

Safety Data Sheet

Version 3.0

Revision Date 12/08/2016

SDS Number 300000005270

Print Date 12/16/2017

1. PRODUCT AND COMPANY IDENTIFICATION

Product name : LTO-410

Chemical formula : C₄H₁₂Si

Product Use Description : Semiconductor Processing

Manufacturer/Importer/Distributor : Air Products and Chemicals, Inc
7201 Hamilton Blvd.
Allentown, PA 18195-1501
GST No. 123600835 RT0001
QST No. 102753981 TQ0001

Telephone : 1-610-481-4911 Corporate
1-800-345-3148 Chemicals Cust Serv
1-800-752-1597 Gases/Electronics Cust Serv

Emergency telephone number (24h) : 800-523-9374 USA
+1 610 481 7711 International

2. HAZARDS IDENTIFICATION

GHS classification

Flammable liquids - Category 2
Skin irritation - Category 2
Eye irritation - Category 2A
Specific target organ toxicity - single exposure - Inhalation Category 3

GHS label elements

Hazard pictograms/symbols



Signal Word: Danger

Hazard Statements:

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H225:Highly flammable liquid and vapour.

H315:Causes skin irritation.

H319:Causes serious eye irritation.

H335:May cause respiratory irritation.

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/Bond container and receiving equipment. P241:Use explosion-proof electrical/ventilating/lighting/equipment. P242:Use only non-sparking tools. P243:Take precautionary measures against static discharge. P261:Avoid breathing dust/fume/gas/mist/vapours/spray. P264:Wash hands thoroughly after handling. P271:Use only outdoors or in a well-ventilated area P280a:Wear protective gloves and eye/face protection.
Response	: P303+P361+P353 :IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. P304+P340 :IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. P305+P351+P338 :IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P312 :Call a POISON CENTRE/doctor if you feel unwell. P332+P313 :If skin irritation occurs: Get medical advice/attention. P337+P313 :If eye irritation persists: Get medical advice/attention. P362 :Take off contaminated clothing and wash before re use. P370+P378 :In case of fire, use recommended extinguishing media for extinction.
Storage	: P403+P233:Store in a well-ventilated place. Keep container tightly closed. P403+P235:Store in a well-ventilated place. Keep cool. P405:Store locked up.
Disposal	: P501:Disposal of contents/container to be specified in accordance with regulations.

Hazards not otherwise classified

None known.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS Number	Concentration (Weight)
Diethylsilane	542-91-6	> 99%

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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. Immediately remove contaminated clothing, and any extraneous chemical, if possible to do so without delay.
Ingestion	: If a person vomits when lying on his back, place him in the recovery position. 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.
Most important symptoms/effects - acute and delayed	: Repeated and/or prolonged exposure to low concentrations of vapors and/or aerosols may cause: Sore throat. Adverse respiratory effects (such as cough, tightness of chest or shortness of breath). Asthma. Skin disorders and Allergies. Adverse skin effects (such as rash, irritation or corrosion). Adverse eye effects (such as conjunctivitis or corneal damage). Eye disease.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	: Alcohol-resistant foam. Carbon dioxide (CO ₂). Dry chemical. Dry sand. Limestone powder.
Specific hazards	: Incomplete combustion may form carbon monoxide. Fire or intense heat may cause violent rupture of packages. Flash back possible over considerable distance. May form explosive mixtures in air. Downwind personnel must be evacuated. Burning produces noxious and toxic fumes. In the event of fire, cool tanks with water spray. Vapor concentrations of 10% or greater can be explosive upon ignition.
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.

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6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment, and Emergency Procedures	: Use self-contained breathing apparatus and chemically protective clothing. Wear suitable protective clothing, gloves and eye/face protection. Remove all sources of ignition. Evacuate personnel to safe areas.
Environmental precautions	: Shut off or remove all ignition sources. Construct a dike to prevent spreading. Prevent spilled product from entering streams or drinking water supplies. Local authorities should be advised if significant spillages cannot be contained. Construct a dike to prevent spreading.
Methods for cleaning up	: Approach suspected leak areas with caution. Call Emergency Response number for advice. 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

Do not breathe vapors/dust. Emergency showers and eye wash stations should be readily accessible. Adhere to work practice rules established by government regulations. Avoid contact with eyes. See "Flammable and Combustible Liquid Code" NFPA No. 30, National Fire Protection Association, Boston, MA. 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.
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. Use an NIOSH/MSHA approved respirator with organic vapor cartridge(s).

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Hand protection	: Impervious gloves. Neoprene gloves. 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 resistant goggles must be worn.
Skin and body protection	: Long sleeve shirts and trousers without cuffs.
Environmental exposure controls	: Shut off or remove all ignition sources. Construct a dike to prevent spreading. Prevent spilled product from entering streams or drinking water supplies. Local authorities should be advised if significant spillages cannot be contained.
Special instructions for protection and hygiene	: Provide readily accessible eye wash stations and safety showers. 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.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	: Liquid. Colorless.
Odor	: Odorless.
Odor threshold	: No data available.
pH	: Not applicable.
Melting point/range	: -209 °F (-134 °C)
Boiling point/range	: 133 °F (56 °C)
Flash point	: -18 °F (-28 °C)
Evaporation rate	: No data available.
Flammability (solid, gas)	: Not applicable.
Upper/lower explosion/flammability limit	: > 10.0 %(V) / 1.1 %(V)
Vapor pressure	: 208.00 mmHg at 68 °F (20 °C)
Water solubility	: Insoluble.

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Relative vapor density	: 3 (air = 1) Heavier than air.
Relative density	: 0.7 (water = 1)
Partition coefficient (n-octanol/water)	: No data available.
Auto-ignition temperature	: 218 °C
Decomposition temperature	: No data available.
Viscosity	: No data available.
Molecular Weight	: No data available.

10. STABILITY AND REACTIVITY

Chemical Stability	: Stable under normal conditions.
Conditions to avoid	: Heat, flames and sparks.
Materials to avoid	: Oxidizing agents. Bases. Mineral acids.
Hazardous decomposition products	: Carbon monoxide. Carbon dioxide (CO ₂). Silicon Dioxide. Hydrogen. Ethylene
Possibility of hazardous Reactions/Reactivity	: No data available.

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	: Causes skin irritation.
Inhalation Effects	: May cause nose, throat, and lung irritation. Inhalation of vapors and/or aerosols in high concentration may cause irritation of respiratory system.
Ingestion Effects	: No data available.
Symptoms	: Repeated and/or prolonged exposure to low concentrations of vapors and/or

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aerosols may cause: Sore throat. Adverse respiratory effects (such as cough, tightness of chest or shortness of breath)., Asthma., Skin disorders and Allergies., Adverse skin effects (such as rash, irritation or corrosion)., Adverse eye effects (such as conjunctivitis or corneal damage)., Eye disease.

Acute toxicity

Acute Oral Toxicity : LD50 : > 2,000 mg/kg Species : Rat.

Inhalation : No data is available on the product itself.

Inhalation - Components
Diethylsilane NOAEC (4 h) : 3093 ppm Species : Rat.

Acute Dermal Toxicity : No data is available on the product itself.

Skin corrosion/irritation : Irritating to skin.

Serious eye damage/eye irritation : Irritating to eyes.

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 : No evidence of mutagenic activity was observed in a bacterial mutation assay.

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

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

Aspiration hazard : No data available.

Delayed and Immediate Effects and Chronic Effects from Short and Long Term Exposure

This product contains no listed carcinogens according to IARC, ACGIH, NTP and/or OSHA in concentrations of 0.1 percent or greater. Adverse respiratory effects (such as cough, tightness of chest or shortness of breath)., Asthma., Skin disorders and Allergies., Adverse skin effects (such as rash, irritation or corrosion)., Adverse eye effects (such as conjunctivitis or corneal damage)., Eye disease.

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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 : No data available.

Bioaccumulation : No data is available on the product itself.

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. : UN1993
Proper shipping name : Flammable liquids, n.o.s., (Diethylsilane)
Class or Division : 3
Packing group : II
Label(s) : 3
Marine Pollutant : No

IATA

UN/ID No. : UN1993
Proper shipping name : Flammable liquid, n.o.s., (Diethylsilane)
Class or Division : 3
Packing group : II
Label(s) : 3
Marine Pollutant : No

IMDG

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UN/ID No. : UN1993
Proper shipping name : FLAMMABLE LIQUID, N.O.S., (Diethylsilane)
Class or Division : 3
Packing group : II
Label(s) : 3
Marine Pollutant : No

TDG

UN/ID No. : UN1993
Proper shipping name : FLAMMABLE LIQUID, N.O.S., (Diethylsilane)
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

Toxic Substance Control Act (TSCA) 12(b) Component(s):

None.

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	Not on Inventory.
Australia	AICS	Not on Inventory.
Japan	ENCS	Not on Inventory.
South Korea	ECL	Included on Inventory.
China	SEPA	Not on Inventory.
Philippines	PICCS	Not on Inventory.

EPA SARA Title III Section 312 (40 CFR 370) Hazard Classification

Fire Hazard. Acute Health Hazard

EPA SARA Title III Section 313 (40 CFR 372) Component(s) above 'de minimus' level

None.

US. California Safe Drinking Water & Toxic Enforcement Act (Proposition 65)

This product does not contain any chemicals known to State of California to cause cancer, birth defects or any other harm.

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16. OTHER INFORMATION

NFPA Rating

Health	:	2
Fire	:	3
Instability	:	1

HMIS Rating

Health	:	2
Flammability	:	3
Physical hazard	:	1

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

Telephone : 1-610-481-4911 Corporate
1-800-345-3148 Chemicals Cust Serv
1-800-752-1597 Gases/Electronics Cust Serv

Preparation Date : 12/16/2017

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