Material Safety Data Sheet

Chloroform (BDH1109-4LG, BDH1109-19L, BDH1109-204L)

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Chloroform (BDH1109-4LG, BDH1109-19L, BDH1109-204L)
MSDS Number : 000000011712
Product Use Description : Solvent

Manufacturer : Honeywell
1953 South Harvey Street
Muskegon, MI 49442

Manufactured for : VWR International LLC
Radnor Corporate Center
Building One
Suite 200
100 Matsonford Road
Radnor PA 19087

For more information call : (Monday-Friday, 8.00am-5:00pm)
1-800-932-5000

In case of emergency call : (24 hours/day, 7 days/week)
1-800-424-9300(USA Only)

For Transportation Emergencies:
1-800-424-9300 (CHEMTREC - Domestic)
1-613-966-6666 (CANUTEC - Canada)

SECTION 2. HAZARDS IDENTIFICATION

Emergency Overview

Form : liquid, clear
Color : colourless
Odor : sweet

Hazard Summary : May be harmful if swallowed. May be harmful if inhaled. Irritating to eyes and respiratory system. The product may be absorbed through the skin. May cause irritation of the gastrointestinal tract. May irritate skin. Repeated exposure may cause skin dryness or cracking. Contains material which may cause cancer based on animal data. Use of alcoholic beverages may enhance toxic effects.
Potential Health Effects

Skin: May irritate skin. The product may be absorbed through the skin. Prolonged or repeated skin contact with liquid may cause defatting resulting in drying, redness and possible blistering. May cause systemic poisoning with symptoms paralleling those of inhalation. May cause systemic poisoning with symptoms paralleling those of ingestion.

Eyes: Irritating to eyes. Causes itching, burning, redness and tearing.

Ingestion: Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea. May cause systemic poisoning with symptoms paralleling those of inhalation. Repeated or prolonged exposure to the substance can produce kidney damage. Repeated or prolonged exposure to the substance can produce liver damage. Use of alcoholic beverages may enhance toxic effects.

Inhalation: Irritating to respiratory system. Causes headache, drowsiness or other effects to the central nervous system. May cause cardiac arrhythmia. Vapours may cause drowsiness and dizziness. High concentration of vapours may induce unconsciousness. Repeated or prolonged exposure to the substance can produce kidney damage. Repeated or prolonged exposure to the substance can produce liver damage.

Chronic Exposure: Repeated and prolonged exposure to solvents may cause brain and nervous system damage. May cause cardiac arrhythmia. Repeated or prolonged exposure to the substance can produce kidney damage. Repeated or prolonged exposure to the substance can produce liver damage. Prolonged or repeated skin contact with liquid may cause defatting resulting in drying, redness and possible blistering. Contains material which may cause cancer based on animal data.
Use of alcoholic beverages may enhance toxic effects.

Aggravated Medical Condition:
- Eye disorders
- Skin disorders
- Kidney disorders
- Liver disorders
- Respiratory disorders
- Neurological disorders
- Heart disease

Target Organs:
- Liver
- Kidney
- Heart
- Eyes
- Skin
- Central nervous system

Carcinogenicity:
- NTP: Chloroform 67-66-3
  Reasonably Anticipated to be a Human Carcinogen.
- IARC: Chloroform 67-66-3
  Group 2B: Possibly carcinogenic to humans
- ACGIH: Chloroform 67-66-3
  A3: Confirmed animal carcinogen

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS-No.</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloroform</td>
<td>67-66-3</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

SECTION 4. FIRST AID MEASURES

Inhalation: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Use oxygen as required, provided a qualified operator is present. Call a physician.

Skin contact: Wash off immediately with plenty of water for at least 15
### SECTION 5. FIREFIGHTING MEASURES

**Suitable extinguishing media**
- Dry chemical
- Carbon dioxide (CO2)
- Foam
- Cool closed containers exposed to fire with water spray.

**Specific hazards during firefighting**
- The product is not flammable.
- Exposure to decomposition products may be a hazard to health.
- In case of fire hazardous decomposition products may be produced such as:
  - Gaseous hydrogen chloride (HCl)
  - Phosgene
  - Chlorine (Cl2)
  - Carbon monoxide
  - Carbon dioxide (CO2)

**Special protective equipment for firefighters**
- Wear self-contained breathing apparatus and protective suit.

**Further information**
- Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

### SECTION 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions**
- Wear personal protective equipment.
- Immediately evacuate personnel to safe areas.
- Keep people away from and upwind of spill/leak.
- Isolate the affected area. Confine entry into the affected area to
### Handling

**Handling**

- Wear personal protective equipment.
- Use only in well-ventilated areas.
- Keep container tightly closed.
- Do not smoke.
- Do not swallow.
- Avoid breathing vapors, mist or gas.
- Avoid contact with skin, eyes and clothing.

**Advice on protection against fire and explosion**

- The product is not flammable.
- Normal measures for preventive fire protection.
- Keep product and empty container away from heat and sources of ignition.
- Fire or intense heat may cause violent rupture of packages.
- Container hazardous when empty.

### Storage

**Requirements for storage areas and containers**

- Keep containers tightly closed in a dry, cool and well-ventilated place.
- Containers which are opened must be carefully resealed and
kept upright to prevent leakage.  
Keep away from heat and sources of ignition.  
Keep away from direct sunlight.  
Protect from physical damage.  
Store away from incompatible substances.  
Container hazardous when empty.  
Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

### SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

<table>
<thead>
<tr>
<th>Protective measures</th>
<th>Ensure that eyewash stations and safety showers are close to the workstation location.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering measures</td>
<td>Use with local exhaust ventilation. Prevent vapor buildup by providing adequate ventilation during and after use.</td>
</tr>
<tr>
<td>Eye protection</td>
<td>Do not wear contact lenses. Wear as appropriate: Safety glasses with side-shields If splashes are likely to occur, wear: Goggles or face shield, giving complete protection to eyes</td>
</tr>
<tr>
<td>Hand protection</td>
<td>Solvent-resistant gloves Gloves must be inspected prior to use. Replace when worn.</td>
</tr>
<tr>
<td>Skin and body protection</td>
<td>Wear as appropriate: Solvent-resistant apron Solvent-resistant gloves If splashes are likely to occur, wear: Protective suit</td>
</tr>
<tr>
<td>Respiratory protection</td>
<td>In case of insufficient ventilation, wear suitable respiratory equipment. Wear a positive-pressure supplied-air respirator. For rescue and maintenance work in storage tanks use self-contained breathing apparatus. Use NIOSH approved respiratory protection.</td>
</tr>
<tr>
<td>Hygiene measures</td>
<td>When using, do not eat, drink or smoke. Wash hands before breaks and immediately after handling the product. Keep working clothes separately. Remove and wash contaminated clothing before re-use.</td>
</tr>
</tbody>
</table>
Do not swallow.
Avoid breathing vapors, mist or gas.
Avoid contact with skin, eyes and clothing.
This material has an established AIHA ERPG exposure limit.
The current list of ERPG exposure limits can be found at

Exposure Guidelines–

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No .</th>
<th>Value</th>
<th>Control parameters</th>
<th>Update</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloroform</td>
<td>67-66-3</td>
<td>TWA : time weighted average</td>
<td>(10 ppm)</td>
<td>2008</td>
<td>ACGIH:US. ACGIH Threshold Limit Values</td>
</tr>
<tr>
<td></td>
<td></td>
<td>STEL : Short term exposure limit</td>
<td>9.78 mg/m3</td>
<td>2005</td>
<td>NIOSH/GUIDE: US. NIOSH: Pocket Guide to Chemical Hazards</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ceiling : Ceiling Limit Value:</td>
<td>240 mg/m3</td>
<td>02 2006</td>
<td>OSHA_TRANS: US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA : time weighted average</td>
<td>9.78 mg/m3</td>
<td>1989</td>
<td>Z1A:US. OSHA Table Z-1-A (29 CFR 1910.1000)</td>
</tr>
</tbody>
</table>
**SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>liquid, clear</td>
</tr>
<tr>
<td>Colour</td>
<td>colourless</td>
</tr>
<tr>
<td>Odour</td>
<td>sweet</td>
</tr>
<tr>
<td>pH</td>
<td>Note: not applicable</td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>-64 °C</td>
</tr>
<tr>
<td>Boiling point/boiling range</td>
<td>62 °C</td>
</tr>
<tr>
<td>Flash point</td>
<td>Note: does not flash</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>0.6</td>
</tr>
<tr>
<td>Method: Compared to Ether (anhydrous)</td>
<td></td>
</tr>
<tr>
<td>Lower explosion limit</td>
<td>Note: not applicable</td>
</tr>
<tr>
<td>Upper explosion limit</td>
<td>Note: not applicable</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>212 hPa at 20 °C(68 °F)</td>
</tr>
<tr>
<td>Vapour density</td>
<td>4.12</td>
</tr>
<tr>
<td>Note: (Air = 1.0)</td>
<td></td>
</tr>
<tr>
<td>Density</td>
<td>1.49 g/cm³ at 20 °C</td>
</tr>
<tr>
<td>Water solubility</td>
<td>8 g/l at 20 °C</td>
</tr>
</tbody>
</table>
Material Safety Data Sheet

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SECTION 10. STABILITY AND REACTIVITY

Conditions to avoid : Heat, flames and sparks.
Protect from heat/overheating.
Keep away from direct sunlight.

Materials to avoid : Metals
Aluminium
Magnesium
Strong bases
Strong oxidizing agents
May attack many plastics, rubbers and coatings.

Hazardous decomposition products : Gaseous hydrogen chloride (HCl).
Phosgene
Chlorine (Cl2)
Carbon monoxide
Carbon dioxide (CO2)

Hazardous reactions : Hazardous polymerisation does not occur.
Stable under recommended storage conditions.

SECTION 11. TOXICOLOGICAL INFORMATION

Acute oral toxicity : LD50: 908 mg/kg
Species: rat

Acute inhalation toxicity : LC50: 47.7 mg/l
Exposure time: 4 h
Species: rat

Acute dermal toxicity : LD50: 20 g/kg
Species: rabbit
### Skin irritation
Species: rabbit  
Result: Mild skin irritation  
Exposure time: 24 h

### Repeated dose toxicity
Species: rat  
Application Route: Inhalation  
Note: (50 ppm; 7 hours/day, 5 days/week for 6 months) Causes damage to the following organs: liver, kidneys.

Species: rat, male  
Application Route: Oral gavage bioassay  
Note: Carcinogenicity (70 g/kg for 78 weeks) Kidney tumors

Species: mouse, both male and female  
Application Route: Oral gavage bioassay  
Note: Carcinogenicity (127 g/kg for 92 weeks) Liver tumors

Species: rat, male  
Application Route: Drinking Water Study  
Note: Carcinogenicity (160 mg/kg/d for 104 days) Kidney tumors

Species: rat  
Application Route: Inhalation  
Note: Embryotoxicity at maternally toxic concentrations.

Species: rat  
Application Route: Inhalation  
Note: Teratogenicity at maternally toxic concentrations.

### Further information
Note: Contains material which may cause cancer based on animal data.

### SECTION 12. ECOLOGICAL INFORMATION

#### Ecotoxicity effects

<table>
<thead>
<tr>
<th>Toxicty to fish</th>
<th>Static test</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC50</td>
<td>43.8 mg/l</td>
</tr>
<tr>
<td>Exposure time</td>
<td>96 h</td>
</tr>
<tr>
<td>Species</td>
<td>Oncorhynchus mykiss (rainbow trout)</td>
</tr>
</tbody>
</table>
Toxicity to daphnia and other aquatic invertebrates: static test
LC50: 28.9 mg/l
Exposure time: 48 h
Species: Daphnia magna (Water flea)

Toxicity to algae:

LC0: 185 mg/l
Species: Microcystis aeruginosa (blue alge)

LC0: 1,110 mg/l
Species: Scenedesmus quadricauda (Green algae)

Toxicity to bacteria:

LC0: 125 mg/l
Species: Pseudomonas putida

Further information on ecology

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods: Observe all Federal, State, and Local Environmental regulations.

Contaminated packaging: Empty remaining contents. Empty containers should be taken to an approved waste handling site for recycling or disposal.

SECTION 14. TRANSPORT INFORMATION

DOT
UN/ID No.: UN 1888
Proper shipping name: CHLOROFORM
Class: 6.1
Packing group: III
Hazard Labels: 6.1

IATA
UN/ID No.: UN 1888
Description of the goods: CHLOROFORM
Class: 6.1
### Chloroform (BDH1109-4LG, BDH1109-19L, BDH1109-204L)

**000000011712**

<table>
<thead>
<tr>
<th>Packaging group</th>
<th>III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazard Labels</td>
<td>6.1</td>
</tr>
<tr>
<td>Packing instruction (cargo aircraft)</td>
<td>680</td>
</tr>
<tr>
<td>Packing instruction (passenger aircraft)</td>
<td>680</td>
</tr>
<tr>
<td>Packing instruction (passenger aircraft)</td>
<td>Y680</td>
</tr>
</tbody>
</table>

**IMDG**

<table>
<thead>
<tr>
<th>UN/ID No.</th>
<th>UN 1888</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of the goods</td>
<td>CHLOROFORM</td>
</tr>
<tr>
<td>Class</td>
<td>6.1</td>
</tr>
<tr>
<td>Packaging group</td>
<td>III</td>
</tr>
<tr>
<td>Hazard Labels</td>
<td>6.1</td>
</tr>
<tr>
<td>EmS Number</td>
<td>F-A</td>
</tr>
<tr>
<td>Marine pollutant</td>
<td>no</td>
</tr>
</tbody>
</table>

**SECTION 15. REGULATORY INFORMATION**

**Inventories**

- **US. Toxic Substances Control Act**: On TSCA Inventory
- **Australia. Industrial Chemical (Notification and Assessment) Act**: On the inventory, or in compliance with the inventory
- **Canada. Canadian Environmental Protection Act (CEPA). Domestic Substances List (DSL)**: All components of this product are on the Canadian DSL list.
- **Japan. Kashin-Hou Law List**: On the inventory, or in compliance with the inventory
- **Korea. Existing Chemicals Inventory (KECI)**: On the inventory, or in compliance with the inventory
- **Philippines. The Toxic Substances and Hazardous and Nuclear Waste Control Act**: On the inventory, or in compliance with the inventory
- **China. Inventory of Existing Chemical Substances**: On the inventory, or in compliance with the inventory
- **New Zealand. Inventory of**: On the inventory, or in compliance with the inventory
Chemicals (NZIoC), as published by ERMA New Zealand

National regulatory information

SARA 302 Components: The following components are subject to reporting levels established by SARA Title III, Section 302:
- Chloroform 67-66-3

SARA 313 Components: The following components are subject to reporting levels established by SARA Title III, Section 313:
- Chloroform 67-66-3

SARA 311/312 Hazards: Acute Health Hazard
- Chronic Health Hazard

CERCLA Reportable Quantity: 10 lbs

California Prop. 65: WARNING! This product contains a chemical known to the State of California to cause cancer.
- Chloroform 67-66-3

- WARNING! This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.
- Chloroform 67-66-3

Massachusetts RTK: Chloroform 67-66-3

New Jersey RTK: Chloroform 67-66-3

Pennsylvania RTK: Chloroform 67-66-3
**WHMIS Classification**
- D1B: Toxic Material Causing Immediate and Serious Toxic Effects
- D2A: Very Toxic Material Causing Other Toxic Effects
- D2B: Toxic Material Causing Other Toxic Effects

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

### SECTION 16. OTHER INFORMATION

<table>
<thead>
<tr>
<th></th>
<th>HMIS III</th>
<th>NFPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health hazard</td>
<td>2*</td>
<td>2</td>
</tr>
<tr>
<td>Flammability</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Physical Hazard</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Instability</td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

* - Chronic health hazard

Hazard rating and rating systems (e.g. HMIS® III, NFPA): This information is intended solely for the use of individuals trained in the particular system.

**Further information**

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. Final determination of suitability of any material is the sole responsibility of the user. This information should not constitute a guarantee for any specific product properties.

Changes since the last version are highlighted in the margin. This version replaces all previous versions.

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Prepared by: Honeywell Performance Materials and Technologies  Product Stewardship Group