1. Product and Company Identification

Product Code: 06611
Product Name: Bromine Monochloride
Company Name: Brooks Rand Instruments
4415 6th Ave NW
Seattle, WA 98107

2. Hazards Identification

Skin Corrosion/Irritation, Category 1B
Target Organ Systemic Toxicity (single exposure), Category 3
Oxidizing Solids, Category 1
Acute Toxicity: Oral, Category 3
Carcinogenicity, Category 1B

GHS Signal Word: Danger

GHS Hazard Phrases:
- H314 - Causes severe skin burns and eye damage.
- H336 - May cause drowsiness or dizziness.
- H271 - May cause fire or explosion; strong oxidizer.
- H301 - Toxic if swallowed.
- H350 - May cause cancer state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard.

GHS Precaution Phrases:
- P260 - Do not breathe dust/fume/gas/mist/vapours/spray.
- P264 - Wash hands thoroughly after handling.
- P280 - Wear protective gloves/protective clothing/eye protection/face protection.
- P261 - Avoid breathing dust/fume/gas/mist/vapours/spray.
- P271 - Use only outdoors or in a well-ventilated area.
- P210 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
- P220 - Keep away from combustible materials.
- P283 - Wear fire/flame resistant/retardant clothing.
- P221 - Take any precaution to avoid mixing with combustibles/...
- P270 - Do not eat, drink or smoke when using this product.
- P201 - Obtain special instructions before use.
- P202 - Do not handle until all safety precautions have been read and understood.
- P281 - Use personal protective equipment as required.

GHS Response Phrases:
- P303+361+353 - IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing. Rinse skin with water/shower.
- P363 - Wash contaminated clothing before reuse.
- P305+351+338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P301+330+331 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
- P304+340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
- P310 - Immediately call a POISON CENTER/doctor/....
- P321 - Specific treatment see ... on this label.
- P312 - Call a POISON CENTER/doctor/... if you feel unwell.
- P371+380+375 - In case of major fire and large quantities: evacuate area and fight fire remotely due to the risk of explosion.
- P370+378 - In case of fire, use ... to extinguish.
P306+360 - IF ON CLOTHING: Rinse immediately contaminated clothing and skin with plenty of water before removing clothes.
P301+310 - IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P330 - Rinse mouth.
P308+313 - IF exposed or concerned: Get medical attention/advice.
P405 - Store locked up.
P501 - Dispose of contents/container to ....
P403+233 - Store container tightly closed in well-ventilated place - if product is as volatile as to generate hazardous atmosphere.

GHS Storage and Disposal Phrases:

Potential Health Effects (Acute and Chronic):

Inhalation: Causes respiratory tract irritation. May be harmful if inhaled. Material is irritating to mucous membranes and upper respiratory tract.

Skin Contact: Causes skin irritation. May be harmful if absorbed through the skin. In the presence of moisture, this material may be absorbed through the skin. Skin Absorption: May be harmful if absorbed through the skin.

Eye Contact: Causes eye irritation. May cause chemical conjunctivitis. Causes moderate eye irritation. May cause transient corneal injury.

Ingestion: May cause irritation of the digestive tract. Harmful if swallowed. Causes gastrointestinal irritation with nausea, vomiting and diarrhea. May cause liver and kidney damage. May cause central nervous system depression. Hearing loss and deafness have been reported. May form methemoglobin which in sufficient concentration causes cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood).

### 3. Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>CAS #</th>
<th>Hazardous Components (Chemical Name)</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>7647-01-0</td>
<td>Hydrochloric acid</td>
<td>97.4 %</td>
</tr>
<tr>
<td>7758-01-2</td>
<td>Potassium bromate</td>
<td>1.52 %</td>
</tr>
<tr>
<td>7758-02-3</td>
<td>Potassium bromide</td>
<td>1.08 %</td>
</tr>
</tbody>
</table>

### 4. First Aid Measures

Emergency and First Aid Procedures:

**In Case of Inhalation:** Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Get medical aid. If inhaled, remove to fresh air.

**In Case of Skin Contact:** Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Get medical aid immediately. In case of contact, immediately wash skin with soap and copious amounts of water.

**In Case of Eye Contact:** Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid. Get medical aid immediately. In case of contact, immediately flush eyes with copious amounts of water for at least 15 minutes.

**In Case of Ingestion:** Never give anything by mouth to an unconscious person. Get medical aid. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water. Wash mouth out with water. Call a poison control center. If swallowed, wash out mouth with water provided person is conscious. Call a physician.

**Signs and Symptoms Of Exposure:** Potassium bromide on prolonged contact with moist skin can produce severe irritation or burns. Prolonged inhalation of dust can produce bronchitis. Ingestion of large quantities
can cause irritability, confusion, tremors, acne-like skin eruptions, memory loss, headache, slurred speech, and anorexia. Can cause CNS depression. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated. Bromide rashes, especially of the face, and resembling acne and furunculosis, often occur when bromide inhalation or administration is prolonged. Blurred vision. Prolonged exposure can cause:

**Note to Physician:** Treat symptomatically and supportively.

### 5. Fire Fighting Measures

**Flash Pt:** NA  
**Method Used:** Estimate  
**Explosive Limits:**  
- LEL: No data.  
- UEL: No data.  
**Autoignition Pt:** NA  
**Suitable Extinguishing Media:** Use water spray, dry chemical, carbon dioxide, or chemical foam. Use flooding quantities of water as spray. Cool containers with flooding quantities of water until well after fire is out. For small fires, do NOT use dry chemicals, carbon dioxide, halon or foams. Use water only! Suitable:  
**Fire Fighting Instructions:** As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Oxidizer. Greatly increases the burning rate of combustible materials. Some oxidizers may react explosively with hydrocarbons(fuel). Containers may explode if exposed to fire. Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes. Specific Hazard(s):  
**Flammable Properties and Hazards:** No data available.

### 6. Accidental Release Measures

**Steps To Be Taken In Case Material Is Released Or Spilled:** Use proper personal protective equipment as indicated in Section 8. Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Provide ventilation. Wash area with soap and water. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Do not use combustible materials such as paper towels to clean up spill. PROCEDURE(S) OF PERSONAL PRECAUTION(S)  
Wear respirator, chemical safety goggles, rubber boots, and heavy rubber gloves. Methods for cleaning up. Sweep up, place in a bag and hold for waste disposal. Avoid raising dust. Ventilate area and wash spill site after material pickup is complete.

### 7. Handling and Storage

**Precautions To Be Taken in Handling:** Avoid breathing dust, vapor, mist, or gas. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Use with adequate ventilation. Wash clothing before reuse. Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Minimize dust generation and accumulation. Do not ingest or inhale. Keep from contact with clothing and other combustible materials. Inform laundry personnel of contaminant's hazards. User Exposure: Do not breathe dust.  
**Precautions To Be Taken in Storing:** Store in a cool, dry place. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from flammable liquids. Keep containers tightly closed. Separate from organic materials. Avoid storage on wood floors. Suitable: Keep tightly closed. SPECIAL REQUIREMENTS:
8. Exposure Controls/Personal Protection

<table>
<thead>
<tr>
<th>CAS #</th>
<th>Partial Chemical Name</th>
<th>OSHA TWA</th>
<th>ACGIH TWA</th>
<th>Other Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>7647-01-0</td>
<td>Hydrochloric acid</td>
<td>CEIL: 5 ppm</td>
<td>CEIL: 2 ppm</td>
<td>No data.</td>
</tr>
<tr>
<td>7758-01-2</td>
<td>Potassium bromate</td>
<td>No data.</td>
<td>No data.</td>
<td>No data.</td>
</tr>
<tr>
<td>7758-02-3</td>
<td>Potassium bromide</td>
<td>No data.</td>
<td>No data.</td>
<td>No data.</td>
</tr>
</tbody>
</table>

Respiratory Equipment (Specify Type): Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Where risk assessment shows air-purifying respirators are appropriate use a dust mask type N95 (US) or type P1 (EN 143) respirator.

Eye Protection: Wear chemical splash goggles. Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Protective Gloves: Wear appropriate protective gloves to prevent skin exposure. Hand: Compatible chemical-resistant gloves. Eyes:

Other Protective Clothing: Wear appropriate protective clothing to prevent skin exposure.

Engineering Controls (Ventilation etc.): Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low. Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels. Safety shower and eye bath. Mechanical exhaust required.

Work/Hygienic/Maintenance Practices: Wash thoroughly after handling.

9. Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Physical States:</th>
<th>[ ] Gas</th>
<th>[ X ] Liquid</th>
<th>[ ] Solid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance and Odor:</td>
<td>yellow.</td>
<td>Caustic Odor.</td>
<td></td>
</tr>
<tr>
<td>Melting Point:</td>
<td>NA - 734.00 C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boiling Point:</td>
<td>NA - 1.00 C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autoignition Pt:</td>
<td>NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flash Pt:</td>
<td>NA</td>
<td>Method Used:</td>
<td>Estimate</td>
</tr>
<tr>
<td>Explosive Limits:</td>
<td>LEL: No data.</td>
<td>UEL: No data.</td>
<td></td>
</tr>
<tr>
<td>Specific Gravity (Water = 1):</td>
<td>1.07</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Density:</td>
<td>~ 2.75 G/CM3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vapor Pressure (vs. Air or mm Hg):</td>
<td>No data.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vapor Density (vs. Air = 1):</td>
<td>No data.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evaporation Rate:</td>
<td>No data.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solubility in Water:</td>
<td>No data.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Percent Volatile: No data.

10. Stability and Reactivity

Stability: Unstable [ ] Stable [ X ]
Conditions To Avoid - Instability: Incompatible materials, dust generation.
Incompatibility - Materials To Avoid: Strong reducing agents, flammable liquids, combustible materials, acids, Strong oxidizing agents, Strong acids, Heavy metal salts, Aluminum.
Possibility of Hazardous Reactions: Will occur [ ] Will not occur [ X ]
Conditions To Avoid - Hazardous Reactions: No data available.

11. Toxicological Information

Toxicological Information: Epidemiology: No information found.
Teratogenicity: No information available. Reproductive Effects: Mutagenicity:
Neurotoxicity: No data available.
Animal tests have shown positive results for the mutagenicity of potassium bromate.
(RTECS)
Other Studies:
Carcinogenicity/Other Information: CAS# 7647-01-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65. CAS# 7758-01-2: ACGIH: Not listed.
California: carcinogen, initial date 1/1/90. NTP: Not listed.
Carcinogenicity: NTP? No IARC Monographs? No OSHA Regulated? No

12. Ecological Information

No data available.

13. Disposal Considerations

Waste Disposal Method: Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261. The generation of waste should be avoided or minimized wherever possible.
Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.
RCRA P-Series: None listed.
RCRA U-Series: None listed. APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.
14. Transport Information

LAND TRANSPORT (US DOT):

DOT Proper Shipping Name: Oxidizing liquid, corrosive, n.o.s.
DOT Hazard Class: 5.1 OXIDIZER
UN/NA Number: UN3098
Packing Group: II

LAND TRANSPORT (Canadian TDG):

TDG Shipping Name: No information available. POTASSIUM BROMATE.
UN Number: 3098
Packing Group: II

LAND TRANSPORT (European ADR/RID):

ADR/RID Shipping Name: No information available. POTASSIUM BROMATE.
UN Number: 3098
Packing Group: II

AIR TRANSPORT (ICAO/IATA):

ICAO/IATA Shipping Name: Oxidizing liquid, corrosive, n.o.s.

15. Regulatory Information

EPA SARA (Superfund Amendments and Reauthorization Act of 1986) Lists

<table>
<thead>
<tr>
<th>CAS #</th>
<th>Hazardous Components (Chemical Name)</th>
<th>S. 302 (EHS)</th>
<th>S. 304 RQ</th>
<th>S. 313 (TRI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7647-01-0</td>
<td>Hydrochloric acid</td>
<td>Yes 500 LB</td>
<td>Yes 5000 LB</td>
<td>Yes</td>
</tr>
<tr>
<td>7758-01-2</td>
<td>Potassium bromate</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>7758-02-3</td>
<td>Potassium bromide</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

This material meets the EPA 'Hazard Categories' defined for SARA Title III Sections

311/312 as indicated:

Acute (immediate) Health Hazard: [X] Yes  [ ] No
Chronic (delayed) Health Hazard: [X] Yes  [ ] No
Fire Hazard: [X] Yes  [ ] No
Sudden Release of Pressure Hazard: [X] Yes  [ ] No
Reactive Hazard: [X] Yes  [ ] No

16. Other Information

Revision Date: 04/11/2014
Additional Information About This Product: No data available.