1. Identification

LIQUICLEAN 103

Product identifier

LIQUICLEAN 103

Other means of identification

None.

Recommended use

Membrane cleaner

Recommended restrictions

None known.

Company/undertaking identification

GE Betz, Inc.
4636 Somerton Road
Trevose, PA 19053
T 215 355 3300, F 215 953 5524

Emergency telephone

(800) 877 1940

2. Hazard(s) identification

Physical hazards

Skin corrosion/irritation

Category 1B

Health hazards

Serious eye damage/eye irritation

Category 1

Carcinogenicity

Category 2

Specific target organ toxicity, single exposure

Category 3 respiratory tract irritation

OSHA defined hazards

Not classified.

Label elements

Signal word

Danger

Hazard statement

Causes severe skin burns and eye damage. Causes serious eye damage. May cause respiratory irritation. Suspected of causing cancer.

Precautionary statement

Prevention

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe mist or vapor. Wash thoroughly after handling. Use only outdoors or in a well-ventilated area. Wear protective gloves/protective clothing/eye protection/face protection.

Response

If swallowed: Rinse mouth. Do NOT induce vomiting. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. If inhaled: Remove person to fresh air and keep comfortable for breathing. 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/doctor. Wash contaminated clothing before reuse.

Storage

Store in a well-ventilated place. Keep container tightly closed. Store locked up.

Disposal

Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise classified

(HNOC)

None known.
3. Composition/information on ingredients

Mixtures

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS #</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydroxyacetic acid</td>
<td>79-14-1</td>
<td>10 - 20</td>
</tr>
<tr>
<td>N-hydroxyethylenediamine triacetic acid trisodium salt</td>
<td>139-89-9</td>
<td>10 - 20</td>
</tr>
<tr>
<td>Sodium glycollate</td>
<td>2836-32-0</td>
<td>1 - 2.5</td>
</tr>
</tbody>
</table>

*Designates that a specific chemical identity and/or percentage of composition has been withheld as a trade secret.

Composition comments: Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this SDS for our assessment of the potential hazards of this formulation.

4. First-aid measures

Inhalation: 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.

Skin contact: Take off immediately all contaminated clothing. Rinse skin with water/shower. Call a physician or poison control center immediately. Chemical burns must be treated by a physician. Wash contaminated clothing before reuse.

Eye contact: Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Keep eyelids apart. Continue rinsing. Call a physician or poison control center immediately.

Ingestion: Do not induce vomiting. Rinse mouth. Call a physician or poison control center immediately. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.

Most important symptoms/effects, acute and delayed: Burning pain and severe corrosive skin damage. Causes serious eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. May cause respiratory irritation.

Indication of immediate medical attention and special treatment needed: Provide general supportive measures and treat symptomatically. Chemical burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital. Keep victim under observation. Symptoms may be delayed.

General information: IF exposed or concerned: Get medical advice/attention. If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire-fighting measures


Unsuitable extinguishing media: Do not use water jet as an extinguisher, as this will spread the fire.

Special protective equipment and precautions for firefighters: Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask.

Specific hazards arising from the chemical: During fire, gases hazardous to health may be formed.

Fire fighting equipment/instructions: Use standard firefighting procedures and consider the hazards of other involved materials. Move containers from fire area if you can do so without risk. In case of fire and/or explosion do not breathe fumes. Cool containers / tanks with water spray.

Specific methods: Use standard firefighting procedures and consider the hazards of other involved materials.

General fire hazards: No unusual fire or explosion hazards noted.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures: Wear appropriate protective equipment and clothing during clean-up. See Section 8 of the SDS for Personal Protective Equipment. Keep unnecessary personnel away. Do not breathe mist or vapor. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.
**Methods and materials for containment and cleaning up**
Ventilate the area. Soak up with inert absorbent material. Place in waste disposal container. Flush area with water. Wet area may be slippery. Spread sand/grit. Use water spray to reduce vapors or divert vapor cloud drift.

Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Absorb in vermiculite, dry sand or earth and place into containers. Following product recovery, flush area with water.

Small Spills: Wipe up with absorbent material e.g. cloth, fleece. Clean surface thoroughly to remove residual contamination.

Never return spills to original containers for re-use. Put material in suitable, covered, labeled containers. For waste disposal, see section 13 of the SDS.

**Environmental precautions**
Avoid discharge into drains, water courses or onto the ground. Water contaminated with this product may be sent to a sanitary sewer treatment facility, or a permitted waste treatment facility, in accordance with any local agreements.

**7. Handling and storage**
**Precautions for safe handling**
Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe mist or vapor. Do not get in eyes, on skin, or on clothing. Avoid prolonged exposure. Should be handled in closed systems, if possible. Provide adequate ventilation. Wear appropriate personal protective equipment. Observe good industrial hygiene practices. Acidic. Do not mix with alkaline material.

**Conditions for safe storage, including any incompatibilities**
Store in accordance with local/regional/national/international regulation. Keep away from strong bases. Store locked up. Store in original tightly closed container. Keep container tightly closed in a dry and well-ventilated place. Do not freeze. If frozen, thaw completely and mix thoroughly prior to use.

**8. Exposure controls/personal protection**
**Biological limit values**
No biological exposure limits noted for the ingredient(s).

**Appropriate engineering controls**
Provide eyewash station. Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

**Individual protection measures, such as personal protective equipment**
**Eye/face protection**
Splash proof chemical goggles. Face shield.

**Skin protection**
Wear appropriate chemical resistant gloves. The choice of an appropriate glove does not only depend on its material but also on other quality features and is different from one producer to the other. Suitable gloves can be recommended by the glove supplier. Glove selection must take into account any solvents and other hazards present.

**Hand protection**
Wear appropriate chemical resistant clothing. Use of an impervious apron is recommended.

**Respiratory protection**
If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.

**Thermal hazards**
Wear appropriate thermal protective clothing, when necessary.

**General hygiene considerations**
Observe any medical surveillance requirements. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

**9. Physical and chemical properties**
**Appearance**
**Color**
Colorless to amber

**Physical state**
Liquid

**Odor**
Slight acetic

**Odor threshold**
Not available.

**pH (concentrated product)**
3.4

**pH in aqueous solution**
3.3 (5% SOL.)

**Melting point/freezing point**
-5 °F (-21 °C)
Initial boiling point and boiling range
210 °F (99 °C)

Flash point
Not applicable.

Evaporation rate
< 1 (Ether = 1)

Flammability (solid, gas)
Not applicable.

Upper/lower flammability or explosive limits

  Flammability limit - lower (%)
  Not available.

  Flammability limit - upper (%)
  Not available.

  Explosive limit - lower (%)
  Not available.

  Explosive limit - upper (%)
  Not available.

Vapor pressure
18 mm Hg

Vapor pressure temp.
70 °F (21 °C)

Vapor density
> 1 (Air = 1)

Relative density
1.35

Relative density temperature
70 °F (21 °C)

Solubilities

  Solubility (water)
  100 %

Partition coefficient

  (n-octanol/water)
  Not available.

Auto-ignition temperature
Not available.

Decomposition temperature
Not available.

Viscosity
50 cps

Viscosity temperature
70 °F (21 °C)

Other information

  Explosive properties
  Not explosive.

  Oxidizing properties
  Not oxidizing.

  Percent volatile
  10 (Estimated)

  Pour point
  0 °F (-18 °C)

  Specific gravity
  1.35

10. Stability and reactivity

Reactivity
The product is stable and non-reactive under normal conditions of use, storage and transport.

Chemical stability
Material is stable under normal conditions.

Possibility of hazardous reactions
Hazardous polymerization does not occur.

Conditions to avoid
Avoid contact with incompatible materials. None under normal conditions.

Incompatible materials
Avoid contact with strong oxidizers. Avoid contact with strong bases.

Hazardous decomposition products
Oxides of carbon and sulphur evolved in fire.

11. Toxicological information

Information on likely routes of exposure

  Inhalation
  May cause irritation to the respiratory system.

  Skin contact
  Causes severe skin burns.

  Eye contact
  Causes severe eye burns.

  Ingestion
  Causes digestive tract burns. Ingestion may cause severe irritation of the mouth, the esophagus and the gastrointestinal tract.

Symptoms related to the physical, chemical and toxicological characteristics
Burning pain and severe corrosive skin damage. Causes serious eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. May cause respiratory irritation.

Information on toxicological effects

Acute toxicity
May cause respiratory irritation.
<table>
<thead>
<tr>
<th>Product</th>
<th>Species</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIQUICLEAN 103 (CAS Mixture)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Acute</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Dermal</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>Rabbit</td>
<td>&gt; 5000 mg/kg, (Calculated according to GHS additivity formula)</td>
</tr>
<tr>
<td><strong>Inhalation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LC50</td>
<td>Rat</td>
<td>&gt; 5 mg/l, 4 Hours, (Calculated according to GHS additivity formula)</td>
</tr>
<tr>
<td><strong>Oral</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>Rat</td>
<td>4923 mg/kg, (Calculated according to GHS additivity formula)</td>
</tr>
<tr>
<td><strong>Components</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydroxyacetic acid (CAS 79-14-1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Acute</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Inhalation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LC50</td>
<td>Rat</td>
<td>3.6 mg/L, 4 Hour</td>
</tr>
<tr>
<td><strong>Oral</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>Rat</td>
<td>1938 mg/kg</td>
</tr>
<tr>
<td>N-hydroxyethylenediamine triacetic acid trisodium salt (CAS 139-89-9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Acute</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Inhalation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LC50</td>
<td>Rat</td>
<td>&gt; 10.054 mg/l, 4 Hour</td>
</tr>
<tr>
<td><strong>Oral</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>Rat</td>
<td>1780 mg/kg</td>
</tr>
<tr>
<td>Sodium glycollate (CAS 2836-32-0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Acute</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Oral</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>Rat</td>
<td>7110 mg/kg</td>
</tr>
</tbody>
</table>

* Estimates for product may be based on additional component data not shown.

**Skin corrosion/irritation** Causes skin burns.

**Serious eye damage/eye irritation** Causes serious eye damage.

**Respiratory or skin sensitization**

- **Respiratory sensitization** This product is not expected to cause respiratory sensitization.
- **Skin sensitization** This product is not expected to cause skin sensitization.

**Germ cell mutagenicity** Not classified.

**Carcinogenicity** Suspected of causing cancer.

**IARC Monographs. Overall Evaluation of Carcinogenicity**

Not listed.


Not regulated.

**US. National Toxicology Program (NTP) Report on Carcinogens**

Not listed.

**Reproductive toxicity**

This product is not expected to cause reproductive or developmental effects.

**Specific target organ toxicity - single exposure**

May cause respiratory irritation.

**Specific target organ toxicity - repeated exposure**

Not classified.

**Aspiration hazard**

Based on available data, the classification criteria are not met. Aspiration of this product may cause the same corrosiveness/irritation impacts as if it were ingested.

**Chronic effects**

Prolonged inhalation may be harmful. Prolonged exposure may cause chronic effects. May increase the risk of cancer based on limited animal data.
12. Ecological information

Ecotoxicity

<table>
<thead>
<tr>
<th>Product</th>
<th>Species</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIQUICLEAN 103 (CAS Mixture)</td>
<td>0% Mortality Fathead Minnow</td>
<td>2000 mg/L, Static Bioassay with 48-Hour Renewal, 96 hour, (pH adjusted)</td>
</tr>
<tr>
<td>Aquatic</td>
<td>LC50</td>
<td>Daphnia magna</td>
</tr>
<tr>
<td>Crustacea</td>
<td>NOEL</td>
<td>Daphnia magna</td>
</tr>
</tbody>
</table>

Bioaccumulative potential

<table>
<thead>
<tr>
<th>Partition coefficient n-octanol / water (log Kow)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydroxyacetic acid</td>
</tr>
<tr>
<td>Sodium glycollate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bioconcentration factor (BCF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium glycollate</td>
</tr>
</tbody>
</table>

Mobility in soil No data available.

Other adverse effects Not available.

Persistence and degradability

- COD (mgO2/g) 335 (calculated data)
- BOD 5 (mgO2/g) 70 (calculated data)
- BOD 28 (mgO2/g) 105 (calculated data)
- Closed Bottle Test (% Degradation in 28 days) 23 (calculated data)
- Zahn-Wellens Test (% Degradation in 28 days) 27 (calculated data)
- TOC (mg C/g) 150 (calculated data)

13. Disposal considerations

Disposal instructions Dispose of contents/container in accordance with local/regional/national/international regulations. Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Incinerate the material under controlled conditions in an approved incinerator.

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Waste from residues / unused products Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging Via an authorized waste disposal contractor to an approved waste disposal site, observing all local and national regulations. Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

DOT

UN number UN3265
UN proper shipping name Corrosive liquid, acidic, organic, n.o.s. (Hydroxyacetic acid)

Transport hazard class(es) Class 8
Subsidiary risk -
Packing group II

Special precautions for user Read safety instructions, SDS and emergency procedures before handling.
ERG number 153

Some containers may be exempt from Dangerous Goods/Hazmat Transport Regulations, please check BOL for exact container classification.
IATA

UN number          UN3265
UN proper shipping name Corrosive liquid, acidic, organic, n.o.s. (Hydroxyacetic acid)
Transport hazard classes
   Class 8
   Subsidiary risk -
Packing group II
Environmental hazards No.
ERG Code 153
Special precautions for user Read safety instructions, SDS and emergency procedures before handling.

IMDG

UN number          UN3265
UN proper shipping name CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Hydroxyacetic acid)
Transport hazard classes
   Class 8
   Subsidiary risk -
Packing group II
Environmental hazards No.
Marine pollutant No.
EmS F-A, S-B
Special precautions for user Read safety instructions, SDS and emergency procedures before handling.

15. Regulatory information

US federal regulations

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)
Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)
Not listed.

SARA 304 Emergency release notification
Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)
Not regulated.
Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories
- Immediate Hazard - Yes
- Delayed Hazard - Yes
- Fire Hazard - No
- Pressure Hazard - No
- Reactivity Hazard - No

SARA 302 Extremely hazardous substance
- Not listed.

SARA 311/312 Hazardous chemical
- Yes

SARA 313 (TRI reporting)
- Not regulated.

Other federal regulations
- Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List
  - Not regulated.
- Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)
  - Not regulated.
- Safe Drinking Water Act (SDWA)
  - Not regulated.

Inventory status

<table>
<thead>
<tr>
<th>Country(s) or region</th>
<th>Inventory name</th>
<th>On inventory (yes/no)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>Domestic Substances List (DSL)</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Non-Domestic Substances List (NDSL)</td>
<td>No</td>
</tr>
<tr>
<td>United States &amp; Puerto Rico</td>
<td>Toxic Substances Control Act (TSCA) Inventory</td>
<td>Yes</td>
</tr>
</tbody>
</table>

* A “Yes” indicates that all components of this product comply with the inventory requirements administered by the governing country(s).

A “No” indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

US state regulations

US. California Proposition 65
- CRT: Listed date/Carcinogenic substance
  - Formaldehyde (CAS 50-00-0) Listed: January 1, 1988
- CRT: Listed date/Developmental toxin
  - No ingredient listed.
- CRT: Listed date/Female reproductive toxin
  - No ingredient listed.
- CRT: Listed date/Male reproductive toxin
  - No ingredient listed.

US. California Proposition 65
WARNING: This product contains a chemical known to the State of California to cause cancer.

16. Other information, including date of preparation or last revision

Issue date: Jul-03-2014
Revision date: Mar-17-2017
Version #: 5.0

List of abbreviations
- CAS: Chemical Abstract Service Registration Number
- NFPA: National Fire Protection Association
- ACGIH: American Conference of Governmental Industrial Hygienists
- TWA: Time Weighted Average
- STEL: Short Term Exposure Limit
- LD50: Lethal Dose, 50%
- LC50: Lethal Concentration, 50%
- EC50: Effect Concentration, 50%
- NOEL: No Observed Effect Level
- COD: Chemical Oxygen Demand
- BOD: Biochemical Oxygen Demand
- TOC: Total Organic Carbon
- CEN: European Committee for Standardisation
- IATA: International Air Transport Association
- IMDG: International Maritime Dangerous Goods Code

TSRN indicates a Trade Secret Registry Number is used in place of the CAS number.
Safety data sheets of raw materials.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Disclaimer

Physical & Chemical Properties: Multiple Properties

Prepared by

This SDS has been prepared by GE Water & Process Technologies Regulatory Department (1-215-355-3300).