PRECAUTIONARY STATEMENTS:

HAZARDS TO HUMANS and DOMESTIC ANIMALS

DANGER Corrosive. Causes irreversible eye damage and skin burns. Do not get in eyes or on clothing. Wear protective eyewear (goggles or face shield) clothing and gloves. Harmful if swallowed, or absorbed through the skin. (Avoid breathing vapor or spray mist) Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash clothing before reuse.

ENVIRONMENTAL HAZARDS

This pesticide 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 (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product into seer systems without previously notifying the sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA Apply this pesticide only as specified on the label

PHYSICAL AND CHEMICAL HAZARDS

STABROM PLUS BIOCIDE is not flammable. Avoid contact with alcohols, aldehydes, strong reducing agents, strong oxidizers, acids, and ammonia containing products. Avoid contact with metals such as steel, aluminum, iron and copper. Use of incompatible materials can promote the exothermic decomposition of this product. In extreme cases, this could result in vigorous gas formation and over-pressurization of storage containers.

DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

When used as directed, Stabrom PLUS Biocide effectively controls bacteria, fungi, algae and slime in commercial and industrial water systems. STABROM PLUS BIOCIDE can also be used to control biofilm deposits from pumps, pipework, heat exchanger, and filters associated with industrial water treatment systems.

STABROM PLUS BIOCIDE may be added at system inlet water or other locations in the system at a point of uniform mixing where the treated water will be circulated or mixed throughout the system. Badly fouled systems should be cleaned before treatment begins. The product may be applied to the system either continuously or intermittently (slug does) or as needed to obtain the recommended total bromine level. The frequency of feeding and dosage rate will depend upon the severity of the problem.

INITIAL DOSES When the system is noticeably fouled, apply sufficient STABROM PLUS BIOCIDE to achieve a total bromine level of 4 10 ppm or as needed to maintain control. Apply 3 fluid ounces to 1000 gallons of water yields a maximum of 6.2 ppm of total bromine.

SUBSEQUENT DOSES: When microbial control is evident, apply sufficient STABROM PLUS BIOCIDE to achieve a total bromine level of 4 10 ppm or as needed to maintain control.

Treatment levels of STABROM PLUS BIOCIDE can be best be measured with test kits for either bromine or chlorine. Tests should be made immediately after drawing water samples from the system. Use test kits according to diretions. When a bromine test kit is used, results can be read directly as ppm bromine. When a chlorine test kit is used, results can be expressed in terms of bromine by multiplying chlorine values by the conversion factor of 2.25.

RECIRCULATING COOLING AND PROCESS WATER SYSTEM

When used as directed Stabrom PLUS Biocide effectively controls bacteria, fungi, algae and slimes in commercial and industrial cooling towers., heat exchange water towers, evaporative condensers, utility plant cooling systems, industrial water scrubbing systems, and influent systems such as flow through filters, lagoons, etc. influent systems such as flow through filters, lagoons, etc.

HEAT TRANSFER SYSTEMS

For control of bacteria and fungi in heat transfer systems such as hydrostatic sterilizers and retorts, pasteurizers and warmers and batch and continuous cookers.

Not for use in heat transfer systems in the State of California

AIR WASHERS AND INDUSTRIAL SCRUBBING SYSTEMS

Use only in industrial air washer systems that have mist-eliminating components. For control of microorganisms in industrial air washer or scrubbing systems add

STABROM® PLUS BIOCIDE

FOR USE AS A FUNGICIDE, ALGICIDE, SLIMICIDE AND MICROBIOCIDE IN
RECIRCULATING COOLING AND PROCESS WATER SYSTEMS.
HEAT TRANSFER SYSTEMS.
AIR WASHERS AND INDUSTRIAL SCRUBBING SYSTEMS,
CONTAINERIZED PONDS AND DECORATIVE FOUNTAINS,
INDUSTRIAL ONCE-THROUGH COOLING WATER SYSTEMS,
PULP AND PAPER MILLS,
WASTE WATER SYSTEMS

CONTROLS BIOFILM DEPOSITS FROM PUMPS, PIPEWORK, HEAT EXCHANGERS AND FILTERS ASSOCIATED WITH INDUSTRIAL WATER TREATMENT SYSTEMS.

ACTIVE INGREDIENT

Bromine Chloride……..……...13.2%

OTHER INGREDIENTS……86.8%

TOTAL……...100.0%

Total Available bromine = approximately 18%
(expressed as chlorine = approximately 8%)

KEEP OUT OF REACH OF CHILDREN

DANGER

FIRST AID

Have the product or label with you when calling a poison control center or doctor, or going for treatment.

If swallowed: Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give anything by mouth to an unconscious person.

IF ON SKIN: Take off contaminate clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.

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.

NOTE TO PHYSICIAN: Probable mucosal damage may contraindicate the use of gastric lavage.

SEE SIDE PANEL FOR ADDITIONAL PRECAUTIONARY STATEMENTS.

ALBEMARLE® CORPORATION

451 FLORIDA STREET
BATON ROUGE LA 70801

In case of emergency endangering life or property involving this product call collect 225-344-7147

EPA REG No. 3377-78
EPA EST. 3377-AR-1

Net Contents:_____

DIRECTIONS FOR USE (CONT.)

Sufficient STABROM PLUS BIOCIDE to the air washer sump or shill water. The STABROM PLUS BIOCIDE should be applied to achieve a total bromine level of 4 10 ppm or as needed to maintain control. Sampling of the treated systems should be at the bleed-off point and total bromine residuals determined with an appropriate test kit.

Not for use in air washers and industrial scrubbing systems in the State of California.

CONTAINERIZED PONDS AND DECORATIVE FOUNTAINS

STABROM PLUS BIOCIDE may be applied at the pond or fountain inlet or at a location that permits complete diffusion into the water at maximum retention time before reaching the outlet. Sufficient STABROM PLUS BIOCIDE should be fed to maintain a total bromine level of 4 10 ppm in all parts of the pond or fountain areas to maintain control.

INDUSTRIAL ONCE-THROUGH COOLING WATER SYSTEMS

When used as directed, ,STABROM PLUS BIOCIDE effectively controls bacteria, fungi, algae and slime in once-through and closed cycle fresh and sea water cooling systems. Apply STABROM PLUS BIOCIDE to the system inlet water or before any other contaminated area in the system.

PULP AND PAPER MILLS.

When used as directed, STABROM PLUS BIOCIDE effectively controls algae, bacterial, and fungal slime in pulp and paper mill fresh and sea water influent water systems, cooling water systems, wastewater treatment systems, and non potable water systems, nonpotable water systems, whitewater systems and other process water. The product may be applied to the system either continuously or intermittently (slug dose) or as needed to obtain the recommended total bromine level.

Advisory Statement: This product can not be used in paper mills and pulp manufacturing sites where food packaging materials are produced.

DOSAGE RATES. Add sufficient STABROM PLUS BIOCIDE o achieve a residual bromine levels of 4-10 ppm or as needed to maintain control of the system.

Feed STABROM PLUS BIOCIDE directly into the water to be treated. Be sure rapid mixing of the treated water, and STABROM PLUS BIOCIDE is achieved. Pump manufacturers can recommend the appropriate materials of construction and capacity for a pump to feed STABROM PLUS BIOCIDE.

Not for use in pump and paper mills in the State of California.

WASTEWATER SYSTEMS

When used as directed, STABROM PLUS BIOCIDE controls microorganisms in wastewater systems. The quantity of STABROM PLUS BIOCIDE required varies with the degree of fouling. Add sufficient STABROM PLUS BIOCIDE TO achieve residual bromine levels of 3 10 ppm, or as needed to maintain control , when measured approximately 5 minutes after treatment. Applying 3 fluid ounces to dosages may be necessary depending upon the system. The product may be applied to the system either continuously or intermittently (slug dose) or as needed to obtain the recommended total bromine level.

Depending on the construction of the wastewater system, STABROM PLUS BIOCIDE may be effectively added to one or more different locations in the system. Frequently the compound is added to wastewater receiving secondary treatment at a contact tank preceding the effluent discharge or at the influent of the final clarifier.

Not for use in wastewater in the State of California.

STORAGE AND DISPOSAL

STORAGE**:** Do not contaminate water, food, or feed by storage, disposal or cleaning of equipment.

PESTICIDE DISPOSAL: Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture or rinsate is a violation of Federal Law. If these wastes cannot be disposed of by use according to label instruction, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

CONTAINER DISPOSAL: [5 gallon-55 gallon plastic] Triple rinse (or equivalent) Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or incarnation, or, if allowed by state and local authorities, by burning. If burned stay out of smoke.

[Totes] Verify that the tote is empty. Do not rinse or clean. Seal tote and contact appropriate vendor for tote pickup.

[Railcars and trailers] Do not rinse or clean the railcar or trailer after unloading the contents. Release the trailer or railcar for return to Albemarle Corporation.

ALBEMARLE®

SAFETY DATA SHEET

STABROM® Plus Biocide

Preparation Date : 24-Apr-2015 **Revision Date:** 22-Feb-2016 **Revision Number:** 2.01

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

Product Identifier
Product Name STABROM® Plus Biocide

Other means of identification
Chemical Family Stabilized bromine biocide, aqueous solution
CAS-No Mixture

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

Classification

Acute toxicity - Inhalation (Dusts/Mists)	Category 4
Skin Corrosion/irritation	Category 1
Serious eye damage/eye irritation	Category 1
Acute aquatic toxicity	Category 2
Corrosive to Metals	Category 1

Label elements

Emergency Overview

Danger

Hazard Statements
Harmful if inhaled
Causes severe skin burns and eye damage
Toxic to aquatic life
May be corrosive to metals

Physical state Liquid **Color** Yellow Orange. **Odor** Mild.

Prevention
Use only outdoors or in a well-ventilated area
Do not breathe dust/fume/gas/mist/vapors/spray
Wash face, hands and any exposed skin thoroughly after handling
Wear protective gloves/protective clothing/eye protection/face protection
Avoid release to the environment
Keep only in original container

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 Call a POISON CENTER or doctor/physician if you feel unwell IF INHALED: Remove person to fresh air and keep comfortable for breathing Immediately call a POISON CENTER or doctor/physician
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting
Absorb spillage to prevent material damage

Storage
Store locked up
Store in corrosive resistant aluminum container with a resistant inner liner

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

Component	CAS-No	Weight %
Stabilized Bromine Chloride	Proprietary.	18-22
Sodium hydroxide	1310-73-2	<15

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 Move to fresh air.

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. Probable mucosal damage may contraindicate the use of gastric lavage.

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 Probable mucosal damage may contraindicate the use of gastric lavage.

5. FIRE-FIGHTING MEASURES

Extinguishing media
Suitable extinguishing media Not required.

Unsuitable Extinguishing Media No information available.

Specific Hazards Arising from the Chemical
Combustion/explosion hazards No information available.

Hazardous Combustion Products Bromine. Chlorine.

Explosion Data
Sensitivity to mechanical impact None.

Sensitivity to static discharge None.

Protective Equipment and Precautions for Firefighters
In the event of fire and/or explosion do not breathe fumes.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures
Personal precautions Ensure adequate ventilation.

Environmental Precautions
Environmental precautions Contain any spill with dikes or absorbents to prevent migration and entry into sewers or streams. Large spills should be collected mechanically (remove by pumping) for disposal. May require excavation of contaminated soil. Take up small spills by first diluting with water and then using a dehalogenating agent such as sodium thiosulfate solution.

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 Soak up with inert absorbent material (e.g. sand, silica gel, universal binder, sawdust)

7. HANDLING AND STORAGE

Precautions for safe handling
Handling Avoid contact with skin, eyes and clothing.

Conditions for safe storage, including any incompatibilities

Storage Avoid freezing, excessive heat or exposure to light, especially direct sunlight. If heating is necessary to prevent freezing, care must be taken to prevent overheating. Precautions should be taken to ensure that the average product temperature is maintained below 43 °C. Temperature monitoring is recommended. At elevated temperatures, self-heating can lead to vigorous gas generation and over-pressurization of storage containers if appropriate controls are not in place. Avoid exposure of this product to incompatible materials/chemicals (see Stability and Reactivity section). Use of incompatible materials can promote the exothermic decomposition of the product. In extreme cases, this could result in vigorous gas formation and over-pressurization of the storage container. STORAGE CONTAINER: Vented and opaque containers: As the product ages, activity is gradually lost and pressure can build-up in the headspace (nitrogen); therefore, the product should be stored in vented containers. Product should also be stored in opaque containers to prevent exposure to light. To maximize product shelf life, store the product in an opaque container, in a cool, dry, well-ventilated area.

Incompatible Materials None known based on information supplied.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines .

Component	CAS-No	ACGIH TLV (TWA)	OSHA PEL (TWA)	NIOSH IDLH
Stabilized Bromine Chloride	-	-	-	-
Sodium hydroxide	1310-73-2	Ceiling: 2 mg/m³	TWA: 2 mg/m³ (vacated) Ceiling: 2 mg/m³	IDLH: 10 mg/m³ Ceiling: 2 mg/m³

Other information Wear suitable protective clothing.

Appropriate engineering controls

Engineering Controls Use only in well-ventilated areas.

Individual protection measures, such as personal protective equipment

Eye/face Protection Chemical goggles or face shield with safety glasses.

Skin Protection Wear protective gloves/clothing.

Hand protection Gloves resistant to chemical permeation.

Respiratory protection None under normal 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

Physical state Liquid
Color Yellow Orange.
Odor Mild.
Odor Threshold No information available

Molecular Weight No information available
pH 12.4 - 14.0 (min.)
Melting point/freezing point ~ 2 °C / 36 °F
Boiling Point/Range ~ 106 °C / 223 °F
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	~15 mm Hg (23°C)
Vapor Density	No data available
Density	1.35 - 1.45 (25°C)
Solubility(ies)	
Water Solubility	Miscible.
Solubility in other solvents	No information available
Partition coefficient :	
Autoignition temperature	No information available
Decomposition temperature	No information available
Viscosity, kinematic	~4 cSt (25°C)
Dynamic viscosity	~5.5 cSt (25°C)
Explosive Properties	No information available
Oxidizing Properties	None

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 Protect from light. Extremes of temperature and direct sunlight. Keep away from heat. Freezing.

Materials to avoid This product is strongly basic and an oxidizing agent. Avoid contact with alcohols, aldehydes, strong reducing agents, strong oxidizers, acids, ammonia-containing products, and common metals such as steel, aluminum, iron and copper. Use of incompatible materials can promote the exothermic decomposition of the product.

Hazardous decomposition products None known based on information supplied.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Inhalation Not an expected route of exposure.

Eye contact Causes burns.

Skin Contact Causes burns.

Ingestion Harmful if swallowed.

Potential Health Effects

Acute Effects

Skin Corrosion/irritation Causes burns.

Serious eye damage/eye irritation Causes eye burns.

Respiratory irritation : Not irritating.

Sensitization Not sensitizing.

STOT - single exposure No information available.

Chronic Effects

Mutagenic Effects No information available.

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

Component	CAS-No	ACGIH Carcinogens	IARC	NTP	OSHA Carcinogens
Stabilized Bromine Chloride	-	-	-	-	-
Sodium hydroxide	1310-73-2	-	-	-	-

Reproductive Effects None known.

STOT - repeated exposure No information available.

Chronic Effects None known.

Aspiration hazard No information available.

Numerical measures of toxicity

Product Information No information available

The following values are calculated based on chapter 3.1 of the GHS document .

ATEmix (oral) 43590 mg/kg

ATEmix (dermal) 25654 mg/kg

ATEmix (inhalation-dust/mist) 3.8 mg/L

LD50 Oral: Rat Oral LD50: 2491 mg/kg

LD50 Dermal: Rat Dermal LD50: > 2000 mg/kg

Inhalation LC50 Rat Inhalation LC50: > 20.37 (rat)

Component Information No information available

Component	Rat Oral LD50:	Rabbit Dermal LD50:	Rat Dermal LD50 :	Rat Inhalation LC50:
Sodium hydroxide 1310-73-2	-	1350 mg/kg		-

12. ECOLOGICAL INFORMATION

Ecotoxicity

Harmful to aquatic life with long lasting effects Toxic to aquatic life

Component	Freshwater Algae EC50/72h :	Freshwater Fish LC50/96h :	Water Flea EC50/48h :
Sodium hydroxide (CAS #: 1310-73-2)	-	189 mg/L	-

Persistence/Degradability No information available.

Bioaccumulation/ Accumulation No information available.

Mobility in Environmental Media No information available.

Other adverse effects No information available

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Waste Disposal Method Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated Packaging Do not reuse container.

14. TRANSPORT INFORMATION

DOT

Proper Shipping Name	CORROSIVE LIQUIDS, BASIC, INORGANIC, N.O.S. (HALOGENATED COMPLEX, SODIUM HYDROXIDE)
Hazard Class	8
UN No.	3266
Packing Group	III
Description	UN 3266 Corrosive liquid, Basic, Inorganic, N.O.S. (Halogenated complex, Sodium hydroxide), 8, III

IMDG/IMO

IMO Class	8
Packing Group	III
UN-No	3266
IMO Labelling and Marking	8
Proper Shipping Name	Corrosive liquid, Basic, Inorganic, N.O.S. (Halogenated complex, Sodium hydroxide)
EmS	F-A, S-B
Marpol - Annex II	Not determined
Marpol - Annex III	Unregulated
Transport Description	UN 3266 Corrosive liquid, Basic, Inorganic, N.O.S. (Halogenated complex, Sodium hydroxide), 8, III

IATA/ICAO

IATA/ICAO Class	8
Packing Group	III
UN-No	3266
IATA/ICAO Labelling/Marking	8
Passenger Aircraft	Forbidden (Product is shipped in containers with vented caps)
Cargo aircraft only	Forbidden (Product is shipped in containers with vented caps)
Proper shipping name	Corrosive liquid, Basic, Inorganic, N.O.S. (Halogenated complex, Sodium hydroxide)
Transport Description	UN 3266 Corrosive liquid, Basic, Inorganic, N.O.S. (Halogenated complex, Sodium hydroxide), 8, III

15. REGULATORY INFORMATION

International Inventories	TSCA	DSL	NDSL	AICS	EINECS	ENCS	KECL	PICCS	IECSC	NZIoC	TCSI
STABROM® Plus Biocide	-	-	-	X	-	-	X	X	X	X	-

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	No

Reportable and Threshold Planning Quantities

The following components have RQs and/or TPQs under SARA and/or CERCLA

Component	CERCLA RQ, lbs	SARA 302 RQ, lbs	SARA 302 TPQ, lbs
Sodium hydroxide (CAS #: 1310-73-2)	1000 lb	-	-

State Right-to-Know

This product contains the following chemicals regulated in the states listed below.

Component	California Prop. 65	New Jersey	Massachusetts	Pennsylvania
Sodium hydroxide (CAS #: 1310-73-2)	-	X	X	X

16. OTHER INFORMATION

NFPA	Health 3	Flammability 0	Instability 0	Physical Hazards -
HMIS	Health 3	Flammability 0	Physical Hazards 0	

Prepared By

Health & Environment DepartmentAlbemarle 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 : 24-Apr-2015
Revision Date: 22-Feb-2016

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