. Toxicological Information**ACUTE TOXICITY:**

LD / LC50 values that are relevant for classification:

Oral: LD50: 468 mg/kg (rat)

Dermal: LD50: > 2000 mg/kg (rabbit)

PRIMARY IRRITANT EFFECT:

On the skin: Caustic effect of burns on skin and mucous membranes.

On the eye: Strong irreversible caustic effect.

SENSITIZATION:

Intensive exposure may cause allergic reactions in certain sensitive individuals.

ADDITIONAL TOXICOLOGICAL INFORMATION:

Swallowing will lead to a strong caustic effect on mouth and throat and to the danger of perforation of esophagus and stomach.

Study results from a material similar to that represented by this MSDS.

12. Ecological Information**GENERAL NOTES:**

This product is toxic to fish and aquatic organisms. Do not allow product to reach ground water, water course or sewage system, even in small quantities. Do not discharge effluent containing this product into lakes, streams, ponds or estuaries, oceans, or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA.

13. Disposal Considerations**Waste Disposal**

Observe all federal, state and local regulations. Dispose in approved landfill sites or an approved incinerator. Triple rinse the container then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill or incinerate.

14. Transportation Information**DOT Shipping Name**

Oxidizing solid, n.o.s. (Bromochloro-5, 5-dimethylhydantoin)

Hazard Class

5.1, Oxidizer

UN Number

UN1479

Packing Group

PG II

NOTE: Oxidizers in Packing Group II in inner packagings not over 1.0 L (0.3 gallon) for liquids or 1.0 kg (2.2 pounds) for solids, packed in strong outer packagings, may be renamed "Consumer Commodity" and reclassified as ORM-D material. Total package may not exceed 30 kg (66 pounds) gross weight.

15. Regulatory Information

TSCA

Hazardous Component(s) subject to reporting on the TSCA List.

16. Other Information

EPA Reg. No. 57787-32

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