

**Polybromide Resin and Everpure
Brominating Cartridges**

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Replaces: 6/21/05

Material Safety Data Sheet

Section 1 – Chemical Product and Company Identification

Product Name: Everpure Brominating Cartridges, containing
Polybromide Resin

Part Number: P/N 255340-401 (2.75 lb. [1.25 kg] net wt.) (1 pack)
P/N 255340-406 / EV954006 (6 pack)
P/N 255340-480 (80 pack)
P/N 255340-416 / EV954001 (160 pack)
P/N 14202 / EV394800 (loaded BRZ resin 300 lb. [136 kg] net wt.)

CAGE Number: 08576
NSN 4610-01-022-9970
DLA Contract: SP0760-99-D-7883

General Description: Polyethylene cartridges containing Polybromide Resin, which is dry ion exchange resin impregnated with 30% elemental bromine, to be used as a source of bromine for disinfecting potable water in marine installations.

Company: Pentair Filtration Solutions, LLC.
1040 Muirfield Drive
Hanover Park, IL 60133-5468 USA

Telephone: 866-873-7506 / 630-307-3000

Facsimile: 920-803-3565

24-Hour Chemical Emergency Number (CHEMTREC®):

USA - (800) 424-9300

International – (703) 527-3887

Section 2 – Composition Information

| <u>Chemical Name</u> | <u>Percent by Weight</u> | <u>CAS#</u> |
|--|--------------------------|-------------|
| Anion Exchange Resin, Strong Base, Type I (Styrene-Divinylbenzene-Quaternary Amine) | 65-70 | 60177-39-1 |
| Bromine | 30 | 7726-95-6 |
| Water | <5 | 7732-18-5 |

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Section 3 – Hazards Identification

Appearance & Odor: Small (<1 mm), hard, dry, red-orange beads with chlorine-like bleach odor. The red-orange color of the resin can be seen through the translucent walls of the Brominating Cartridge canisters.

Emergency Overview: In order to function properly, Everpure Brominating Cartridges must not be altered from their original manufactured shape and design. Everpure Brominating Cartridges do not release Polybromide resin or excessive levels of bromine under normal conditions of use and do not pose a physical hazard or health risk to employees when kept in the original cartridge design. The Polybromide resin contained in Everpure Brominating Cartridges releases low levels of elemental bromine vapor giving off a slight chlorine-like odor. If wetted under uncontrolled conditions, the resin may produce a bromine solution of up to about 500 mg/L at pH 3 and irritating, corrosive fumes of bromine and hydrobromic acid. If the cartridge is damaged and resin beads are spilled, for clean-up wear protective gloves, goggles, and acid/gas respirator, and protect metals from corrosion with adequate ventilation or rinsing. Resin beads can be a “falling hazard,” simulating small ball bearings on the floor creating slippery conditions. The Polybromide Resin will not burn or support combustion, but is a powerful oxidizer capable of starting a fire if mixed with liquid mercury, oils, alcohols or ketones, or powdered metals.

Fire & Explosion Hazards: Will not burn or support combustion, but high temperatures can cause the material to oxidize itself, leading to charring and loss of utility. Fire may produce toxic fumes of bromine, hydrobromic acid, carbon monoxide, and cyanide.

Primary Route(s) of Exposure: From brominated water or resin beads- eyes, skin absorption, inhalation, ingestion.

Inhalation-Acute Effects: None, under normal conditions. Persons trapped or unconscious in an enclosed space with high levels of bromine fumes may suffer irritation of the mucous membranes and respiratory tract, coughing, asthma, pulmonary edema, and death.

Skin Contact-Acute Effects: None, under normal conditions. Extended skin contact with the Polybromide Resin may produce severe irritation or chemical burns. Skin contact with the bromine-water concentrate will have no significant effect, even if from a fresh cartridge (worst case).

Eye Contact – Acute Effects: Eye contact with the brominated water or Polybromide Resin may cause irritation.

Ingestion – Acute Effects: Ingestion may cause burning sensations, severe corrosive gastroenteritis, abdominal pain, diarrhea, fever, vomiting, stupor and shock.

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Section 4 – First Aid Measures

Inhalation First Aid: Remove affected person from area to fresh air and provide oxygen if breathing is difficult. Give artificial respiration ONLY if breathing has stopped, and give CPR ONLY if there is no breathing or pulse. Seek medical attention.

Skin Contact First Aid: Remove affected clothing and wash skin thoroughly with soap and water. Seek medical assistance if irritation develops. Do not neutralize the affected skin area.

Eye Contact First Aid: Immediately irrigate eyes with flowing water continuously for 15 minutes while holding the eyes open. Contact lenses should be removed first. Seek medical attention if irritation develops. Do not attempt to neutralize.

Ingestion First Aid: If a quantity of Polybromide Resin beads is swallowed, immediately give plenty of water, milk, or milk of magnesia to drink. If victim is conscious, alert, and not convulsing, vomiting may need to be induced, but only under the direction of a physician or poison control specialist.

Medical Conditions Aggravated: Bromine fumes may affect persons with allergies, asthma, and/or bronchitis more strongly than others.

Note to Physician: No specific antidote, treat patient symptomatically.

Section 5 – Fire Fighting Measures

Flash Point/Method: Not applicable.

Auto Ignition Temperature: Not applicable.

Upper/Lower Explosion Limits: Not applicable.

Extinguishing Media: No restrictions.

Fire Fighting Procedures: Use acid-gas respirator wherever bromine fumes may be present.

Fire & Explosion Hazards: Will not burn or support combustion but high temperatures may cause the material to oxidize itself, leading to charring and loss of utility. Fire may produce toxic fumes of bromine, hydrobromic acid, carbon monoxide, and cyanide.

Hazardous Products of Decomposition and / or Combustion: None due to normal aging; fire may produce toxic fumes of bromine, hydrobromic acid, carbon monoxide, and cyanide.

NFPA Ratings: HEALTH: 0 = minimal hazard FLAMMABILITY: 0 = minimal hazard
REACTIVITY: 1 = slight hazard OTHER: OX – oxidizer

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Section 6 – Accidental Release Measures

Do not dump any spilled resin into any sewers, on the ground, or into any body of water. All disposal methods must be in compliance with all Federal, State, Local, and Provincial laws and regulations, which may vary in different locations. Waste characterizations and compliance with the applicable laws are the sole responsibility of the waste generator.

If Polybromide Resin is spilled: Use of protective gloves, goggles, and acid-gas respirator is recommended. First, sweep up the material and seal in plastic bags or store under a layer of water. Resin can be stripped of bromine by soaking in strong base, followed by chemical reduction with sulfite or thiosulfate salts. Exhausted or stripped resin may be discarded in ordinary trash or sent to a non-hazardous waste facility.

Section 7 – Handling and Storage

Handling: Use plastic gloves and goggles when changing Brominating Cartridges. Let the old cartridge drain thoroughly before removing. Store the old cartridge in the plastic bag taken from the new cartridge.

Storage: Protect from temperature extremes. The 2-year Shelf Life is contingent on a storage temperature of 85°F (30°C) or cooler. Store in well ventilated area.

Do not store in areas with critical electrical devices or other equipment that may be harmed by potential metal corrosion.

General Comments: none

Section 8 – Personal Protection/Exposure Control

Respiratory Protection: Have acid-gas type respirator at hand if needed. If the smell of bromine is detectable to the nose, use the respirator for exposures greater than 15 minutes.

Skin Protection: Rubber or plastic gloves are recommended where bromine-water drips are possible.

Eye Protection: Goggles or face shield is recommended where bromine-water spatters are possible.

Ventilation Protection: General ventilation is sufficient.

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Section 8 – Personal Protection/Exposure Control - continued

Other Protection: Eye wash fountains, or other means of washing the eyes with a gentle flow of cool to tepid tap water, should be readily available in all areas where this material is handled or stored. Water should be supplied through insulated and heat-traced lines to prevent freeze-ups in cold weather.

Exposure Limits: (for Bromine)

OSHA PEL: 0.1 ppm (0.7 mg/m³) 8 hr TWA/0.3 ppm (2 mg/m³) STEL

NIOSH REL: 0.1 ppm (0.7 mg/m³) 8 hr TWA/0.3 ppm (2 mg/m³) STEL

NIOSH IDLH: 3 ppm

ACGIH TLV: 0.1 ppm (0.7 mg/m³) 8 hr TWA/0.3 ppm (2mg/m³) STEL

Section 9 – Physical and Chemical Properties

Appearance and Odor: Small (<1 mm), hard, dry, red-orange beads with chlorine-like bleach odor. The red-orange color of the resin can be seen through the translucent walls of the Brominating Cartridge canisters.

Vapor Pressure: not determined

Specific Gravity: not determined

Boiling Point: not applicable

Melting Point: not applicable

Solubility in Water: Bromine, up to 500 ppm

pH: 3.0 (Concentrated Bromine-Water)

Flash Point/method: not applicable

Auto Ignition Temperature: not applicable

Upper/Lower Explosion Limits: not applicable

Vapor Density (Air=1): Heavier than air (Bromine Fumes from Polybromide Resin)

Volatile Percentage: 30-35% by weight (the bromine, plus any moisture)

Other: Bulk Density of Polybromide Resin: 1.2 g/mL

Section 10 – Stability and Reactivity

Stability: Polybromide Resin is a strong oxidizer capable of starting a fire if mixed with liquid mercury, oils, alcohols and ketones, or finely-divided or powdered metals.

Incompatibilities: highly flammable materials, mercury, powdered metals, alkali metals.

Polymerization: Will not polymerize.

Decomposition: None due to normal aging. High temperatures may cause the material to oxidize itself, leading to charring and loss of utility. Fire may produce toxic fumes of bromine, hydrobromic acid, carbon monoxide, and cyanide.

Conditions to Avoid: Protect from temperature extremes. The 2-year Shelf Life is contingent on a storage temperature of 85°F (30°C) or cooler.

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Section 11 – Toxicological Information

Inhalation – Acute: The inhalation LC₅₀ (mouse) for bromine is 750 ppm for 9 minutes. Persons trapped or unconscious in an enclosed space with high levels of bromine fumes may suffer mucous membrane and respiratory irritation, coughing, asthma, pulmonary edema, and death.

Inhalation – Chronic: There are no known chronic inhalation effects.

Skin Contact – Acute: Extended skin contact with Polybromide Resin may cause irritation or chemical burns. Skin contact with the bromine-water concentrate will have no significant effect, even if from a fresh cartridge (worst case).

Skin Contact – Chronic: There are no known chronic dermal effects.

Eye Contact – Acute: Eye contact with the brominated water or Polybromide Resin may cause irritation.

Ingestion – Acute: Ingestion may cause burning sensations, severe corrosive gastroenteritis, abdominal pain, diarrhea, fever, vomiting, stupor and shock.

Ingestion – Chronic: There are no known chronic ingestion effects at the recommended average treatment concentration of 1 mg/L of bromine.

Carcinogenicity/Mutagenicity: There are no known carcinogenic/mutagenic effects.

Reproductive Effects: There are no known reproductive effects.

Neurotoxicity: There are no known neurotoxic effects at the recommended average treatment concentration of 1 mg/L of bromine.

Other Effects: There are no other known toxic effects.

Target Organs: This product may affect the eyes and skin.

Section 12 – Ecological Information

No ecological information about Polybromide Resin is available, except that bromine is known to be toxic to aquatic species and to the bacteria in sewage treatment plants.

The materials of construction of Brominating Cartridges are safe and non-toxic, but they are not formulated to disintegrate rapidly in the environment or waste sites.

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Section 13 – Disposal Considerations

Material that cannot be used or chemically reprocessed, and empty containers, should be disposed of in accordance with all applicable regulations. Generators of waste material are required to evaluate all waste for compliance with RCRA and any other local disposal procedures and regulations. Note that State and local regulations may be more stringent than federal regulations.

Used, exhausted Brominating Cartridges (with little of the original red-orange color remaining on the resin) may be discarded in ordinary trash, for disposal at a non-hazardous waste site.

Overheated Brominating Cartridges containing black (charred) resin are void of bromine and can be discarded in ordinary trash.

Old Brominating Cartridges that are beyond their shelf life date, but which contain Polybromide Resin that is still mostly red-orange in color may still contain substantial amounts of active bromine. These must either be treated to remove or neutralize the bromine (either by running water through them to strip off the bromine, or by soaking in strong base and neutralizing with a reducing agent such as thiosulfate salts) before normal non-hazardous disposal or be sent to a hazardous waste site.

Section 14 – Transportation Information

Proper Shipping Name: “Corrosive Solid, Acidic, Inorganic, N.O.S. Polybromide Resin”

Hazard Class: Class 8

Identification No.: UN3260

Packing Group: III

Labeling Requirements: CORROSIVE

Quantity Limitations:

Passenger Aircraft/Rail Car: 25 Kg net wt. (20 cartridges)

Cargo Aircraft: 100 Kg net wt. (80 cartridges)

Vessel Stowage: Category A- “on deck” or “under deck”, cargo vessel or passenger Vessel

United Nations Transport of Dangerous Goods Packaging Designation Code:

UN 4G/X 13.8/S91

USA/+AB0385

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Section 15 – Regulatory Information

Plymouth Products, Inc. bromine cartridge is registered for use as a pesticide (disinfectant) for marine applications by the U.S. Environmental Protection Agency, with the following identifications:

EPA Registration No.: 73450-6
EPA Establishment No.: 73450-IL-1

The U.S. Food and Drug Administration has established tolerances for “Bromide Ion and Residual Bromine”. Residual bromine is permitted in “aqueous food” up to the level of 1.0 mg/L at the time of consumption; no limitation was established for total bromide ion.

Section 16 – Other Information

Disclaimer: The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the user thereof. It is the buyer’s responsibility to ensure that its activities comply with federal, state, provincial and local laws.