

Issue Date: 12/06/2007

Reviewed Date: 01/08/2016

Page 1 of 17

SECTION 1 – CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Manufacturer: Shintech Louisiana, LLC 3 Greenway Plaza, Suite 1150

Houston, TX 77046 (713) 965-0713

PRODUCT NAME: Vinyl Chloride Monomer

CAS#: 75-01-4

Synonyms: VCM, Vinyl Chloride Monomer;

Monochloroethylene; Chloroethene;

Chloroethylene; Ethylene

Product Use: PVC Manufacturing

CHEMICAL FORMULA: CH₂ CH CI

For information regarding a chemical emergency involving a spill or leak, call:

24 — Hour Emergency Contact:

U.S.: 1-800-424-9300 — CHEMTREC

SECTION 2 – HAZARDS IDENTIFICATION

Global Harmonization System (GHS) Classification:

Category 2 Skin corrosion/irritation

Category 2 Eye damage/eye irritation

Category 1 Known human Carcinogen

Category 1 Specific target organ toxicity - Single and

repeated exposure



Issue Date: 12/06/2007

Reviewed Date: 01/08/2016

Page 2 of 17

National Fire Protection Association (NFPA) Rating Hazardous Materials Identification Systems (HMIS) Rating

	NFPA	HMIS	
Health	2	2	4 = Extreme/Severe \times \text{\text{\$\psi}\$} = Water
			Reactive
Fire	4	4	3 = High/Serious
Reactivity	2	1	2 = Moderate
			1 = Slight
			0 = Minimum

EMERGENCY OVERVIEW

Color:	Colorless
Odor:	Sweet
Physical State:	Compressed, Liquefied gas
Signal Word:	DANGER

DANGER! POISON! Extremely flammable liquid and vapor — Vapor may cause flash fire. May be fatal if inhaled. May cause frostbite. Inhalation may cause central nervous system effects and narcosis. May cause anesthetic effects. Possible cancer hazard. Keep upwind of spill. Vapor explosion hazard. Vapors may travel a long distance; ignition and/or flash back may occur. Flammable gas that is heavier than air. Stay out of low areas. Warn public of downwind explosion hazard. Elevated temperatures can cause hazardous polymerization. Eliminate ignition sources. Avoid temperatures above 400°C (752°F)

GHS Label Elements:





Issue Date: 12/06/2007

Reviewed Date: 01/08/2016

Page 3 of 17



GHS Hazard Statements: May cause frostbite if contact is made with eyes and skin

> Brief inhalation exposure (minutes) to easily attainable concentrations may cause serious adverse effects, even

death

Has caused cancer in humans

OSHA Hazard

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR Communication Standard:

1910.1200.

GHS Precautionary Statements:

Storage: Keep container closed and properly labeled.

Store in cool, dry place.

Avoid heat, flames, sparks and other sources of ignition.

Ventilation Controls: Do not breathe vapor.

Hygiene Measures: When using, do not smoke.

Avoid contact with skin and eyes.

Personal Protective Wear suitable protective clothing, gloves, and eye/face

> Equipment: protection.

First Aid: (See Section 4)

Environmental Protection: Prevent from entering into soil, ditches, sewers, waterways

and/or groundwater.

POTENTIAL HEALTH EFFECTS:

Inhalation: Mist may cause severe irritation of upper respiratory tract

(nose and throat). May cause chemical burns to the

respiratory tract.

Skin Contact: Brief contact may cause severe skin burns. Symptoms



Issue Date: 12/06/2007

Reviewed Date: 01/08/2016

Page 4 of 17

may include pain, severe local redness and tissue

damage.

Skin Absorption: Prolonged skin contact is unlikely to result in absorption of

harmful amounts.

Eye Contact: May cause severe irritation with corneal injury which may

result in permanent impairment of vision, even blindness. Chemical burns may occur. Mist may cause eye irritation.

Ingestion: Swallowing may result in burns of the mouth and throat.

Swallowing may result in gastrointestinal irritation, ulceration, nausea and/or vomiting. Aspiration into the lungs may occur during ingestion or vomiting, causing

tissue damage or lung injury.

Conditions Aggravated by

Respiratory disorders, pre-existing skin disorders,

Exposure:

eye/vision disorders.

Target Organs Effected: Skin, Eyes, Respiratory System.

SECTION 3 – COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous ingredients (specific)	%	CAS Number
Vinyl Chloride	>99.9	75-01-4

SECTION 4 – FIRST AID MEASURES		
INHALATION:	Move person to fresh air. If not breathing, give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask, etc.). If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.	
SKIN CONTACT:	Immediately flush skin with plenty of water for 15 minutes Seek medical attention immediately. Liquid VCM may cause frostbite on contact.	
INGESTION:	Not a likely route of exposure.	
EYE CONTACT:	In case of frostbite, immediately flush eyes with water; remove contact lenses, if present, after the first 5 minutes,	



Issue Date: 12/06/2007

Reviewed Date: 01/08/2016

Page 5 of 17

then continue flushing eyes for at least 15 minutes. Obtain medical attention promptly, preferably from an ophthalmologist.

NOTES TO PHYSICIAN:

Treat for frostbite if present. Maintain adequate ventilation and oxygenation of the patient. The following disease states have been observed in industrial workers exposed to vinyl chloride vapors: acroosteolysis, scleroderma, and Raynaud's phenomenon. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Stimulants such as epinephrine may induce ventricular fibrillation.

SECTION 5 – FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA:

Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Do not use direct water stream. Straight or direct water streams may not be effective to extinguish fire. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective.

FIRE FIGHTING PROCEDURES:

Keep people away. Isolate fire and deny unnecessary entry. Stay upwind. Keep out of low areas where gases (fumes) can accumulate. Water may not be effective in extinguishing fire. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Do not use direct water stream. May spread fire. Eliminate ignition sources. Move container from fire area if this is possible without hazard. For tank, rail car or tank truck: Stop the leak if possible without personal risk. Let burn unless the leak can be stopped immediately. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. Avoid accumulation of water. Product may be carried across water surface spreading fire or contacting an ignition source.



Issue Date: 12/06/2007

Reviewed Date: 01/08/2016

Page 6 of 17

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTERS:

Wear positive-pressure self-contained breathing apparatus (SCBA) and protective firefighting clothing (includes firefighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during firefighting operations. If contact is likely, change to full chemical resistant firefighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

Container may vent and/or rupture due to fire. When product is stored in closed containers, a flammable atmosphere can develop. Electrically ground and bond all equipment. Flammable mixtures of this product are readily ignited even by static discharge. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. Flammable mixtures may exist within the vapor space of containers at room temperature. Flammable concentrations of vapor can accumulate at temperatures above flash point; see Section q

HAZARDOUS COMBUSTION PRODUCTS:

During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Hydrogen chloride. Carbon monoxide. Carbon dioxide. Combustion products may include trace amounts of: Phosgene

SECTION 6 – ACCIDENTAL RELEASE MEASURES

Steps to be Taken if Material is Released or Spilled:

See Section 13, Disposal

Considerations, for additional information. Pump with explosion-proof equipment. If available, use foam to smother or suppress. Knock down and dilute vapors with water fog or spray. Isolate area until gas has dispersed.

Personal Precautions:

Evacuate area. Keep upwind of spill. Keep personnel out of low areas. Ventilate area of leak or spill. No smoking in area. For large spills, warn public of downwind explosion hazard. Eliminate all sources of ignition in vicinity of spill or released vapor to avoid fire or explosion. Vapor explosion



Issue Date: 12/06/2007

Reviewed Date: 01/08/2016

Page 7 of 17

hazard. Keep out of sewers. Check area with combustible gas detector before reentering area. Ground and bond all containers and handling equipment.

Environmental Precautions:

Prevent from entering into soil, ditches, sewers, waterways and/or groundwater.

SECTION 7 – HANDLING AND STORAGE

HANDLING:

General Handling:

General Handling: Keep away from heat, sparks and flame. Avoid contact with eyes. Do not breathe vapor. Use with adequate ventilation. Keep container closed. No smoking, open flames or sources of ignition in handling and storage area. Electrically bond and ground all containers, personnel and equipment before transfer or use of material. Use of non-sparking or explosion-proof equipment may be necessary, depending upon the type of operation.

Other Precautions:

Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. Never use air pressure for transferring product. Containers, even those that have been emptied, can contain vapors. Do not cut, drill, grind, weld, or perform similar operations on or near empty containers.

STORAGE REQUIREMENTS:

Store and handle in accordance with all current regulations and standards. Keep container tightly closed and properly labeled. Store in a cool, dry place. Do not enter confined spaces unless adequately ventilated. Avoid heat, flames, sparks and other sources of ignition. Subject to storage regulations: U.S. OSHA 29 CFR 1910.106. Keep separated from incompatible substances.

SECTION 8 - EXPOSURE CONTROL / PERSONAL PROTECTION

EXPOSURE LIMITS

Vinyl Chloride: 1.0 ppm OSHA-PEL (8 Hour TWA)

5 ppm OSHA /STEL (Average, not exceeding any 15 minute

period) 0.5 ppm OSHA action level



Issue Date: 12/06/2007

Reviewed Date: 01/08/2016

Page 8 of 17

1 ppm ACGIH-TLV (8 Hour TWA) 5 ppm (13 mg/m3) MEXICO TWA

A "skin" notation following the exposure guideline refers to the potential for dermal absorption of the material including mucous membranes and the eyes either by contact with vapors or by direct skin contact. It is intended to alert the reader that inhalation may not be the only rouge of exposure and that measures to minimize dermal exposures should be considered.

PERSONAL PROTECTION

Eye/face Protection: For handling the gas, wear safety glasses. When contact

with the liquid (condensed gas) is possible, wear chemical

goggles

Hand Protection: Use gloves with insulation for thermal protection, when

needed. Use gloves with insulation for thermal protection

(EN 407), when needed.

Clothing: Wear chemical resistant clothing to prevent skin contact.

Respiratory Protection: Atmospheric levels should be maintained below the

exposure guideline. When respiratory protection is required, a NIOSH approved respirator (29 CFR 1910.132, 1910.134 and 1910.1017) with organic vapor cartridges may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits, or when symptoms have been observed that are indicative of overexposure. Respirator must be selected based on the airborne levels found in the work place and must not exceed the working limits of the respirator. SHORT ORGANIC

VAPOR CARTRIDGE SERVICE LIFE is anticipated.

Ingestion: No precautions necessary due to the physical properties of

the material.

ENGINEERING CONTROLS

Ventilation: Provide local exhaust ventilation where vapor may be

generated. All energized electrical equipment must be designed in accordance with the electrical classification of the area (e.g., Class I, Division I). Ensure compliance with applicable exposure limits. Use explosion proof ventilation



Issue Date: 12/06/2007

Reviewed Date: 01/08/2016

Page 9 of 17

equipment.



Issue Date: 12/06/2007

Reviewed Date: 01/08/2016

Page 10 of 17

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES		
Physical State	Gas, Liquid	
Physical Form	Compressed, liquefied gas	
Color	Colorless	
Odor	Sweet	
Autoignition Temperature	472 °C (882 °F) Literature	
Vapor pressure	2,524 mmHg @ 20 °C Literature	
Boiling Point (760 mmHg)	-13.4 °C (7.9 °F) Literature	
Vapor Density (air=1)	2.2 Literature	
Specific Gravity (H₂O=1)	0.913 Literature	
Flash Point – Open cup	-78°C (-108 °F) Cleveland Open Cup ASTM D92	
Flammable Limits in Air	Lower: 3.6% (V) Literature	
	Upper: 33.0%(V) <i>Literature</i>	
Freezing Point	-153.8 °C (-244.8 °F) <i>Literature</i>	
Melting Point	-153.8 °C (-244.8 °F) <i>Literature</i>	
Solubility in Water (by weight)	0.7 % Literature	
рН	Not applicable	
Molecular Weight	62.5 g/mol	
Evaporation Rate (Butyl Acetate =1)	1,000 High - gas	
Kinematic Viscosity	No test data available	
Volatility	100%	
Odor Threshold	Not reliable to prevent excessive exposure	
Evaporation Rate	>15	
voc	100%	

SECTION 10 – STABILITY AND REACTIVITY

STABILITY/INSTABILITY: Stable under recommended storage conditions. See

Storage, Section 7.



Issue Date: 12/06/2007

Reviewed Date: 01/08/2016

Page 11 of 17

Conditions to Avoid: Avoid contact with air (oxygen). Avoid temperatures above 400°C (752°F) Exposure to elevated temperatures can cause product to decompose. Avoid static discharge. Avoid moisture. Avoid open flames, welding arcs, or other temperature sources which induce thermal

decomposition. Avoid direct sunlight

Incompatibility (materials to

avoid):

Avoid contact with: Air. Moist air. Oxygen. Strong

oxidizers. Avoid contact with metals such as:

Aluminum. Aluminum alloys. Copper.

Hazardous Polymerization: Can Elevated temperatures can occur.

hazardous polymerization. Polymerization can be catalyzed by: Air. Free radical initiators. Moisture.

Oxygen. Sunlight.

Thermal Decomposition: Decomposition products depend upon temperature, air

> supply and the presence of other materials. Decomposition products can include and are not limited to: Hydrogen chloride. Toxic gases are released during decomposition. Decomposition products can include

trace amounts of: Phosgene.

SECTION 11 – TOXICOLOGICAL INFORMATION

Toxicity Data: 500 mg/kg oral-rat LD50; 180000 ppm/15 minute(s)

inhalation-rat LC50

Carcinogen Status: OSHA: Carcinogen; NTP: Known Human Carcinogen;

!ARC: Human Sufficient Evidence, Animal Sufficient

Evidence, Group 1

Local Effects: Irritant: skin, eye

Acute Toxicity Level: Toxic: ingestion; Relatively Non-toxic: inhalation.

Target Organs: Central nervous system

Additional Data: Long, latent period may exist between exposure and

symptom onset. This material does not accumulate in

the body and is readily eliminated.



Issue Date: 12/06/2007

Reviewed Date: 01/08/2016

Page 12 of 17

HEALTH EFFECTS

INHALATION:

Acute Exposure:

VINYL CHLORIDE: May be irritating. Exposure to 1,000-16,000 ppm may cause central nervous system depression with drowsiness, vertigo, staggering gait, tingling and numbness of hands and feet, impaired hearing and vision, cardiac arrhythmias and possibly unconsciousness; 20,000-25,000 ppm for 3-5 minutes may cause dizziness, lightheadedness, disorientation, nausea and burning sensation of the soles of the feet; and 120,000 ppm may be fatal.

Additional effects may include narcolepsy, headache, undue fatigue, muscle and joint pain, dyspnea, and anesthesia. Death may be due to respiratory paralysis with cardiac arrest. Human and animal pathologic reports show pulmonary edema, hyperemia of kidneys and liver and hepatic degeneration.

Chronic Exposure:

VINYL CHLORIDE: Repeated exposure may result in dose-related sensory disorders, nervous system effects, blood system damage, hepatic-like liver changes, liver malfunction, impotence and pulmonary insufficiency. Workers overexposed to this material may exhibit symptoms of peripheral circulation changes resulting in pallor, cyanosis, redness, skin changes, and pseudo-clubbing of the fingers. Occupational overexposure has produced angiosarcomas of the liver. Animal studies show that vinyl chloride is carcinogenic in rats. This material does not bioaccumulate and is readily eliminated.

SKIN CONTACT:

Acute Exposure:

VINYL CHLORIDE: Contact may cause irritation with redness and pain. Due to rapid evaporation, the liquid may cause thermal burns with redness, tingling, and pain or numbness. In more severe cases, the skin may become hard and white and develop blisters

Chronic Exposure:

VINYL CHLORIDE: Workers overexposed to this material may exhibit symptoms of peripheral circulation changes resulting in pallor, cyanosis, redness, skin changes, and pseudo-clubbing of the fingers. Repeated or prolonged



Issue Date: 12/06/2007

Reviewed Date: 01/08/2016

Page 13 of 17

exposure to irritants may cause dermatitis.

EYE CONTACT

Acute Exposure: VINYL CHLORIDE: Contact may cause immediate and

severe irritation, and corneal injury with complete recovery in 48 hours. Due to rapid evaporation, the liquid may cause thermal burns with redness, pain and blurred

vision.

Chronic Exposure: VINYL CHLORIDE: Repeated or prolonged exposure to

irritants may cause conjunctivitis.

INGESTION

Acute Exposure: VINYL CHLORIDE: This is not a likely route of exposure.

If the liquid is swallowed, thermal burns to the lips, mouth

and mucous membranes may occur.

Chronic Exposure: VINYL CHLORIDE: This is not a likely route of exposure.

Oral administration to rats, mice, and hamsters resulted in

angiosarcomas of the liver.

SECTION 12 – ECOLOGICAL INFORMATION

ECOTOXICITY DATA

Fish toxicity: This material is practically non-toxic to fish on an acute

basis (LC50>100mg/L).

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).

Bioconcentration: Bioconcentration potential is low (BCF <100 or low Pow

<3).

SECTION 13 – DISPOSAL CONSIDERATIONS

Reuse or reprocess if possible. Dispose in accordance with all applicable Federal, State/Provincial and local laws and regulations. Subject to disposal regulations: U.S.



Issue Date: 12/06/2007

Reviewed Date: 01/08/2016

Page 14 of 17

EPA 40 CFR 262. Hazardous Waste Number(s): D001. U043. Waste characterization and compliance with applicable laws and regulations are the responsibility of the waste generator.

SHINTECH LOUISIANA, LLC HAS NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN SDS SECTION.

SECTION 14 – TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:

Shipping Name	Vinyl Chloride, Stabilized
Hazard Class / Division	2.1
Identification No.	UN1086
Labeling Requirements	2.1
DOT Hazardous Substance(s)	Vinyl Chloride 1 lb(s) (0.454 kg(s))

Canadian Transportation of Dangerous Goods

Shipping Name: Vinyl Chloride, stabilized UN

Number: UN 1086

Class: 2.1

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

SECTION 15 – REGULATORY INFORMATION

OSHA Hazard Communication Standard:

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

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency



Issue Date: 12/06/2007

Reviewed Date: 01/08/2016

Page 15 of 17

Planning and Community Right-to-Know Act of 1986 Sections 311 and 312

Immediate (Acute) Health Hazard	Yes
Delayed (Chronic) Health Hazard	Yes
Fire Hazard	Yes
Reactive Hazard	No
Sudden Release of Pressure Hazard	Yes

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313:

This product contains the following substances which are subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and which are listed in 40 CFR 372.

Component	CAS#	Amount
Vinyl Chloride	75-01-4	>99.9%

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List:

The following product components are cited in the Pennsylvania Hazardous Substance List and/or the Pennsylvania Environmental Substance List, and are present at levels which require reporting.

Component	CAS#	Amount
Vinyl Chloride	75-01-4	>99.9%

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)

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

Component	CAS#	Amount
Vinyl Chloride	75-01-4	>99.9%

US Toxic Substances Control All components of this product are on the TSCA Inventory or



Issue Date: 12/06/2007

Reviewed Date: 01/08/2016

Page 16 of 17

Act: are exempt from TSCA Inventory requirements under 40

CFR 720.30.

Canada Inventory (DSL/NDSL): All substances contained in this product are listed on the

Canadian Domestic Substances List (DSL) or are not

required to be listed.

SECTION 16 – OTHER INFORMATION

IMPORTANT: The information presented herein, while not guaranteed, was prepared by competent technical personnel and is true and accurate to the best of our knowledge. NO WARRANTY OF MERCHANT ABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE, OR WARRANTY OR GUARANTY OF ANY OTHER KIND, EXPRESS OR IMPLIED, IS MADE REGARDING PERFORMANCE, SUITABILITY, STABILITY OR OTHERWISE. The information included herein is not intended to be all-inclusive as to the appropriate manner and/or conditions of use, handling and/or storage. Factors pertaining to certain conditions of storage, handling, or use of this product may involve other or additional safety or performance considerations. While our technical personnel will be happy to respond to questions regarding safe handling and use procedures, safe handling and use remains the responsibility of the customer. No suggestions for use are intended to, and nothing herein shall be construed as a recommendation to, infringe any existing patents or violate any laws, rules, regulations or ordinances of any governmental entity.

Shintech Louisiana, LLC urges each customer or recipient of this SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as to the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product.

Revisions:

- April 2014 The MSDS was updated to follow new Global Harmonization Guidelines. The MSDS are now called Safety Data Sheets (SDS).
- January 2016 Corrections to improve nomenclature and technical data.

SDS Status: Revision Date: 01/08/2016



SAFETY DATA SHEET SHINTECH VINYL CHLORIDE MONOMER **MONOMER**

Issue Date: 12/06/2007

Reviewed Date: 01/08/2016

Page 17 of 17

Supersedes: 04/11/2014