TRICHLOROETHYLENE- MATERIAL SAFETY DATA SHEET

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1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Matheson Tri-Gas, Inc.

The telephone numbers listed below are emergency numbers, please contact your local branch for routine inquiries.

USA
959 Route 46 East
Parsippany, New Jersey
07054-0624 USA
Phone: 973-257-1100

CANADA
530 Watson Street
Whitby, Ontario
L1N 5R9 Canada
Phone: 905-668-3570

SUBSTANCE: TRICHLOROETHYLENE
SYMBOL: \( \text{C}_2\text{HCl}_3 \)

TRADE NAMES/SYNONYMS:
ACETYLENE TRICHLORIDE; ETHYLENE TRICHLORIDE; ALGYLEN; 1-CHLORO-2,2-DICHLOROETHYLENE; 1,1-DICHLORO-2-CHLOROETHYLENE; TCE; ANAMETH; ETHINYL TRICHLORIDE; TRICHLOROETHENE; 1,1,2-TRICHLOROETHYLENE; ETHYLENE, TRICHLORO-; CHLORYLEN; 1,1,2-TRICHLOROETHENE; ETHENE, TRICHLORO-; CHLORILEN; TRILEN; UN 1710; RCRA U228; STCC 4941171; C2HCL3; MAT23850; RTECS KX4550000

CHEMICAL FAMILY: halogenated, aliphatic

CREATION DATE: Jan 24 1989
REVISION DATE: Mar 16 1999

2. COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: TRICHLOROETHYLENE

CAS NUMBER: 79-01-6

EC NUMBER (EINECS): 201-167-4

PERCENTAGE: >99

COMPONENT: INHIBITORS

CAS NUMBER: Not assigned.

EC NUMBER: Not assigned.

PERCENTAGE: <0.1

COMPONENT: AMINES

CAS NUMBER: Not assigned.

EC NUMBER: Not assigned.

PERCENTAGE: <0.1

3. HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=2 FIRE=1 REACTIVITY=0
WHMIS CLASSIFICATION: D2

EC CLASSIFICATION (ASSIGNED):
Carcinogen Category 3
R 40-52/53

EC Classification may be inconsistent with independently-researched data.

EMERGENCY OVERVIEW:

Color: colorless

Physical Form: liquid

Odor: sweet odor

Major Health Hazards: respiratory tract irritation, skin irritation, eye irritation, central nervous system depression, allergic reactions

Physical Hazards: May polymerize. Containers may rupture or explode. May decompose on contact with air, light, moisture, heat or storage and use above room temperature. Releases toxic, corrosive, flammable or explosive gases.

POTENTIAL HEALTH EFFECTS:

INHALATION:
  Short Term Exposure: irritation, nausea, vomiting, stomach pain, difficulty breathing, headache, drowsiness, symptoms of drunkenness, disorientation, visual disturbances, bluish skin color, lung congestion, kidney damage, liver damage, nerve damage, coma
  Long Term Exposure: wheezing, irregular heartbeat, liver damage, brain damage

SKIN CONTACT:
  Short Term Exposure: irritation, allergic reactions, blisters
  Long Term Exposure: nausea, wheezing, joint pain, paralysis

EYE CONTACT:
  Short Term Exposure: irritation (possibly severe), tearing, blurred vision
  Long Term Exposure: blindness

INGESTION:
  Short Term Exposure: nausea, vomiting, diarrhea, irregular heartbeat, headache, symptoms of drunkenness, kidney damage, paralysis, convulsions, coma
  Long Term Exposure: drowsiness

CARCINOGEN STATUS:
OSHA: N
4. FIRST AID MEASURES

INHALATION:
Remove from exposure immediately. Use a bag valve mask or similar device to perform artificial respiration (rescue breathing) if needed. Get medical attention.

SKIN CONTACT:
Remove contaminated clothing, jewelry, and shoes immediately. Wash with soap or mild detergent and large amounts of water until no evidence of chemical remains (at least 15-20 minutes). Get medical attention, if needed.

EYE CONTACT:
Wash eyes immediately with large amounts of water or normal saline, occasionally lifting upper and lower lids, until no evidence of chemical remains. Get medical attention immediately.

INGESTION:
If vomiting occurs, keep head lower than hips to help prevent aspiration. If person is unconscious, turn head to side. Get medical attention immediately.

NOTE TO PHYSICIAN:
For ingestion, consider gastric lavage. Consider oxygen.

5. FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS:
Slight fire hazard.

EXTINGUISHING MEDIA:
carbon dioxide, regular dry chemical

Large fires: Use regular foam or flood with fine water spray.

FIRE FIGHTING:
Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. For tank, rail car or tank truck, evacuation radius: 800 meters (1/2 mile).

FLASH POINT:
No data available.

LOWER FLAMMABLE LIMIT:
7.8% @ 100 C

UPPER FLAMMABLE LIMIT:
52% @ 100 C

AUTOIGNITION:
770 F (410 C)
AIR RELEASE: 
Reduce vapors with water spray. Collect runoff for disposal as potential hazardous waste.

SOIL RELEASE: 
Dig holding area such as lagoon, pond or pit for containment. Dike for later disposal. Absorb with sand or other non-combustible material.

WATER RELEASE: 

OCCUPATIONAL RELEASE: 
Avoid heat, flames, sparks and other sources of ignition. Stop leak if possible without personal risk. Small liquid spills: Absorb with sand or other non-combustible material. Large spills: Dike for later disposal. Remove sources of ignition. Keep unnecessary people away, isolate hazard area and deny entry. Reportable Quantity (RQ): 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)424-8802 (USA) or (202)426-2675 (USA).

7. HANDLING AND STORAGE
Store and handle in accordance with all current regulations and standards. Store in a cool, dry place. Store in a well-ventilated area. Avoid heat, flames, sparks and other sources of ignition. Keep separated from incompatible substances.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:

TRICHLOROETHYLENE: 
100 ppm OSHA TWA  
200 ppm OSHA ceiling  
300 ppm OSHA peak 5 minute(s)/2 hour(s)  
50 ppm (269 mg/m3) OSHA TWA (vacated by 58 FR 35338, June 30, 1993)  
200 ppm (1070 mg/m3) OSHA STEL (vacated by 58 FR 35338, June 30, 1993)  
50 ppm (269 mg/m3) ACGIH TWA  
100 ppm (537 mg/m3) ACGIH STEL

VENTILATION: Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.

EYE PROTECTION: Wear splash resistant safety goggles. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

CLOTHING: Wear appropriate chemical resistant clothing.

GLOVES: Wear appropriate chemical resistant gloves.

RESPIRATOR: The following respirators and maximum use concentrations are drawn from
NIOSH and/or OSHA.

At any detectable concentration -
Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode. 
Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply.
Escape -
Any air-purifying respirator with a full facepiece and an organic vapor canister. 
Any appropriate escape-type, self-contained breathing apparatus.

For Unknown Concentrations or Immediately Dangerous to Life or Health -
Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply. 
Any self-contained breathing apparatus with a full facepiece.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: liquid

COLOR: colorless

ODOR: sweet odor

MOLECULAR WEIGHT: 131.39

MOLECULAR FORMULA: CL-C-H-C-CL2

BOILING POINT: 189 F (87 C)

FREEZING POINT: -99 F (-73 C)

VAPOR PRESSURE: 58 mmHg @ 20 C

VAPOR DENSITY (air=1): 4.53

SPECIFIC GRAVITY (water=1): 1.4642

WATER SOLUBILITY: 0.1%

PH: Not available

VOLATILITY: Not available

ODOR THRESHOLD: 21 ppm

EVAPORATION RATE: 0.69 (carbon tetrachloride=1)

COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available

SOLVENT SOLUBILITY:
Soluble: alcohol, ether, acetone, chloroform, benzene, vegetable oils

10. STABILITY AND REACTIVITY

Up to Table of Contents
REACTIVITY:  
May decompose on contact with air, light, moisture, heat or storage and use above room temperature. Releases 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.

INCOMPATIBILITIES:  
bases, metals, combustible materials, oxidizing materials

HAZARDOUS DECOMPOSITION:  
Thermal decomposition products: phosgene, halogenated compounds, oxides of carbon

POLYMERIZATION:  
May polymerize. Avoid contact with heat or light and monitor inhibitor content.

11. TOXICOLOGICAL INFORMATION

TRICHLOROETHYLENE:

IRRITATION DATA:  
2 mg/24 hour(s) skin-rabbit severe; 20 mg/24 hour(s) eyes-rabbit moderate

TOXICITY DATA:  
8450 ppm/4 hour(s) inhalation-mouse LC50; >20 gm/kg skin-rabbit LD50; 5650 mg/kg oral-rat LD50

CARCINOGEN STATUS:  
IARC: Human Limited Evidence, Animal Sufficient Evidence, Group 2A; ACGIH: A5 -Not Suspected as a Human Carcinogen

LOCAL EFFECTS:  
Irritant: inhalation, skin, eye

ACUTE TOXICITY LEVEL:  
Slightly Toxic: inhalation, ingestion

TARGET ORGANS:  
immune system (sensitizer), central nervous system

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:  
heart problems

TUMORIGENIC DATA:  
Available.

MUTAGENIC DATA:  
Available.

REPRODUCTIVE EFFECTS DATA:  
Available.

ADDITIONAL DATA:  
May cross the placenta. Stimulants such as epinephrine may induce ventricular fibrillation.
12. ECOLOGICAL INFORMATION

ECOTOXICITY DATA:

FISH TOXICITY:
3100 ug/L 96 hour(s) LC50 (Mortality) Flagfish (Jordanella floridae)

INVERTEBRATE TOXICITY:
1700 ug/L 7 hour(s) EC50 (Regeneration) Flatworm (Dugesia japonica)

OTHER TOXICITY:
45000 ug/L 48 week(s) LC50 (Mortality) Clawed toad (Xenopus laevis)

FATE AND TRANSPORT:

BIOCONCENTRATION:
17 ug/L 1-14 hour(s) BCF (Residue) Bluegill (Lepomis macrochirus) 8.23 ug/L

13. DISPOSAL CONSIDERATIONS

Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): U228. Hazardous Waste Number(s): D040. Dispose of in accordance with U.S. EPA 40 CFR 262 for concentrations at or above the Regulatory level. Regulatory level- 0.5 mg/L. Dispose in accordance with all applicable regulations.

14. TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101. SHIPPING NAME-UN NUMBER; HAZARD CLASS; PACKING GROUP; LABEL:
Trichloroethylene-UN1710; 6.1; III; Keep away from food

15. REGULATORY INFORMATION

U.S. REGULATIONS:
TSCA INVENTORY STATUS: Y

TSCA 12(b) EXPORT NOTIFICATION: Not listed.

CERCLA SECTION 103 (40CFR302.4): Y
Trichloroethylene: 100 LBS RQ

SARA SECTION 302 (40CFR355.30): N

SARA SECTION 304 (40CFR355.40): N

SARA SECTION 313 (40CFR372.65): Y
Trichloroethylene

SARA HAZARD CATEGORIES, SARA SECTIONS 311/312 (40CFR370.21):
ACUTE: Y
CHRONIC: Y
FIRE: N
REACTIVE: N
SUDDEN RELEASE: N


STATE REGULATIONS:
California Proposition 65: Y
Known to the state of California to cause the following:
Trichloroethylene
Cancer (Apr 01, 1988)

EUROPEAN REGULATIONS:
EC NUMBER (EINECS): 201-167-4

EC RISK AND SAFETY PHRASES:

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<tr>
<th>R</th>
<th>Description</th>
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<tr>
<td>40</td>
<td>Possible risks of irreversible effects.</td>
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<td>52/53</td>
<td>Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.</td>
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<td>2</td>
<td>Keep out of reach of children.</td>
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<td>23</td>
<td>Do not breathe gas, fumes, vapour, or spray.</td>
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<td>36/37</td>
<td>Wear suitable protective clothing and gloves.</td>
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<tr>
<td>61</td>
<td>Avoid release to the environment. Refer to special instructions/Safety data sheets.</td>
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CONCENTRATION LIMITS:
C>=1% Xn R 40

16. OTHER INFORMATION

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