# MATERIAL SAFETY DATA SHEET

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

<table>
<thead>
<tr>
<th>NFPA</th>
<th>HMIS</th>
<th>Personal Protective Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>![NFPA Rating]</td>
<td>![HMIS Rating]</td>
<td>![PPE Rating]</td>
</tr>
</tbody>
</table>

### Product code: D1267

### Product Name: DIMETHYL SULFOXIDE, 98 PERCENT

### Chemical Name: Methane, 1,1'-sulfinylbis-

### Synonyms:
- Deltan
- Demasorb
- Demavet
- Demeso
- Demosodrox
- Dermasorb
- Dimethyl sulphoxide
- Dimexide
- Dipirartril-tropico
- DMSO
- Dolicur
- Domoso
- Dromisol
- Durasorb
- Gamasol 90
- Hyadur
- Infiltrina
- Methane, sulfinylbis-
- Methylsulfinylmethane
- Methyl Sulfoxide
- Somipront
- Sulfanyl(is)methane
- Syntexan
- Diméthylsulfoxyde (French)
- Sulfoxyde diméthylique (French)
- Dimetil sulfóxido (Spanish)

### Recommended use:

### CAS #:
67-68-5

### RTECS #:
PV6210000

### Formula:
C2-H6-O-S

### CI#:
Not available

---

See Section 8.
2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW
CAUTION! COMBUSTIBLE LIQUID
May cause skin and eye irritation
May cause irritation of respiratory tract

<table>
<thead>
<tr>
<th>Odor:</th>
<th>Physical state:</th>
<th>Appearance:</th>
<th>Color:</th>
</tr>
</thead>
</table>

OSHA Regulatory Status
This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200)

POTENTIAL HEALTH EFFECTS

Principal Routes of Exposure:
Skin. Ingestion. Eyes.

Acute Potential Health Effects:

Skin Contact:
May cause skin irritation. Mild skin irritation. May cause burning or stinging sensation, redness of the skin, inflammation of the skin. May cause itching. May cause urticaria (hives). Dimethyl Sulfoxide readily penetrates the skin and may carry other dissolved chemicals into the body. Skin absorption of DMSO may result in garlic-like breath and body odor. If absorbed through skin it may cause systemic effects with symptoms similar to those of ingestion. May cause dyspnea (shortness of breath and difficulty breathing) and cyanosis.

Eye Contact:

Inhalation:
May cause irritation of respiratory tract. Inhalation of a high concentration of vapors may cause headache, dizziness, and sedation.

Ingestion:
Ingestion may cause gastrointestinal irritation, nausea, vomiting, and diarrhoea. May cause constipation. May cause anorexia. May cause a garlic-onion-oyster smell on the body and on the breath. May cause central nervous system effects. May cause headache. May cause dizziness. May affect the cardiovascular system. May affect respiration. May affect the liver. It may affect the kidneys. May affect the blood. May cause hypoglycemia.

Chronic Potential Health Effects:

<table>
<thead>
<tr>
<th>Component</th>
<th>Carcinogen Status:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimethyl Sulfoxide 67-68-5 (100)</td>
<td>No information available</td>
</tr>
</tbody>
</table>
Target Organs: Kidneys. Skin. Central nervous system.

Mutagenic Effects: May affect genetic material
Mutations in microorganisms
Experiments with bacteria and/or yeast have shown mutagenic effects
Mutagenic effects in mammalian somatic cells

Teratogenic Effects: Showed teratogenic effects in animal experiments
Dimethyl Sulfoxide (DMSO) has been associated with teratogenic and/or embryotoxic effects in animals (hamster, mouse, rat), particularly when administered parenterally (intraperitoneal or intravenous routes). DMSO has not been shown to be teratogenic or embryotoxic via oral or dermal routes at dose levels that do not produce overt maternal toxicity
No data in humans was available to evaluate the effects of exposure on development

Aggravated Medical Conditions: No information available

See Section 11 for additional Toxicological Information

POTENTIAL ENVIRONMENTAL EFFECTS
No information available

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimethyl Sulfoxide</td>
<td>67-68-5</td>
<td>100</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

General Advice: Poison information centres in each State capital city can provide additional assistance for scheduled poisons (13 1126)

Skin Contact: Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. Get medical attention.

Eye Contact: Flush eye with water for 15 minutes. Get medical attention.

Inhalation: Move to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion: Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Obtain medical attention.

Notes to Physician: Treat symptomatically

5. FIRE-FIGHTING MEASURES

Flammable Properties

<table>
<thead>
<tr>
<th>Flashpoint (°C/°F):</th>
<th>89 ºC/192.2 ºF</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>95 ºC/203 ºF</td>
</tr>
</tbody>
</table>

Product code: D1267  Product name: DIMETHYL SULFOXIDE, 98 PERCENT
Flash Point Tested according to:
- Closed cup
- Open cup

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower Explosion Limit (%)</td>
<td>2.6%</td>
</tr>
<tr>
<td>Upper Explosion Limit (%)</td>
<td>42%</td>
</tr>
<tr>
<td>Autoignition Temperature (°C/°F)</td>
<td>215 °C/419 °F</td>
</tr>
</tbody>
</table>

**Suitable Extinguishing Media:**
Dry chemical. Carbon dioxide (CO2). Water spray mist or foam.

**Unsuitable Extinguishing Media:**
High volume water jet. Do not use a solid (straight) water stream as it may scatter and spread fire.

**Hazardous Combustion Products:**
Carbon monoxide; Carbon dioxide; Sulfur oxides; Formaldehyde and Methyl mercaptan may also be formed

**Specific hazards:**
Combustible material. Vapors may form explosive mixtures with air. Most vapors are heavier than air. They will spread along the ground and collect in low or confined areas (sewers, basements, tanks). Container explosion may occur under fire conditions or when heated. Fire may produce irritating, corrosive and/or toxic gases.

**Special Protective Equipment for Firefighters:**
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear

**Specific Methods:**
Water mist may be used to cool closed containers. For larger fires, use water spray or fog. Cool containers with flooding quantities of water until well after fire is out.

6. ACCIDENTAL RELEASE MEASURES

**Personal Precautions:**
Ensure adequate ventilation. Avoid contact with skin, eyes and clothing. Use personal protective equipment. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment. All equipment used when handling the product must be grounded.

**Environmental Precautions:**
Prevent further leakage or spillage if safe to do so. Should not be released into the environment. Prevent entry into waterways, sewers, basements or confined areas. In case of large spill, dike if needed. Dike far ahead of liquid spill for later disposal.

**Methods for Cleaning Up:**
Absorb spill with inert material (e.g. vermiculite, dry sand or earth), then place in a suitable chemical waste container. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

**Handling**
Technical Measures/Precautions:
Provide sufficient air exchange and/or exhaust in work rooms. Remove all sources of ignition. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded. Keep away from incompatible materials.

Safe Handling Advice:
Wear personal protective equipment. Avoid contact with skin, eyes and clothing. Keep away from heat and sources of ignition. Take precautionary measures against static discharges. Do not ingest. Do not breathe vapors or spray mist. Handle in accordance with good industrial hygiene and safety practice.

Storage

Technical Measures/Storage Conditions:

Incompatible Materials:

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures to reduce exposure: Ensure adequate ventilation. Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors and mist below their respective threshold limit value.

Personal Protective Equipment

Eye protection: Goggles.

Skin and body protection: Long sleeved clothing. Chemical resistant apron. Gloves.

Respiratory protection: Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Respiratory protection is not necessary for normal handling. Good room ventilation or use of local exhaust (fume hood) is sufficient. Use a vapor respirator under conditions where exposure to the substance is apparent (e.g. generation of high concentrations of mist or vapor, inadequate ventilation, development of respiratory tract irritation), and engineering controls are not feasible. Be sure to use an approved/certified respirator or equivalent.

Hygiene measures: Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product. When using, do not eat, drink or smoke.

National occupational exposure limits

United States
U.S Occupational Exposure Limits:

<table>
<thead>
<tr>
<th>Components</th>
<th>OSHA</th>
<th>NIOSH</th>
<th>ACGIH</th>
<th>AIHA WHEEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimethyl Sulfoxide - 67-68-5</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>250 ppm TWA</td>
</tr>
</tbody>
</table>

Canada
Canada Occupational Exposure Limits: Not determined

Product code: D1267
Product name: DIMETHYL SULFOXIDE, 98 PERCENT
### 9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Physical state:</th>
<th>Liquid.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash point (°C):</td>
<td>89</td>
</tr>
<tr>
<td>Autoignition Temperature (°C/°F):</td>
<td>215 °C/419 °F</td>
</tr>
<tr>
<td>pH:</td>
<td>No information available</td>
</tr>
<tr>
<td>Decomposition temperature(°C/°F):</td>
<td>No information available</td>
</tr>
<tr>
<td>Evaporation rate:</td>
<td>No information available</td>
</tr>
<tr>
<td>Odor threshold (ppm):</td>
<td>No information available</td>
</tr>
<tr>
<td>Appearance:</td>
<td>No information available</td>
</tr>
<tr>
<td>Taste</td>
<td>Slightly bitter with a sweet after-taste.</td>
</tr>
<tr>
<td>Specific gravity:</td>
<td>1.100</td>
</tr>
<tr>
<td>Bulk density:</td>
<td>No information available</td>
</tr>
<tr>
<td>Vapor density:</td>
<td>No information available</td>
</tr>
<tr>
<td>Partition coefficient (n-octanol/water):</td>
<td>-1.35</td>
</tr>
<tr>
<td>Molecular/Formula weight:</td>
<td>78.13</td>
</tr>
<tr>
<td>Flash point (°C):</td>
<td>89</td>
</tr>
<tr>
<td>Autoignition Temperature (°C/°F):</td>
<td>215 °C/419 °F</td>
</tr>
<tr>
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</tr>
<tr>
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</tr>
<tr>
<td>Evaporation rate:</td>
<td>No information available</td>
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<tr>
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</tr>
<tr>
<td>Molecular/Formula weight:</td>
<td>78.13</td>
</tr>
</tbody>
</table>

### 10. STABILITY AND REACTIVITY

| Stability: | Stable at normal conditions |

**Product code:** D1267  
**Product name:** DIMETHYL SULFOXIDE, 98 PERCENT


Possibility of Hazardous Reactions: Dimethyl Sulfoxide forms a violently or explosive reaction with the following: Acetyl Chloride, Benzenesulfonyl chloride, Bromobenzoyl acetonilide, Cyanuric chloride, Disulfur dichloride, Iodine pentafluoride, Oxalyl chloride, Magnesium perchlorate, Bromomethane, Diphosphorus trioxide, Phosphorous trichloride, Phosphoryl chloride, Silver difluoride, Sodium hydride, Sulfur dichloride, Tetrachlorosilane, Thionyl chloride, Boron compounds, 4(4'-Bromobenzoyl)acetanilide, Carbonyl diisothiocyanate; Copper + trichloroacetic acid, Dinitrogen tetraoxide, metal alkoxides, Trifluoroacetic acid anhydride, Aluminum perchlorate, Iron (III) nitrate; Sodium perchlorate. Dimethyl sulfoxide is incompatible with Perchloric acid, Periodic acid, Sulfur trioxide, metal oxosalts

Polymerization: Hazardous polymerisation does not occur

Corrosivity: No hazardous polymerisation available

Special Remarks on Corrosivity: No information available

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Component Information

**Dimethyl Sulfoxide - 67-68-5**

- LD50/oral/rat = 14500 mg/kg Oral LD50 Rat
- LD50/oral/mouse = 7920-21400 mg/kg
- LD50/dermal/rat = 40 g/kg Dermal LD50 Rat
- LD50/dermal/rabbit = No information available
- LC50/inhalation/rat = >1600 mg/m3 4 h
- LC50/inhalation/mouse = No information available
- Other LD50 or LC50 information = 17400 mg/kg LD50 oral Rat
- 28300 mg/kg LD50 oral Rat

Product Information

- LC50/inhalation/rat >1600 mg/m3 4 h
- LC50/inhalation/mouse No information available
- LD50/dermal/rabbit No information available
- LD50/dermal/rat 40000mg/kg
- LD50/oral/mouse = 7920mg/kg
- LD50/oral/rat = 14500mg/kg

Local Effects

Product code: D1267
Product name: DIMETHYL SULFOXIDE, 98 PERCENT
Skin irritation: May cause skin irritation. Mild skin irritation. May cause burning sensation or stinging, redness, and inflammation of the skin. May cause urticaria (hives). May cause itching.

Eye irritation: Contact with eyes may cause irritation. Mild eye irritation. May cause conjunctival irritation.

Inhalation: May cause irritation of respiratory tract. Inhalation of a high concentration of vapors may cause headache, dizziness, and sedation.

Ingestion: Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea. May cause constipation. May cause abdominal pain. May cause decreased appetite or anorexia. May cause cyanosis. May affect respiration (difficult or labored breathing resulting in shortness of breath). May affect respiration (respiratory depression). May affect urinary system (kidneys). May cause increase in urine volume. It may affect the blood (anemia, eosinophilia). It may affect the brain. May affect blood (changes in serum composition). May affect the cardiovascular system (vasodilation, hypotension, tachycardia, chest pain). May affect behavior/central nervous system (ataxia). May affect behavior/central nervous system (muscle weakness, convulsions). May affect behavior/central nervous system (dizziness, headache). May affect behavior/central nervous system (analgesia, fatigue, sedation, tremor). May cause hypoglycemia (low blood sugar), which is characterized by symptoms such as blurred vision, chills, cold sweat, dizziness, drowsiness, shaking, rapid heart rate, confusion, weakness, headache, fainting, hunger, tingling of the hands or feet. May affect liver.

Sensitization: No information available

Chronic Toxicity

Chronic Toxicity Prolonged or repeated ingestion may cause nausea, vomiting, loss of appetite. Prolonged or repeated ingestion may affect the blood (changes in red blood cell count). Prolonged or repeated ingestion may affect the blood (normocytic anemia). Prolonged or repeated ingestion may affect the kidneys (polyuria (increase in urine volume, hematuria (blood in the urine), tubular necrosis). Prolonged skin contact may cause skin irritation and/or dermatitis. Chronic exposure may cause drying and scaling of the skin.

Carcinogenic effects: Equivocal tumorigenic agent by Registry of Toxic Effects of Chemical Substances (RTECS) criteria

<table>
<thead>
<tr>
<th>Components</th>
<th>NTP</th>
<th>IARC</th>
<th>OSHA HCS - Carcinogens</th>
<th>ACGIH - Carcinogens</th>
<th>Australia - Prohibited Carcinogenic Substances</th>
<th>Australia - Notifiable Carcinogenic Substances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimethyl Sulfoxide</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
</tbody>
</table>

Mutagenic Effects: May affect genetic material
Mutations in microorganisms
Experiments with bacteria and/or yeast have shown mutagenic effects
Mutagenic effects in mammalian somatic cells

Reproductive Effects: Experiments have shown reproductive toxicity effects on laboratory animals
May cause adverse reproductive effects based on animal data
No information on reproductive toxicity effects on humans was found
Teratogenic Effects: Showed teratogenic effects in animal experiments. Dimethyl Sulfoxide (DMSO) has been associated with teratogenic and/or embryotoxic effects in animals (hamster, mouse, rat), particularly when administered parenterally (intraperitoneal or intravenous routes). DMSO has not been shown to be teratogenic or embryotoxic via oral or dermal routes at dose levels that do not produce overt maternal toxicity. No data in humans was available to evaluate the effects of exposure on development.

Target Organs: Kidneys. Skin. Central nervous system.

12. ECOLOGICAL INFORMATION

ECOTOXICITY

Toxicity to terrestrial and aquatic plants and animals: Information given is based on data on the components and the ecotoxicology of similar products

Ecotoxicity effects:

Aquatic toxicity:

*Dimethyl Sulfoxide - 67-68-5*

**Freshwater Algae Data:** 12350 - 25500 mg/L EC50 Skeletonema costatum 96 h

**Freshwater Fish Species Data:**
- 33-37 g/L LC50 Oncorhynchus mykiss 96 h static 1
- 34 mg/L LC50 Pimephales promelas 96 h 1
- 41.7 g/L LC50 Cyprinus carpio 96 h 1
- 40 g/L LC50 Lepomis macrochirus 96 h static 1

**Water Flea Data:** 7000 mg/L EC50 Daphnia species 24 h

**Mobility:** It is expected to have very high mobility based on estimated Koc.

**Persistence and degradability:** Readily biodegradable

**Bioaccumulative potential:** Potential for bioconcentration in aquatic organisms is low.

13. DISPOSAL CONSIDERATIONS

Waste from residues / unused products:
Waste must be disposed of in accordance with Federal, State and Local regulation.

Contaminated packaging:
Empty containers should be taken for local recycling, recovery or waste disposal

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimethyl Sulfoxide</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

14. TRANSPORT INFORMATION

**DOT**

- **UN-No:** Not regulated
- **Proper Shipping Name:** No information available
- **Hazard Class:** No information available
- **Packing Group:** None
- **Subsidiary Risk:** Not applicable
- **Marine Pollutant** No data available
- **ERG No:** No information available
- **DOT RQ (lbs):** No information available

**Product code:** D1267  **Product name:** DIMETHYL SULFOXIDE, 98 PERCENT
15. REGULATORY INFORMATION

Product code: D1267  
Product name: DIMETHYL SULFOXIDE, 98 PERCENT
International Inventories

<table>
<thead>
<tr>
<th>Components</th>
<th>U.S. TSCA</th>
<th>Philippines (PICCS)</th>
<th>KOREA KECL</th>
<th>Japan ENCS</th>
<th>CHINA</th>
<th>Australia (AICS)</th>
<th>EINECS-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimethyl Sulfoxide</td>
<td>Present</td>
<td>Present</td>
<td>Present KE-32367</td>
<td>Present (2)-1553</td>
<td>Present</td>
<td>Present</td>
<td>Present 200-664-3</td>
</tr>
</tbody>
</table>

U.S. Regulations

**Dimethyl Sulfoxide**

**New Jersey RTK Hazardous Substance List:** Present

**California Prop. 65: Safe Drinking Water and Toxic Enforcement Act of 1986.**

**Chemicals Known to the State of California to Cause Cancer:**

This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

**Chemicals Known to the State of California to Cause Reproductive Toxicity:**

This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

<table>
<thead>
<tr>
<th>Components</th>
<th>Carcinogen</th>
<th>Developmental Toxicity</th>
<th>Male Reproductive Toxicity</th>
<th>Female Reproductive Toxicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimethyl Sulfoxide</td>
<td>Not Listed</td>
<td>Not Listed</td>
<td>Not Listed</td>
<td>Not Listed</td>
</tr>
</tbody>
</table>

**CERCLA/SARA**

<table>
<thead>
<tr>
<th>Components</th>
<th>CERCLA - Hazardous Substances and their Reportable Quantities</th>
<th>Section 302 Extremely Hazardous Substances and TPQs</th>
<th>Section 302 Extremely Hazardous Substances and RQs</th>
<th>Section 313 - Chemical Category</th>
<th>Section 313 - Reporting de minimis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimethyl Sulfoxide</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

**U.S. TSCA**

<table>
<thead>
<tr>
<th>Components</th>
<th>TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS)</th>
<th>TSCA 8(d) - Health and Safety Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimethyl Sulfoxide</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

**Canada**

**WHMIS hazard class:**

B3  Combustible liquid

**Dimethyl Sulfoxide**

B3

**Canada Controlled Products Regulation:**

This product has been classified according to the hazard criteria of the CPR (Controlled Products Regulation) and the MSDS contains all of the information required by the CPR.

<table>
<thead>
<tr>
<th>Components</th>
<th>WHMIS Ingredient Disclosure List -</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimethyl Sulfoxide</td>
<td>1 %</td>
</tr>
</tbody>
</table>

**Inventory**

<table>
<thead>
<tr>
<th>Components</th>
<th>Canada (DSL)</th>
<th>Canada (NDSL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimethyl Sulfoxide</td>
<td>Present</td>
<td>Not Listed</td>
</tr>
</tbody>
</table>

**Product code:** D1267  **Product name:** DIMETHYL SULFOXIDE, 98 PERCENT
<table>
<thead>
<tr>
<th>Components</th>
<th>CEPA Schedule I - Toxic Substances</th>
<th>CEPA - 2010 Greenhouse Gases Subject to Mandatory Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimethyl Sulfoxide</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
</tbody>
</table>

**EU Classification**

**R-phrase(s)**
not determined

**S-phrase(s)**
none

<table>
<thead>
<tr>
<th>Components</th>
<th>Classification</th>
<th>Concentration Limits:</th>
<th>Safety Phrases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimethyl Sulfoxide</td>
<td></td>
<td>No information</td>
<td></td>
</tr>
</tbody>
</table>

The product is classified in accordance with Annex VI to Directive 67/548/EEC

**Indication of danger:**
Not dangerous

### 16. OTHER INFORMATION

The MSDS format complies with ANSI Z400.1/Z129.1-2010 standards.

**Preparation Date:** 17-Sep-2014

**Reason for revision:** Not applicable

**Prepared by:** Sonia Owen

**Literature reference:** No information available

All chemicals may pose unknown hazards and should be used with caution. This Material Safety Data Sheet (MSDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this MSDS. The physical properties reported in this MSDS are obtained from the literature and do not constitute product specifications. Information contained herein does not constitute a warranty, whether expressed or implied, as to the safety, merchantability or fitness of the goods for a particular purpose. Spectrum Chemicals & Laboratory Products, Inc. assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits, arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this MSDS is based on technical data judged to be reliable, Spectrum assumes no responsibility for the completeness or accuracy of the information contained herein.