


# LAMPIRAN 11

MATERIAL SAFETY DATA SHEET	
VINYL CHLORIDE (MONOMER)	

## SECTION 1 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT IDENTIFIER: VINYL CHLORIDE (MONOMER)  
 RECOMMENDED USAGE: PVC Manufacturing & Copolymer

MANUFACTURER:

**PT ASAHIMAS CHEMICAL**  
 Ds Gunung Sugih, Jalan Raya Anyer Km-122  
 Cilegon 42447 Banten - Indonesia  
 Tel: +62 254 601252  
 Fax: +62 254 602027  
 Contact Department: CVT Department

EMERGENCY PHONE NUMBER: +62 254 601252

## SECTION 2 HAZARDS IDENTIFICATION

GHS Classification:

Health	Environmental	Physical
Acute Toxicity - Category 3 Eye Corrosion - Category 1A Skin Corrosion - Category 1A Skin Sensitization - Category 1 Mutagenicity - Category 1A Carcinogenicity - Category 1B Reproductive/Developmental - Category 1A Target Organ Toxicity (Repealed) - Category 1	Aquatic Toxicity: • Acute 1 • Chronic 1	Substance which in contact with water emit flammable gasses - Category 1

GHS Label:

Symbol: skull and crossbones, Gas under pressure, health hazard, flammable liquid




**Hazard Statements**

**DANGER!**  
**EXTREMELY FLAMMABLE GAS UNDER PRESSURE**  
 Easy ignited by heat, sparks or flames  
 Fatal if inhaled.  
 Harmful if swallowed,  
 Liquid may cause FROSTBITE to eyes and skin.  
 May cause central nervous system effects.  
 May cause liver damage.  
 Known human carcinogen.

**Precautionary Statements**

Flammable gas.  
 Keep away from heat, sparks and flame, may cause flash fire.  
 May polymerize.  
 Keep container tightly closed.  
 Avoid breathing vapor.  
 Avoid contact with eyes, skin and clothing.  
 Wash thoroughly after handling.  
 Containers may rupture or explode.

MATERIAL SAFETY DATA SHEET	
VINYL CHLORIDE (MONOMER)	

### SECTION 3 COMPOSITION, INFORMATION ON INGREDIENTS

CHEMICAL IDENTITY: VINYL CHLORIDE MONOMER

TRADE NAMES/SYNONYMS:

1-CHLOROETHYLENE; 1-CHLOROETHENE; CHLOROETHYLENE; CHLOROETHENE;  
 CHLORETHENE; CHLORETHYLENE; ETHYLENE MONOCHLORIDE;  
 MONOCHLOROETHYLENE; MONOCHLORO ETHENE; MONOCHLOROETHENE; VINYL  
 CHLORIDE MONOMER; VINYL CHLORIDE, INHIBITED; VINYL C MONOMER; RCRA U043; UN  
 1086; C2H3Cl; MAT24940; RTECS KU9625000

EC NUMBER: 200-831-0

CAS NUMBER: 75-01-4

PERCENTAGE: >99.9


### SECTION 4 FIRST AID MEASURES

- **INHALATION:** If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. If respiration or pulse has stopped, have a trained person administer Basic Life Support (Cardio-Pulmonary Resuscitation/ Automatic External Defibrillation) and CALL FOR EMERGENCY SERVICES IMMEDIATELY. Get immediate medical attention.
- **SKIN CONTACT:** If frostbite or freezing occur, immediately flush with plenty of lukewarm water (105-115 F; 41-46 C). DO NOT USE HOT WATER. If warm water is not available, gently wrap affected parts in blankets. Get immediate medical attention.
- **EYE CONTACT:** Immediately flush eyes with a directed stream of water for at least 15 minutes, occasionally lifting upper and lower lids, until no evidence of chemical remains. Washing eyes within several seconds is essential to achieve maximum effectiveness. Get medical attention immediately.
- **INGESTION:** If a large amount is swallowed, get medical attention.
- **NOTE TO PHYSICIAN:** For inhalation, consider oxygen. Stimulants such as epinephrine may induce ventricular fibrillation.

### SECTION 5 FIRE FIGHTING MEASURES

- **SUITABLE EXTINGUISHING MEDIA:** Stop flow of gas before extinguishing fire. Use carbon dioxide, regular dry chemical, regular foam or water. Use water spray to keep containers cool.
- **FIRE AND EXPLOSION HAZARDS:** Severe fire hazard. Severe explosion hazard. The vapor is heavier than air. Vapors or gases may ignite at distant ignition sources and flash back. Vapor/air mixtures are explosive. Electrostatic discharges may be generated by flow or agitation resulting in ignition or explosion. Containers may rupture or explode if exposed to heat.
- **FIRE FIGHTING:** Move container from fire area if it can be done without risk.  
 For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire.  
 For tank, rail car or tank truck: Stop leak if possible without personal risk. Let burn unless leak can be stopped immediately.  
 For smaller tanks or cylinders, extinguish and isolate from other flammables.  
 Evacuation radius: 800 meters (1/2 mile). Do not attempt to extinguish fire unless flow of material can be stopped first. Flood with fine water spray. Cool containers with water spray until well after the fire is out. Apply water from a protected location or from a safe distance. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. Evacuate if fire gets out of control or containers are directly exposed to fire.



MATERIAL SAFETY DATA SHEET	
VINYL CHLORIDE (MONOMER)	

Evacuation radius: 500 meters (1/3 mile). Consider downwind evacuation if material is leaking.

## SECTION 6 ACCIDENTAL RELEASE MEASURES

### WATER RELEASE:

Subject to California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65). Keep out of water supplies and sewers.

### OCCUPATIONAL RELEASE:

Vapors or gases may ignite at distant ignition sources and flash back. Avoid heat, flames, sparks and other sources of ignition. Stop leak if possible without personal risk. Reduce vapors with water spray. Keep unnecessary people away, isolate hazard area and deny entry. Remove sources of ignition. Ventilate closed spaces before entering. Keep out of water supplies and sewers. Releases should be reported, if required, to appropriate agencies. 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).

## SECTION 7 HANDLING AND STORAGE

### PRECAUTIONS FOR SAFE HANDLING

Avoid breathing vapor or mist. Avoid contact with eyes, skin and clothing. Keep away from heat, sparks and flame. Electrostatic charges may build up during handling. Ground any equipment used in handling. All energized electrical equipment must be designed in accordance with the electrical classification of the area.

### PRECAUTIONS FOR SAFE STORAGE (including any incompatibilities):

Store and handle in accordance with all current regulations and standards. Protect from physical damage. Store outside or in a detached building. Inside storage: Store in a cool, dry place. Keep container tightly closed and properly labeled. Store in a well-ventilated area. Do not enter confined spaces unless adequately ventilated. Avoid heat, flames, sparks and other sources of ignition. Grounding and bonding required. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101. See original container for storage recommendations. Keep separated from incompatible substances.

## SECTION 8 EXPOSURE CONTROLS, PERSONAL PROTECTION

### -CONTROL PARAMETERS:

#### OCCUPATIONAL EXPOSURE LIMIT or BIOLOGICAL LIMIT VALUE:

- 1.0 ppm OSHA TWA
- 5 ppm OSHA ceiling 15 minute(s)
- 0.5 ppm OSHA action level
- 1 ppm ACGIH TWA
- NIOSH TWA (lowest feasible concentration)

### -APPROPRIATE ENGINEERING CONTROLS:

Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Use closed systems when possible. Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

MATERIAL SAFETY DATA SHEET

VINYL CHLORIDE (MONOMER)



PERSONAL PROTECTIVE EQUIPMENT



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

**CLOTHING:** Wear chemical resistant clothing to prevent skin contact.

**GLOVES:**

For the gas: Wear appropriate chemical resistant gloves.  
For the liquid: Wear chemical resistant, insulated gloves such as Perfect Fit® NL-56. Gloves should be selected based on permeation test data.

**OSHA REGULATED SUBSTANCES:** U.S. OSHA 29 CFR 1910.1017.

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

**OSHA Standard:**  
Respirator selection should comply with 29 CFR 1910.134, 29 CFR 1910.1017, and the final rule published in the Federal Register on August 24, 2006.

**NIOSH Recommendations:** 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 a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

**ESCAPE**

Any air-purifying full-facepiece respirator (gas mask) with a chin-style, front-mounted or back-mounted canister providing protection against the compound of concern.  
Any appropriate escape-type, self-contained breathing apparatus.

**SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES**

**APPEARANCE**

PHYSICAL STATE: GAS

COLOR: COLORLESS

CHANGE IN APPEARANCE: Compressed, Liquefied Gas

ODOR: faint odor, sweet odor

ODOR THRESHOLD: 260 ppm

MOLECULAR WEIGHT: 62.50

MOLECULAR FORMULA: C<sub>2</sub>H<sub>3</sub>Cl

PH: Not applicable

FREEZING POINT: -245 F (-154 C)

BOILING POINT: 9 F (-13 C)

FLASH POINT: -108 F (-78 C) (CC)

LOWER FLAMMABLE LIMIT: 3.6%

UPPER FLAMMABLE LIMIT: 33.0%



MATERIAL SAFETY DATA SHEET

VINYL CHLORIDE (MONOMER)



EVAPORATION RATE: > 15  
VAPOR PRESSURE: 2515.6 mmHg @ 21.1 C (2980 mmHg @25 C)  
VAPOR DENSITY (air=1): 2.15  
SPECIFIC GRAVITY (water=1): 0.9106 @ 25/25 C  
VOLATILITY: 100%  
VISCOSITY: 0.01072 cP @ 20 C  
WATER SOLUBILITY: 0.25% (2.7 g/L) ; slightly  
PARTITION COEFFICIENT *n-octanol/water*: 1.38  
SOLVENT SOLUBILITY:  
Soluble: ethanol; Very soluble: ether, carbon tetrachloride, benzene  
AUTOIGNITION: 682 F (472 C)  
DECOMPOSITION TEMPERATURE: Not available

SECTION 10 STABILITY AND REACTIVITY

-CHEMICAL REACTIVITY: May polymerize. Avoid contact with light or storage and use above room temperature.  
-CONDITIONS TO AVOID: Avoid air, sunlight, heat, flames, sparks and other sources of ignition. Containers may rupture or explode if exposed to heat.  
-INCOMPATIBILITIES: oxidizing materials, oxides of nitrogen, metals, aluminum, aluminum alloys, copper, metal alkyl complexes and alkali metals such as sodium, potassium and their alloys, peroxides  
-HAZARDOUS DECOMPOSITION (COMBUSTION PRODUCT):  
Thermal decomposition products: halogenated compounds (Hydrogen Chloride); oxides of carbon, phosgene  
-POLYMERIZATION: May polymerize. Avoid contact with heat, light, air, water, other polymerization catalysts/initiators or incompatible materials. Closed containers may rupture violently.

SECTION 11 TOXICOLOGICAL INFORMATION

TOXICITY DATA: 18 ppm/15 minute(s) inhalation-rat LC50; 500 mg/kg oral-rat LD50  
390 mg/M<sup>2</sup> hour(s) inhalation-rat LC50  
CARCINOGEN STATUS: OSHA: Carcinogen; NTP: Known Human Carcinogen; IARC: Human Sufficient Evidence, Animal Sufficient Evidence, Group I; ACGIH: A1 -Confirmed Human Carcinogen; EC: Category 1

LOCAL EFFECTS: Irritant; skin; eye

CARCINOGEN STATUS:  
OSHA: Carcinogen;  
NTP: Known Human Carcinogen;  
IARC: Human Sufficient Evidence, Animal Sufficient Evidence, Group 1

ACUTE TOXICITY LEVEL:  
Toxic: ingestion  
Relatively Non-toxic: inhalation  
TARGET ORGANS: central nervous system, liver

CHRONIC EFFECTS:  
Occupational overexposure has produced cancer (angiosarcomas of the liver)and changes in bones and skin, especially in the extremities such as the fingers (acroosteolysis). Additionally, repeated exposure may result in dose-related sensory disorders, nervous system effects, blood system damage, hepatic-like liver changes, liver malfunction, pulmonary insufficiency, and dermatitis.  
TUMORIGENIC DATA: Available.  
MUTAGENIC DATA:

**MATERIAL SAFETY DATA SHEET****VINYL CHLORIDE (MONOMER)**

Mutagenic in bacteria studies. Genetic studies in animals were negative in some cases and positive in others.  
DEVELOPMENTAL/REPRODUCTIVE: Did not cause birth defects when tested in rats, mice, or rabbits.  
Studies in rats show that inhalation produces fetal toxicity only at exposure levels that also produce maternal toxicity.

REPRODUCTIVE EFFECTS DATA: Available.

ADDITIONAL DATA: Stimulants such as epinephrine may induce ventricular fibrillation. May cause birth defects. Long, latent period may exist between exposure and symptom onset. This material does not accumulate in the body and is readily eliminated.

**POTENTIAL HEALTH EFFECTS:****INHALATION:**

SHORT TERM EXPOSURE: Several minutes of exposure to high, but attainable concentrations (over 1000 ppm) may cause central nervous system depression with effects such as dizziness, drowsiness, disorientation, tingling, numbness or burning sensation of the hands and feet, impaired vision, nausea, headache, difficulty breathing, cardiac arrhythmias, unconsciousness, irritation, irregular heartbeat, joint pain, loss of coordination, hearing loss, lung congestion or even death.

LONG TERM EXPOSURE: impotence, bluish skin color, blood disorders, liver damage, cancer

**SKIN CONTACT:**

SHORT TERM EXPOSURE: Contact with vapor may cause irritation with redness and pain. Contact with liquid may cause frostbite.

LONG TERM EXPOSURE: irritation, blisters

**EYE CONTACT:**

SHORT TERM EXPOSURE: Contact with vapor may cause irritation with redness and pain. Contact with liquid may cause frostbite.

LONG TERM EXPOSURE: irritation, eye damage

**INGESTION:**

SHORT TERM EXPOSURE: frostbite

LONG TERM EXPOSURE: cancer

**SECTION 12 ECOLOGICAL INFORMATION****ECOTOXICITY DATA:**

FISH TOXICITY: 388000 ug/L 10 month(s) LETH (Mortality) Northern pike (Esox lucius)

This material is practically non-toxic to fish on an acute basis (LO50 >100 mg/L).

INVERTEBRATE TOXICITY: 41.74 ug/L 72 day(s) (Residue) Mosquito (Culex pipiens quinquefasciata)

ALGAL TOXICITY: 41.74 ug/L 72 day(s) (Residue) Green algae (Oedogonium cardiacum)

**FATE AND TRANSPORT:**

BIODEGRADATION: Biodegradation may occur under anaerobic conditions (in the absence of oxygen).

PERSISTENCE: Tropospheric half-life is estimated to be 23 hour(s). If released to air, this material will remain in the gas phase. If released to soil, volatilization will occur, but material that does not volatilize may be highly mobile. If released to water, evaporation will occur.

BIOCONCENTRATION: Bioconcentration potential is low (BCF <100 or log Kow <3).

**SECTION 13 DISPOSAL CONSIDERATIONS**



MATERIAL SAFETY DATA SHEET

VINYL CHLORIDE (MONOMER)



Dispose in accordance with all applicable regulations. Hazardous Waste Number(s): D043. Dispose of in accordance with U.S. EPA 40 CFR 262 for concentrations at or above the Regulatory level. Regulatory level: 0.2 mg/L. U043.

**SECTION 14 TRANSPORT INFORMATION**

U.S. DOT 49 CFR 172.101:

PROPER SHIPPING NAME: Vinyl chloride, stabilized

ID NUMBER: UN1086

HAZARD CLASS OR DIVISION: 2.1

LABELING REQUIREMENTS: 2.1

QUANTITY LIMITATIONS:

PASSENGER AIRCRAFT OR RAILCAR: Forbidden

CARGO AIRCRAFT ONLY: 150 kg

CANADIAN TRANSPORTATION OF DANGEROUS GOODS:

SHIPPING NAME: Vinyl chloride, stabilized

UN NUMBER: UN1086

CLASS: 2.1

**SECTION 15 REGULATORY INFORMATION**

U.S. REGULATIONS:

CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4): Vinyl chloride: 1 LBS RQ

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.30): Not regulated.

SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.40): Not regulated.

SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370.21):

ACUTE: Yes

CHRONIC: Yes

FIRE: Yes

REACTIVE: Yes

SUDDEN RELEASE: Yes

SARA TITLE III SECTION 313 (40 CFR 372.65): Vinyl chloride

This product contains a toxic chemical or chemicals subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR 372.

OSHA PROCESS SAFETY (29CFR1910.119): Quantities of 10000 pounds or more are regulated.

STATE REGULATIONS: California Proposition 65:

Known to the state of California to cause the following: Cancer (Feb 27, 1987)

CANADIAN REGULATIONS:


This product has been classified in accordance with the criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

WHMIS CLASSIFICATION: A, B1, D1A, D2A, D2B.

NATIONAL INVENTORY STATUS:

U.S. INVENTORY (TSCA): Listed on inventory.

TSCA 12(b) EXPORT NOTIFICATION: Not listed.

MATERIAL SAFETY DATA SHEET	
VINYL CHLORIDE (MONOMER)	

CANADA INVENTORY (DSL/NDL): Listed on DSL.

**SECTION 16 OTHER INFORMATION**

NFPA RATINGS (SCALE 0-4): HEALTH#2 FIRE#4 REACTIVITY#2

HMIS RATINGS (SCALE 0-4): HEALTH#2\* FLAMMABILITY#4 REACTIVITY#2

This information is intended solely for the use of individuals trained in the NFPA and/or HMIS systems. Rated using 2nd Edition HMIS Instructions.

Revise: 3

Date: August 20, 2009

MSDS SUMMARY OF CHANGES

Change of ASC LOGO

Licensed to: Supplier to make unlimited paper copies for ASC customer only.

*The information in this MSDS was believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall PT ASC be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if PT ASC has been advised of the possibility of such damages.*

