1. PRODUCT AND COMPANY IDENTIFICATION

Product Name Chloroform, stabilized with ethanol
Cat No. BP1145-1; C294-1; C294-4; C295-4; C295-20; C295S-4; C298-1; C298-1LC; C298-4; C298-20; C298-200; C298-200LC; C298-500; C298FB-19; C298FB-50; C298FB-115; C298FB-200; C298RB-115; C298RB-200; C298RS-19; C298RS-28; C298RS-50; C298RS-200; C298S-4; C298SK-4; C298SS-50; C298SS-115; C298SS-200; C574-1; C574-4; C574SK-4; C606-1; C606-4; C606RS-28; C606RS-115; C606SK-1; C606SK-4; C606SS-28; C606SS-50; C606SS-115; C606SS-200
Synonyms Trichloromethane, preserved with Ethanol (Molecular Biology/Technical/Certified ACS/Spectranalyzed/HPLC)
Recommended Use Laboratory chemicals
Company Fisher Scientific
Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100
Emergency Telephone Number CHEMTREC®, Inside the USA: 800-424-9300
CHEMTREC®, Outside the USA: 703-527-3887

2. HAZARDS IDENTIFICATION

WARNING!
Possible cancer hazard. May cause cancer based on animal data. Harmful if swallowed. Irritating to eyes and skin. May cause central nervous system effects. Aspiration hazard if swallowed - can enter lungs and cause damage. May be harmful if inhaled. May cause irritation of respiratory tract. Danger of serious damage to health by prolonged exposure.

Appearance Colorless
Physical State Liquid
odor aromatic

Target Organs Skin, Eyes, Central nervous system (CNS), Liver, Kidney, Blood

Potential Health Effects

Acute Effects
Principle Routes of Exposure

Eyes Irritating to eyes.
Skin
Irritating to skin. May be harmful in contact with skin.
Inhalation
May be harmful if inhaled. May cause irritation of respiratory tract. Inhalation may cause central nervous system effects.
Ingestion
Harmful if swallowed. Aspiration hazard. May cause central nervous system effects. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

Chronic Effects
Possible cancer hazard based on tests with laboratory animals. Tumorigenic effects have been reported in experimental animals.: May cause adverse liver effects. May cause adverse kidney effects.

See Section 11 for additional Toxicological information.

Aggravated Medical Conditions

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloroform</td>
<td>67-66-3</td>
<td>99</td>
</tr>
<tr>
<td>Ethyl alcohol</td>
<td>64-17-5</td>
<td>1</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

Eye Contact
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Obtain medical attention.

Skin Contact
Wash off immediately with plenty of water for at least 15 minutes. Obtain medical attention.

Inhalation
Move to fresh air. If breathing is difficult, give oxygen. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with a respiratory medical device. Obtain medical attention.

Ingestion
Do not induce vomiting. Call a physician or Poison Control Center immediately.

Notes to Physician
Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Flash Point
No information available.
Method
No information available.

Autoignition Temperature
No information available.
Explosion Limits
Upper
No data available
Lower
No data available

Suitable Extinguishing Media
Substance is nonflammable; use agent most appropriate to extinguish surrounding fire..

Unsuitable Extinguishing Media
No information available.

Hazardous Combustion Products
Phosgene, Chlorine.
Sensitivity to mechanical impact
No information available.

Sensitivity to static discharge
No information available.

Specific Hazards Arising from the Chemical
Thermal decomposition can lead to release of irritating gases and vapors.

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

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions
Use personal protective equipment. Ensure adequate ventilation. Avoid contact with skin, eyes and clothing.

Environmental Precautions
Should not be released into the environment.

Methods for Containment and Clean Up
Soak up with inert absorbent material. Keep in suitable and closed containers for disposal.

7. HANDLING AND STORAGE

Handling
Use only under a chemical fume hood. Wear personal protective equipment. Do not breathe vapors or spray mist. Do not get in eyes, on skin, or on clothing.

Storage
Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from light.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Measures
Use only under a chemical fume hood. Ensure that eyewash stations and safety showers are close to the workstation location.

Exposure Guidelines

<table>
<thead>
<tr>
<th>Component</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>NIOSH IDLH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloroform</td>
<td>TWA: 10 ppm</td>
<td>(Vacated) TWA: 2 ppm</td>
<td>IDLH: 500 ppm</td>
</tr>
<tr>
<td></td>
<td>(Vacated) TWA: 9.78 mg/m³</td>
<td>Ceiling: 50 ppm</td>
<td>STEL: 9.78 mg/m³</td>
</tr>
<tr>
<td></td>
<td>Ceiling: 240 mg/m³</td>
<td></td>
<td>STEL: 2 ppm</td>
</tr>
<tr>
<td>Ethyl alcohol</td>
<td>TWA: 1000 ppm</td>
<td>(Vacated) TWA: 1900 mg/m³</td>
<td>IDLH: 3300 ppm</td>
</tr>
<tr>
<td></td>
<td>(Vacated) TWA: 1000 ppm</td>
<td>TWA: 1900 mg/m³</td>
<td>TWA: 1000 ppm</td>
</tr>
<tr>
<td></td>
<td>TWA: 1000 ppm</td>
<td>TWA: 1900 mg/m³</td>
<td>TWA: 1900 mg/m³</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Component</th>
<th>Quebec</th>
<th>Mexico OEL (TWA)</th>
<th>Ontario TWAEV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloroform</td>
<td>TWA: 5 ppm</td>
<td>TWA: 10 ppm</td>
<td>TWA: 49 mg/m³</td>
</tr>
<tr>
<td></td>
<td>TWA: 24.4 mg/m³</td>
<td>TWA: 10 ppm</td>
<td>TWA: 10 ppm</td>
</tr>
</tbody>
</table>
### Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical State</td>
<td>Liquid</td>
</tr>
<tr>
<td>Appearance</td>
<td>Colorless</td>
</tr>
<tr>
<td>odor</td>
<td>aromatic</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>No information available.</td>
</tr>
<tr>
<td>pH</td>
<td>No information available.</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>213 mbar  @ 20 °C</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>4.12 (Air = 1.0)</td>
</tr>
<tr>
<td>Viscosity</td>
<td>0.56  mPa.s at 20 °C</td>
</tr>
<tr>
<td>Boiling Point/Range</td>
<td>60.5 - 61.5°C / 140.9 - 142.7°F</td>
</tr>
<tr>
<td>Melting Point/Range</td>
<td>-63°C / -81.4°F</td>
</tr>
<tr>
<td>Decomposition temperature °C</td>
<td>290°C</td>
</tr>
<tr>
<td>Flash Point</td>
<td>No information available.</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>11.6 (Butyl Acetate = 1.0)</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.480</td>
</tr>
<tr>
<td>Solubility</td>
<td>Slightly soluble in water</td>
</tr>
<tr>
<td>log Pow</td>
<td>No data available</td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>119.38</td>
</tr>
<tr>
<td>Molecular Formula</td>
<td>C H Cl₃</td>
</tr>
</tbody>
</table>

### Stability and Reactivity

- **Stability**: Light sensitive.
- **Conditions to Avoid**: Incompatible products. Exposure to light. Excess heat.
- **Incompatible Materials**: Strong oxidizing agents, Strong bases, Powdered metals
- **Hazardous Decomposition Products**: Phosgene, Hydrogen chloride gas, Chlorine
- **Hazardous Polymerization**: Hazardous polymerization does not occur.
- **Hazardous Reactions .**: None under normal processing..

### Toxicological Information

### Acute Toxicity
Component Information

<table>
<thead>
<tr>
<th>Component</th>
<th>LD50 Oral</th>
<th>LD50 Dermal</th>
<th>LC50 Inhalation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloroform</td>
<td>695 mg/kg</td>
<td>3980 mg/kg</td>
<td>4770 mg/kg</td>
</tr>
<tr>
<td></td>
<td>(Rat)</td>
<td>(Rabbit)</td>
<td>(Rat) 4 h</td>
</tr>
<tr>
<td>Ethyl alcohol</td>
<td>7060 mg/kg</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
<tr>
<td></td>
<td>(Rat)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Irritation

Irritating to eyes and skin

Toxicologically Synergistic Products

No information available.

Chronic Toxicity

Carcinogenicity

The table below indicates whether each agency has listed any ingredient as a carcinogen.

<table>
<thead>
<tr>
<th>Component</th>
<th>ACGIH</th>
<th>IARC</th>
<th>NTP</th>
<th>OSHA</th>
<th>Mexico</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloroform</td>
<td>A3</td>
<td>Group 2B</td>
<td>Reasonably Anticipated</td>
<td>X</td>
<td>Not listed</td>
</tr>
<tr>
<td>Ethyl alcohol</td>
<td>Not listed</td>
<td>Group 1</td>
<td>Not listed</td>
<td>X</td>
<td>Not listed</td>
</tr>
</tbody>
</table>

ACGIH: (American Conference of Governmental Industrial Hygienists)
A1 - Known Human Carcinogen
A2 - Suspected Human Carcinogen
A3 - Animal Carcinogen

IARC: (International Agency for Research on Cancer)
Group 1 - Carcinogenic to Humans
Group 2A - Probably Carcinogenic to Humans
Group 2B - Possibly Carcinogenic to Humans

NTP: (National Toxicity Program)
Known - Known Carcinogen
Reasonably Anticipated - Reasonably Anticipated to be a Human Carcinogen

Mexico - Occupational Exposure Limits - Carcinogens
A1 - Confirmed Human Carcinogen
A2 - Suspected Human Carcinogen
A3 - Confirmed Animal Carcinogen
A4 - Not Classifiable as a Human Carcinogen
A5 - Not Suspected as a Human Carcinogen

Sensitization

No information available.

Mutagenic Effects

Mutagenic effects have occurred in experimental animals.

Reproductive Effects

Experiments have shown reproductive toxicity effects on laboratory animals.

Developmental Effects

Developmental effects have occurred in experimental animals.

Teratogenicity

Teratogenic effects have occurred in experimental animals.

Other Adverse Effects

Tumorigenic effects have been reported in experimental animals. See actual entry in RTECS for complete information.
Endocrine Disruptor Information  No information available

12. ECOLOGICAL INFORMATION

Ecotoxicity

<table>
<thead>
<tr>
<th>Component</th>
<th>Freshwater Algae</th>
<th>Freshwater Fish</th>
<th>Microtox</th>
<th>Water Flea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloroform</td>
<td>EC50 = 560 mg/L/48h</td>
<td>Not listed</td>
<td>Photobacterium phosphoreum: EC50 = 520 mg/L/5 min&lt;br&gt;Photobacterium phosphoreum: EC50 = 670 mg/L/15 min&lt;br&gt;Photobacterium phosphoreum: EC50 = 670 mg/L/30 min</td>
<td>EC50 = 28.9 mg/L/48h</td>
</tr>
<tr>
<td>Ethyl alcohol</td>
<td>Not listed</td>
<td>Leucidus idus: LC50 = 8.14 mg/L/48h&lt;br&gt;Photobacterium phosphoreum: EC50 = 34634 mg/L/30 min&lt;br&gt;Photobacterium phosphoreum: EC50 = 35470 mg/L/5 min</td>
<td>Photobacterium phosphoreum: EC50 = 9268 mg/L/48h&lt;br&gt;EC50 = 10800 mg/L/24h</td>
<td></td>
</tr>
</tbody>
</table>

Persistence and Degradability  No information available

Bioaccumulation/ Accumulation  No information available

Mobility

<table>
<thead>
<tr>
<th>Component</th>
<th>log Pow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloroform</td>
<td>2</td>
</tr>
<tr>
<td>Ethyl alcohol</td>
<td>-0.32</td>
</tr>
</tbody>
</table>

13. DISPOSAL CONSIDERATIONS

Waste Disposal Methods

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

<table>
<thead>
<tr>
<th>Component</th>
<th>RCRA - U Series Wastes</th>
<th>RCRA - P Series Wastes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloroform - 67-66-3</td>
<td>U044</td>
<td>-</td>
</tr>
</tbody>
</table>

14. TRANSPORT INFORMATION

DOT

<table>
<thead>
<tr>
<th>UN-No</th>
<th>Proper Shipping Name</th>
<th>Hazard Class</th>
<th>Packing Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN1888</td>
<td>CHLOROFORM</td>
<td>6.1</td>
<td>III</td>
</tr>
</tbody>
</table>
14. TRANSPORT INFORMATION

TDG
- UN-No: UN1888
- Proper Shipping Name: CHLOROFORM
- Hazard Class: 6.1
- Packing Group: III

IATA
- UN-No: UN1888
- Proper Shipping Name: CHLOROFORM
- Hazard Class: 6.1
- Packing Group: III

IMDG/IMO
- UN-No: UN1888
- Proper Shipping Name: CHLOROFORM
- Hazard Class: 6.1
- Packing Group: III

15. REGULATORY INFORMATION

International Inventories

<table>
<thead>
<tr>
<th>Component</th>
<th>TSCA</th>
<th>DSL</th>
<th>NDSL</th>
<th>EINECS</th>
<th>ELINCS</th>
<th>NLP</th>
<th>PICCS</th>
<th>ENCS</th>
<th>AICS</th>
<th>CHINA</th>
<th>KECL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloroform</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>200-663-8</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>KE-34076</td>
<td>X</td>
</tr>
<tr>
<td>Ethyl alcohol</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>200-578-6</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>KE-13217</td>
<td>X</td>
</tr>
</tbody>
</table>

Legend:
- X - Listed
- E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.
- F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.
- N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.
- P - Indicates a commenced PMN substance
- R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.
- S - Indicates a substance that is identified in a proposed or final Significant New Use Rule
- T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.
- XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base
- Production and Site Reports (40 CFR 710(B)).
- Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.
- Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.
U.S. Federal Regulations

TSCA 12(b) Not applicable

SARA 313

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>Weight %</th>
<th>SARA 313 - Threshold Values %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloroform</td>
<td>67-66-3</td>
<td>99</td>
<td>0.1</td>
</tr>
</tbody>
</table>

SARA 311/312 Hazardous Categorization

- Acute Health Hazard: No
- Chronic Health Hazard: No
- Fire Hazard: No
- Sudden Release of Pressure Hazard: No
- Reactive Hazard: No

Clean Water Act

<table>
<thead>
<tr>
<th>Component</th>
<th>CWA - Hazardous Substances</th>
<th>CWA - Reportable Quantities</th>
<th>CWA - Toxic Pollutants</th>
<th>CWA - Priority Pollutants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloroform</td>
<td>X</td>
<td>10 lb</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

Clean Air Act

<table>
<thead>
<tr>
<th>Component</th>
<th>HAPS Data</th>
<th>Class 1 Ozone Depleters</th>
<th>Class 2 Ozone Depleters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloroform</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

OSHA

Not applicable

CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

<table>
<thead>
<tr>
<th>Component</th>
<th>Hazardous Substances RQs</th>
<th>CERCLA EHS RQs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloroform</td>
<td>10 lb</td>
<td>10 lb</td>
</tr>
</tbody>
</table>

California Proposition 65

This product contains the following Proposition 65 chemicals:

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>California Prop. 65</th>
<th>Prop 65 NSRL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloroform</td>
<td>67-66-3</td>
<td>Carcinogen</td>
<td>20 µg/day</td>
</tr>
<tr>
<td>Ethyl alcohol</td>
<td>64-17-5</td>
<td>Developmental</td>
<td>40 µg/day</td>
</tr>
</tbody>
</table>

State Right-to-Know

<table>
<thead>
<tr>
<th>Component</th>
<th>Massachusetts</th>
<th>New Jersey</th>
<th>Pennsylvania</th>
<th>Illinois</th>
<th>Rhode Island</th>
</tr>
</thead>
</table>

Page 8 / 10
<table>
<thead>
<tr>
<th>Component</th>
<th>Massachusetts</th>
<th>New Jersey</th>
<th>Pennsylvania</th>
<th>Illinois</th>
<th>Rhode Island</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloroform</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Ethyl alcohol</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>X</td>
</tr>
</tbody>
</table>

**U.S. Department of Transportation**

Reportable Quantity (RQ): Y
DOT Marine Pollutant N
DOT Severe Marine Pollutant N

**U.S. Department of Homeland Security**

This product contains the following DHS chemicals:

<table>
<thead>
<tr>
<th>Component</th>
<th>DHS Chemical Facility Anti-Terrorism Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloroform</td>
<td>15000 lb STQ</td>
</tr>
</tbody>
</table>

**Other International Regulations**

Mexico - Grade
No information available

Canada

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

**WHMIS Hazard Class**

D1B Toxic materials
D2A Very toxic materials
D2B Toxic materials

---

**16. OTHER INFORMATION**

Prepared By  
Regulatory Affairs  
Thermo Fisher Scientific  
Tel: (412) 490-8929

Creation Date  
20-Jan-2010

Print Date  
20-Jan-2010

Revision Summary  
"***", and red text indicates revision
Disclaimer
The information provided on 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 guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as 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 material or in any process, unless specified in the text.

End of MSDS