Safety Data Sheet

Version 3.0 SDS Number 300000005309
Revision Date 11/10/2016 Print Date 12/16/2017

1. PRODUCT AND COMPANY IDENTIFICATION

Product name	:	Trans-LC
Chemical formula	:	C2H2 CI2
Synonyms	:	trans-1,2-dichloroethylene; trans-dichloroethylene acetylene, dichloride, Dioform
Product Use Description	:	Semiconductor Processing
Manufacturer/Importer/Distributor	:	Air Products Canada Ltd. 2233 Argentia Rd, Suite 203 Mississauga, Ontario L5N 2X7 GST No.877787945 RT0001
Telephone	:	905-816-6670
Emergency telephone number (24h)	:	877-288-5002 (Canada, Multilingual) 800-523-9374 (US)

2. HAZARDS IDENTIFICATION

GHS classification

Acute aquatic toxicity. - Category 3
Chronic aquatic toxicity - Category 3
Flammable liquids - Category 2
Acute toxicity - Category 4

GHS label elements

Hazard pictograms/symbols

Signal Word: Danger

Hazard Statements:

H225:Highly flammable liquid and vapour.

Precautionary Statements:

Prevention	:	P210:Keep away from heat, hot surfaces, sparks, open flames, and other ignition sources. No smoking. P233:Keep container tightly closed. P240:Ground and bond container and receiving equipment. P241:Use explosion-proof electrical/ventilating/lighting/equipment. P242:Use non-sparking tools. P243:Take action to prevent statis discharge. P280a:Wear protective gloves and eye/face protection.
Response	:	P303+P361+P353 :IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. P370+P378 :In case of fire, use recommended extinguishing media for extinction.
Storage	:	P403+P235:Store in a well-ventilated place. Keep cool.
Disposal	:	P501:Disposal of contents/container to be specified in accordance with regulations.

Hazards not otherwise classified

May be a static accumulator – Sparks may ignite liquid and vapor
Immediate fire and explosion hazard exists when mixed with air at concentrations exceeding the lower flammability limit (LFL).

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS Number	Concentration (Weight)
trans-Dichloroethylene	156-60-5	100 %

Concentration is nominal. For the exact product composition, please refer to technical specifications. Contains no other components or impurities which will influence the classification of the product.

4. FIRST AID MEASURES

General advice	:	Seek medical advice. If breathing has stopped or is labored, give assisted respirations. Supplemental oxygen may be indicated. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation immediately.
Eye contact	:	Rinse immediately with plenty of water also under the eyelids for at least 20 minutes. Remove contact lenses.
Skin contact	:	Wash off immediately with plenty of water for at least 20 minutes. Wash off with soap and water. Immediately remove contaminated clothing, and any extraneous

chemical, if possible to do so without delay.

Ingestion : Never give anything by mouth to an unconscious person. If a person vomits when lying on his back, place him in the recovery position. Do not induce vomiting. Prevent aspiration of vomit. Turn victim's head to the side.

Inhalation : If breathing has stopped or is labored, give assisted respirations. Supplemental oxygen may be indicated. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation immediately. Move to fresh air.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media : Alcohol-resistant foam.
Carbon dioxide (CO2).
Dry chemical.
Dry sand.
Limestone powder.

Specific hazards : Burning produces noxious and toxic fumes. In the event of fire, cool tanks with water spray . Downwind personnel must be evacuated. Fire or intense heat may cause violent rupture of packages. Flash back possible over considerable distance. May form explosive mixtures in air. Ignitable by static electricity.

Special protective equipment for fire-fighters : Use personal protective equipment. Wear self contained breathing apparatus for fire fighting if necessary.

Further information : Do not allow run-off from fire fighting to enter drains or water courses., Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions : Wear suitable protective clothing, gloves and eye/face protection. Use self-contained breathing apparatus and chemically protective clothing. Remove all sources of ignition. Evacuate personnel to safe areas.

Environmental precautions : Prevent spilled product from entering streams or drinking water supplies. Local authorities should be advised if significant spillages cannot be contained. Shut off or remove all ignition sources. Construct a dike to prevent spreading.

Methods for cleaning up : Call Emergency Response number for advice. Approach suspected leak areas with caution. Absorb with inert absorbent materials such as: Dry sand. Vermiculite. Activated charcoal. Place in appropriate chemical waste container.

Additional advice : Open enclosed spaces to outside atmosphere. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. If possible, stop flow of product.

7. HANDLING AND STORAGE

Handling

See "Flammable and Combustible Liquid Code" NFPA No. 30, National Fire Protection Association, Boston, MA. Emergency showers and eye wash stations should be readily accessible. Adhere to work practice rules established by government regulations. Handling operations that can promote accumulation of static charges include but are not limited to: mixing, filtering, pumping at high flow rates, splash filling, creating mists or sprays, tank and container filling, tank cleaning, sampling, gauging, switch loading, vacuum truck operations. To reduce potential for static discharge, ensure that all equipment is properly grounded, bonded and meets appropriate electrical classification requirements. Use only in well-ventilated areas. Avoid contact with eyes. Avoid breathing vapors and/or aerosols. Use personal protective equipment. When using, do not eat, drink or smoke.

Storage

Keep containers tightly closed in a dry, cool and well-ventilated place. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded. Keep away from heat and sources of ignition. Keep in a dry, cool place. Keep away from oxidizers.

Technical measures/Precautions

Keep away from open flames, hot surfaces and sources of ignition.

Storage Temperature : 32 - 104 °F (0 - 40 °C)

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures

Use explosion-proof equipment.
Apply process controls to ensure safe operating conditions. Assess potential flammability hazards based on flashpoint and potential ignition sources.
Provide readily accessible eye wash stations and safety showers.
Provide natural or explosion-proof ventilation adequate to ensure concentrations are kept below exposure limits.

Personal protective equipment

Respiratory protection : Wear appropriate respirator when ventilation is inadequate. In an emergency or when the airborne concentration is greater than 1000 ppm, use positive pressure self-contained breathing apparatus (SCBA). Use a NIOSH/MSHA full face respirator with organic vapor cartridge(s) when the airborne concentration is less than 1000 ppm.

Hand protection : Viton gloves.
Polyvinyl Alcohol Gloves (PVA).
Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Eye protection : Chemical safety glasses.

Skin and body protection : Long sleeve shirts and trousers without cuffs.

Environmental exposure controls	:	Prevent spilled product from entering streams or drinking water supplies. Local authorities should be advised if significant spillages cannot be contained. Shut off or remove all ignition sources.
Special instructions for protection and hygiene	:	Wash hands at the end of each workshift and before eating, smoking or using the toilet. Provide readily accessible eye wash stations and safety showers.

Exposure limit(s)

trans-Dichloroethylene	Time Weighted Average (TWA): CAD AB OEL	200 ppm	793 mg/m3
trans-Dichloroethylene	Time Weighted Average (TWA): CAD BC OEL	200 ppm	-
trans-Dichloroethylene	Time Weighted Average (TWA): OEL (QUE)	200 ppm	793 mg/m3
trans-Dichloroethylene	Time Weighted Average (TWA): CAD ON OEL	200 ppm	790 mg/m3
trans-Dichloroethylene	Short Term Exposure Limit (STEL): CAD ON OEL	250 ppm	990 mg/m3
trans-Dichloroethylene	Time Weighted Average (TWA): OEL (QUE)	200 ppm	793 mg/m3
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trans-Dichloroethylene	Time Weighted Average (TWA): CAD AB OEL	200 ppm	793 mg/m3
trans-Dichloroethylene	8 hour average contamination limit: CAD SK OEL	200 ppm	-
trans-Dichloroethylene	15 minute average contamination limit: CAD SK OEL	250 ppm	-
trans-Dichloroethylene	Time Weighted Average (TWA): CAD ON OEL	200 ppm	790 mg/m3
trans-Dichloroethylene	Short Term Exposure Limit (STEL): CAD ON OEL	250 ppm	990 mg/m3
trans-Dichloroethylene	Time Weighted Average (TWA): CAD MB OEL	200 ppm	-
trans-Dichloroethylene	Time Weighted Average (TWA): CAD ON OEL	200 ppm	-
trans-Dichloroethylene	Short Term Exposure Limit (STEL): CAD ON OEL	250 ppm	990 mg/m3
trans-Dichloroethylene	Time Weighted Average (TWA): CAD MB OEL	200 ppm	-

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Liquid. Colorless.
Odor	:	Sweet.
Odor threshold	:	No data available.
pH	:	No data available.
Melting point/range	:	-58 °F (-50 °C)
Boiling point/range	:	118 °F (48 °C)
Flash point	:	43 °F (6 °C)

Evaporation rate	:	No data available.
Flammability (solid, gas)	:	Not applicable.
Upper/lower explosion/flammability limit	:	16.5 %(V) / 9 %(V)
Vapor pressure	:	265.41 mmHg at 68 °F (20 °C)
Water solubility	:	0.0063 g/l
Relative vapor density	:	3.67 (air = 1) Heavier than air.
Relative density	:	1.257 (water = 1)
Partition coefficient (n-octanol/water)	:	No data available.
Auto-ignition temperature	:	460 °C
Decomposition temperature	:	No data available.
Viscosity	:	No data available.
Molecular Weight	:	96.94 g/mol

10. STABILITY AND REACTIVITY

Chemical Stability	:	Stable under normal conditions.
Conditions to avoid	:	Heat, flames and sparks. Exposure to air. Exposure to light. Exposure to moisture.
Materials to avoid	:	Oxidizing agents. Alkalies. Amines. Copper. Aluminium. Aluminum alloys. Reducing agents. Strong oxidizing agents. Rubber products. Plastics.
Hazardous decomposition products	:	Hazardous combustion products: Gaseous hydrogen chloride (HCl). Carbon monoxide. Phosgene.

11. TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Likely routes of exposure

Effects on Eye	:	Contact with eyes may cause irritation.
Effects on Skin	:	If absorbed through the skin, may cause central nervous system effects, such as headache, nausea, dizziness, confusion, breathing difficulties. Mild skin irritation.
Inhalation Effects	:	May cause central nervous system effects, such as headache, nausea, dizziness, confusion, breathing difficulties. Severe cases of overexposure can result in respiratory failure. May cause nose, throat, and lung irritation. Inhalation of vapors and/or aerosols in high concentration may cause irritation of respiratory system.
Ingestion Effects	:	May be harmful if swallowed.
Symptoms	:	Repeated and/or prolonged exposure to low concentrations of vapors and/or aerosols may cause: Sore throat. Headache. Nausea. Dizziness. Tremors. Incoordination. Vomiting. Drowsiness. Kidney disorders., Neurological disorders, Liver disorders.

Acute toxicity

Acute Oral Toxicity	:	LD50 : > 5,000 mg/kg Species : (Rat)
Inhalation	:	LC50 (4 h) : 24100 ppm Species : Rat. Inhalation may cause nausea, vomiting, weakness, tremors, and epigastric cramps.
Acute Dermal Toxicity	:	LD50 : > 5,000 mg/kg Species : Rabbit.
Skin corrosion/irritation	:	Mild skin irritation.
Serious eye damage/eye irritation	:	Mild eye irritation.
Sensitization.	:	No data available.

Chronic toxicity or effects from long term exposures

Carcinogenicity	:	No data available.
Reproductive toxicity	:	No data is available on the product itself.
Germ cell mutagenicity	:	Tests show no mutagenic effects.
Specific target organ systemic	:	No data available.

toxicity (single exposure)

Specific target organ systemic toxicity (repeated exposure) : No data available.

Aspiration hazard : No data available.

This product contains no listed carcinogens according to IARC, ACGIH, NTP and/or OSHA in concentrations of 0.1 percent or greater.Chronic exposure may cause damage to the lung, li ver and kidneys., Tests have shown non-mutagenicity.Kidney disorders., Neurological disorders, Liver disorders.

Primarily excreted through the lungs.

12. ECOLOGICAL INFORMATION

Ecotoxicity effects

Aquatic toxicity : No data is available on the product itself.

Toxicity to other organisms : No data available.

Persistence and degradability

Biodegradability : No data is available on the product itself.

Mobility : If released to the soil, the material should leach into the groundwater. It will be lost from the water primarily by volatilization (half-life is 3 hours in a model river).

Bioaccumulation : Biodegradation, adsorption to sediment, and bioconcentration (BCF:22) in aquatic organisms should not be significant.

Further information

If released to the atmosphere, it will be lost by reaction with hydroxy radicals (half-life is 3.6 days) or lost to rain, since it is water soluble.

13. DISPOSAL CONSIDERATIONS

Waste from residues / unused products : Contact supplier if guidance is required.

Contaminated packaging : Dispose of container and unused contents in accordance with federal, state, and local requirements.

14. TRANSPORT INFORMATION

DOT

UN/ID No.	:	UN1150
Proper shipping name	:	1,2-Dichloroethylene
Class or Division	:	3
Packing group	:	II
Label(s)	:	3
Marine Pollutant	:	No

IATA

UN/ID No.	:	UN1150
Proper shipping name	:	1,2-Dichloroethylene
Class or Division	:	3
Packing group	:	II
Label(s)	:	3
Marine Pollutant	:	No

IMDG

UN/ID No.	:	UN1150
Proper shipping name	:	1,2-DICHLOROETHYLENE
Class or Division	:	3
Packing group	:	II
Label(s)	:	3
Marine Pollutant	:	No
Segregation Group:	:	Liquid Halogenated Hydrocarbons

TDG

UN/ID No.	:	UN1150
Proper shipping name	:	1,2-DICHLOROETHYLENE
Class or Division	:	3
Packing group	:	II
Label(s)	:	3
Marine Pollutant	:	No

Further Information

The transportation information is not intended to convey all specific regulatory data relating to this material. For complete transportation information, contact customer service.

15. REGULATORY INFORMATION

Country	Regulatory list	Notification
USA	TSCA	Included on Inventory.
EU	EINECS	Included on EINECS inventory or polymer substance, monomers included on EINECS inventory or no longer polymer.
Canada	DSL	Included on Inventory.

Australia	AICS	Included on Inventory.
Japan	ENCS	Included on Inventory.
South Korea	ECL	Included on Inventory.
China	SEPA	Included on Inventory.
Philippines	PICCS	Included on Inventory.

16. OTHER INFORMATION

NFPA Rating

Health : 2
Fire : 3
Instability : 2

HMIS Rating

Health : 2
Flammability : 3
Physical hazard : 3

Prepared by : Air Products and Chemicals, Inc. Global EH&S Department

Telephone : 905-816-6670

Preparation Date : 12/16/2017

For additional information, please visit our Product Stewardship web site at
http://www.airproducts.com/productstewardship/