1. Identification

Product identifier: WATERMARK® KARL FISCHER REAGENT, PYRIDINE-FREE SINGLE SOLUTION, 2 mg/ml

Other means of identification

Product code: 1601

Recommended use: Laboratory reagent for water determination using the Karl Fischer method.

Recommended restrictions: None known.

Manufacturer/Importer/Supplier/Distributor information

Manufacturer

Company name: GFS Chemicals, Inc.
Address: P.O. Box 245
Powell, OH 43065
United States

Telephone
Phone: 740-881-5501
Toll Free: 800-858-9682
Fax: 740-881-5989

Website: www.gfschemicals.com
E-mail: service@gfschemicals.com

Emergency phone number: Emergency Assistance Chemtrec 800-424-9300

2. Hazard(s) identification

Physical hazards

Flammable liquids
Acute toxicity, dermal
Skin corrosion/irritation
Serious eye damage/eye irritation
Sensitization, skin
Carcinogenicity
Reproductive toxicity
Specific target organ toxicity, single exposure
Specific target organ toxicity, repeated exposure

Category 3
Category 4
Category 2
Category 2B
Category 1
Category 2
Category 1
Category 3 respiratory tract irritation
Category 1

Health hazards

Environmental hazards

Hazardous to the aquatic environment, acute hazard
Hazardous to the aquatic environment, long-term hazard

Category 2
Category 2

OSHA defined hazards

Not classified.

Label elements

Signal word: Danger

Hazard statement: Flammable liquid and vapor. Harmful in contact with skin. Causes skin irritation. May cause an allergic skin reaction. Causes eye irritation. May cause respiratory irritation. Suspected of causing cancer. May damage fertility or the unborn child. Causes damage to organs through prolonged or repeated exposure. Toxic to aquatic life with long lasting effects.
Precautionary statement

Prevention
Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Keep container tightly closed. Ground/bond container and receiving equipment. Use explosion-proof electrical/ventilating/lighting equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Do not breathe mist or vapor. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Contaminated work clothing must not be allowed out of the workplace. Avoid release to the environment. Wear protective gloves/protective clothing/eye protection/face protection.

Response
IF ON SKIN: Wash with plenty of soap and water. 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. If exposed or concerned: Get medical advice/attention. Call a POISON CENTER or doctor/physician if you feel unwell. If skin irritation or rash occurs: Get medical advice/attention. If eye irritation persists: Get medical advice/attention. Take off contaminated clothing and wash before reuse. In case of fire: Use appropriate media to extinguish. Collect spillage.

Storage
Keep cool. Store in a well-ventilated place. Keep container tightly closed.

Disposal
Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Hazard(s) not otherwise classified (HNOC)
None known.

Supplemental information
10-20% of the mixture consists of component(s) of unknown acute oral toxicity. 25-50% of the mixture consists of component(s) of unknown acute dermal toxicity. 10-20% of the mixture consists of component(s) of unknown acute inhalation toxicity. >80% of the mixture consists of component(s) of unknown acute hazards to the aquatic environment. >80% of the mixture consists of component(s) of unknown long-term hazards to the aquatic environment.

3. Composition/information on ingredients

Mixtures

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Common name and synonyms</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>ETHYLENEGLYCOLMONOMETHYL ETHER</td>
<td>METHYL CELLOSOLVE ETHYLENE GLYCOL MONOMETHYL ETHER 2-METHOXYETHANOL</td>
<td>109-86-4</td>
<td>60 - &lt; 70*</td>
</tr>
<tr>
<td>DIETHANOLAMINE</td>
<td>BIS(2-HYDROXYETHYL)AMINE</td>
<td>111-42-2</td>
<td>10 - &lt; 20*</td>
</tr>
<tr>
<td>SULFUR DIOXIDE</td>
<td></td>
<td>7446-09-5</td>
<td>10 - &lt; 20*</td>
</tr>
<tr>
<td>IMIDAZOLE</td>
<td>1H-IMIDAZOLE 1,3-DIAZA-2,4-CYCLOPENTADIENE Glyoxalin</td>
<td>288-32-4</td>
<td>5 - &lt; 10*</td>
</tr>
<tr>
<td>IODINE</td>
<td></td>
<td>7553-56-2</td>
<td>3 - &lt; 5*</td>
</tr>
</tbody>
</table>

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

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
Remove contaminated clothing immediately and wash skin with soap and water. Get medical advice/attention if you feel unwell. In case of eczema or other skin disorders: Seek medical attention and take along these instructions. 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. Continue rinsing. Get medical attention if irritation develops and persists.

Ingestion
Rinse mouth. Get medical advice/attention if you feel unwell.

Most important symptoms/effects, acute and delayed

Indication of immediate medical attention and special treatment needed
Provide general supportive measures and treat symptomatically. Thermal 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 warm. Keep victim under observation. Symptoms may be delayed.
Environmental precautions

5. Fire-fighting measures

Suitable extinguishing media
Water fog. Alcohol resistant foam. Dry chemical powder. Carbon dioxide (CO2).

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

Specific hazards arising from the chemical
Vapors may form explosive mixtures with air. Vapors may travel considerable distance to a source of ignition and flash back. During fire, gases hazardous to health may be formed.

Special protective equipment and precautions for firefighters
Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Fire fighting equipment/instructions
In case of fire and/or explosion do not breathe fumes. Move containers from fire area if you can do so without risk.

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

General fire hazards
Flammable liquid and vapor.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures
Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Wear appropriate protective equipment and clothing during clean-up. Do not breathe mist or vapor. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering them. 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
Stop leak if you can do so without risk. Use water spray to reduce vapors or divert vapor cloud drift. Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Prevent entry into waterways, sewers, basements or confined areas. Keep combustibles (wood, paper, oil, etc.) away from spilled material. Take precautionary measures against static discharge. Use only non-sparking tools. Clean contaminated surface thoroughly. This product is miscible in water. This material is classified as a water pollutant under the Clean Water Act and should be prevented from contaminating soil or from entering sewage and drainage systems which lead to waterways. Should not be released into the environment. Clean up in accordance with all applicable regulations.

Large Spills: Dike the spilled material, where this is possible. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. After removal flush contaminated area thoroughly with water. 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 release to the environment. Inform appropriate managerial or supervisory personnel of all environmental releases. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground.

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 handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. Explosion-proof general and local exhaust ventilation. Take precautionary measures against static discharges. All equipment used when handling the product must be grounded. Use non-sparking tools and explosion-proof equipment. Do not breathe mist or vapor. Avoid contact with eyes, skin, and clothing. Avoid prolonged exposure. When using, do not eat, drink or smoke. Pregnant or breastfeeding women must not handle this product. Should be handled in closed systems, if possible. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Avoid release to the environment. Wash contaminated clothing before reuse. Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities
Keep at temperatures between 13 and 30°C. Keep away from heat, sparks and open flame. Prevent electrostatic charge build-up by using common bonding and grounding techniques. Store in a cool, dry place out of direct sunlight. Store in original tightly closed container. Store in a well-ventilated place. Keep in an area equipped with sprinklers. Store away from incompatible materials (see Section 10 of the SDS).
8. Exposure controls/personal protection

Occupational exposure limits
The following constituents are the only constituents of the product which have a PEL, TLV or other recommended exposure limit. At this time, the other constituents have no known exposure limits.

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

<table>
<thead>
<tr>
<th>Components</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ETHYLENEGLYCOLMONONE THYL ETHER (CAS 109-86-4)</td>
<td>PEL</td>
<td>80 mg/m3</td>
</tr>
<tr>
<td>IODINE (CAS 7553-56-2)</td>
<td>Ceiling</td>
<td></td>
</tr>
<tr>
<td>SULFUR DIOXIDE (CAS 7446-09-5)</td>
<td>PEL</td>
<td>13 mg/m3</td>
</tr>
</tbody>
</table>

US. ACGIH Threshold Limit Values

<table>
<thead>
<tr>
<th>Components</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIETHANOLAMINE (CAS 111-42-2)</td>
<td>TWA</td>
<td>1 mg/m3</td>
</tr>
<tr>
<td>ETHYLENEGLYCOLMONONE THYL ETHER (CAS 109-86-4)</td>
<td>TWA</td>
<td>0.1 ppm</td>
</tr>
<tr>
<td>SULFUR DIOXIDE (CAS 7446-09-5)</td>
<td>STEL</td>
<td>0.25 ppm</td>
</tr>
</tbody>
</table>

US. NIOSH: Pocket Guide to Chemical Hazards

<table>
<thead>
<tr>
<th>Components</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIETHANOLAMINE (CAS 111-42-2)</td>
<td>TWA</td>
<td>15 mg/m3</td>
</tr>
<tr>
<td>ETHYLENEGLYCOLMONONE THYL ETHER (CAS 109-86-4)</td>
<td>TWA</td>
<td>3 ppm</td>
</tr>
<tr>
<td>IODINE (CAS 7553-56-2)</td>
<td>Ceiling</td>
<td>0.1 ppm</td>
</tr>
<tr>
<td>SULFUR DIOXIDE (CAS 7446-09-5)</td>
<td>STEL</td>
<td>13 mg/m3</td>
</tr>
<tr>
<td></td>
<td>TWA</td>
<td>5 ppm</td>
</tr>
</tbody>
</table>

Biological limit values

<table>
<thead>
<tr>
<th>Components</th>
<th>Value</th>
<th>Determinant</th>
<th>Specimen</th>
<th>Sampling Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>ETHYLENEGLYCOLMONONE THYL ETHER (CAS 109-86-4)</td>
<td>1 mg/g</td>
<td>2-Methoxyacetic acid</td>
<td>Creatinine in urine</td>
<td>*</td>
</tr>
</tbody>
</table>

* - For sampling details, please see the source document.

Exposure guidelines

US - Tennessee OELs: Skin designation
ETHYLENEGLYCOLMONOMETHYL ETHER (CAS 109-86-4) Can be absorbed through the skin.

US ACGIH Threshold Limit Values: Skin designation
DIETHANOLAMINE (CAS 111-42-2) Can be absorbed through the skin.
ETHYLENEGLYCOLMONOMETHYL ETHER (CAS 109-86-4) Can be absorbed through the skin.

US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants
DIETHANOLAMINE (CAS 111-42-2) Can be absorbed through the skin.
ETHYLENEGLYCOLMONOMETHYL ETHER (CAS 109-86-4) Can be absorbed through the skin.

US. Minnesota Hazardous Substances List (Minn. Rules 5206.0400).
ETHYLENEGLYCOLMONOMETHYL ETHER (CAS 109-86-4) Skin designation applies.

US. NIOSH: Pocket Guide to Chemical Hazards
ETHYLENEGLYCOLMONOMETHYL ETHER (CAS 109-86-4) Can be absorbed through the skin.

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)
ETHYLENEGLYCOLMONOMETHYL ETHER (CAS 109-86-4) Can be absorbed through the skin.
Explosion-proof general and local exhaust ventilation. Good general ventilation (typically 10 air changes per hour) 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. Provide eyewash station. Eye wash fountain and emergency showers are recommended. An eye wash and safety shower must be available in the immediate work area.

Appropriate engineering controls

Individual protection measures, such as personal protective equipment

Eye/face protection
Wear safety glasses with side shields (or goggles).

Skin protection
Hand protection
Wear appropriate chemical resistant gloves.

Other
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. Chemical respirator with organic vapor cartridge.

Thermal hazards
Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations
Observe any medical surveillance requirements. When using do not smoke. 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. Contaminated work clothing should not be allowed out of the workplace.

9. Physical and chemical properties

Appearance
Physical state
Liquid.
Form
Liquid.
Color
Red brown.
Odor
Strong. Irritating.
Odor threshold
Not available.
pH
6 approximately
Melting point/freezing point
-59 °F (-51 °C) estimated
Initial boiling point and boiling range
255.2 °F (124 °C)
Flash point
114.8 °F (46.0 °C)
Evaporation rate
Not available.
Flammability (solid, gas)
Not applicable.

Upper/lower flammability or explosive limits
Flammability limit - lower (%)
2.3 % estimated
Flammability limit - upper (%)
Not available.
Explosive limit - lower (%)
Not available.
Explosive limit - upper (%)
Not available.

Vapor pressure
439 hPa estimated
Vapor density
Not available.
Relative density
Not available.
Solubility(ies)
Solubility (water)
Miscible
Partition coefficient (n-octanol/water)
Not available.
Auto-ignition temperature
690 °F (365 °C) estimated
Decomposition temperature
Not available.
Viscosity
Not available.

Other information
Density
1.20 g/cm3

Explosive properties
Not explosive.
Flammability class: Combustible II estimated
Flash point class: Combustible II
Oxidizing properties: Not oxidizing.
Percent volatile: 60 % estimated
Specific gravity: 1.2
VOC: 60 - 70 %

10. Stability and reactivity
Reactivity: The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability: Stable at normal conditions.
Possibility of hazardous reactions: Hazardous polymerization does not occur.
Conditions to avoid: Avoid heat, sparks, open flames and other ignition sources. Avoid temperatures exceeding the flash point. Contact with incompatible materials.
Hazardous decomposition products: Carbon dioxide, carbon monoxide, oxides of sulfur and nitrogen.

11. Toxicological information
Information on likely routes of exposure
Inhalation: May cause damage to organs through prolonged or repeated exposure by inhalation. May cause irritation to the respiratory system.
Skin contact: Harmful in contact with skin. Causes skin irritation. May cause an allergic skin reaction.
Eye contact: Causes eye irritation.
Ingestion: Expected to be a low ingestion hazard.
Symptoms related to the physical, chemical and toxicological characteristics: Headache. Irritation of eyes. Exposed individuals may experience eye tearing, redness, and discomfort. May cause respiratory irritation. Coughing. Skin irritation. May cause redness and pain. May cause an allergic skin reaction. Dermatitis. Rash.

Information on toxicological effects
Acute toxicity: Harmful in contact with skin.

<table>
<thead>
<tr>
<th>Product</th>
<th>Species</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>WATERMARK® KARL FISCHER REAGENT, PYRIDINE-FREE SINGLE SOLUTION, 2 mg/ml</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute Inhalation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LC50</td>
<td>Guinea pig</td>
<td>5136 mg/l</td>
</tr>
<tr>
<td></td>
<td>Mouse</td>
<td>5227 mg/l</td>
</tr>
<tr>
<td></td>
<td>Rat</td>
<td>2419 mg/l</td>
</tr>
<tr>
<td>Oral</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>Mouse</td>
<td>99999 mg/kg</td>
</tr>
<tr>
<td></td>
<td>Rabbit</td>
<td>99999 mg/kg</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Components</th>
<th>Species</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIETHANOLAMINE (CAS 111-42-2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute Dermal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>Rabbit</td>
<td>11.9 ml/kg</td>
</tr>
<tr>
<td>Oral</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>Rat</td>
<td>1820 mg/kg</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>Mouse</td>
<td>2300 mg/kg</td>
</tr>
</tbody>
</table>

<p>| ETHYLENGLYCOLMONOMETHYL ETHER (CAS 109-86-4) | | |
| Acute Dermal | | |
| LD50 | Rabbit | 1280 mg/kg |</p>
<table>
<thead>
<tr>
<th>Components</th>
<th>Species</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Inhalation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LC50</td>
<td>Rat</td>
<td>1500 mg/l, 7 hours</td>
</tr>
<tr>
<td><strong>Oral</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>Guinea pig</td>
<td>950 mg/kg</td>
</tr>
<tr>
<td></td>
<td>Mouse</td>
<td>2560 mg/kg</td>
</tr>
<tr>
<td></td>
<td>Rabbit</td>
<td>890 mg/kg</td>
</tr>
<tr>
<td></td>
<td>Rat</td>
<td>2370 mg/kg</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>Mouse</td>
<td>2147 mg/kg</td>
</tr>
<tr>
<td></td>
<td>Rat</td>
<td>2140 mg/kg</td>
</tr>
<tr>
<td><strong>IMIDAZOLE (CAS 288-32-4)</strong></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>970 mg/kg</td>
</tr>
<tr>
<td><strong>IODOINE (CAS 7553-56-2)</strong></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>Mouse</td>
<td>22 g/kg</td>
</tr>
<tr>
<td></td>
<td>Rabbit</td>
<td>10 g/kg</td>
</tr>
<tr>
<td></td>
<td>Rat</td>
<td>14 g/kg</td>
</tr>
<tr>
<td><strong>SULFUR DIOXIDE (CAS 7446-09-5)</strong></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>Guinea pig</td>
<td>1000 ppm, 20 Hours</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1000 mg/l, 20 Hours</td>
</tr>
<tr>
<td></td>
<td></td>
<td>130 ppm, 154 Hours</td>
</tr>
<tr>
<td></td>
<td></td>
<td>130 mg/l, 154 Hours</td>
</tr>
<tr>
<td>Mouse</td>
<td></td>
<td>1000 ppm, 4 Hours</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1000 mg/l, 4 Hours</td>
</tr>
<tr>
<td></td>
<td></td>
<td>150 ppm, 847 Hours</td>
</tr>
<tr>
<td></td>
<td></td>
<td>150 mg/l, 847 Hours</td>
</tr>
</tbody>
</table>

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

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

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

**Respiratory or skin sensitization**

- **Respiratory sensitization**  Not a respiratory sensitizer.
- **Skin sensitization**  May cause an allergic skin reaction.

**Germ cell mutagenicity**  No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

**Carcinogenicity**  Suspected of causing cancer.

**IARC Monographs. Overall Evaluation of Carcinogenicity**

- **DIETHANOLAMINE (CAS 111-42-2)**  2B Possibly carcinogenic to humans.
- **SULFUR DIOXIDE (CAS 7446-09-5)**  3 Not classifiable as to carcinogenicity to humans.

**US OSHA Hazard Categories (1)**

- Not regulated.

**US OSHA Hazard Categories (10)**

- Not regulated.

**US OSHA Hazard Categories (2)**

- Not regulated.

**US OSHA Hazard Categories (3)**

- Not regulated.
US OSHA Hazard Categories (4)  
Not regulated.

US OSHA Hazard Categories (5)  
Not regulated.

US OSHA Hazard Categories (6)  
Not regulated.

US OSHA Hazard Categories (7)  
Not regulated.

US OSHA Hazard Categories (8)  
Not regulated.

US OSHA Hazard Categories (9)  
Not regulated.

US. National Toxicology Program (NTP) Report on Carcinogens  
Not listed.

Reproductive toxicity  
May damage fertility or the unborn child.

Specific target organ toxicity  
May cause respiratory irritation.

- single exposure

Specific target organ toxicity  
Causes damage to organs through prolonged or repeated exposure.

- repeated exposure

Aspiration hazard  
Not an aspiration hazard.

Chronic effects  
Causes damage to organs through prolonged or repeated exposure. Prolonged inhalation may be harmful. Prolonged exposure may cause chronic effects.

12. Ecological information

Ecotoxicity  
Toxic to aquatic life with long lasting effects.

<table>
<thead>
<tr>
<th>Product</th>
<th>Species</th>
<th>Test Results</th>
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</thead>
<tbody>
<tr>
<td>WATERMARK® KARL FISCHER REAGENT, PYRIDINE-FREE SINGLE SOLUTION, 2 mg/ml</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aquatic</td>
<td>Crustacea EC50 Daphnia</td>
<td>426.2069 mg/l, 48 hours estimated</td>
</tr>
<tr>
<td></td>
<td>Fish LC50 Fish</td>
<td>63.889 mg/l, 96 hours estimated</td>
</tr>
</tbody>
</table>

| DIETHANOLAMINE (CAS 111-42-2) | | |
| Aquatic | Crustacea EC50 Water flea (Ceriodaphnia dubia) | 61.8 - 86.04 mg/l, 48 hours |
| | Fish LC50 Fathead minnow (Pimephales promelas) | 100 mg/l, 96 hours |

| ETHYLENEGLYCOLMONOMETHYL ETHER (CAS 109-86-4) | | |
| Aquatic | Fish LC50 Bluegill (Lepomis macrochirus) | > 10000 mg/l, 96 hours |

| IODINE (CAS 7553-56-2) | | |
| Aquatic | Fish LC50 Rainbow trout, donaldson trout (Oncorhynchus mykiss) | 0.48 - 0.58 mg/l, 96 hours |

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

Persistence and degradability

Bioaccumulative potential

<table>
<thead>
<tr>
<th>Partition coefficient n-octanol / water (log Kow)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DIETHANOLAMINE</td>
<td>-1.43</td>
</tr>
<tr>
<td>ETHYLENEGLYCOLMONOMETHYL ETHER</td>
<td>-0.77</td>
</tr>
<tr>
<td>IODINE</td>
<td>2.49</td>
</tr>
</tbody>
</table>

Mobility in soil  
No data available.

Other adverse effects  
The product contains volatile organic compounds which have a photochemical ozone creation potential.

Material name: WATERMARK® KARL FISCHER REAGENT, PYRIDINE-FREE SINGLE SOLUTION, 2 mg/ml  
1601  
Version #: 02  
Revision date: December-28-2016  
Issue date: March-21-2014  
8 / 12
13. Disposal considerations

**Disposal instructions**
Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with local/regional/national/international regulations.

**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**
Dispose of in accordance with local regulations. 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**
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**

<table>
<thead>
<tr>
<th>UN number</th>
<th>UN1188</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>UN proper shipping name</strong></td>
<td>Ethylene glycol monomethyl ether mixture</td>
</tr>
<tr>
<td><strong>Transport hazard class(es)</strong></td>
<td></td>
</tr>
<tr>
<td>Class</td>
<td>3</td>
</tr>
<tr>
<td>Subsidiary risk</td>
<td>-</td>
</tr>
<tr>
<td>Label(s)</td>
<td>3</td>
</tr>
<tr>
<td>Packing group</td>
<td>III</td>
</tr>
<tr>
<td>Special precautions for user</td>
<td>Read safety instructions, SDS and emergency procedures before handling.</td>
</tr>
<tr>
<td>Special provisions</td>
<td>B1, IB3, T2, TP1</td>
</tr>
<tr>
<td>Packaging exceptions</td>
<td>150</td>
</tr>
<tr>
<td>Packaging non bulk</td>
<td>203</td>
</tr>
<tr>
<td>Packaging bulk</td>
<td>242</td>
</tr>
</tbody>
</table>

**IATA**

<table>
<thead>
<tr>
<th>UN number</th>
<th>UN1188</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>UN proper shipping name</strong></td>
<td>Ethylene glycol monomethyl ether mixture</td>
</tr>
<tr>
<td><strong>Transport hazard class(es)</strong></td>
<td></td>
</tr>
<tr>
<td>Class</td>
<td>3</td>
</tr>
<tr>
<td>Subsidiary risk</td>
<td>-</td>
</tr>
<tr>
<td>Packing group</td>
<td>III</td>
</tr>
<tr>
<td>Environmental hazards</td>
<td>No.</td>
</tr>
<tr>
<td>ERG Code</td>
<td>3L</td>
</tr>
<tr>
<td>Special precautions for user</td>
<td>Read safety instructions, SDS and emergency procedures before handling.</td>
</tr>
</tbody>
</table>

**Other information**

| Passenger and cargo aircraft | Allowed with restrictions. |
| Cargo aircraft only | Allowed with restrictions. |

**IMDG**

<table>
<thead>
<tr>
<th>UN number</th>
<th>UN1188</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>UN proper shipping name</strong></td>
<td>ETHYLENE GLYCOL MONOMETHYL ETHER MIXTURE</td>
</tr>
<tr>
<td><strong>Transport hazard class(es)</strong></td>
<td></td>
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<tr>
<td>Class</td>
<td>3</td>
</tr>
<tr>
<td>Subsidiary risk</td>
<td>-</td>
</tr>
<tr>
<td>Packing group</td>
<td>III</td>
</tr>
<tr>
<td>Environmental hazards</td>
<td>No.</td>
</tr>
<tr>
<td>Marine pollutant</td>
<td>No.</td>
</tr>
<tr>
<td>EmS</td>
<td>F-E, S-D</td>
</tr>
<tr>
<td>Special precautions for user</td>
<td>Read safety instructions, SDS and emergency procedures before handling.</td>
</tr>
</tbody>
</table>

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**
Not established.
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)**

ETHYLENEGLYCOLMONOMETHYL ETHER (CAS 109-86-4) 1.0 % One-Time Export Notification only.

**CERCLA Hazardous Substance List (40 CFR 302.4)**

DIETHANOLAMINE (CAS 111-42-2) Listed.

**SARA 304 Emergency release notification**

SULFUR DIOXIDE (CAS 7446-09-5) 500 LBS

**US OSHA Hazard Categories (1)**

Not regulated.

**US OSHA Hazard Categories (2)**

Not regulated.

**US OSHA Hazard Categories (3)**

Not regulated.

**US OSHA Hazard Categories (4)**

Not regulated.

**US OSHA Hazard Categories (5)**

Not regulated.

**US OSHA Hazard Categories (6)**

Not regulated.

**US OSHA Hazard Categories (7)**

Not regulated.

**US OSHA Hazard Categories (8)**

Not regulated.

**US OSHA Hazard Categories (9)**

Not regulated.

**US OSHA Hazard Categories (10)**

Not regulated.

**Superfund Amendments and Reauthorization Act of 1986 (SARA)**

<table>
<thead>
<tr>
<th>Hazard categories</th>
<th>Immediate Hazard</th>
<th>Delayed Hazard</th>
<th>Fire Hazard</th>
<th>Pressure Hazard</th>
<th>Reactivity Hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>SARA 302 Extremely hazardous substance</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS number</th>
<th>Reportable quantity (pounds)</th>
<th>Threshold planning quantity (pounds)</th>
<th>Threshold planning quantity, lower value (pounds)</th>
<th>Threshold planning quantity, upper value (pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SULFUR DIOXIDE</td>
<td>7446-09-5</td>
<td>500</td>
<td>500</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**SARA 311/312**

No

**Hazardous chemical**

**SARA 313 (TRI reporting)**

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS number</th>
<th>% by wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIETHANOLAMINE</td>
<td>111-42-2</td>
<td></td>
</tr>
<tr>
<td>ETHYLENEGLYCOLMONOMETHYL ETHER</td>
<td>109-86-4</td>
<td>60 - &lt; 70</td>
</tr>
</tbody>
</table>

**Other federal regulations**

**Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List**

DIETHANOLAMINE (CAS 111-42-2)

**Clean Air Act (CAA) Section 112(r)* Accidental Release Prevention (40 CFR 68.130)**

SULFUR DIOXIDE (CAS 7446-09-5)

**Safe Drinking Water Act (SDWA)**

Drug Enforcement Administration (DEA). List 1 & 2 Exempt Chemical Mixtures (21 CFR 1310.12(c))

IODINE (CAS 7553-56-2) 2.2 %WV

DEA Exempt Chemical Mixtures Code Number

IODINE (CAS 7553-56-2) 6699

FEMA Priority Substances Respiratory Health and Safety in the Flavor Manufacturing Workplace

SULFUR DIOXIDE (CAS 7446-09-5) High priority

**US state regulations**

WARNING: This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

**US - California Proposition 65 - CRT: Listed date/Carcinogenic substance**

DIETHANOLAMINE (CAS 111-42-2) Listed: June 22, 2012

**US - California Proposition 65 - CRT: Listed date/Developmental toxin**

ETHYLENEGLYCOLMONOMETHYL ETHER (CAS 109-86-4) Listed: January 1, 1989

SULFUR DIOXIDE (CAS 7446-09-5) Listed: July 29, 2011

**US - California Proposition 65 - CRT: Listed date/Male reproductive toxin**

ETHYLENEGLYCOLMONOMETHYL ETHER (CAS 109-86-4) Listed: January 1, 1989

**US. California. Candidate Chemicals List. Safer Consumer Products Regulations (Cal. Code Regs, tit. 22, 69502.3, subd. (a))**

DIETHANOLAMINE (CAS 111-42-2)

ETHYLENEGLYCOLMONOMETHYL ETHER (CAS 109-86-4)

IMIDAZOLE (CAS 288-32-4)

SULFUR DIOXIDE (CAS 7446-09-5)

**International Inventories**

<table>
<thead>
<tr>
<th>Country(s) or region</th>
<th>Inventory name</th>
<th>On inventory (yes/no)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Australian Inventory of Chemical Substances (AICS)</td>
<td>Yes</td>
</tr>
<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>China</td>
<td>Inventory of Existing Chemical Substances in China (IECSC)</td>
<td>Yes</td>
</tr>
<tr>
<td>Europe</td>
<td>European Inventory of Existing Commercial Chemical Substances (EINECS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Europe</td>
<td>European List of Notified Chemical Substances (ELINCS)</td>
<td>No</td>
</tr>
<tr>
<td>Japan</td>
<td>Inventory of Existing and New Chemical Substances (ENCS)</td>
<td>No</td>
</tr>
<tr>
<td>Korea</td>
<td>Existing Chemicals List (ECL)</td>
<td>Yes</td>
</tr>
<tr>
<td>New Zealand</td>
<td>New Zealand Inventory</td>
<td>Yes</td>
</tr>
<tr>
<td>Philippines</td>
<td>Philippine Inventory of Chemicals and Chemical Substances (PICCS)</td>
<td>Yes</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).

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

**Issue date** March-21-2014

**Revision date** December-28-2016

**Version #** 02
Disclaimer

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. GFS Chemicals, Inc. cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available.

Revision information

This document has undergone significant changes and should be reviewed in its entirety.