MATERIAL SAFETY DATA SHEET

Emergency Phone: 800-992-5994
Dow AgroSciences LLC
Indianapolis, IN 46268

Effective Date: 4/19/05
Product Code: 87272
MSDS: 004950

TRANS 1,3-DICHLOROPROPENE

1. PRODUCT AND COMPANY IDENTIFICATION:

PRODUCT: Trans 1,3-Dichloropropene

COMPANY IDENTIFICATION:
Dow AgroSciences LLC
9330 Zionsville Road
Indianapolis, IN 46268-1189

2. COMPOSITION/INFORMATION ON INGREDIENTS:

Trans 1,3-Dichloropropene	CAS# 010061-02-6	97.4%
Cis 1,3-Dichloropropene	CAS# 010061-01-5	1.1%
Balance		1.5%

3. HAZARDOUS IDENTIFICATIONS:

EMERGENCY OVERVIEW

Product is colorless to straw-colored liquid with a sweet, pungent odor. May cause severe eye irritation with slight corneal injury. A single prolonged exposure may result in skin absorption with irritation and burns. Potential carcinogen. Flammable liquid, keep away from flames. If involved in fire, use water fog, foam, CO_2 or dry chemical. Highly toxic and irritating fumes are released in fire situations. Highly toxic to aquatic invertebrates and moderately toxic to fish and birds on an acute basis.

EMERGENCY PHONE NUMBER: 800-992-5994

4. FIRST AID:

EYES: Irrigate with flowing water immediately and continuously for 15 minutes. Consult medical personnel.

SKIN: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician if irritation persists. Destroy items which cannot be decontaminated, such as shoes.

INGESTION: Do not induce vomiting. Call a physician or transport to an emergency facility immediately.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.

NOTE TO PHYSICIAN: Because rapid absorption may occur through lungs if aspirated and cause systemic effects, the decision of whether to induce vomiting or not should be made by a physician. If lavage is performed, endotracheal and/or esophageal control is suggested. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. If burn is present, treat as any thermal burn, after decontamination. Repeated excessive exposure may aggravate preexisting lung, liver, and kidney disease. No specific antidote. Supportive care. Treatment based on judgment of the physician in response to reactions of the patient. Persons receiving a significant exposure of this material by inhalation should be observed 24-48 hours for delayed pulmonary edema.

5. FIRE FIGHTING MEASURES:

FLASH POINT: 83°F (28°C)
METHOD USED: TCC

FLAMMABLE LIMITS
LFL: 2.6% @ 60°C
UFL: 12% @ 100°C

EXTINGUISHING MEDIA: Water fog, foam, CO_2, dry chemical. For large-scale fires, straight or direct water streams may be ineffective to extinguish fire, but copious fine water spray will help control situation by its cooling action. General purpose foams are preferred if available. Alcohol-resistant foams may function also. Water fog, applied gently, may be used as a blanket for fire extinguishing. If possible, contain fire run-off water.

FIRE & EXPLOSION HAZARDS: Keep unnecessary people away; isolate hazard area and deny unnecessary entry. Highly toxic and irritating fumes are released in fire situations. Keep product vapors away from possible ignition sources. Vapors can form flammable mixtures at ordinary temperatures. Static electricity may accumulate and create a fire ignition. Vapors are heavier than air and may travel a considerable distance where they may linger and/or find an ignition source and flash back. Stay upwind; keep out of low areas.

FIRE-FIGHTING EQUIPMENT: Use NIOSH or MSHA-approved positive-pressure, self-contained breathing apparatus and special protective clothing, including heavy neoprene or rubber boots and neoprene gloves.

6. ACCIDENTAL RELEASE MEASURES:

ACTION TO TAKE FOR SPILLS/LEAKS: Use proper protective equipment when cleaning spills and leaks. Cover or confine small spills or leaks with an absorbent such as diatomaceous earth, clay, dry sand, or other non-combustible, absorptive material. Report large spills or leaks to Dow AgroSciences at 800-992-5594.

7. HANDLING AND STORAGE:

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: For handling relative to the end-use of this product and information concerning the use of personal protective equipment (PPE) under the Worker Protection Standard of 1993, see the product label. Store in original container away from heat, sparks and flame.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION:

These precautions are suggested for conditions where a potential for exposure exists. Emergency conditions may require additional precautions.

EXPOSURE GUIDELINE(S):
1,3-Dichloropropene: ACGIH TLV and OSHA PEL is 1 ppm, skin. ACGIH classifies as A3.

ENGINEERING CONTROLS: Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines. Lethal concentrations may exist in areas with poor ventilation.

RECOMMENDATIONS FOR MANUFACTURING, COMMERCIAL BLENDING, AND PACKAGING WORKERS:

RESPIRATORY PROTECTION: Atmospheric levels should be maintained below the exposure guideline. When respiratory protection is required for certain operations, use a NIOSH approved positive-pressure supplied-air respirator. For emergency and other conditions where the exposure guideline may be greatly exceeded, use a NIOSH approved positive-pressure self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply. In confined or poorly ventilated areas, use a NIOSH approved positive-pressure supplied-air respirator.

SKIN PROTECTION: Use protective clothing impervious to this material. Selection of specific items such as faceshield, gloves, boots, apron, or full body suit will depend on operation. Safety shower should be located in immediate work area. Remove contaminated clothing immediately, wash skin area with soap and water, and launder clothing before reuse. Contaminated leather items, such as shoes, belts and watchbands, should be removed and destroyed.

EYE/FACE PROTECTION: Use chemical goggles. If vapor exposure causes eye discomfort, use a NIOSH approved full-face respirator.

APPLICATORS AND ALL OTHER HANDLERS: Please refer to the product label for personal protective clothing and equipment.

9. PHYSICAL AND CHEMICAL PROPERTIES:

BOILING POINT: Approximately 220°F (104°C)
VAPOR PRESSURE: 28 mm Hg at 25°C (77°F)
VAPOR DENSITY: Not applicable
SOLUBILITY IN WATER: Approximately 0.1%
SPECIFIC GRAVITY: 1.211 at 20°C (68°F)
APPEARANCE: Colorless to straw colored liquid
ODOR: Pungent, sweet, penetrating odor

10. STABILITY AND REACTIVITY:

STABILITY: (CONDITIONS TO AVOID) May form explosive mixtures with air when confined.

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID) Corrosive to some metals. Do not use containers or equipment containing aluminum, magnesium, zinc, cadmium, or their alloys. Avoid strong bases.

HAZARDOUS DECOMPOSITION PRODUCTS: Hydrogen chloride and other toxic, irritating gases may be formed if product is involved in fire.

HAZARDOUS POLYMERIZATION: Not known to occur.

11. TOXICOLOGICAL INFORMATION:

POTENTIAL HEALTH EFFECTS: This section includes possible adverse effects which could occur if this material is not handled in the recommended manner.

EYE: May cause severe eye irritation and slight corneal injury. Vapors may cause irritation and lacrimation (tears).

SKIN: A single prolonged exposure may result in the material being absorbed in harmful amounts. The LD_{50} for skin absorption in rabbits is 300-500 mg/kg. Prolonged or repeated exposure may cause skin irritation, even a burn. Animal data indicate that this material is a potential skin sensitizer.

INGESTION: Single dose oral toxicity is considered to be moderate. The oral LD_{50} for rats is 200-300 mg/kg. Small amounts swallowed incidental to normal handling operations are not likely to cause injury; however, swallowing larger amounts than that may cause serious injury, even death. If aspirated (liquid enters the lung), may be rapidly absorbed through the lungs and result in injury to other body systems.

INHALATION: Excessive vapor concentrations are readily attainable and may cause serious adverse effects, even death. Excessive exposure may cause irritation to upper respiratory tract and lungs. The vapor LC_{50} for male rats is 855-1035 ppm for 4 hours and is 904 for 4 hours for female rats.

SYSTEMIC (OTHER TARGET ORGAN) EFFECTS): In animals, effects have been reported on the following organs: bladder, kidney, liver, lungs, stomach, and upper respiratory tract. **See regulations section.

CANCER INFORMATION: For hazard communication purposes under OSHA Standard 29 CFR Part 1910.1200, 1,3-dichloropropene is listed as a potential carcinogen by IARC and NTP. Has been shown to cause cancer in laboratory animals by the oral route. Inhalation exposure resulted in an increase in the normal occurrence of benign lung tumors in male mice. **See regulations section.

TERATOLOGY (BIRTH DEFECTS): Birth defects are unlikely. Even exposures having an adverse effect on the mother should have no effect on the fetus. **See regulations section.

REPRODUCTIVE EFFECTS: In animal studies, has been shown not to interfere with reproduction.

MUTAGENICITY: In-vitro mutagenicity studies were negative in some cases and positive in other cases. Animal mutagenicity studies were negative.

12. ECOLOGICAL INFORMATION:

ENVIRONMENTAL FATE

MOVEMENT & PARTITIONING:
Bioconcentration potential is low (BCF <100 or Log Pow <3).
Measured log octanol/water partition coefficient (log Pow) is 2.06.
Log octanol/water partition coefficient (log Pow) is estimated using a structural fragment method to be 1.603.
Potential for mobility in soil is very high (Koc between 0 and 50).
Soil organic carbon/water partition coefficient (Koc) is 23 and 26.

DEGRADATION & PERSISTENCE:
The hydrolysis half-life is 2-70 days.
Tropospheric half-life is estimated to be 29-50 hours.
Biodegradation reached in Closed Bottle Test (OECD Test No. 301D) after 28 days: 8%.
Biodegradation may occur under aerobic conditions (in the presence of oxygen).

ECOTOXICOLOGY:
Material is very highly toxic to aquatic organisms on an acute basis (LC_{50}/E_{50} <0.1 mg/L in most sensitive species).
Acute LC_{50} in sheepshead minnow *(Cyprinodon variegatus)* is 0.068-1.8 mg/L.
Acute LC_{50} in water flea *(Daphnia magna)* is 0.09-6.2 mg/L.
Acute LC_{50} in mysid *(Mysidopsis bahia)* is 0.79 mg/L.
Acute LC_{50} in rainbow trout (Oncorhynchus mykiss) is 2.96 mg/L.
Acute LC_{50} in channel catfish *(Ictalurus punctatus)* is 4.4 mg/L.
Acute LC_{50} in bluegill *(Lepomis macrochirus)* is 3.9-6.1 mg/L.
Acute LC_{50} in fathead minnow *(Pimephales promelas)* is 4.1 mg/L.
Material is practically non-toxic to birds on an acute basis (LD_{50} > 2000 mg/kg).

Acute contact LD_{50} in honey bee *(Apis mellifera)* is >6.6 ug/bee.
Growth inhibition EC_{50} in green alga *(Selenastrum capricornutum)* is 4.95 mg/L.
Growth inhibition EC_{50} in marine diatom *(Skeletonema costatum)* is 1.0 - 12.7 mg/L.
Growth inhibition EC_{50} in diatom *(Navicula sp.)* is 0.28 mg/L.
Growth inhibition EC_{50} in blue-green alga *(Anabaena flos-aquae)* is 15.5 mg/L.

13. DISPOSAL CONSIDERATIONS:

DISPOSAL METHOD: If wastes and/or containers cannot be disposed of according to the product label directions, disposal of this material must be in accordance with your local or area regulatory authorities. This information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. If the material as supplied becomes a waste, follow all applicable regional, national and local laws and regulations.

14. TRANSPORT INFORMATION:

UNITED STATES DEPARTMENT OF TRANSPORTATION (U.S. DOT) INFORMATION:

For packages sizes less than 102 pounds by all modes of transportation:
PESTICIDES, LIQUID, TOXIC, FLAMMABLE, N.O.S./ (1,3-DICHLOROPROPENE)/6.1(3)/UN2903/PGII

For packages sizes greater than or equal 102 pounds by all modes of transportation:
PESTICIDES, LIQUID, TOXIC, FLAMMABLE, N.O.S./ (1,3-DICHLOROPROPENE)/6.1(3)/UN2903/PGII/RQ (1,3-DICHLOROPROPENE)

15. REGULATORY INFORMATION:

NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations.

U.S. REGULATIONS

SARA 313 INFORMATION: This product contains the following substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:

CHEMICAL NAME	CAS NUMBER	CONCENTRATION
Trans-1,3-Dichloropropene	010061-02-6	98%

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

An immediate health hazard
A delayed health hazard
A fire hazard

CALIFORNIA PROPOSITION 65: The following statement is made in order to comply with the California Safe Drinking Water and Toxic Enforcement Act of 1986: (See Section 3 or 11 of the MSDS for details on carcinogenicity.)

WARNING: This product contains a chemical known to the State of California to cause cancer.

TOXIC SUBSTANCES CONTROL ACT (TSCA): All ingredients are on the TSCA inventory or are not required to be listed on the TSCA inventory.

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STATE RIGHT-TO-KNOW: This product is not known to contain any subject to the disclosure requirements of

New Jersey
Pennsylvania

OSHA HAZARD COMMUNICATION STANDARD: This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) RATINGS:

Category	Rating
Health	3
Flammability	3
Reactivity	0

COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT (CERCLA, or SUPERFUND): To the best of our knowledge, this product contains no chemical subject to reporting under CERCLA.

16. OTHER INFORMATION:

MSDS STATUS: Revised sections: 2,3,11,13,14,15
Reference: DR-0006-0071
Replaces MSDS dated: 5/4/99

The Information Herein Is Given In Good Faith, But No Warranty, Express Or Implied, Is Made. Consult Dow AgroSciences For Further Information.