MATERIAL SAFETY DATA SHEET

SECTION 1 – CHEMICAL PRODUCT AND COMPANY IDENTIFICATION
Company Address: 5301 Keystone Ct, Rolling Meadows, IL 60008
Tel: 1-847-253-8868 Emergency: (CHEMTREC) 800-424-9300
Fax: 1-847-253-8877

Chemical Family: Chlorinated Unsaturated Hydrocarbon
Product Name: Trans-1,2-dichloroethylene
Synonyms: Trans-acetylene Dichloride; Trans-dichloroethylene; Trans; C2H2Cl2

SECTION 2 – COMPOSITION / INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS #</th>
<th>OSHA PEL</th>
<th>ACGIH TLV</th>
<th>NIOSH REL</th>
<th>Wt. %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trans-1,2-Dichloroethylene</td>
<td>156-60-5</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>&gt;99%</td>
</tr>
</tbody>
</table>

SECTION 3 – HAZARDS IDENTIFICATION

Emergency Overview:
WARNING! Flammable. May cause irritation to eyes and skin. Vapor harmful. Hazardous if swallowed.

Potential Health Effects:
Inhalation: This product is a central nervous system depressant. Inhalation can cause irritation of the respiratory tract, dizziness, nausea, headache, loss of coordination and equilibrium, unconsciousness and even death in confined or poorly ventilated areas. Cardiac sensitization has occurred in dogs dosed at concentrations greater than 25%.

Eye: Eye contact can result in discomfort, pain, irritation and discharge. Washing of the eyes with water may result in corneal injury.

Skin: Prolonged contact such as occurs when material is trapped on the skin (e.g. under a glove) may result in severe irritation. Skin absorption is not expected to be of toxicological significance under normal industrial use.

Ingestion: Swallowing may irritate the mouth and GI tract as well as cause the effects listed for inhalation exposure. Vomiting may cause aspiration into the lungs that may lead to potentially fatal chemical pneumonia and pulmonary edema.

SECTION 4 – FIRST AID MEASURES

Inhalation: Remove from area to fresh air. If symptomatic, contact a poison control center, emergency room or physician for treatment information.

Eye: Remove contact lens and pour a gentle stream of warm water through the affected eye for at least 15 minutes. If irritation persists, contact a poison control center, emergency room, or physician as further treatment may be necessary.

Skin: Run a gentle stream of water over the affected area for 15 minutes. A mild soap may be used if available. If any symptoms persist, contact a poison control center, emergency room, or physician as further treatment may be necessary.

Ingestion: Gently wipe or rinse the inside of the mouth with water. Sips of water may be given if person is fully conscious. Never induce vomiting. Contact a poison control center, emergency room or physician right away as further treatment may be necessary.

SECTION 5 – FIRE FIGHTING MEASURES

Flash Point: 36°F (2°C, closed cup) LEL: 9.7% UEL: 12.8%
Flammability Class (OSHA): IB Autoignition: >860°F (460°C)
Fire and Explosion Hazards: Severe fire hazard. Vapor/air mixtures are explosive above flash point. The vapor is heavier than air.
Extinguishing Media: Vapors or gases may ignite at distant ignition sources and flash back.
Large fires: Use regular foam or flood with fine water spray.
Fire-Fighting Instruction: Emits toxic fumes under fire conditions. Vapor concentration in a confined or poorly ventilated area can be ignited upon contact with a high energy spark, flame, or high intensity source of heat. Vapors may travel a considerable distance to source of ignition and flash back. Vapor/air mixtures are explosive.
Fire-Fighting Equipment: NIOSH approved pressure demand, self-contained breathing apparatus and full protective clothing.
Fire-Fighting Instructions: Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Withdraw immediately in case of rising sound from venting safety device. For tank, rail car or tank truck: Evacuation radius: 800 meters (1/2 mile). Do not attempt to extinguish fire unless flow of material can be stopped first. Flood with fine water spray. Do not scatter spilled material with high-pressure water streams. Cool containers with water spray until well after the fire is out. Apply water from a protected location or from a safe distance. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. Water may be ineffective.

SECTION 6 – ACCIDENTAL RELEASE MEASURES

Spill/Leak Procedures: Immediately evacuate the area. Provide maximum ventilation. Unprotected personnel should move upwind of spill. Only personnel equipped with proper respiratory and eye/skin protection should be...
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MATERIAL SAFETY DATA SHEET

permitted in the area. Take precautions as necessary to prevent contamination of ground and surface waters. Recover spilled material on adsorbents, such as sawdust or vermiculite, and sweep into closed containers for disposal. After all visible traces, including ignitable vapors, have been removed, thoroughly wet vacuum the area. Do not flush to sewer. If area of spill is porous, remove as much earth and gravel, etc. as necessary and place in closed containers for disposal.


Small spills: Absorb with sand or other non-combustible material. Collect spilled material in appropriate container for disposal.

Large spills: Dike for later disposal. Remove sources of ignition. Keep unnecessary people away, isolate hazard area and deny entry. Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)426-8802 (USA) or (202)246-2675 (USA).

SECTION 7 – HANDLING AND STORAGE
Handling Precautions: Keep container closed when not in use. Store only in closed, properly labeled containers. Avoid contamination of water supplies. Handling, storage and use procedures must be carefully monitored to avoid spills or leaks. Any spill or leak has the potential to cause underground water contamination which may, if sufficiently severe, render a drinking water source unfit for human consumption.

Other Precautions: Contamination that does occur cannot be easily corrected. Do not use cutting or welding torches on drums that contain this product unless properly purged and cleaned. Vapors are heavier than air and will collect in low areas. This material can react with air to form explosive peroxide. Do not use in poorly ventilated or confined spaces without proper respiratory protection.

Storage: Store and handle in accordance with all current regulations and standards. Subject to storage regulations: U.S. OSHA 1910.106 Grounding and bonding required. Keep Separated from incompatible substances.

SECTION 8 – EXPOSURE CONTROLS / PERSONAL PROTECTION
Ventilation Requirements: Use local exhaust or general room/dilution ventilation sufficient to maintain employee exposure below permissible exposure limits.

Respiratory Protection: Use a half or full facepiece organic vapor chemical cartridge or canister respirator when concentrations exceed permissible limits. Use self-contained breathing apparatus (SCBA) or full facepiece airline respirator with auxiliary SCBA operated in the pressure demand mode for emergencies and for all work performed in storage vessels, poorly ventilated rooms, and other confined areas. Respirators must be approved by NIOSH. The respiratory use limitations made by NIOSH or the manufacturer must be observed. Respiratory protection programs must be in accordance with 29 CFR 1910.134

Eye/Face: Splash proof goggles and face shield.

Protective Gloves: Wear appropriate chemical resistant gloves.

Protective Clothing: Personal protective clothing and use of equipment must be in accordance with 29 CFR 1910.132 (general requirements), .133 (eye and face protection), and .13 (hand protection).

Special/Other: Boots, aprons, or chemical suits should be used when necessary to prevent skin contact.

NFPA Code: Health = 2, Flammability = 3, Reactivity = 2

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Physical State: liquid

Appearance: clear, colorless

Odor: Pleasant

Boiling Point: 118°F (48°C)

Freezing Point: -58°F (-50°C)

Evaporation Rate: NA

Heat of Solution: NA

Water Solubility: slightly

Vapor Pressure: 400 mmHg @ 87°F

Volume % Volatile: NA

Relative Vapor Density: 3.34

Specific Gravity: 1.2565 (water =1)

Bulk Density: NA

SECTION 10 – STABILITY AND REACTIVITY

Stability: May decompose on contact with air, light, moisture, heat or storage and use above room temperature.

Release toxic, corrosive, flammable or explosive gases.

Conditions to Avoid: Avoid heat, flames, sparks and other sources of ignition. Containers may rupture or explode if exposed to heat. Keep out of water supplies and sewers.

Incompatibilities: Bases, metals, combustible materials, oxidizing materials, acids, steam, oxidizers, elevated temperatures, caustic soda, and caustic potash. Shock sensitive compounds may be formed.

Products of Decomposition: phosgene, halogenated compounds, oxides of carbon

Hazardous Polymerization: May polymerize. Avoid contact with incompatible materials.

SECTION 11 – TOXICOLOGICAL INFORMATION

Acute Inhalation LC50 (rat) 24,100 ppm (4 hours).

Acute Dermal LD50 (rabbit) >5000 mg/kg

Skin Irritation: Mildly to moderately irritating.

Eye Irritation: Moderately to severely irritating.

Acute Oral LD50: Slight to very low toxicity.

Chronic Effects/Carcinogenicity: This product is NOT listed as a carcinogen or suspected carcinogen by NTP, IARC, or OSHA.

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Medical Conditions Aggravated: None known.
Delayed Effects Of Overexposure:
Subchronic: A 90 day inhalation study exposing rats to 1,2-dichloroethylene reported no adverse effects on body weight, clinical observations, food consumption, clinical or anatomical pathology parameters, or liver cell proliferation. The no-observed-effect level (NOEL) for this study was 4000 ppm in rats that suggests a low order of toxicity by the inhalation.
In an NTP study, rats and mice were dose fed for a period of 13 weeks. No mortality, clinical observations of toxicity, or food consumption effects was noted in mice or rats. Minor reductions in body weights were observed in mice. Liver organ weights changes were reported in rats. Rats dosed at the highest level (50,000 ppm) showed a few abnormal clinical pathology findings. Histopathology reports revealed no microscopic evidence of treatment-related target organ effects.
In separate 90-day drinking water studies, 1,2-dichloroethylene exposed rats and mice showed no does related effects in hematological, serological, and gross pathological, or urinary parameters.
MUTAGENESIS: Trans-1,2-dichloroethylene was not mutagenic to E-coli or S. Typhimurium when tested with microsomal activation. In another study, trans-1,2-dichloroethylene did not product mutations in Saccharomyces cerevisiae with or without microsomal activation. No genetic effects were reported in a vivo host mediated mutagenic assay.
REPRODUCTIVE/DEVELOPMENTAL: In a teratology study conducted in rats by the inhalation route of exposure, significant fetal toxicity (i.e., decreased body weight, increased skeletal variations) was observed only at maternally toxic concentrations (12,000 ppm). Based on the results of this study, trans-1,2-dichloroethylene would not be considered to be a developmental toxicant.

SECTION 12 – ECOLOGICAL INFORMATION
Invertebrate Toxicity: <110000 ug/L 48 hour(s) (Mortality) Water flea (Daphnia magna)

SECTION 13 – DISPOSAL CONSIDERATIONS
Waste Disposal Method:
Contaminated sand, sawdust, vermiculite, soil or porous surface must be disposed of in a permitted hazardous waste management facility. Recovered liquids may be reprocessed or incinerated or must be treated in a permitted hazardous waste management facility. Care must be taken when using or disposing of chemical materials and/or their containers to prevent environmental contamination. Dispose in accordance with all applicable regulations, subject to disposal regulations: US EPA 40 CFR 262. It is your duty to dispose of the chemical materials and/or their containers in accordance with the Clean Air Act, the Clean Water Act, the Resource Conservation and Recovery Act, as well as any other relevant Federal, State, or local laws/regulations regarding disposal.
Hazardous Waste Number(s): U079

SECTION 14 – TRANSPORT INFORMATION
Proper Shipping Name: 1,2-Dichloroethylene
Hazard Class: 3 (Flammable Liquid)
UN Number: UN1150
Packing Group: II
USA-RQ, Hazardous Substance and Quantity: 1000 lbs/454 kg (1,2-trans- Dichloroethylene)

SECTION 15 – REGULATORY INFORMATION
USA TSCA: All components of this product are listed on the TSCA Inventory.
EUROPE EINECS: All components in this product are listed on EINECS or meet the polymer definition. (205-860-2)
CANADA DOMESTIC SUBSTANCES LIST (DSL): This product and/or all of its components are listed on the Canadian DSL.
AUSTRALIA AICS: All components of this product are listed on AICS.
KOREA ECL: All components in this product are listed on the Korean Existing Chemicals Inventory (KECI).
JAPAN MITI (ENCS): All components of this product are listed on MITI.
PHILIPPINES PICCS: One or more components in this product are not listed on the Philippines Inventory of Chemical and Chemical Substances (PICCS). This product can only be used in R&D applications.
SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370 Subparts B and C):
ACUTE: Yes
CHRONIC: No
FIRE: Yes
REACTIVE: Yes
SUDDEN RELEASE: No
SARA TITLE III SECTION 313 (40 CFR 372.65): 1,2-DICHLOROETHYLENE (ALL ISOMERS)
CERCLA Hazardous Substance: Listed in Table 302.4 of 40 CFR Part 302 as a hazardous substance with a reportable quantity of 1000 pounds. Releases to air, land or water which exceed the RQ must be reported to the National Response Center, 800-424-8802.
STATE REGULATIONS:
California Proposition 65: Not regulated.
CANADA INVENTORY (DSL/NDSL): Not determined.
CANADIAN TRANSPORTATION OF DANGEROUS GOODS:
Proper Shipping Name: 1,2-Dichloroethylene
Hazard Class: 3 (Flammable Liquid)
UN Number: UN1150
Packing Group: II
USA-RQ. Hazardous Substance and Quantity: 1000 lbs./454 kg (1,2-trans-Dichloroethylene)  
RCRA: Waste trans and contaminated soils/materials from spill cleanup are U079 hazardous waste as per 40 CFR 261.33 and must be disposed of accordingly under RCRA.  

SECTION 16 – OTHER INFORMATION  
UNISTAR CHEMICAL, INC. MAKES NO EXPRESS OR IMPLIED WARRANTIES, GUARANTEES OR REPRESENTATIONS REGARDING THE PRODUCT OR THE INFORMATION HEREIN, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR USE. MATHESON TRI-GAS, INC. SHALL NOT BE LIABLE FOR ANY PERSONAL INJURY, PROPERTY OR OTHER DAMAGES OF ANY NATURE, WHETHER COMPENSATORY, CONSEQUENTIAL, EXEMPLARY, OR OTHERWISE, RESULTING FROM ANY PUBLICATION, USE OR RELIANCE UPON THE INFORMATION HEREIN.