Material Safety Data Sheet

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Version 1.4
According to 91/155/EEC

1 - Product and Company Information

Product Name	VINYL CHLORIDE, 99.5+%
Product Number	387622
Company	Sigma-Aldrich Pte Ltd #08-01 Citilink Warehouse Singapore 118529 Singapore
Technical Phone #	65 271 1089
Fax	65 271 1571

2 - Composition/Information on Ingredients

Product Name	CAS #	EC no	Annex I Index Number
VINYL CHLORIDE	75-01-4	200-831-0	602-023-00-7

Formula	C2H3Cl
Molecular Weight	62.5 AMU
Synonyms	Chloroethene * Chloroethylene * Chlorure de vinyle (French) * Cloruro di vinile (Italian) * Ethene, chloro- * Ethylene monochloride * Monochloroethene * Monochloroethylene * RCRA waste number U043 * VCM * Vinile (cloruro di) (Italian) * Vinylchlorid (German) * Vinyl chloride (ACGIH:OSHA) * Vinyl chloride monomer * Vinyle(chlorure de) (French) * Vinyl C monomer * Winylu chlorek (Polish)

3 - Hazards Identification

SPECIAL INDICATION OF HAZARDS TO HUMANS AND THE ENVIRONMENT
May cause cancer. Extremely flammable.
Carc. Cat.1

4 - First Aid Measures

AFTER INHALATION
If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

AFTER SKIN CONTACT
In case of contact, immediately wash skin with soap and copious amounts of water.

AFTER EYE CONTACT
Contamination of the eyes should be treated by immediate and prolonged irrigation with copious amounts of water. Assure adequate flushing of the eyes by separating the eyelids with fingers.

AFTER INGESTION
If swallowed, wash out mouth with water provided person is conscious. Call a physician.

5 - Fire Fighting Measures

EXTINGUISHING MEDIA
Suitable: Use water spray or fog nozzle to keep cylinder cool. Move cylinder away from fire if there is no risk.

SPECIAL RISKS
Specific Hazard(s): Extremely flammable. Vapor may travel considerable distance to source of ignition and flash back. Emits toxic fumes under fire conditions.
Explosion Hazards: May form explosive mixtures with air Vapor may travel considerable distance to source of ignition and flash back. Container explosion may occur under fire conditions.

SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS
Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

SPECIFIC METHOD(S) OF FIRE FIGHTING
Do not extinguish burning gas if flow cannot be shut off immediately. Use water spray or fog nozzle to keep cylinder cool. Move cylinder away from fire if there is no risk.

6 - Accidental Release Measures

PERSONAL PRECAUTION PROCEDURES TO BE FOLLOWED IN CASE OF LEAK OR SPILL
Evacuate area and keep personnel upwind. Shut off all sources of ignition. Shut off leak if there is no risk.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)
Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP
Ventilate area and wash spill site after material pickup is complete.

7 - Handling and Storage

HANDLING
Directions for Safe Handling: Do not breathe gas. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

STORAGE
Conditions of Storage: Keep tightly closed. Keep away from heat, sparks, and open flame. Use with equipment rated for cylinder pressure, and of compatible materials of construction. Close valve when not in use and when empty. Make sure cylinder is properly secured when in use or stored Cylinder temperature should not exceed 125°F (52°C).
Unsuitable: Store away from heat and direct sunlight

SPECIAL REQUIREMENTS: Contents under pressure. Light sensitive.

8 - Exposure Controls / Personal Protection

ENGINEERING CONTROLS
Warning: suck-back into cylinder may cause rupture. Use

back-flow-preventive device in piping. Use only in a chemical fume hood. Safety shower and eye bath.

GENERAL HYGIENE MEASURES
Discard contaminated clothing and shoes. Wash thoroughly after handling.

EXPOSURE LIMITS

Country	Source	Type	Value
Poland		NDS	5 MG/M3
Poland		NDSCh	30 MG/M3
Poland		NDSP	-

EXPOSURE LIMITS - DENMARK

Source	Type	Value
OEL	TWA	3 mg/m3
		1 ppm

Remarks: HK

EXPOSURE LIMITS - GERMANY

Source	Type	Value
TRGS 900	OEL	8 mg/m3
		3 ppm

Remarks: 4
Remarks: TRK,TRGS 901

EXPOSURE LIMITS - NORWAY

Source	Type	Value
	OEL	3 mg/m3
		1 ppm

Remarks: K

EXPOSURE LIMITS - SWEDEN

Source	Type	Value
	LLV (Level	2.5 mg/m3
		1 ppm

Remarks: H, K

EXPOSURE LIMITS - SWITZERLAND

Source	Type	Value
OEL	OEL	5.2 mg/m3
		2 ppm

Remarks: K M

EXPOSURE LIMITS - UNITED KINGDOM

Source	Type	Value
OEL	OEL	7 ppm

PERSONAL PROTECTIVE EQUIPMENT
Respiratory Protection: Self-contained breathing apparatus.
Hand Protection: Compatible chemical-resistant gloves.
Eye Protection: Chemical safety goggles.

9 - Physical and Chemical Properties

Appearance — Physical State: Compressed gas

Property	Value	At Temperature or Pressure
pH	N/A	
BP/BP Range	-13.4 °C	760 mmHg
MP/MP Range	-153.8 °C	

Flash Point	-61 °C	Method: closed cup
Flammability	N/A	
Autoignition Temp	N/A	
Oxidizing Properties	N/A	
Explosive Properties	N/A	
Explosion Limits	N/A	
Vapor Pressure	N/A	
SG/Density	0.911 g/cm3	
Partition Coefficient	N/A	
Viscosity	N/A	
Vapor Density	N/A	
Saturated Vapor Conc.	N/A	
Evaporation Rate	N/A	
Bulk Density	N/A	
Decomposition Temp.	N/A	
Solvent Content	N/A	
Water Content	N/A	
Surface Tension	N/A	
Conductivity	N/A	
Miscellaneous Data	N/A	
Solubility	N/A	

10 - Stability and Reactivity

STABILITY
Stable: Stable.
Conditions to Avoid: Light.
Materials to Avoid: Chemically active metals, Copper.

HAZARDOUS DECOMPOSITION PRODUCTS
Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide.

HAZARDOUS POLYMERIZATION
Hazardous Polymerization: May undergo autopolymerization
Hazardous Polymerization Reactions: May polymerize on exposure to light.

11 - Toxicological Information

RTECS NUMBER: KU9625000

ACUTE TOXICITY

LD50
Oral
Rat
500 mg/kg

LC50
Inhalation
Rat
18 PPH/15M
Remarks: Behavioral:Tremor. Behavioral:Convulsions or effect on seizure threshold. Lungs, Thorax, or Respiration:Respiratory depression.

SIGNS AND SYMPTOMS OF EXPOSURE
Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

ROUTE OF EXPOSURE
Skin Contact: Can cause severe frostbite. Causes skin irritation.
Skin Absorption: May be harmful if absorbed through the skin.
Eye Contact: Causes eye irritation.
Inhalation: Can cause rapid suffocation. May be harmful if inhaled. Material is irritating to mucous membranes and upper respiratory tract.
Ingestion: Harmful if swallowed.

TARGET ORGAN INFORMATION
Liver. Blood. Brain. Central nervous system.

CHRONIC EXPOSURE - CARCINOGEN
Result: This is or contains a component that has been reported to be carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.

Man
Route of Application: Inhalation
Exposure Time: 14Y
Result: Tumorigenic:Carcinogenic by RTECS criteria. Liver:Tumors.

Rat
Route of Application: Oral
Exposure Time: 52W
Result: Tumorigenic:Carcinogenic by RTECS criteria. Liver:Tumors. Kidney, Ureter, Bladder:Kidney tumors.

Rat
Route of Application: Inhalation
Exposure Time: 4H/52W
Result: Tumorigenic:Carcinogenic by RTECS criteria. Skin and Appendages: Other: Tumors.

Rat
Route of Application: Inhalation
Exposure Time: 4H (12
Result: Tumorigenic:Carcinogenic by RTECS criteria. Tumorigenic Effects: Uterine tumors. Endocrine:Tumors.

Rat
Route of Application: Intraperitoneal
Exposure Time: 65W
Result: Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Skin and Appendages: Other: Tumors. Gastrointestinal:Tumors.

Rat
Route of Application: Subcutaneous
Exposure Time: 67W
Result: Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Skin and Appendages: Other: Tumors.

Mouse
Route of Application: Inhalation
Exposure Time: 30W
Result: Tumorigenic:Carcinogenic by RTECS criteria. Vascular:Tumors. Skin and Appendages: Other: Tumors.

Hamster
Route of Application: Inhalation

Exposure Time: 4H/30W
Result: Tumorigenic:Carcinogenic by RTECS criteria.
Blood:Lymphomas including Hodgkin's disease. Skin and
Appendages: Other: Tumors.

Rat
Route of Application: Inhalation
Exposure Time: 7H/26W
Result: Tumorigenic:Carcinogenic by RTECS criteria.
Vascular:Tumors. Skin and Appendages: Other: Tumors.

Rat
Route of Application: Inhalation
Exposure Time: 7H/26W
Result: Tumorigenic:Carcinogenic by RTECS criteria.
Liver:Tumors. Skin and Appendages: Other: Tumors.

Mouse
Route of Application: Inhalation
Exposure Time: 47W
Result: Tumorigenic:Carcinogenic by RTECS criteria. Lungs,
Thorax, or Respiration:Tumors. Liver:Tumors.

Rat
Route of Application: Oral
Exposure Time: 3Y
Result: Tumorigenic:Carcinogenic by RTECS criteria.
Liver:Angiosarcoma. Kidney, Ureter, Bladder:Kidney tumors.

Mouse
Route of Application: Inhalation
Exposure Time: 6H/4W
Result: Tumorigenic:Carcinogenic by RTECS criteria. Lungs,
Thorax, or Respiration:Tumors. Skin and Appendages: Other:
Tumors.

Mouse
Route of Application: Inhalation
Exposure Time: 4H/30W
Result: Tumorigenic:Carcinogenic by RTECS criteria.
Liver:Tumors. Skin and Appendages: Other: Tumors.

Rat
Route of Application: Inhalation
Exposure Time: 2Y
Result: Tumorigenic:Carcinogenic by RTECS criteria. Sense Organs
and Special Senses (Nose, Eye, Ear, and Taste):Ear:Tumors.
Liver:Angiosarcoma.

Human
Route of Application: Inhalation
Exposure Time: W-
Result: Tumorigenic:Carcinogenic by RTECS criteria. Blood:Tumors.

Rat
Route of Application: Inhalation
Exposure Time: 4H/52W
Result: Tumorigenic:Carcinogenic by RTECS criteria. Skin and
Appendages: Other: Tumors.

Rat
Route of Application: Inhalation

Exposure Time: 6H/43W
Result: Tumorigenic:Carcinogenic by RTECS criteria. Skin and Appendages: Other: Tumors.

IARC CARCINOGEN LIST

Rating: Group 1

CHRONIC EXPOSURE - MUTAGEN

Human
10 MMOL/L
Cell Type: HeLa cell
Cytogenetic analysis

Human
7500 PPT
Cell Type: lymphocyte
Mutation in mammalian somatic cells.

Rat
2000 PPM
Inhalation
14W
Morphological transformation.

Rat
18 GM/KG
Oral
2Y
DNA

Rat
205 PPM
Inhalation
5H
DNA damage

Rat
2100 UMOL/L
Cell Type: liver
Unscheduled DNA synthesis

Rat
9500 UG/KG
Intravenous
DNA inhibition

Rat
150 UG/M3/14W-C
Inhalation
Cytogenetic analysis

Rat
1 PPH/24H-C
Cell Type: S. cerevisiac
Host-mediated assay

Mouse
5 PPH/4H
Inhalation
Micronucleus test

Mouse
75 MG/L
Cell Type: Embryo
Morphological transformation.

Mouse
700 MG/KG
Cell Type: S. pombe
Host-mediated assay

Mouse
700 MG/KG
Cell Type: S. cerevisiac
Host-mediated assay

Hamster
30 PPH
Cell Type: Embryo
Micronucleus test

Hamster
20 PPH/5H (+S9)
Cell Type: lung
Mutation in microorganisms

Hamster
12500 PPM
Inhalation
6H
Cytogenetic analysis

Hamster
600 MG/KG
Multiple
Cytogenetic analysis

Hamster
12500 PPM
Inhalation
6H
Sister chromatid exchange

Hamster
10 PPH
Cell Type: ovary
Mutation in mammalian somatic cells.

CHRONIC EXPOSURE - TERATOGEN

Species: Rat
Dose: 500 PPM/7H
Route of Application: Inhalation
Exposure Time: (6-15D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Rat
Dose: 500 PPM/7H
Route of Application: Inhalation
Exposure Time: (6-15D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death,

e.g., stunted fetus). Specific Developmental Abnormalities: Musculoskeletal system.

Species: Mouse
Dose: 500 PPM/7H
Route of Application: Inhalation
Exposure Time: (6-15D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Specific Developmental Abnormalities: Musculoskeletal system.

CHRONIC EXPOSURE - REPRODUCTIVE HAZARD
Result: Overexposure may cause reproductive disorder(s) based on tests with laboratory animals.

Species: Man
Dose: 30 MG/M3
Route of Application: Inhalation
Exposure Time: (5Y MALE)
Result: Paternal Effects: Spermatogenesis (including genetic material, sperm morphology,motility, and count).

Species: Rat
Dose: 100 PPM/6H
Route of Application: Inhalation
Exposure Time: (26W MALE)
Result: Paternal Effects: Testes, epididymis, sperm duct.

Species: Rat
Dose: 1500 PPM/24H
Route of Application: Inhalation
Exposure Time: (1-9D PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Rat
Dose: 250 PPM/6H
Route of Application: Inhalation
Exposure Time: (55D PRE)
Result: Effects on Fertility: Female fertility index (e.g., # females pregnant per # sperm positive females; # females pregnant per # females mated).

Species: Mouse
Dose: 30000 PPM/6H
Route of Application: Inhalation
Exposure Time: (5D MALE)
Result: Effects on Fertility: Pre-implantation mortality (e.g., reduction in number of implants per female; total number of implants per corpora lutea).

Species: Rabbit
Dose: 500 PPM/7H
Route of Application: Inhalation
Exposure Time: (6-18D PREG)
Result: Effects on Fertility: Litter size (e.g.; # fetuses per litter; measured before birth). Specific Developmental Abnormalities: Musculoskeletal system.
CMR CAT.: Carc. Cat.1

12 - Ecological Information

No data available.

13 - Disposal Considerations

SUBSTANCE DISPOSAL
Contact a licensed professional waste disposal service to dispose of this material. Observe all federal, state, and local environmental regulations.
CONTAMINATED CONTAINER DISPOSAL
Caution: no-return cylinder. Do not reuse. Empty cylinder will contain hazardous residue. Follow proper disposal techniques.

14 - Transport Information

RID/ADR
UN#: 1086
Class: 2
Proper Shipping Name: Vinyl chloride, stabilized

IMDG
UN#: 1086
Class: 2.1
Proper Shipping Name: Vinyl chloride, stabilized
Marine Pollutant: No
Severe Marine Pollutant: No

IATA
UN#: 1086
Class: 2.1
Proper Shipping Name: Vinyl chloride, stabilized
Inhalation Packing Group I: No

15 - Regulatory Information

CLASSIFICATION AND LABELING ACCORDING TO EU DIRECTIVES
ANNEX I INDEX NUMBER: 602-023-00-7
NOTA: D
INDICATION OF DANGER: F+ T
Extremely Flammable. Toxic.
R-PHRASES: 45 12
May cause cancer. Extremely flammable.
S-PHRASES: 53 45
Restricted to professional users. Attention - Avoid exposure - obtain special instructions before use. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

COUNTRY SPECIFIC INFORMATION

Germany
WGK: 2

SWITZERLAND
SWISS POISON CLASS: 1*

16 - Other Information

WARRANTY
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to

appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.

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