SAFETY DATA SHEET: CHLOROFORM

1. IDENTIFICATION
Product Name: CHLOROFORM
Synonyms: Trichloromethane; Methyl trichloride; Methane trichloride
Formula and Formula Weight: CHCl₃  119.37
Integra numbers beginning with: C455.10; C455.15; C455.18; C455.31
Recommended Use: Commercial, industrial use
Restrictions on Use: No information available

INTEGRA Chemical Company
24 Hour Emergency Response: CHEMTREC 800-424-9300 (Outside USA 703-527-3887)
1216 6th Ave N
Kent WA  98032
Phone: 253-479-7000

2. HAZARDS IDENTIFICATION

<table>
<thead>
<tr>
<th>OSHA Classification</th>
<th>Hazard Category</th>
<th>Hazard Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Toxicity - Oral</td>
<td>4</td>
<td>Harmful if swallowed.</td>
</tr>
<tr>
<td>Acute Toxicity - Inhalation</td>
<td>4</td>
<td>Harmful if inhaled.</td>
</tr>
<tr>
<td>Skin Corrosion/Irritation</td>
<td>2</td>
<td>Causes skin irritation.</td>
</tr>
<tr>
<td>Eye Damage/Irritation</td>
<td>2A</td>
<td>Causes serious eye irritation.</td>
</tr>
<tr>
<td>Carcinogenicity</td>
<td>2</td>
<td>Suspected of causing cancer.</td>
</tr>
<tr>
<td>Toxic to Reproduction</td>
<td>2</td>
<td>Suspected of damaging fertility or the unborn child.</td>
</tr>
<tr>
<td>Specific Target Organ Toxicity (single exposure)</td>
<td>3</td>
<td>May cause drowsiness or dizziness.</td>
</tr>
<tr>
<td>Specific Target Organ Toxicity (repeated exposure)</td>
<td>2</td>
<td>May cause damage to organs through prolonged or repeated exposure.</td>
</tr>
</tbody>
</table>

Signal Word: WARNING

Precautionary Statements

Prevention:
- Obtain special instructions before use.
- Do not handle until all safety precautions have been read and understood.
- Do not breathe fume, gas, mist, vapors, spray.
- Wash thoroughly after handling.
- Do not eat, drink or smoke when using this product.
- Use only outdoors or in a well-ventilated area.
- Wear protective gloves, protective clothing, eye protection, face protection.

Response
- If swallowed: Rinse mouth.
- If on skin: Wash with plenty of water.
- 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, doctor if you feel unwell.
- If skin irritation occurs: Get medical advice, attention.
- If eye irritation persists: Get medical advice, attention.
- Take off contaminated clothing and wash it before reuse.

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

Disposal
- Dispose of contents, container in accordance with all governmental regulations.

Hazards Not Otherwise Classified: No information available

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Component</th>
<th>Synonyms</th>
<th>CAS #</th>
<th>% Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloroform</td>
<td>Trichloromethane; Methyl trichloride; Methane trichloride</td>
<td>00067-66-3</td>
<td>&gt;98</td>
</tr>
</tbody>
</table>

OSHA SDS #: 25410 rev 101  3/27/2015  CHLOROFORM
Ethyl Alcohol 00064-17-5 <2Ethanol

4. FIRST AID MEASURES

Inhalation: Remove person to fresh air and keep comfortable for breathing. If not breathing, give artificial respiration. If breathing is difficult administer oxygen. Seek medical attention.

Eye Contact: Flush eyes with water for at least 15 minutes. Remove contact lenses, if present and easy to do. If irritation persists, seek medical attention.

Skin Contact: Wash with soap and water. Seek medical attention if irritation develops.

Ingestion: Do not induce vomiting. If victim is conscious, rinse mouth, give water. Never give anything by mouth to an unconscious person. Seek immediate medical attention.

Additional notes: Symptoms and effects include dizziness, confusion, irritability, nausea, headache, fatigue, anesthesia, eye and skin irritation.

5. FIRE-FIGHTING MEASURES

Extinguishing Media: Material is not flammable. Use extinguishing media suitable to surrounding materials.

Special Equipment and Precautions: Use water to cool nearby containers and structures. Wear full protective equipment, including suitable respiratory protection.

Specific Hazards: Toxic vapors

Hazardous combustion products: Thermal decomposition produces toxic vapors of hydrogen chloride, chlorine and phosgene.

6. ACCIDENTAL RELEASE MEASURES

Spill Procedures: Prevent spread of spill. Absorb with inert material and place into a container for disposal. Use personal protective equipment. Do not breathe fume/gas/mist/vapors/spray.

7. HANDLING AND STORAGE


Storage and Handling: Store locked up in a cool, dry, well-ventilated area away from incompatible materials. Keep containers tightly closed and protect them from physical damage. Protect from exposure to light and air.

Obtain special instructions before use.

Do not handle until all safety precautions have been read and understood.

Do not breathe fume, gas, mist, vapors, spray.

Wash thoroughly after handling.

Do not eat, drink or smoke when using this product.

Use only outdoors or in a well-ventilated area.

Wear protective gloves, protective clothing, eye protection, face protection.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

OSHA & ACGIH Exposure Limits:

<table>
<thead>
<tr>
<th>Chemical</th>
<th>OSHA Ceiling</th>
<th>ACGIH TWA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloroform</td>
<td>50 ppm</td>
<td>10 ppm</td>
</tr>
<tr>
<td>Ethyl Alcohol</td>
<td>OSHA TWA: 1000 ppm; 1900 mg/m³</td>
<td>ACGIH STEL: 1000 ppm; 1880 mg/m³</td>
</tr>
</tbody>
</table>

Engineering Controls: Use general or local exhaust ventilation to meet TLV and PEL requirements.

Respiratory Protection: Respiratory protection required if airborne concentrations exceed PEL or TLV. Use a NIOSH approved chemical cartridge respirator with an organic vapor cartridge. Where vapor concentrations are likely to exceed 2 ppm the use of a NIOSH/MSHA approved self-contained breathing apparatus or air line respirator with a full face piece is advised.

Skin/Eye Protective Equipment: Safety goggles, protective clothing and gloves appropriate for the risk of exposure. Polyvinyl gloves are recommended.

Facilities storing or utilizing this material should have readily accessible eyewash stations and safety showers. Select respirators and other safety equipment in accordance with regulations and based upon the particular conditions of use and risk of exposure. Always use safe chemical-handling and good industrial hygiene practices.

9. PHYSICAL AND CHEMICAL PROPERTIES

Apearance: Clear, colorless liquid.

Odor: Mildly sweet odor.

Odor Threshold: 85 ppm

pH: Not available

Melting/Freezing Point: -64 °C

Initial Boiling Point and Boiling Range: 61 °C

Flash Point: Not applicable

Evaporation Rate: Not applicable

Flammability: Not flammable

Flammable or Explosive Limits (% by volume in air): Lower: Not applicable

Vapor Pressure: 160 mm Hg @20°C

Vapor Density: 4.1

Relative Density: 1.48 Water = 1

Solubility: 1.8 g in 100 g water @25°C
10. STABILITY AND REACTIVITY

Reactivity: No information available
Stability: Stable
Possibility of Hazardous Reactions: Hazardous polymerization will not occur
Conditions to Avoid: Heat, sparks and open flame. Light, air and moisture.
Incompatibilities: Incompatible with strong acids, strong bases, strong oxidizers. Oxygen, alkali metals, metallic powders.
Decomposition Products: Thermal decomposition produces toxic vapors of hydrogen chloride, chlorine and phosgene.

11. TOXICOLOGICAL INFORMATION

Effects of Over Exposure:
- Inhalation: Harmful or fatal if inhaled. Headache, nausea, vomiting, dizziness, drowsiness, respiratory irritation, dryness of the mouth and throat and unconsciousness. Overexposure may cause respiratory failure, kidney failure, coma, death.
- Skin Contact: Contact with skin may be irritating. Material may be absorbed through the skin in harmful amounts. Prolonged contact may cause dermatitis.
- Eye Contact: Contact is irritating to the eyes. May cause corneal damage, conjunctivitis, sensitization to light.
- Ingestion: Harmful if swallowed. Ingestion may cause nausea, vomiting and gastrointestinal irritation. Overexposure may cause respiratory failure, kidney failure, coma, death.
- Chronic Effects: Liver damage, kidney damage.
- Target Organs: Liver, kidneys, heart, eyes, skin, central nervous system.
- Additional Effects: May aggravate pre-existing pulmonary disease, kidney disorders, liver disorders, skin disorders.
- Reproductive Effects: Chloroform has been found to be embryotoxic and fetal toxic and has delayed fatal development in experimental animals. Studies in mice and rats have shown a marginal teratogenic (birth defect) effect.
- Carcinogenicity:
  - Chloroform is listed by the NTP as Anticipated Human Carcinogen and by the IARC as Group 2B, Possible Human Carcinogen.

Toxicity Data:

<table>
<thead>
<tr>
<th>Substance</th>
<th>Route</th>
<th>Dose or Concentration</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloroform</td>
<td>Irritation (skin, rabbit)</td>
<td>Mild: 500 mg/24 hr</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Irritation (eye, rabbit)</td>
<td>Moderate: 20 mg/24 hr</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LC50 (inhalation, mouse)</td>
<td>17200 mg/m3/2 hr</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LD50 (subcutaneous, mouse)</td>
<td>704 mg/kg</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LD50 (oral, rat)</td>
<td>695 mg/kg</td>
<td></td>
</tr>
<tr>
<td>Ethyl Alcohol</td>
<td>LC50 (inhalation, rat)</td>
<td>20000 ppm/10 hr</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LD50 (oral, rat)</td>
<td>7060 mg/kg</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LDLo (skin, rabbit)</td>
<td>20000 mg/kg</td>
<td></td>
</tr>
</tbody>
</table>

12. ECOLOGICAL INFORMATION

Aquatic Toxicity Data:
- Chloroform: LC50 Golden orfe: 162 mg/L - 48h
- Ethyl Alcohol: LC50 Oncorhynchus mykiss: >10,000 mg/L

Terrestrial Toxicity Data:
- No information available

Persistence and degradability: No information available
Bioaccumulative potential: No information available
Mobility in soil: No information available
Other adverse effects: No information available

13. DISPOSAL CONSIDERATIONS

Disposal Procedures: Dispose of material and containers in accordance with all local, state and federal regulations.

14. TRANSPORTATION INFORMATION

This product is a regulated material for domestic ground transportation, per CFR Title 49.

- UN Number: UN1888
- Proper Shipping Name: Chloroform
- Packing Group: III
- Hazard Class: 6.1
- Environmental hazards: No information available
- Special precautions: No information available
- Bulk transport: No information available

15. REGULATORY INFORMATION

Chloroform is listed in the TSCA inventory, in SARA 302, and in SARA 313.
Ethyl Alcohol is listed in the TSCA inventory.

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16. OTHER INFORMATION

The information presented above is offered for informational purposes only. This SDS, and the associated product, is intended for use only by technically qualified persons, and at their own discretion and risk. Since conditions and manner of use are outside the control of Integra Chemical Company, we make no warranties, either expressed or implied, and assume no liability in connection with any use of this information.

***** END OF SDS *****