PART I  What is the material and what do I need to know in an emergency?

1. PRODUCT IDENTIFICATION

TRADE NAME (AS LABELED): MICRO MATIC BEER LINE CLEANER
CHEMICAL NAME/CLASS: Chelated Sodium Hydroxide Solution (30%)
PRODUCT USE: Draft Line Cleaner
U.S. SUPPLIER/MANUFACTURER'S NAME: MICRO MATIC
U.S. ADDRESS: 4601 Saucon Creek Road
Center Valley, PA 18034 USA
U.S. BUSINESS PHONE: 1-800-345-3020
EMERGENCY PHONE: 1-800-424-9300 (CHEMTREC) [Within U.S. and Canada]
EUROPEAN DISTRIBUTOR'S NAME: MICRO MATIC A/S
ADDRESS: Holkebjergvej 48
DK - 5250 Odense SV, Denmark
BUSINESS PHONE: 45-66-171122
BUSINESS FAX PHONE: 45-66-171133
EMERGENCY PHONE: 01-703-527-3887 (CHEMTREC) [International Collect]
DATE OF PREPARATION: July 11, 2003

2. COMPOSITION and INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>CHEMICAL NAME</th>
<th>CAS #</th>
<th>EINECS #</th>
<th>% w/w</th>
<th>EXPOSURE LIMITS IN AIR</th>
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<tr>
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<td></td>
<td>ACGIH-TLV</td>
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<tr>
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<td>TWA mg/m³</td>
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<tr>
<td>Sodium Hydroxide</td>
<td>1310-73-2</td>
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<td>30</td>
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<td>Sodium Gluconate</td>
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<td>Surfactant Mixture</td>
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NE = Not Established. See Section 16 for Definitions of Terms Used.
NOTE: ALL WHMIS required information is included in appropriate sections based on the ANSI Z400.1-1998 format. This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR and EC Directives.

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: This product is a clear, corrosive solution with no distinct odor.  Health Hazards: This solution is corrosive, and can be damaging to contaminated tissue. Ingestion of large quantities can be fatal.  Fire Hazards: This product is not flammable. If involved in a fire, this product may decompose to produce sodium oxides and a variety of other compounds (i.e. carbon monoxide and carbon dioxide, oxides of sodium). Reactivity Hazards: This solution reacts with water to generate heat.  Environmental Hazards: This product may damage plants and animals if released to a terrestrial or aquatic environment. The product presents no bioaccumulation hazard.  Emergency Considerations: In the event of fire or spill, adequate precautions must be taken. Emergency responders must wear the proper personal protective equipment suitable for the situation to which they are responding.
3. HAZARD IDENTIFICATION (Continued)

SYMPTOMS OF OVEREXPOSURE BY ROUTE OF EXPOSURE: The most significant routes of occupational overexposure are inhalation and contact with skin and eyes. The symptoms of overexposure to this product, via route of exposure, are as follows:

INHALATION: Inhalation of vapors, mists, or sprays of this solution may cause pulmonary irritation, irritation of the mucus membranes, coughing, and a sore throat. Severe overexposure may damage the tissues of the respiratory system and cause potentially fatal lung conditions (e.g., chemical pneumonitis and pulmonary edema). Chronic low-level inhalation of vapors, mists or sprays of this product may result in permanent damage to lung tissue and reduction of lung capacity, including development of emphysema and other lung conditions.

CONTACT WITH SKIN or EYES: Eye contact will cause irritation, pain, reddening, and blindness. Depending on the duration of skin contact, skin overexposures may cause reddening, discomfort, irritation, and chemical burns. Skin contact may result in a "soapy" feel and cause reddening, discomfort, and irritation. Prolonged exposure may result in ulcerating burns which could leave scars. Repeated skin overexposure to low levels can cause dermatitis (dry, red skin).

SKIN ABSORPTION: The components of this product are not known to be absorbed through intact skin.

INGESTION: Ingestion is not anticipated to be a significant route of occupational exposure. If this product is swallowed, it can burn and irritate the mouth, throat, esophagus, and other tissues of the digestive system. Symptoms of such overexposure can include nausea, vomiting, diarrhea, and ulceration of the gastrointestinal tract. Ingestion of large volumes of this product may be fatal.

INJECTION: Accidental injection of this product, via laceration or puncture by a contaminated object, may cause pain and irritation in addition to the wound.

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in Lay Terms. In the event of exposure, the following symptoms may be observed:

ACUTE: This solution is corrosive. Depending on the duration of contact, overexposures can irritate or burn the eyes, skin, mucous membranes, and any other exposed tissue. Inhalation may cause coughing and difficulty breathing. Skin contact can cause blisters and scars. Eye contact can cause blindness. Severe inhalation and ingestion overexposures may be fatal.

CHRONIC: Repeated skin overexposures can cause dermatitis (dry, red skin). Repeated low-level inhalation exposure may result in permanent tissue damage and development of adverse lung conditions.

TARGET ORGANS: ACUTE: Respiratory system, skin, eyes. CHRONIC: Skin, respiratory system.

PART II What should I do if a hazardous situation occurs?

4. FIRST-AID MEASURES

Victims of chemical exposure must be taken for medical attention. Remove or cover gross contamination to avoid exposure to rescuers. Rescuers should be taken for medical attention, if necessary. Take copy of label and MSDS to physician or health professional with victim.

SKIN EXPOSURE: If the product contaminates the skin, immediately begin decontamination with running water. Minimum flushing is for 15 minutes. Do NOT interrupt flushing. Remove exposed or contaminated clothing, taking care not to contaminate eyes. Victim must seek immediate medical attention.

EYE EXPOSURE: If this product's liquid or vapors enter the eyes, open victim's eyes while under gently running water. Use sufficient force to open eyelids. Have victim "roll" eyes. Minimum flushing is for 15 minutes. Do NOT interrupt flushing.

INHALATION: If vapors, mists, or sprays of this product are inhaled, remove victim to fresh air. If necessary, use artificial respiration to support vital functions. Seek medical attention if any adverse effect occurs.

INGESTION: If this product is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. If professional advice is not available, do not induce vomiting. Rinse mouth with water immediately, if conscious. Victim should drink milk, egg whites, or large quantities of water to dilute chemical. Never induce vomiting or give diluents (milk or water) to someone who is unconscious, having convulsions, or unable to swallow. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration. If contaminated individual is convulsing, maintain an open airway and obtain immediate medical attention.

RECOMMENDATIONS TO PHYSICIANS: Treat symptoms and eliminate overexposure.
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Pre-existing dermatitis and respiratory problems may be aggravated by overexposure to this product.
5. FIRE-FIGHTING MEASURES

FLASH POINT: Not flammable.
AUTOIGNITION TEMPERATURE: Not flammable.
FLAMMABLE LIMITS (in air by volume, %): Lower (LEL): Not applicable.
Upper (UEL): Not applicable.

FIRE EXTINGUISHING MATERIALS:
Water Spray: YES
Carbon Dioxide: YES
Foam: YES
Dry Chemical: YES
Halon: YES
Other: Any "ABC" Class.

UNUSUAL FIRE AND EXPLOSION HAZARDS: This product is corrosive and presents a significant contact hazard to firefighters. Though the product is not flammable, this product can react with water, creating an exothermic reaction which result in severe spattering of the product. When involved in a fire, this material may decompose and produce caustic vapors and toxic gases (e.g., oxides of sodium and carbon).

Explosion Sensitivity to Static Discharge: Not sensitive.

SPECIAL FIRE-FIGHTING PROCEDURES: Prevent the spread of any released product to combustible objects. Incipient fire responders should wear eye protection. Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment. Chemical resistant clothing may be necessary. Move fire-exposed containers of this product out of area, if it can be done without risk to firefighters. If this product is involved in a fire, fire runoff water should be contained to prevent possible environmental damage.

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a large spill, clear the affected area, protect people, and respond with trained personnel. Minimum Personal Protective Equipment for non-incidental releases should be Level B: triple-gloves (rubber gloves and nitrile gloves over latex gloves), chemical resistant suit and boots, hard hat, and Self Contained Breathing Apparatus. Absorb spilled liquid with suitable absorbent material. Neutralize residue with citric acid or other neutralizing agent for basic materials. Decontaminate the area thoroughly. Test area with litmus paper to ensure neutralization is complete. Place all spill residue in an appropriate container and seal. Dispose of in accordance with U.S. Federal, State, and local hazardous waste disposal regulations and those of Canada and its Provinces and EC Member States (see Section 13, Disposal Considerations).

PART III How can I prevent hazardous situations from occurring?

7. HANDLING and STORAGE

WORK AND HYGIENE PRACTICES: As with all chemicals, avoid getting this product ON YOU or IN YOU. Wash thoroughly after handling this product. Do not eat, drink, smoke, or apply cosmetics while handling this product. Avoid breathing vapors or mists generated by this product. Use in a well-ventilated location. Remove contaminated clothing immediately.

STORAGE AND HANDLING PRACTICES: All employees who handle this material should be trained to handle it safely. Keep container tightly closed when not in use. If this product is transferred into another container, only use portable containers and dispensing equipment (faucet, pump, drip can) approved for corrosive, basic liquids. Never add water to this product, always add product, with constant stirring, slowly to surface of lukewarm [27-38°C (80-100°F)] water, to assure product is being completely dissolved as it is added. Never add more product than can be absorbed by solution while maintaining temperatures below 93°C (200°F) to prevent boiling and spattering of caustic solution.

For Non-Bulk Containers: Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Material should be stored in secondary containers or in a diked area, as appropriate. Store containers away from incompatible chemicals (see Section 10, Stability and Reactivity). When using this product, open valves on pipelines and other production equipment that contains this product slowly. Periodically inspect totes or tanks of this product for leaks or damage. Perform routine maintenance on all process equipment. Storage areas should be made of corrosion resistant materials. Post warning and "NO SMOKING" signs in storage and use areas, as appropriate. Empty containers may contain residual liquid or vapors; therefore, empty containers should be handled with care. Never store food, feed, or drinking water in containers that held this product.

Bulk Containers: All tanks and pipelines which contain this material must be labeled. Perform routine maintenance on tanks or pipelines which contain this product. Report all leaks promptly.

Tank Car Shipments: Tank cars carrying this product should be loaded and unloaded in strict accordance with tank-car manufacturer’s recommendation and all established on-site safety procedures. Appropriate personal protective equipment must be used (see Section 8, Engineering Controls and Personal Protective Equipment.). [continued on following page]
7. HANDLING and STORAGE (Continued)

Tank Car Shipments (continued): All loading and unloading equipment must be inspected, prior to each use. Loading and unloading operations must be attended, at all times. Tank cars must be level and wheels must be locked or blocked prior to loading or unloading. Tank car (for loading) or storage tank (for unloading) must be verified to be correct for receiving this product and be properly prepared, prior to starting the transfer operations. Hoses must be verified to be clean and free of incompatible chemicals, prior to connection to the tank car or vessel. Valves and hoses must be verified to be in the correct positions, before starting transfer operations. A sample (if required) must be taken and verified (if required) prior to starting transfer operations. All lines must be blown-down and purged before disconnecting them from the tank car or vessel.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain that application equipment is locked and tagged-out safely. Always use this product in areas where adequate ventilation is provided. Before maintenance begins, decontaminate equipment with neutralizing agent appropriate for basic materials and follow with a triple-rinse with water. Test equipment with litmus paper to ensure neutralization is complete. Collect all rinsates and dispose of according to applicable Federal, State, or local procedures.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation. If necessary, vent material to outside, taking appropriate precautions to prevent environmental contamination. Ensure eyewash/safety shower stations are available near where this product is used.

INTERNATIONAL EXPOSURE LIMITS: The following international exposure limits are currently available for the Sodium Hydroxide component of this product, as follows:

**SODIUM HYDROXIDE:**
- **Australia:** MAK = 2 mg/m³, JAN 1993
- **Austria:** MAK = 2 mg/m³, JAN 1999
- **Belgium:** STEL = 2 mg/m³, JAN 1993
- **Denmark:** TWA = 2 mg/m³, JAN 1999
- **Finland:** TWA = 2 mg/m³, JAN 1999
- **France:** VME = 2 mg/m³, JAN 1999
- **Germany:** MAK = 2 mg/m³, JAN 1999

**SODIUM HYDROXIDE (continued):**
- **Japan:** OEL(C) = 2 mg/m³, JAN1999
- **The Netherlands:** MAC-TGG = 2 mg/m³, JAN 1999
- **Norway:** TWA = 2 mg/m³, JAN 1999
- **The Philippines:** TWA = 2 mg/m³, JAN 1993
- **Poland:** MAC (TWA) = 0.5 mg/m³, MAC(STEL) = 1 mg/m³, JAN 1999
- **Sweden:** TGV = 2 mg/m³, JAN 1999
- **Thailand:** TWA = 2 mg/m³, JAN 1993
- **Turkey:** TWA = 2 mg/m³, JAN 1993
- **United Kingdom:** STEL = 2 mg/m³, SEP 2000

**RESPIRATORY PROTECTION:** Maintain airborne contaminant concentrations below exposure limits listed in Section 2 (Composition and Information on Ingredients). For operations in which mists or sprays of this product will be generated, use only respiratory protection authorized in the U.S. Federal OSHA Respiratory Protection Standard (29 CFR 1910.134), or equivalent U.S. State standards, Canadian CSA Standard Z94.4-93, and the European Standard EN149, and EC member states. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under OSHA’s Respiratory Protection Standard (1910.134-1998). The following NIOSH guidelines for Sodium Hydroxide (the main component of this product) are provided for further information.

**SODIUM HYDROXIDE CONCENTRATION**

**RESPIRATORY PROTECTION**

Up to 10 mg/m³: Any Supplied-Air Respirator (SAR) operated in a continuous-flow mode, or any Air-Purifying, Full-Facepiece respirator with a high-efficiency particulate filter, or any Powered, Air-Purifying Respirator (PAPR) with a dust and mist filter, or any Self-Contained Breathing Apparatus (SCBA) with a full facepiece, or any SAR with a full facepiece.

Emergency or Planned Entry into Unknown Concentrations or IDLH Conditions: Any SCBA that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode, or any SAR that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary SCBA operated in pressure-demand or other positive-pressure mode.

Escape: Any Air-Purifying, Full-Facepiece Respirator with a high-efficiency particulate filter, or any apparatus escape-type, SCBA.

**EYE PROTECTION:** Splash goggles or safety glasses. Face shields recommended when using quantities of this solution in excess of 1 gallon. If necessary, refer to U.S. OSHA 29 CFR 1910.133, the European Standard EN166, or appropriate Canadian Standards.

**HAND PROTECTION:** Wear neoprene or vinyl gloves for routine industrial use. Use triple gloves for spill response, as stated in Section 6 (Accidental Release Measures) of this MSDS. If necessary, refer to U.S. OSHA 29 CFR 1910.138, appropriate Standards of Canada and those of EC Member States.

**BODY PROTECTION:** Use body protection appropriate for task. During handling of containers of 15 gallons or larger, an apron or other impermeable body protection is suggested. For 40 oz bottles or other container less than 15 gallons an apron is not necessary. Wear clothing appropriate for situation of handling. Full-body chemical protective clothing is recommended for emergency response procedures. If a hazard of injury to the feet exists due to falling objects, rolling objects, where objects may pierce the soles of the feet or where employee’s feet may be exposed to electrical hazards, use foot protection, as described in U.S. OSHA 29 CFR 1910.136. If necessary, refer appropriate Standards of Canada, the European Economic Community.
9. PHYSICAL and CHEMICAL PROPERTIES

- **PHYSICAL STATE:** Liquid
- **BOILING POINT:** 760 mm Hg: 119°C (246.2°F)
- **FREEZING POINT:** 0°C (32°F)
- **SPECIFIC GRAVITY:** @ 15.6°C: 1.33
- **VAPOR PRESSURE mm Hg @ 60°C:** 76
- **DENSITY -- lb-gal @ 15.6°C:** 11.11
- **VAPOR DENSITY:** Not determined
- **EVAPORATION RATE (water = 1):** Similar to water.
- **ODOR THRESHOLD:** Not established.
- **LOG WATER/OIL DISTRIBUTION COEFFICIENT:** Not established.
- **APPEARANCE, ODOR AND COLOR:** This product is a clear, colorless liquid with no distinct odor.
- **HOW TO DETECT THIS SUBSTANCE (warning properties):** Litmus paper will turn purple/blue upon contact with this solution.

10. STABILITY and REACTIVITY

- **STABILITY:** Stable under conditions of normal temperature and pressure. This solution may react with water to generate heat.
- **DECOMPOSITION PRODUCTS:** Thermal decomposition will generate sodium oxides, carbon oxides, and caustic vapors.
- **MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE:** This product reacts with water and strong acids. Additionally, it is incompatible with organic halogen compounds, organic nitro compounds, aluminum, zinc, tin, and other metals. Avoid contact with leather and wool.
- **HAZARDOUS POLYMERIZATION:** Will not occur.
- **CONDITIONS TO AVOID:** Contact with or exposure to incompatible materials, extreme temperatures.

PART IV  
**Is there any other useful information about this material?**

11. TOXICOLOGICAL INFORMATION

- **TOXICITY DATA:** Additional toxicology information for components greater than 1 percent in concentration is provided below:

  **ORGANIC PHOSPHONATE:**
  - LD₅₀ (rabbit) = >2000 mg/kg
  - LD₅₀ (rat) = >5000 mg/kg

  **SODIUM HYDROXIDE:**
  - Standard Draize Test (Eye-Monkey) 1%/24 hours: Severe
  - Standard Draize Test (Skin-Rabbit) 500 mg/24 hours: Severe
  - Standard Draize Test (Eye-Rabbit) 400 µg: Mild

  **SODIUM HYDROXIDE (continued):**
  - Standard Draize Test (Eye-Rabbit) 50 µg/24 hours: Severe
  - Standard Draize Test (Eye-Rabbit) 1 mg/24 hours: Severe
  - Rinse with water (Eye-Rabbit) 1 mg/30 seconds: Severe

  **SODIUM HYDROXIDE (continued):**
  - LD₅₀ (Intraperitoneal-Mouse) 40 mg/kg
  - LD₅₀ (Oral-Rabbit) 500 mg/kg
  - LD₅₀ (Parenteral-Grasshopper) 20 mg
  - LD₅₀ (Intravenous, rabbit) = 7630 mg/kg
  - LD₅₀ (Oral-Rabbit) = 2000 mg/kg
  - LD₅₀ (Parenteral-Grasshopper) = 16 mmol/L
  - LD₅₀ (Intravenous, rabbit) = 7630 mg/kg
  - LD₅₀ (Oral-Rabbit) = 2000 mg/kg
  - LD₅₀ (Parenteral-Grasshopper) = 16 mmol/L
  - LD₅₀ (Parenteral-Grasshopper) = 16 mmol/L
  - LD₅₀ (Parenteral-Grasshopper) = 16 mmol/L
  - LD₅₀ (Parenteral-Grasshopper) = 16 mmol/L
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  - LD₅₀ (Parenteral-Grasshopper) = 16 mmol/L
  - LD₅₀ (Parenteral-Grasshopper) = 16 mmol/L

- **SUSPECTED CANCER AGENT:** None of the components of this product are found on the following lists: FEDERAL OSHA Z LIST, NTP, IARC, CAL/OSHA, and therefore are not considered to be, cancer causing agents by these agencies.

- **IRRITANCY OF PRODUCT:** This product is extremely irritating and corrosive to contaminated tissue.

- **SENSITIZATION OF PRODUCT:** No component of this product is known to be a skin or respiratory sensitizer.

- **REPRODUCTIVE TOXICITY INFORMATION:** Listed below is information concerning the effects of this product and its components on the human reproductive system.

  **Mutagenicity:** The components of this product are not reported to produce mutagenic effects in humans. Mutation data are available for the Sodium Chlorate and Sodium Hydroxide components of this product, obtained during clinical studies on animal tissues exposed to high doses of this compound.

  **Embryotoxicity:** The components of this product are not reported to produce embryotoxic effects in humans.

  **Teratogenicity:** The components of this product are not reported to cause teratogenic effects in humans.

  **Reproductive Toxicity:** The components of this product are not reported to cause reproductive effects in humans.

A **mutagen** is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. An **embryotoxin** is a chemical which causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A **teratogen** is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A **reproductive toxin** is any substance which interferes in any way with the reproductive process.

- **BIOLOGICAL EXPOSURE INDICES:** Currently there are no Biological Exposure Indices (BEIs) determined for the components of this product.
12. ECOLOGICAL INFORMATION
ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.
ENVIRONMENTAL STABILITY: This product will decompose over time in ambient environmental conditions. Additional environmental data are available for some components, and are provided below.

**SODIUM HYDROXIDE**
Water Solubility = 9 g/0.9 ml water
Octanol/Water Partition Coefficient: SRP4: Too low to be measured
(or possibly virtually 0)

**SODIUM HYDROXIDE (continued):**
BOD: None.
Persistence: Can persist for extended periods of time.

**ORGANIC PHOSPHONATE**

**EFFECT OF MATERIAL ON PLANTS or ANIMALS:** Due to the corrosivity of this solution, this product can be harmful or fatal to plant and animal life, if this product is released into the environment.

**EFFECT OF CHEMICAL ON AQUATIC LIFE:** This solution can substantially lower the pH of an aquatic environment and can be extremely toxic to fish and aquatic plants. Additional aquatic toxicity data are available for some components, as follows:

**SODIUM HYDROXIDE:**
Acute Hazard Level:
Lethal pH (goldfish) = 10.9
Lethal pH (bluegill) = 10.5

**SODIUM HYDROXIDE (continued):**

**LC**<sub>100</sub> (Cyprinus carpio) 24 hours = 180 ppm/ 25°C
TL<sub>50</sub> (mosquito fish) 96 hours = 125 ppm/ fresh water
TL<sub>50</sub> (bluegill) 48 hours = 99 mg/L/ tap water

13. DISPOSAL CONSIDERATIONS
PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate U.S. Federal, State, and local regulations and those of Canada and EC Member States. This solution, if unaltered by use, may be disposed of by treatment at a permitted facility or as advised by your local hazardous waste regulatory authority.

U.S. EPA WASTE NUMBER: D002 (Characteristic, Corrosive) applicable to wastes consisting only of this solution.

14. TRANSPORTATION INFORMATION
THIS PRODUCT IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

**PROPER SHIPPING NAME:** Sodium hydroxide solution
HAZARD CLASS NUMBER and DESCRIPTION: 8 (Corrosive)
UN IDENTIFICATION NUMBER: UN 1824
PACKING GROUP: II
DOT LABEL(S) REQUIRED: Corrosive
NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2000): 154

**MARINE POLLUTANT:** No component of this product is designated by the Department of Transportation to be a Marine Pollutant as per 49 CFR 172.101, Appendix B.

NOTE: Shipments of this product may be shipped under small quantity and limited quantity exceptions as indicated under 49 CFR §173.4 and 49 CFR §173.150, if all requirements are met.

**Small Quantity Exception (49 CFR 173.4):** Small quantities of Class 8 material are not subjected to other requirements of the Hazardous Materials Regulations (Subchapter C) when the maximum quantity per inner receptacle is limited to 30 mL (liquids). Refer to 49 CFR 173.4 for specific information in packaging small quantity materials.

**Limited Quantity Exceptions [49 CFR 173.154(b)]:** Limited quantities for Class 8, Packing Group III materials have inner packagings not over 1.0 L [0.3 gal] (liquids) net capacity each, packed in strong outer packaging.

**TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS:** This material is considered as Dangerous Goods, per regulations of Transport Canada. The use of the above U.S. DOT information from the U.S. 49 CFR regulations is allowed for shipments that originate in the U.S. For shipments via ground vehicle or rail that originate in Canada, the following information is applicable.

UN IDENTIFICATION NUMBER: UN 1824
HAZARD CLASS NUMBER: Sodium hydroxide solution
HAZARD LABEL(S) REQUIRED: Class 8 (Corrosive)

**SPECIAL PROVISIONS:** None
**EXPLOSIVE LIMIT & LIMITED QUANTITY INDEX:** 1
**ERAP INDEX:** None
**PASSENGER CARRYING SHIP INDEX:** None
**PASSENGER CARRYING ROAD OR RAIL VEHICLE INDEX:** 15
**MARINE POLLUTANT:** Not applicable.
14. TRANSPORTATION INFORMATION (Continued)

INTERNATIONAL AIR TRANSPORT ASSOCIATION (IATA) DESIGNATION: This product is considered as dangerous goods under the International Air Transport Association rules. As applicable, use the following information for the preparation of shipments of this product.

PROPER SHIPPING NAME: Sodium hydroxide solution
HAZARD CLASS NUMBER and DESCRIPTION: 8 (Corrosive Material)
UN IDENTIFICATION NUMBER: UN 1824
PACKING GROUP: II
HAZARD LABEL(S) REQUIRED: 8 (Corrosive)
EMERGENCY RESPONSE DRILL CODE DESIGNATION: 8L

The following Packaging Information is applicable to this product:

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</tr>
<tr>
<td>813</td>
<td>5 L</td>
</tr>
</tbody>
</table>

INTERNATIONAL MARITIME ORGANIZATION SHIPPING INFORMATION (IMO): This product is considered as dangerous goods, per the International Maritime Organization.

UN IDENTIFICATION NUMBER: UN 1824
NAME and DESCRIPTION: Sodium hydroxide solution.
CLASS: 8 (Corrosive)
CLASSIFICATION CODE: C5
PACKING GROUP: II
HAZARD LABEL(S) REQUIRED: Class 8 (Corrosive)
EmS: F-A, S-B
STOWAGE and SEGREGATION: Category A. “Away from Acids”

EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY ROAD (ADR): This product is considered by the UN Economic Commission for Europe to be dangerous goods.

UN IDENTIFICATION NUMBER: UN 1824
NAME and DESCRIPTION: Sodium hydroxide solution.
CLASS: 8 (Corrosive)
CLASSIFICATION CODE: C5
PACKING GROUP: II
HAZARD LABEL(S) REQUIRED: Class 8 (Corrosive)
SPECIAL PROVISIONS: None
LIMITED QUANTITIES: LQ22
PACKING INSTRUCTIONS: P001, IBC02
VEHICLE FOR TANK CARRIAGE: AT
TRANSPORT CATEGORY: 2
HAZARD IDENTIFICATION: 80

15. REGULATORY INFORMATION

ADDITIONAL UNITED STATES REGULATIONS:
SARA REPORTING REQUIREMENTS: The components of this product are subject to the reporting requirements of Sections 302, 304 and 313 of Title III of the Superfund Amendments and Reauthorization Act as follows:

<table>
<thead>
<tr>
<th>CHEMICAL NAME</th>
<th>SARA 302 (40 CFR 355, Appendix A)</th>
<th>SARA 304 (40 CFR Table 302.4)</th>
<th>SARA 313 (40 CFR 372.65)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium Hydroxide</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

U.S. SARA THRESHOLD PLANNING QUANTITY: There are no specific Threshold Planning Quantities for the components of this product. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lb (4,540 kg) may apply, per 40 CFR 370.20.

U.S. TSCA INVENTORY STATUS: The components of this product are listed on the TSCA Inventory.

U.S. CERCLA REPORTABLE QUANTITY (RQ): Sodium Hydroxide = 1000 lb (454 kg)

OTHER U.S. FEDERAL REGULATIONS: Not applicable.
15. REGULATORY INFORMATION (Continued)

ADDITIONAL UNITED STATES REGULATIONS (continued):

U.S. STATE REGULATORY INFORMATION: The components of this product are covered under specific State regulations, as denoted below:

- **Alaska** - Designated Toxic and Hazardous Substances: Sodium Hydroxide.
- **California** - Permissible Exposure Limits for Chemical Contaminants: Sodium Hydroxide.
- **Florida** - Substance List: Sodium Hydroxide.
- **Illinois** - Toxic Substance List: Sodium Hydroxide.
- **Kansas** - Section 302/313 List: Sodium Hydroxide.
- **Massachusetts** - Substance List: Sodium Hydroxide.
- **Michigan** - Critical Materials Register: No.
- **Minnesota** - List of Hazardous Substances: Sodium Hydroxide.
- **Missouri** - Employer Information/Toxic Substance List: Sodium Hydroxide.
- **New Jersey** - Right to Know Hazardous Substance List: Sodium Hydroxide.
- **North Dakota** - List of Hazardous Chemicals, Reportable Quantities: Sodium Hydroxide.
- **Pennsylvania** - Hazardous Substance List: Sodium Hydroxide.
- **Rhode Island** - Hazardous Substance List: Sodium Hydroxide.
- **Texas** - Hazardous Substance List: Sodium Hydroxide.
- **West Virginia** - Hazardous Substance List: Sodium Hydroxide.
- **Wisconsin** - Toxic and Hazardous Substances: Sodium Hydroxide.

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): No component of this product is listed on the California Proposition 65 lists.

ANSI LABELING (Z129.1): **DANGER!** CORROSIVE MATERIAL! LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED. MAY CAUSE LUNG DAMAGE. REACTS VIOLENTLY WITH WATER AND ACIDS. AVOID SPATTERING BY SLOWLY ADDING TO SOLUTION. Do not get into eyes, on skin, or on clothing. Do not breathe spray or mist. Do not take internally. Use with adequate ventilation and employ respiratory protection when exposed to the mist or spray. When handling, wear chemical splash goggles, face shield, rubber gloves and protective clothing, and NIOSH/MSHA-approved respiratory protection, as appropriate. Do not transfer to unlabeled containers. Wash thoroughly after handling. Keep container closed when not in use. FIRST-AID: In case of contact, immediately flush skin or eyes for at least 15 minutes. If inhaled, move to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If ingested, do not induce vomiting. Get medical attention. IN CASE OF FIRE: Use dry chemical, CO₂, or alcohol foam. IN CASE OF SPILL: Absorb spill with neutralizing agent for basic materials and place in suitable container. Refer to MSDS for additional information.

ADDITIONAL CANADIAN REGULATIONS:

- **CANADIAN DSL/NDSL INVENTORY STATUS:** The components of this product are listed on the DSL Inventory.
- **OTHER CANADIAN REGULATIONS:** Not applicable.
- **CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITY SUBSTANCES LISTS:** The components of this product are not on the CEPA Priority Substances Lists.
- **CANADIAN WHMIS SYMBOLS:** Class E: Corrosive Material (pH = 13.5)

ADDITIONAL EUROPEAN COMMUNITY REGULATIONS:

PRODUCT: Based on the information of the product’s components described above and an assessment of the physical and health hazards associated with this material, the following assignments have been made (per Council Directive 67/548/EEC and subsequent regulations, to current date).

- **CODE LETTER AND HAZARD DESIGNATION OF PRODUCT:** C (Corrosive)
- **RISK PHRASES:** [R: 35]: Causes severe burns.
- **SAFETY PHRASES:** Keep locked up and out of reach of children. (*This safety phrase can be omitted from the label when the substance or preparation is sold for industrial use only.*) In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. In case of accident, or if you feel unwell, seek medical advice immediately (show label where possible). [S: (1/2–), 26, 45]

EUROPEAN COMMUNITY ANNEX II HAZARD SYMBOL:
A large number of abbreviations and acronyms appear on a MSDS. Some of these which are commonly used include the following:

**CAS #:** This is the Chemical Abstract Service Number that uniquely identifies each constituent.

**EXPOSURE LIMITS IN AIR:**

**CEILING LEVEL:** The concentration that shall not be exceeded during any part of the working exposure.

**LOQ:** Limit of Quantitation.

**NIOSH CEILING:** The exposure that shall not be exceeded during any part of the workday. If instantaneous monitoring is not feasible, the ceiling shall be assumed as a 15-minute TWA exposure (unless otherwise specified) that shall not be exceeded at any time during a workday.

**NIOSH RELs:** NIOSH's Recommended Exposure Limits.

**PEL-Permissible Exposure Limit:** OSHA's Permissible Exposure Limits. This exposure value means exactly the same as a TWA, except that it is enforceable by OSHA. The OSHA Permissible Exposure Limits are based in the 1989 PELs and the June, 1993 Air Contaminants Rule (enforceable by OSHA). The OSHA Permissible Exposure Limits are based on the 1989 PELs and the June, 1993 Air Contaminants Rule (enforceable by OSHA).

**TWA:** Time Weighted Average exposure concentration for a conventional 8 hr (TWA, PEL) or up to a 10 hr (REL) workday and a 40 hr workweek.

**IDLH:** Immediately Dangerous to Life and Health: This level represents a concentration from which one can escape within 30 minutes without suffering escape-preventing or permanent injury.

**HAZARDOUS MATERIALS IDENTIFICATION SYSTEM HAZARD RATINGS:** This rating system was developed by the National Paint and Coating Association and has been adopted by industry to identify the degree of chemical hazards.

**HEALTH HAZARD:**

0 (Minimal Hazard): No significant health risk, irritation of skin or eyes not anticipated. **Skin Irritation:** Essentially non-irritating. **Eye Irritation:** Essentially non-irritating, or minimal effects which clear in < 24 hours [e.g. mechanical irritation]. **Draize = 0.** Oral Toxicity LD₅₀ Rat or Rabbit: < 5000 mg/kg. **Dermal Toxicity LD₅₀ Rat or Rabbit:** < 2000 mg/kg. **Inhalation Toxicity 4-hrs Rat or Rabbit:** < 20 mg/L; (1) Slight Hazard: Minor reversible injury may occur; slightly or mildly irritating. **Skin Irritation:** Slightly or mildly irritating. **Eye Irritation:** Slightly or mildly irritating. Oral Toxicity LD₅₀ Rat or Rabbit: > 500-5000 mg/kg. **Dermal Toxicity LD₅₀ Rat or Rabbit:** > 1000-2000 mg/kg. **Inhalation Toxicity LC₅₀ 4-hrs Rat or Rabbit:** > 2-20 mg/L; (2) Moderate Hazard: Temporary or transitory injury may occur. **Skin Irritation:** Moderately irritating; primary irritant; sensitizer. (continued in following column)
HAZARDOUS MATERIALS IDENTIFICATION SYSTEM HAZARD RATINGS (continued):

**HEALTH HAZARD (continued):**

1. (Severe Hazard) - Materials that will rapidly or completely vaporize at atmospheric pressure and normal ambient temperature and that are readily dispersed in air, and which will burn readily, including: Flammable gases; Flammable cryogenic materials; Any liquid or gaseous material that is liquid while under pressure and has a flash point below 22.8°C [73°F] and a boiling point below 37.8°C [100°F] [e.g. OSHA Class IA; Material that ignite spontaneously when exposed to air at a temperature of 54.4°C [130°F] or below (e.g. pyrophoric)]

2. (Moderate Hazard) - Materials that are normally stable, even under fire conditions and will not react with water. Explosives: Substances that are Non-Explosive. Unstable Compressed Gases: No Rating. Pyrophorics: No Rating. Oxidizers: No “0” rating allowed. Unstable Reactives: Substances that will not polymerize, decompose, condense or self-react.; 1 (Water Reactivity) - Materials that change or decompose on contact with water. Organic Peroxides: Materials that are normally stable, but can become unstable at high temperatures and pressures. These materials may react with water, but will not release energy. Explosives: Division 1.5 & 1.6 substances that are very insensitive explosives or that do not have a mass explosion hazard. Compressed Gases: Pressure below OSHA definition. Pyrophorics: No Rating. Oxidizers: Packaging Group III; Solids: any material that, in combination with a minimum temperature of 1°C (33°F), exhibits a mean burning time less than or equal to the mean burning time of a 3.7 potassium bromate/cellulose mixture and the criteria for Packing Group I and II are not met. Liquids: any material that exhibits a mean pressure rise time less than or equal to the pressure rise time of a 1:1 nitric acid (65%)/cellulose mixture and the criteria for Packing Group I and II are not met. Unstable Reactives: Substances that may decompose, condense or self-react, but only under conditions that might be encountered at specified temperature and pressure. These materials may react violently with water. Organic Peroxides: Materials that, in themselves, are normally unstable and will readily undergo violent chemical change, but will not detonate. These materials may also react violently with water. Explosives: Division 1.4 – Explosive substances where the explosive effect is largely confined to the package and no projection of fragments of appreciable size or range are expected. An external fire must not cause virtually instantaneous explosion of almost the entire contents of the package. Compressed Gases: Pressurized and meet OSHA definition but < 514.7 psi absolute at 21.1°C (70°F) [500 psig]. Pyrophorics: No Rating. Oxidizers: Packaging Group II Solids: any material that, either in concentration tested, exhibits a mean burning time of less than or equal to the mean burning time of a 2.3 polassium bromate/cellulose mixture and the criteria for Packing Group I and II are not met. Liquids: any material that exhibits a mean pressure rise time less than or equal to the pressure rise of a 1:1 aqueous sodium chlorate solution (40%)/cellulose mixture and the criteria for Packing Group I are not met. Unstable Reactives: Substances that may polymerize, decompose, condense, or self-react at ambient temperature and/or pressure, but have a low potential for significant heat generation or explosion. Substances that readily form peroxides upon exposure to air or oxygen at room temperature; 3 (Water Reactivity) - Materials that may form explosive reactions with water. Organic Peroxides: Materials that are capable of detonation or explosive reaction, but require a strong initiating source, or must be heated under confinement before initiation; or materials that react explosively with water. Explosives: Division 1.2 – Explosive substances that have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but that do not have a mass explosion hazard. Compressed Gases: Pressure > 514.7 psi absolute at 21.1°C (70°F) [500 psig]. Pyrophorics: No Rating. Oxidizers: Packaging Group I Solids: any material that, in either concentration tested, exhibits a mean burning time less than the mean burning time of a 3.2 potassium bromate/cellulose mixture. Liquids: Any material that spontaneously ignites when mixed with cellulose in a 1:1 ratio, or which exhibits a mean pressure rise time less than the pressure rise time of a 1:1 perchloric acid (50%)/cellulose mixture. Unstable Reactives: Substances that may polymerize, decompose, condense or self-react at ambient temperature and/or pressure and have a moderate potential to cause significant heat generation or explosion;
DEFINITIONS OF TERMS (Continued)

TOXICOLOGICAL INFORMATION:
Human and Animal Toxicology: Possible health hazards as derived from human data, animal studies, or from the results of studies with similar compounds are presented. Definitions of some terms used in this section are: LD$_{50}$ - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; LC$_{50}$ - Lethal Concentration (gases) which kills 50% of the exposed animals; ppm concentration expressed in parts of material per million parts of air or water; mg/m$^3$ concentration expressed in weight of substance per volume of air; mg/kg quantity of material, by weight, administered to a test subject, based on their body weight in kg. Other measures of toxicity include TDLo, the lowest dose to cause a symptom and TCLo the lowest concentration to cause a symptom; TDo, LDLo, and LDo, or TC, TCo, LCLo, and LCo, the lowest dose (or concentration) to cause lethal or toxic effects. Cancer Information: The sources are: IARC - the International Agency for Research on Cancer; NTP - the National Toxicology Program, RTECS - the Registry of Toxic Effects of Chemical Substances, OSHA and CAL/OSHA. IARC and NTP rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used. Other Information: BEI - ACGIH Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV. ECOLOGICAL INFORMATION:
EC is the effect concentration in water. BCF = Bioconcentration Factor, which is used to determine if a substance will concentrate in lifeforms which consume contaminated plant or animal matter. TLM = median threshold limit; Coefficient of Oil/Water Distribution is represented by $\log K_{ow}$ or $\log K_{oc}$ and is used to assess a substance’s behavior in the environment.

REGULATORY INFORMATION:
U.S. and CANADA: This section explains the impact of various laws and regulations on the material. ACGIH: American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits. EPA is the U.S. Environmental Protection Agency. NIOSH is the National Institute of Occupational Safety and Health, which is the research arm of the U.S. Occupational Safety and Health Administration (OSHA). WHMIS is the Canadian Workplace Hazardous Materials Information System. DOT and TC are the U.S. Department of Transportation and the Transport Canada, respectively. Superfund Amendments and Reauthorization Act (SARA); the Canadian Domestic/Non-Domestic Substances List (DSL/NDSL); the U.S. Toxic Substance Control Act (TSCA); Marine Pollutant status according to the DOT; the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund); and various state regulations. This section also includes information on the precautionary warnings which appear on the material’s package label. OSHA - U.S. Occupational Safety and Health Administration.

EUROPE: EC is the European Community (formerly known as the EEC, European Economic Community). EINECS: This is the European Inventory of Now-Existing Chemical Substances. The ARD is the European Agreement Concerning the International Carriage of Dangerous Goods by Road and the RID are the International Regulations Concerning the Carriage of Dangerous Goods by Rail.