



MATERIAL SAFETY DATA SHEET

Vinyl Chloride Monomer

Product No.: 06611 E00 0000

Issue: S91

Issued: April 1993

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Written by: M. Hross

SECTION I

The B.F. Goodrich Company
Geon Vinyl Division
6100 Oak Tree Blvd.
Cleveland, Ohio 44131

Telephone No.: 1-(800) 438-4366

Transportation Emergency No.:

CHEMTREC: 1-(800) 424-9300

Medical Emergency No.:

POISON CENTER: (216) 379-8562

The B. F. Goodrich Company
195 Columbia Street West
Waterloo, Ontario N2J 4N9

Telephone No.: (519) 888-4318

Transportation Emergency No.:

CANUTEC: (613) 996-6666

Chemical Family: Vinyl Halide

Chemical Name/Synonyms: Vinyl Chloride, Chlorethene, Chloroethene, Chloroethylene

Trade Mark: None

Formula: $\text{CH}_2=\text{CHCl}$

C.A.S. Registry No.: 75-01-4

TSCA Inventory Status: All ingredients are found on the USEPA's TSCA inventory

Canadian Domestic Substances List Status: All ingredients have been nominated for inclusion

Workplace Hazardous Materials Information System (WHMIS) Classification: A, B1, D1A

Product Use: Manufacture of polyvinyl chloride (PVC) plastics and vinyl chloride copolymers

SECTION II - Hazardous Ingredients

Hazard Summary Statement: CAUTION! Inhalation of the material can cause dizziness, euphoria, nervousness, drowsiness, headache, blurred vision. Extremely high concentrations may cause unconsciousness and death. Vinyl chloride is a confirmed human carcinogen. Read entire Material Safety Data Sheet (MSDS). WARNING! Flammable Gas.

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<u>Material</u>	<u>C.A.S. Number</u>	<u>Amount in Product</u>	<u>ACGIH TLV-TWA</u>	<u>OSHA PEL-TWA</u>
Vinyl Chloride Monomer ^{1,2,3,4,5,6}	75-01-4	>99.9%	5 ppm	1 ppm (5 ppm TWA for any 15 minute period)

Vinyl Chloride Monomer LD₅₀ (rat, inhalation) - 18 pph/15M
Vinyl Chloride Monomer LC₅₀ - N.E.

N.A. - Not Applicable

N.E. - Not Established

Vinyl chloride monomer is shown as an OSHA cancer suspect agent (29 CFR 1910.1017), an American Conference of Governmental Industrial Hygienists (ACGIH) confirmed human carcinogen, and a National Toxicology Program (NTP) and an International Agency for Research on Cancer (IARC) human carcinogen.

Legislative Footnotes

¹ Ingredient listed on SARA Section 313 List of Toxic Chemicals

² Ingredient listed on the *Pennsylvania Hazardous Substances List*

³ Ingredient listed on the California listing of *Chemicals Known to the State to Cause Cancer or Reproductive Toxicity*

⁴ Ingredient listed on the *Massachusetts Substance List*

⁵ *Workplace Hazardous Materials Information System* ingredient found on the Ingredient Disclosure List - Canada

⁶ Ingredient listed on the *New Jersey Right to Know Hazardous Substance List*

Notes: TLV-TWA -- Threshold Limit Value - Time Weighted Average for concentration of the chemical substance in the ambient workplace air. American Conference of Governmental Industrial Hygienists (ACGIH).

OSHA PEL -- OSHA Permissible Exposure Limit, 8-hour TWA. 29 CFR1910.1000 1989.

SECTION III - Physical Data

Appearance: Colorless gas	Specific Gravity: 0.97 @ -13°C (9°F) - liquid
Odor: Mild, sweet odor	Melting Point: -154°C (-245°F)
Percent Volatiles: 100%	Molecular Weight: 62.5
Solubility in Water: 0.11 g/100 g @ 25°C	Vapor Density: 2.2 (air = 1)
Physical State: gas (under normal temperatures)	

SECTION IV - Fire and Explosion Hazard Data

Flash Point: -78°C (-108°F)

Lower Explosive Limit (LEL): 3.6%

Upper Explosive Limit (UEL): 33%

Self-Ignition Temperature: 472°C (882°F)

Notes: *Flash-Ignition Temperature* -- The lowest initial temperature of air passing around the specimen at which sufficient combustible gas is evolved to be ignited by a small external pilot flame.

Self-Ignition Temperature -- The lowest initial temperature of air passing around the specimen at which, in absence of an ignition source, ignition occurs of itself, as indicated by an explosion, flame or sustained glow.

Extinguishing Media: ABC dry chemical and halons

Special Firefighting Procedures: Firefighters should wear a self-contained breathing apparatus (SCBA) under positive pressure and full protective gear to prevent all body contact.

Stopping the flow of gas rather than extinguishing the fire is usually the best procedure to follow when escaping gas is burning. It may be dangerous to extinguish the flame and allow the gas to continue to flow as an explosive mixture may be formed with air which, if ignited, may cause far greater damage than if the original fire had been permitted to burn. Extinguishing the flame by dry chemical may be desirable where necessary to permit immediate access to shut off the supply.

Unusual Fire and Explosion Hazards: Vapors are heavier than air and may travel along the ground or may be moved by ventilation and ignited by flame, sparks, heaters or other ignition sources at distant locations. Vapors can form flammable mixtures in air.

SECTION V - Reactivity

Stability: Stable (hazardous peroxide can form by oxidation with atmospheric oxygen when stored for prolonged periods in the presence of a variety of contaminants).

Hazardous Polymerization: Will occur. (Polymerizes in the presence of air, sunlight or heat.)

Hazardous Decomposition Products: Hydrogen chloride gas, carbon monoxide, carbon dioxide, and possibly trace amounts of phosgene and other gases.

Incompatibility (Materials to Avoid): Avoid contact with strong oxidizers. Can cause violent polymerization increasing risks of fire and explosion. Metals such as copper, aluminum and certain catalytic impurities can initiate a violent polymerization.

SECTION VI - Health Hazard Data

Threshold Limit Value: 5 ppm

Permissible Exposure Limit: 1 ppm

Primary Routes of Exposure: Inhalation, skin and eye contact

Effects of Overexposure: Overexposure to vinyl chloride vapors can produce dizziness, light-headedness, euphoria, nervousness, drowsiness, headache, blurred vision, impaired hearing and confusion. Extremely high concentrations (>70,000 ppm) may cause unconsciousness and death. Vapor is moderately irritating to the eyes, nose and throat. Liquid vinyl chloride can produce immediate pain and severe irritation and may cause permanent damage to the eyes. Frostbite may cause permanent damage to the skin. Prolonged exposure to high concentrations may cause degeneration of the ends of the finger bones.

Vinyl chloride causes angiosarcoma of the liver, a rare form of liver cancer in humans. Transplacental carcinogenicity has been observed in some long term studies with animals. Vinyl chloride does not accumulate in the body and is readily eliminated.

Emergency and First Aid Procedures:

Inhalation (of process emissions): Remove affected individual to fresh air while insuring the rescuers utilize appropriate protective equipment. If breathing has ceased, administer artificial respiration. If no pulse is found administer cardio-pulmonary resuscitation immediately. Avoid mouth to mouth contact. Obtain medical attention immediately..

Eye Contact: Immediately flush eyes with lukewarm water for at least 20 minutes while lifting upper and lower eyelids. Seek medical attention immediately.

Skin Contact: Immediately flush contaminated area with lukewarm water for at least 20 minutes. Carefully cut around clothing that sticks to damaged skin and remove rest of garment. Obtain immediate medical attention.

Ingestion: Not an anticipated hazard.

SECTION VII - Spill and Leak Procedure

Steps to be taken in case material is released or spilled: Restrict access to area until completion of clean-up. Insure clean-up is conducted by trained personnel. Wear appropriate personal protection and ventilate area. Extinguish or remove all ignition sources and remove or isolate

flammable and combustible materials. Notify governmental authorities as required. Do not touch spilled material. Prevent material from entering sewers or confined spaces. Stop or reduce leak if safe to do so. Keep materials which can burn away from spilled material. Permit small spills to evaporate. For large spills, dike or flush to ground and allow it to evaporate. Remove contaminated soil and dispose of as hazardous waste.

Waste disposal method: Dispose of waste in accordance with all federal, state and local regulations. If burned, incinerator should be equipped with a hydrogen chloride scrubber. Contaminated soil and containers must be managed as a hazardous waste (U043).

SECTION VIII - Special Protection Information

Ventilation: Effective exhaust ventilation should always be provided to draw fumes or vapors away from workers to prevent routine inhalation. Ventilation should be adequate to maintain the ambient workplace atmosphere below the legislated levels listed in Section II.

Respiratory Protection: Utilize a NIOSH/MSHA-approved respirator under the provisions of 30 CFR Part 11. Read 29 CFR 1910.1017(g)4 for complete details for selection of respirators for vinyl chloride: Unknown atmospheric concentration of vinyl chloride or above 3,600 ppm - open-circuit, self-contained breathing apparatus, pressure demand type with full face piece is required; not over 1,000 ppm - Type C supplied air respirator, continuous flow type, with full or half face piece (helmet or hood) is required.

Protective Equipment: Wear impervious gloves, coveralls, boots and/or other resistant protective clothing. Wear chemical safety goggles and face shield. Have a safety shower/eye-wash station readily available in the immediate work area. An impervious full-body encapsulating suit and respiratory protection may be required in some operations. (Remove contaminated clothing promptly and keep contaminated clothing in a closed container. Discard or launder contaminated clothing before reuse. Inform laundry personnel of contaminants hazards.)

Do not smoke or consume food or beverages in the work area. Wash thoroughly after handling the product.

SECTION IX - Special Precautions

Material Handling: Handle under well-ventilated conditions. Keep product away from sparks, flames and other ignition sources. Sources of ignition, such as static discharge, should be addressed by the user to prevent the ignition and sudden release of energy. Post "NO SMOKING OR OPEN FLAMES" signs in the areas of use or storage. Bond and ground all containers. Label containers according to OSHA standards (29 CFR 1910.1017(l)). All wiring and equipment in storage or use areas must be suitable for Class I, Group D.

Storage: Store in a cool, dry, well-ventilated area, out of direct sunlight and away from incompatible materials. Store away from heat and ignition sources. Store in suitable, labeled containers. Containers should be tightly closed when not in use and when empty protect from damage. Emptied containers may contain residual liquid or vapors which may ignite or explode. Use

non-sparking ventilation systems and electrical equipment.

SECTION X - Hazard Codes

NFPA 704 (1980)

(National Fire Protection Association)

Health: 2
Flammability: 4
Reactivity: 1
Special:

HMIS

(Hazardous Materials Identification System -
National Paint and Coatings Association)

Health: 3
Flammability: 4
Reactivity: 2
Personal Protection: See MSDS

Section VIII

Key: 0 = Insignificant

1 = Slight

2 = Moderate

3 = High

4 = Extreme

User's Responsibility

This bulletin cannot cover all possible situations which the user may experience during processing. Each aspect of the user's operation should be examined to determine if, or where, additional precautions may be necessary. All health and safety information contained within this bulletin should be provided to the user's employees or customers. We must rely upon the user to utilize this information to develop appropriate work practice guidelines and employee instructional programs for his or her operation.

Disclaimer of Liability

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PRODUCT LABELING INFORMATION

Product: Vinyl Chloride

The B.F. Goodrich Company
Geon Vinyl Division
6100 Oak Tree Blvd.
Cleveland, Ohio 44131

The B.F. Goodrich Company
195 Columbia Street West
Waterloo, Ontario N2J 4N9

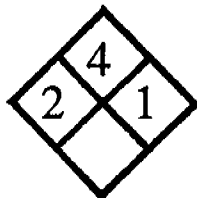
Telephone No.: 1-(800) 438-4366
Transportation Emergency No.:
CHEMTREC: 1-(800) 424-9300
Medical Emergency No.:
POISON CENTER: (216) 379-8562

Telephone No.: (519) 888-4318
Transportation Emergency No.:
CANUTEC: (613) 996-6666

READ MATERIAL SAFETY DATA SHEET (MSDS) BEFORE USE

**Vinyl Chloride
Contains Vinyl Chloride
Vinyl Chloride is a Cancer-Suspect Agent**

NFPA



HMIS

Health	3
Flammability	4
Reactivity	2
Personal Protection	*

* See MSDS Section VIII

CAUTION! Inhalation of the material can cause dizziness, euphoria, nervousness, drowsiness, headache, blurred vision.

Extremely high concentrations may cause unconsciousness and death. Vinyl chloride is a confirmed human carcinogen of the liver.

WARNING! Flammable Gas.

First Aid:

Inhalation of process emissions: Remove affected individual to fresh air. Contact a physician immediately

Eye contact: Flush eyes with water for at least 15 minutes while lifting upper and lower eyelids. Seek medical attention immediately.

Skin contact: Immediately flush area with luke warm water for 20 minutes.

Contains:

Vinyl Chloride
(CAS No. 75-01-4) 100%

Ingredients List Required by the New Jersey Right-To-Know:

Vinyl Chloride CAS No. 75-01-4

Shipping Information

IDENTIFICATION - DOMESTIC TRANSPORTATION

Proper Shipping Name (172.10(c)): Vinyl Chloride

(Technical Names(s)) (172.203(k)): N.A.

Hazard Class (172.101(d)): Flammable Gas

UN/NA# (172.101(e)): NA 1086

Haz. Substance (171.8): Vinyl Chloride

Reportable Quantity: 1 lb.

Inhalation Hazard (172.2a(b)): N.A.

PACKAGING (Part 173)

- Packaging Sections (172.101(g)) - Col. 5(a): 173.306 Col.5(b): 173.304, 173.314, 173.315
- General Packaging Sections - General 173.24 Hazard Class: Flammable

DANGEROUS GOODS DETERMINATION (2.1) - INTERNATIONAL TRANSPORT

Proper Shipping Name (Col. B): Vinyl Chloride, Inhibited

Class/Division (Col. C): 2

Subsidiary Risk (Co. D): 3

UN/ID# (Col. A): UN 1086

U.S. Haz. Substance (US 1): Other/Inhalation Haz. (US 34):

Variations (1.8): States (Governments):

Carrier (Table 1.8B): N.A.

PACKAGING

- Max. Qty. Per PKg.(Cols. H/J) - Passenger: Forbidden Cargo: 150 Kg.
- Packaging Instructions (Cols. G/I) - Passenger: Forbidden Cargo: 200

MARKING

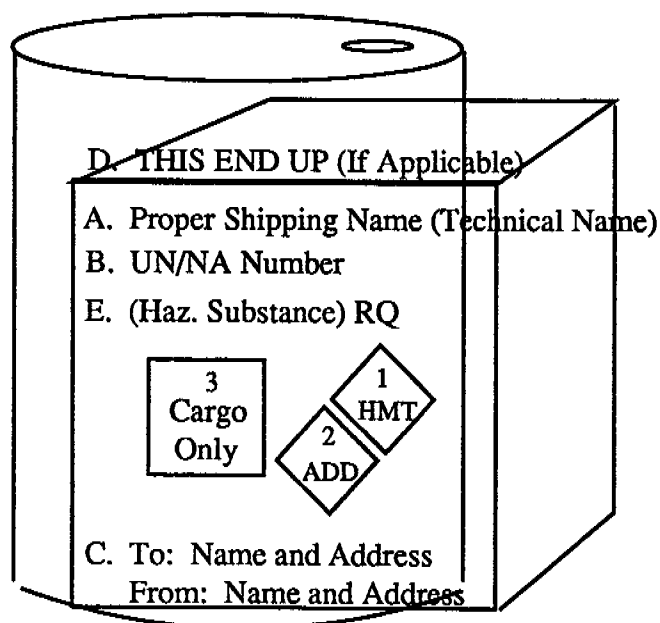
- A. Proper Shipping Name (172.301(a))
(Technical Name(s))(172.301(c))
- B. UN/NA Number (172.301(a))
- C. Name and Address (172.306(a))
- D. THIS END UP 9(172.312(a))
- E. Haz. Substance RQ (Name)(172.324)
 - ORM Designation (172.316(a))
 - Inhalation Hazard (172.301(a))

DOMESTIC LABELING

1. HMT LABELS (172.400)
2. Additional Hazard (172.402(a))

INTERNATIONAL LABELING

1. Primary Hazard
2. Subsidiary Risk (If Appropriate)
3. Cargo Aircraft (If Appropriate)



MATERIAL SAFETY DATA SHEET

Vista Chemical Company
P.O. Box 19029
Houston, Texas 77224

1. PRODUCT IDENTIFICATION

MANUFACTURING SITE	Lake Charles VCM Plant		
ADDRESS	P.O. Box 605, VCM Plant Road, Westlake, LA 70669		
TRADE NAME	VINYL CHLORIDE MONOMER		
SYNONYMS	VCM, Chloroethene		
CAS NUMBER(S)	75-01-4 Vinyl Chloride		
TELEPHONE NO.	(713) 588-3491	EMERGENCY TELEPHONE NO.	(318) 494-5142

2. COMPONENTS AND HAZARD CLASSIFICATION

HAZARDOUS INGREDIENTS: Vinyl Chloride 99.98%

- Vinyl Chloride is regulated by OSHA as a carcinogen and is listed in IARC Monographs and in the latest NTP annual report as a carcinogen.
- Toxic, carcinogen, pyrophoric, and compressed gas as defined by the OSHA Hazard Communication Standard.
- Contains no chemicals subject to SARA 302 reporting.
- SARA 311/312 "immediate (acute) health hazard", "delayed (chronic) health hazard", "fire hazard", and "pressure hazard".
- Contains a maximum of 100% vinyl chloride (CAS#75-01-4) which is a chemical subject to SARA 313 reporting.

3. PHYSICAL DATA

BOILING POINT (°F)	7.0	SPECIFIC GRAVITY (H ₂ O = 1)	.912
VAPOR PRESSURE (mm Hg.)	2580 @ 68°F	MELTING POINT	-302°F
SOLUBILITY IN WATER	1.1 ml/l @ 77°C	VAPOR DENSITY	2.15
APPEARANCE AND ODOR	Colorless gas or liquid under pressure. Faint, sweet odor.		

4. FIRE AND EXPLOSION DATA

FLASH POINT (TEST METHOD)	-108°F (PM)	AUTOIGNITION TEMPERATURE	882°F
FLAMMABLE LIMITS IN AIR. % BY VOL.	LOWER 4.0	UPPER 22.0	
EXTINGUISHING MEDIA	CO ₂ , dry chemical, water spray.		
SPECIAL FIRE FIGHTING PROCEDURES	Stop flow of gas. Cool exposed equipment with water spray. Use self-contained breathing apparatus if fighting fire in confined spaces.		
UNUSUAL FIRE AND EXPLOSION HAZARD	Vapors can form flammable mixtures in air at normal ambient conditions. Burning VCM generates hydrogen chloride gas.		

5. HEALTH HAZARD INFORMATION**FIRST AID**

- EYES:** Immediately flush eyes with large amounts of water for 15 to 30 minutes. Seek medical attention. Apply loose, dry, sterile bandages. Call a physician.
- SKIN:** Immediately flush with large amounts of water for 15 to 30 minutes. Seek medical attention. Remove contaminated clothing. Apply loose, dry, sterile bandages. Call a physician.
- INHALATION:** Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
- INGESTION:** If swallowed, call a physician immediately. ONLY induce vomiting at the instruction of a physician. Never give anything by mouth to an unconscious person.

NATURE OF HAZARD

- EYES:** Excessive exposure to gas may cause irritation. Contact with liquid form may cause burns or frostbite.
- SKIN:** No effects from high concentrations in gaseous form. Contact with liquid form may cause burns or frostbite. Prolonged contact with liquid form may result in circulatory and bone changes in fingertips and other systemic effects.
- INHALATION:** Asphyxiant and anesthetic at high concentrations. Symptoms include rapid respiration, mental dullness, incoordination, and nausea, progressing to unconsciousness and death. Prolonged exposure, or exposure to high concentrations may cause cancer.
- INGESTION:** This product is a gas at room temperature and should not be a significant hazard via ingestion.

EXPOSURE LIMITS

OSHA PEL: 1.0 ppm 8-hour time-weighted average.
 5.0 ppm peak exposure for any 15-minute period.
 1989/90 ACGIH TLV: 5.0 ppm 8-hour time-weighted average.

TOXICITY DATA

- EYE CONTACT:** No specific data available.
- SKIN CONTACT:** No specific data available.
- INHALATION:** Rat and Mouse LC₅₀: Approximately 200,000 ppm at 30 minutes.
- INGESTION:** Rat LD₅₀: 500 mg/kg. This value is reported in literature; however, ingestion is not expected route of exposure.

SPECIAL PRECAUTIONS VCM IS AN ANIMAL AND HUMAN CARCINOGEN.

SHINTECH-000665

6. REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY:

Exposure to air, oxygen, sunlight, moisture, heat, and all sources of ignition.

INCOMPATIBILITY:

Oxidizing materials, copper or copper alloys, aluminum or aluminum alloys, other metals which form acetylides.

HAZARDOUS DECOMPOSITION PRODUCTS:

Hydrogen chloride, carbon monoxide.

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION:

Polymerizes slowly in presence of air, sunlight, or oxygen and rapidly in the presence of peroxides, generates considerable heat.

7. SPILL OR LEAK PROCEDURES

Evacuate the area and eliminate ignition sources. Wet down the area with large quantities of water. Dissipate vapor with water spray. Increase ventilation if in an enclosed area. Stop leak or remove leaking cylinders. Do not attempt recovery of spilled material - VCM will vaporize rapidly. Prevent liquid or vapors from entering sewers or other low areas.

WASTE CLASSIFICATION: If discarded in its purchased form, this product would have the EPA Hazardous Waste Number of U043. Re-evaluation of the product may be required by the user at the time of disposal, since the product uses, transformations, and mixtures may change the classification.

8. SPECIAL PROTECTION INFORMATION

VENTILATION RECOMMENDATIONS

Provide adequate explosion-proof, general and exhaust ventilation to meet TLV requirements and keep out of explosive range. Ventilate low-lying areas such as sumps and confined spaces.

SPECIFIC PERSONAL PROTECTIVE EQUIPMENT

EYES: Chemical goggles or safety shield.

SKIN: Full protective clothing, boots, and gloves.

RESPIRATORY PROTECTION:

Wear NIOSH approved air supplied or self-contained breathing apparatus for non-routine and emergency work.

9. SHIPPING, TRANSFER AND STORAGE**SHIPPING INFORMATION**

DOT PROPER SHIPPING NAME:	Vinyl Chloride
DOT HAZARD CLASS:	Flammable Gas
DOT IDENTIFICATION NUMBER:	UN 1086
ADDITIONAL INFORMATION:	RQ (Vinyl Chloride) = 1 lb.
IATA NAME AND DESCRIPTION:	Vinyl Chloride, Inhibited
IATA UN OR ID NO.:	UN 1086
IATA CLASS OR DIVISION:	2
IATA SUBSIDIARY RISK:	3

TRANSPORTATION AND STORAGE

USUAL SHIPPING CONTAINERS:	Tank car, ships, barges
STORAGE/TRANSPORT TEMPERATURE:	Ambient
STORAGE/TRANSPORT PRESSURE:	Dependent on ambient temperature. See Section 3.
LOADING/UNLOADING TEMPERATURE:	Ambient
VISCOSITY:	Unknown

HANDLING AND STORAGE MATERIALS AND COATINGS

SUITABLE:	Carbon steel
UNSUITABLE:	Copper or copper alloys, aluminum or aluminum alloys, other acetylide-forming metals.

THE ABOVE DATA IS BASED ON TESTS AND EXPERIENCE WHICH VISTA BELIEVES RELIABLE AND ARE SUPPLIED FOR INFORMATIONAL PURPOSES ONLY. VISTA'S PRODUCTS ARE INTENDED FOR SALE TO INDUSTRIAL AND COMMERCIAL CUSTOMERS. VISTA REQUESTS THAT CUSTOMERS INSPECT AND TEST OUR PRODUCTS BEFORE USE AND SATISFY THEMSELVES AS TO CONTENTS AND SUITABILITY. VISTA DISCLAIMS ANY LIABILITY FOR DAMAGE OR INJURY WHICH RESULTS FROM THE USE OF THE ABOVE DATA AND NOTHING CONTAINED THEREIN SHALL CONSTITUTE A GUARANTEE, WARRANTY (INCLUDING WARRANTY OF MERCHANTABILITY) OR REPRESENTATION (INCLUDING FREEDOM FROM PATENT LIABILITY) BY VISTA WITH RESPECT TO THE DATA, THE PRODUCT DESCRIBED, OR THEIR USE FOR ANY SPECIFIC PURPOSE, EVEN IF THAT PURPOSE IS KNOWN TO VISTA.

Prepared: 1/17/90
Revised:
5002WP\VCM.002

SHINTECH-000667



MATERIAL SAFETY DATA SHEET

97367 (4-85)

MSDS NUMBER

6,450-10

PAGE 1

24 HOUR EMERGENCY ASSISTANCE			GENERAL MSDS ASSISTANCE		
SHELL: 713-473-9461 CHEMTREC: 800-424-9300			SHELL: 713-241-4819		
ACUTE HEALTH + 3	FIRE 4	REACTIVITY 2	HAZARD RATING LEAST - 0 SLIGHT - 1 MODERATE - 2 HIGH - 3 EXTREME - 4		
*For acute and chronic health effects refer to the discussion in Section III					



SECTION I		NAME	
PRODUCT	VINYL CHLORIDE MONOMER		
CHEMICAL NAME	ETHENE, CHLORO-		
CHEMICAL FAMILY	VINYL HALIDE		
SHELL CODE	32301		

SECTION II-A		PRODUCT/INGREDIENT	
NO.	COMPOSITION	CAS NUMBER	PERCENT
P	VINYL CHLORIDE MONOMER	75-01-4	100

SECTION II-B		ACUTE TOXICITY DATA	
NO.	ACUTE ORAL LD50	ACUTE DERMAL LD50	ACUTE INHALATION LC50
P			150.000PPM/2 H (RAT)

SECTION III HEALTH INFORMATION

THE HEALTH EFFECTS NOTED BELOW ARE CONSISTENT WITH REQUIREMENTS UNDER THE OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200).

EYE CONTACT

DIRECT CONTACT WITH LIQUID CAN RESULT IN EYE BURNS.

SKIN CONTACT

DIRECT CONTACT WITH LIQUID CAN RESULT IN SKIN BURNS (FROSTBITE).

INHALATION

HIGH CONCENTRATIONS MAY CAUSE CNS DEPRESSION AND KIDNEY/LIVER DAMAGE, AS WELL AS AFFECT HEART RHYTHMS. PROLONGED AND REPEATED EXPOSURE MAY RESULT IN CHANGES IN THE BLOOD SYSTEM AND LOSS OF BONE FROM FINGER TIPS.

INGESTION

NOT A RELEVANT ROUTE OF EXPOSURE.

SIGNS AND SYMPTOMS

FREEZE BURNS AS NOTED ABOVE. EARLY TO MODERATE CNS (CENTRAL NERVOUS SYSTEM) DEPRESSION MAY BE EVIDENCED BY GIDDINESS, HEADACHE, DIZZINESS AND NAUSEA; IN EXTREME CASES, UNCONSCIOUSNESS AND DEATH MAY OCCUR. KIDNEY DAMAGE MAY BE EVIDENCED BY CHANGES IN URINE OUTPUT, URINE APPEARANCE OR EDEMA (SWELLING FROM FLUID RETENTION). LIVER DAMAGE MAY BE EVIDENCED BY LOSS OF APPETITE, JAUNDICE (YELLOWISH SKIN COLOR) AND SOMETIMES PAIN IN THE UPPER ABDOMEN ON THE RIGHT SIDE.

SHINTECH-000668

PRODUCT NAME: VINYL CHLORIDE MONOMER

MSDS 8,450-10
PAGE 2

AGGRAVATED MEDICAL CONDITIONS

PREEXISTING EYE, SKIN AND RESPIRATORY DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO THIS PRODUCT. IMPAIRED KIDNEY AND LIVER FUNCTION(S) FROM PREEXISTING DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO THIS PRODUCT.

OTHER HEALTH EFFECTS

LISTED AS A KNOWN CARCINOGEN BY THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION, THE NATIONAL TOXICOLOGY TESTING PROGRAM AND THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER. LONG-TERM EXPOSURE TO VINYL CHLORIDE VAPORS HAS CAUSED CANCER IN ANIMALS. SOME PRODUCTION WORKERS HAVE DEVELOPED LIVER CANCER WHEN EXPOSED FOR MANY YEARS TO MUCH HIGHER CONCENTRATIONS OF VINYL CHLORIDE VAPOR THAN ENCOUNTERED IN PLANTS OPERATING TODAY. IN ADDITION, THERE ARE REPORTS THAT VCM MAY CAUSE OTHER FORMS OF CANCER THAN JUST LIVER CANCER.

SEE SECTION VI FOR SUPPLEMENTAL INFORMATION.

SECTION IV

OCCUPATIONAL EXPOSURE LIMITS

NO.	OSHA PEL/TWA	PEL/CEILING	ACGIH TLV/TWA	TLV/STEL	OTHER
P	1.0 PPM (A)	5.0 PPM	5.0 PPM (B)	*	

(A) OSHA ACTION LEVEL 0.5 PPM (B) ACGIH-HUMAN CARCINOGEN

SECTION V

EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT

IF DIRECT LIQUID CONTACT OCCURS, FLUSH EYES WITH WATER. GET MEDICAL ATTENTION.

SKIN CONTACT

IF DIRECT LIQUID CONTACT OCCURS, FLUSH WITH WATER. IF FROSTBITE OR BURN OCCURS, GET MEDICAL ATTENTION.

INHALATION

REMOVE VICTIM TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING. GET MEDICAL ATTENTION.

INGESTION

NOT APPLICABLE.

SECTION VI

SUPPLEMENTAL HEALTH INFORMATION

VINYL CHLORIDE MONOMER HAS BEEN DEMONSTRATED TO BE MUTAGENIC IN CULTURED CELL TESTS, INSECTS AND LABORATORY ANIMALS.

SECTION VII

PHYSICAL DATA

BOILING POINT: 7
(DEG F)

SPECIFIC GRAVITY: 0.91
(H₂O=1)

VAPOR PRESSURE: 2580
(MM HG) @ 68 DEG F

MELTING POINT: -245
(DEG F)

SOLUBILITY: SLIGHT
(IN WATER)

VAPOR DENSITY: 2.15
(AIR=1)

EVAPORATION RATE (N-BUTYL ACETATE = 1): >1

SHINTECH-000669

APPEARANCE AND ODOR: COLORLESS GAS; LIQUID UNDER PRESSURE. SWEET ODOR.

SECTION VIII

FIRE AND EXPLOSION HAZARDS

FLASH POINT AND METHOD:
-108 DEG F (TOC)FLAMMABLE LIMITS % VOLUME IN AIR
LOWER: 3.6 UPPER: 3.3

EXTINGUISHING MEDIA

USE WATER FOG, FOAM, DRY CHEMICAL OR CO2.

SPECIAL FIRE FIGHTING PROCEDURES AND PRECAUTIONS

DANGER. EXTREMELY FLAMMABLE. CLEAR FIRE AREA OF UNPROTECTED PERSONNEL AND ISOLATE. DO NOT ENTER CONFINED FIRE SPACE WITHOUT FULL BUNKER GEAR (HELMET WITH FACE SHIELD, BUNKER COATS, GLOVES AND RUBBER BOOTS), INCLUDING A POSITIVE PRESSURE NIOSH APPROVED SELF-CONTAINED BREATHING APPARATUS. COOL FIRE EXPOSED CONTAINERS WITH WATER.

UNUSUAL FIRE AND EXPLOSION HAZARDS

CONTAINERS EXPOSED TO INTENSE HEAT FROM FIRES SHOULD BE COOLED WITH WATER TO PREVENT VAPOR PRESSURE BUILDUP WHICH COULD RESULT IN CONTAINER RUPTURE. CONTAINER AREAS EXPOSED TO DIRECT FLAME CONTACT SHOULD BE COOLED WITH LARGE QUANTITIES OF WATER AS NEEDED TO PREVENT WEAKENING OF CONTAINER STRUCTURE.

SECTION IX

REACTIVITY

STABILITY: UNSTABLE

HAZARDOUS POLYMERIZATION: MAY OCCUR

CONDITIONS AND MATERIALS TO AVOID:

HEAT, CONTACT WITH OXIDIZING AGENTS, OXYGEN, AIR, SUNLIGHT AND OTHER POLYMERIZATION CATALYSTS, COPPER, ALUMINUM, METAL ALKYLs AND ALKALI METALS SUCH AS SODIUM AND POTASSIUM AND THEIR ALLOYS, CAN FORM SHOCK SENSITIVE PEROXIDES ON EXPOSURE TO AIR.

HAZARDOUS DECOMPOSITION PRODUCTS

HCL, CO, PHOSGENE ON COMBUSTION.

SECTION X

EMPLOYEE PROTECTION

RESPIRATORY PROTECTION

AVOID BREATHING VAPOR. IF EXPOSURE MAY OR DOES EXCEED OCCUPATIONAL EXPOSURE LIMITS (SEC. IV) USE A NIOSH-APPROVED RESPIRATOR AS REQUIRED TO PREVENT OVEREXPOSURE. IN ACCORD WITH 29 CFR 1910.134, USE EITHER AN ATMOSPHERE-SUPPLYING RESPIRATOR OR AN AIR-PURIFYING RESPIRATOR FOR ORGANIC VAPORS.

PROTECTIVE CLOTHING

AVOID LIQUID CONTACT WITH EYES. WEAR CHEMICAL GOGGLES IF THERE IS LIKELIHOOD OF CONTACT WITH EYES. AVOID LIQUID CONTACT WITH SKIN AND CLOTHING. WEAR CHEMICAL-RESISTANT GLOVES AND PROTECTIVE CLOTHING.

ADDITIONAL PROTECTIVE MEASURES

USE EXPLOSION-PROOF VENTILATION AS REQUIRED TO CONTROL VAPOR CONCENTRATIONS.

SECTION XI

ENVIRONMENTAL PROTECTION

SPILL OR LEAK PROCEDURES

DANGER! EXTREMELY FLAMMABLE. ELIMINATE ALL SOURCES OF IGNITION. ISOLATE HAZARD AREA AND DENY ENTRY TO UNNECESSARY OR UNPROTECTED PERSONNEL. STAY UPWIND AND KEEP OUT OF LOW AREAS. NOTIFY LOCAL FIRE DEPARTMENT. DISPERSE ANY VAPOR CLOUD WITH A SUSTAINED FLOW OF WATER SPRAY. SHUT OFF SOURCE OF LEAK ONLY IF IT CAN BE DONE SAFELY.

WASTE DISPOSAL

UNDER EPA - RCRA (40 CFR 261.21), IF VINYL CHLORIDE BECOMES A WASTE MATERIAL, IT WOULD BE A HAZARDOUS WASTE, HAZARDOUS WASTE NUMBER UO43. REFER TO LATEST EPA OR STATE REGULATIONS REGARDING PROPER DISPOSAL.

PRODUCT NAME: VINYL CHLORIDE MONOMER

MSDS 6,450-10
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ENVIRONMENTAL HAZARDS

EPA - COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION AND LIABILITY ACT. UNDER EPA-CERCLA ("SUPERFUND") RELEASES TO AIR, LAND OR WATER WHICH EXCEED THE REPORTABLE QUANTITY MUST BE REPORTED TO THE NATIONAL RESPONSE CENTER, 800-424-8802.

SECTION XII

SPECIAL PRECAUTIONS

KEEP LIQUID AND VAPOR AWAY FROM HEAT, SPARKS AND FLAME. SURFACES THAT ARE SUFFICIENTLY HOT MAY IGNITE EVEN LIQUID PRODUCT IN THE ABSENCE OF SPARKS OR FLAME. EXTINGUISH PILOT LIGHTS, CIGARETTES AND TURN OFF OTHER SOURCES OF IGNITION PRIOR TO USE AND UNTIL ALL VAPORS ARE GONE. VAPORS MAY ACCUMULATE AND TRAVEL TO IGNITION SOURCES DISTANT FROM THE HANDLING SITE; FLASHFIRE CAN RESULT. KEEP CONTAINERS CLOSED WHEN NOT IN USE. USE (ONLY) WITH ADEQUATE VENTILATION.

CONTAINERS, EVEN THOSE THAT HAVE BEEN EMPTIED, CAN CONTAIN EXPLOSIVE VAPORS. DO NOT CUT, DRILL, GRIND, WELD OR PERFORM SIMILAR OPERATIONS ON OR NEAR CONTAINERS.

STATIC ELECTRICITY MAY ACCUMULATE AND CREATE A FIRE HAZARD. GROUND FIXED EQUIPMENT. BOND AND GROUND TRANSFER CONTAINERS AND EQUIPMENT.

SECTION XIII

TRANSPORTATION REQUIREMENTS

DEPARTMENT OF TRANSPORTATION CLASSIFICATION: FLAMMABLE GAS
D.O.T. PROPER SHIPPING NAME: VINYL CHLORIDE

OTHER REQUIREMENTS:
UN1086

SECTION XIV

OTHER REGULATORY CONTROLS

THIS PRODUCT IS LISTED ON THE EPA/TSCA INVENTORY OF CHEMICAL SUBSTANCES

THE INFORMATION CONTAINED HEREIN IS BASED ON THE DATA AVAILABLE TO US AND IS BELIEVED TO BE CORRECT. HOWEVER, SHELL MAKES NO WARRANTY, EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF. SHELL ASSUMES NO RESPONSIBILITY FOR INJURY FROM THE USE OF THE PRODUCT DESCRIBED HEREIN.

DATE PREPARED: SEPTEMBER 30, 1985

JOHN P. SEPESE

BE SAFE

READ OUR PRODUCT
SAFETY INFORMATION ...AND PASS IT ON
(PRODUCT LIABILITY LAW
REQUIRES IT)

SHELL OIL COMPANY
PRODUCT SAFETY AND COMPLIANCE
P. O. BOX 4320
HOUSTON, TX 77210

SHINTECH-000671



PPG INDUSTRIES, INC.

ONE PPG PLACE

PITTSBURGH, PA 15272

*** VINYL CHLORIDE (VCM)

MSDS NUMBER: 0129
DATE: 06/22/94
EDITION: 008
TRADE NAME: VINYL CHLORIDE (VCM)
CHEMICAL NAME/SYNONYMS: VINYL CHLORIDE MONOMER, CHLOROETHYLENE, CHLOROETHENE
CHEMICAL FAMILY: CHLORINATED HYDROCARBON
FORMULA: $\text{CH}_2 = \text{CHCL}$ CAS NUMBER: 000075 01 4
U.S. DOT SHIPPING NAME: VINYL CHLORIDE
U.S. DOT HAZARD CLASS: 2.1 (FLAMMABLE GAS)
SUBSIDIARY RISK: N/A
I.D. NUMBER: NA1086
PACKING GROUP: N/A
REPORTABLE QUANTITY: 1 LB.
IMO DESCRIPTION: VINYL CHLORIDE, INHIBITED, CLASS 2.1, UN1086

SECTION 1 * PHYSICAL DATA

BOILING POINT @ 760 MM HG: 7 F
VAPOR DENSITY (AIR=1): 2.15
SPECIFIC GRAVITY (H₂O=1): 0.9121 @ 20/4 C
PH OF SOLUTIONS: APPROX. 7
FREEZING/MELTING POINT: -245 F (-153.7 C)
SOLUBILITY (WEIGHT % IN WATER): 0.11% @ 25 C (77 F)
BULK DENSITY: APPROX. 7.59 LBS/GAL
VOLUME % VOLATILE: 100%
VAPOR PRESSURE: 2580 MM HG @ 20 C
EVAPORATION RATE: (ETHYL ETHER=1): < 1
HEAT OF SOLUTION: N/A
APPEARANCE AND ODOR:
CLEAR, COLORLESS, LIQUIFIED GAS UNDER PRESSURE; MILD, SWEET ODOR

SECTION 2 * INGREDIENTS

MATERIAL	PERCENT
VINYL CHLORIDE MONOMER	100

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* * VINYL CHLORIDE (VCM)

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SECTION 3 * FIRE/EXPLOSION HAZARD DATA

FLASH POINT (METHOD USED):

-108 F (CLEVELAND OPEN CUP) (-78 C)

FLAMMABLE LIMITS IN AIR (% BY VOLUME)

LEL: 3.6%

UEL: 33%

EXTINGUISHING MEDIA:

CARBON DIOXIDE OR DRY CHEMICAL FOR SMALL FIRES.

SPECIAL FIRE FIGHTING PROCEDURES:

FOR ANY VCM FIRE, IMMEDIATELY EVACUATE AREA. VINYL CHLORIDE GAS IS HEAVIER THAN AIR. ONLY FIREFIGHTERS EQUIPPED WITH PRESSURE DEMAND, SELF-CONTAINED BREATHING APPARATUS SHOULD BE ALLOWED IN AREA. USE WATER SPRAY TO COOL EQUIPMENT. (ALSO SEE COMMENTS AT END OF MSDS)

UNUSUAL FIRE AND EXPLOSION HAZARDS:

BURNS TO FORM TOXIC AND CORROSIVE GASES, MOSTLY HYDROGEN CHLORIDE.

SECTION 4 * HEALTH HAZARD DATA

TOXICITY DATA:

LC50 INHALATION: SEE SECTION 5

LD50 DERMAL: SEE SECTION 5

SKIN/EYE IRRITATION: SEE SECTION 5

LD50 INGESTION: SEE SECTION 5

FISH, LC50 (LETHAL CONCENTRATION): UNKNOWN

CLASSIFICATION:

INHALATION: SEE SECTION 5

SKIN: SEE SECTION 5

SKIN/EYE: SEE SECTION 5

INGESTION: SEE SECTION 5

AQUATIC: UNKNOWN

SECTION 5 * EFFECTS OF OVEREXPOSURE

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IS CHEMICAL LISTED AS A CARCINOGEN OR POTENTIAL CARCINOGEN?

NTP - YES IARC - YES OSHA - YES

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:

PROLONGED EXPOSURE TO HIGH CONCENTRATIONS OF VINYL CHLORIDE MAY COMPLICATE EXISTING LIVER, SKIN AND BONE DISEASE.

PERMISSIBLE EXPOSURE LIMITS:

OSHA: 1 PPM, 8-HOUR TWA (TIME-WEIGHTED AVERAGE); 5 PPM AVERAGED OVER ANY 15-MINUTE PERIOD, STEL (SHORT-TERM EXPOSURE LIMIT); ACTION LEVEL - 0.5 PPM, 8-HOUR TWA; 29 CFR 1910.1017.

ACGIH: 5 PPM, 8-HOUR TWA.

PPG INTERNAL PERMISSIBLE EXPOSURE LIMIT: 1 PPM, 8-HOUR TWA.

ACUTE:

INHALATION: ACUTE INHALATION OVEREXPOSURE TO VINYL CHLORIDE CAN CAUSE LUNG IRRITATION, DIZZINESS, AND UNCONSCIOUSNESS FOLLOWING SHORT-TERM EXPOSURE.

SKIN/EYE: SKIN AND EYE CONTACT WITH THE LIQUID MONOMER CAN CAUSE FREEZING OF EXPOSED TISSUES BECAUSE OF LOW STORAGE TEMPERATURES REQUIRED FOR THIS PRODUCT.

CHRONIC:

VINYL CHLORIDE HAS BEEN DEMONSTRATED TO BE A HUMAN CARCINOGEN. OCCUPATIONAL EXPOSURES TO VINYL CHLORIDE MONOMER HAVE BEEN ASSOCIATED WITH A VARIETY OF HUMAN DISEASE CONDITIONS. AMONG THESE ARE LIVER LESIONS, INCLUDING FIBROSIS AND CANCER (ANGIOSARCOMA AND OTHER CANCERS OF THE LIVER AND BILIARY TRACT), SKIN CONDITIONS (SCLERODERMA), AND SHORTENING OF THE FINGERS (ACROOSTEOLYSIS). OTHER ABNORMALITIES LINKED WITH VINYL CHLORIDE MONOMER EXPOSURES INCLUDE SPLEEN, LUNG, BLOOD, AND NERVOUS SYSTEM ABNORMALITIES (INCLUDING CANCER OF THE BRAIN AND OTHER CNS PARTS). IN A RECENT DRAFT REPORT ENTITLED "EPIDEMIOLOGIC STUDY OF VINYL CHLORIDE WORKERS," THE STUDY FOUND A MORTALITY EXCESS IN EMPHYSEMA, HOWEVER, THE STUDY DID NOT FIND ANY EXCESS IN EITHER RESPIRATORY CANCER OR LYMPHATIC AND HEMATOPOIETIC CANCER.

*** EMERGENCY AND FIRST AID PROCEDURES**

INHALATION:

REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION.

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PREFERABLY MOUTH-TO-MOUTH. IF BREATHING IS DIFFICULT, GIVE OXYGEN. CALL A PHYSICIAN.

EYE OR SKIN CONTACT:

EYE CONTACT - FLUSH IMMEDIATELY WITH WATER FOR AT LEAST 15 MINUTES. CALL A PHYSICIAN. SKIN CONTACT - WASH WITH WATER, THEN SOAP AND WATER WHILE REMOVING CONTAMINATED CLOTHING AND SHOES. VINYL CHLORIDE'S RAPID EVAPORATION RATE CAN PRODUCE FROSTBITE. FOR FROSTBITE, DO NOT RUB BUT WARM AFFECTED AREA BY PLACING IN LUKEWARM WATER. EXERCISE AFFECTED AREA AFTERWARDS. GIVE PATIENT WARM DRINK. IF IRRITATION PERSISTS, CONTACT A PHYSICIAN. THOROUGHLY CLEAN CONTAMINATED CLOTHING BEFORE REUSE OR DISCARD.

INGESTION:

NOT APPLICABLE.

NOTES TO PHYSICIAN (INCLUDING ANTIDOTES):

IT SHOULD BE NOTED THAT ENZYMOLOGIC LIVER FUNCTION TESTS ARE NOT ABNORMAL IN INDIVIDUALS WITH VINYL CHLORIDE-ASSOCIATED LIVER LESIONS. ALTERNATE DIAGNOSTIC PROCEDURES ARE REQUIRED.

SECTION 6 * REACTIVITY DATA

STABILITY: STABLE

CONDITIONS TO AVOID: OXYGEN, MOISTURE, POLYMERIZATION INITIATORS, COPPER, ALUMINUM
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR (NORMAL COND)

CONDITIONS TO AVOID: NONE

INCOMPATIBILITY (MATERIALS TO AVOID):

OXYGEN, MOISTURE, POLYMERIZATION INITIATORS, COPPER, ALUMINUM

HAZARDOUS DECOMPOSITION PRODUCTS:

HYDROGEN CHLORIDE, CARBON MONOXIDE, AND POSSIBLE TRACES OF PHOSGENE

SECTION 7 * SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS SPILLED OR RELEASED:

IMMEDIATELY EVACUATE AREA, REMOVE ALL SOURCES OF IGNITION AND PROVIDE MAXIMUM VENTILATION. ONLY PERSONNEL EQUIPPED WITH NIOSH/MSHA-APPROVED, SELF-CONTAINED BREATHING APPARATUS OR FULL FACE PIECE, AIRLINE RESPIRATORS WITH AUXILIARY SCBA'S OPERATED IN THE PRESSURE-DEMAND MODE AND SKIN/EYE PROTECTION SHOULD BE ALLOWED IN AREA. CLOSE OFF SOURCE OF LEAK AND ALLOW ALL SPILLED MATERIAL TO EVAPORATE. THEN WASH AREA OF SPILL WITH PLENTY OF WATER. CONTINUE TO THOROUGHLY VENTILATE AREA AND DO NOT ALLOW UNPROTECTED PERSONNEL TO ENTER AREA UNTIL MONOMER CONCENTRATION IS BELOW PERMISSIBLE EXPOSURE LIMIT.

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WASTE DISPOSAL METHOD:

VINYL CHLORIDE EVAPORATES COMPLETELY, BUT ADEQUATE VENTILATION MUST BE PROVIDED TO PREVENT EXPLOSIVE MIXTURES. CARE MUST BE TAKEN WHEN USING OR DISPOSING OF CHEMICAL MATERIALS AND/OR THEIR CONTAINERS TO PREVENT ENVIRONMENTAL CONTAMINATION. IT IS YOUR DUTY TO DISPOSE OF THE CHEMICAL MATERIALS AND/OR THEIR CONTAINERS IN ACCORDANCE WITH THE CLEAN AIR ACT, THE CLEAN WATER ACT, THE RESOURCE CONSERVATION AND RECOVERY ACT, AS WELL AS ANY OTHER RELEVANT FEDERAL, STATE, OR LOCAL LAWS/REGULATIONS REGARDING DISPOSAL.

SECTION 8 * SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:

NIOSH/MSHA-APPROVED, PRESSURE-DEMAND SUPPLIED AIR, RESPIRATORY PROTECTION WHEN AIR CONCENTRATIONS EXCEED THE PERMISSIBLE EXPOSURE LIMITS. SEE SECTION 7 FOR RESPIRATORY PROTECTION DURING SPILLS OR LEAKS. THE RESPIRATOR USE LIMITATIONS SPECIFIED BY NIOSH/MSHA OR THE MANUFACTURER MUST BE OBSERVED. RESPIRATORY PROTECTION PROGRAMS MUST MEET THE REQUIREMENTS OF 29 CFR 1910.134.

VENTILATION(TYPE):

USE GENERAL OR LOCAL EXHAUST VENTILATION SUFFICIENT TO LIMIT EMPLOYEE EXPOSURE BELOW PERMISSIBLE EXPOSURE LIMITS.

EYE PROTECTION:

CHEMICAL SAFETY GOGGLES

GLOVES:

NITRILE OR NORTH SILVER SHIELD GLOVES

OTHER PROTECTIVE EQUIPMENT:

BOOTS, APRONS, OR CHEMICAL SUITS SHOULD BE WORN WHEN NECESSARY TO PREVENT SKIN CONTACT. PERSONAL PROTECTIVE CLOTHING AND USE OF EQUIPMENT MUST BE IN ACCORDANCE WITH 29 CFR 1910.132 AND 29 CFR 1910.133.

SECTION 9 * SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN DURING HANDLING AND STORING:

- * THIS MATERIAL IS NORMALLY SHIPPED BULK IN TANK CARS. FOR DETAILS ON HANDLING PLEASE REFER TO THE PPG BROCHURE, VINYL CHLORIDE HANDLING AND PROPERTIES (A994-115).
- * BEFORE UNLOADING, PURGE OXYGEN FROM UNLOADING SYSTEM.
- * CONTAINER AND SYSTEM MUST BE ELECTRICALLY GROUNDED BEFORE UNLOADING.
- * STORE AWAY FROM DIRECT SUNLIGHT AND OTHER SOURCES OF HEAT.
- * AVOID CONTACT WITH FLAMES, HOT GLOWING SURFACES OR ELECTRIC ARCS.
- * DO NOT USE IN POORLY VENTILATED OR CONFINED AREAS.

SHINTECH-000676

*** 24-HOUR EMERGENCY ASSISTANCE: (304) 843-1300 ***



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* * VINYL CHLORIDE (VCM)

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* STORE ONLY IN CLOSED, PROPERLY LABELED CONTAINERS.

OTHER PRECAUTIONS:

* KEEP OUT OF REACH OF CHILDREN.

* DO NOT BREATHE VAPORS. CANCER-CAUSING AGENT; VAPOR CAN ALSO CAUSE LUNG IRRITATION, DIZZINESS, ANESTHESIA, HELPLESSNESS OR UNCONSCIOUSNESS.

* AVOID CONTACT WITH EYES AND SKIN. CAN CAUSE FROSTBITE AND/OR TISSUE DAMAGE DUE TO RAPID EVAPORATION.

* DO NOT SWALLOW.

* DO NOT EAT, DRINK, OR SMOKE IN WORK AREAS.

* USE ONLY WITH ADEQUATE VENTILATION SUFFICIENT TO LIMIT EMPLOYEE EXPOSURE BELOW PERMISSIBLE EXPOSURE LIMIT.

COMMENTS:

SPECIAL FIREFIGHTING PROCEDURES (CON'T):

FOR SMALL FIRES, EXTINGUISH WITH CARBON DIOXIDE OR DRY CHEMICAL AGENTS AND WHILE CONTINUING TO COOL EQUIPMENT, ATTEMPT TO CLOSE OFF SOURCE OF LEAK.

THERE IS NO KNOWN EFFECTIVE EXTINGUISHING AGENT FOR LARGE FIRES. THEREFORE, IF SOURCE OF LEAK CANNOT BE CLOSED OFF, CONTINUE COOLING EQUIPMENT WITH STREAMS OF WATER TO AVOID TANK RUPTURE AND EXPLOSION AND ALLOW FIRE TO SELF-EXTINGUISH. NO ONE WITHOUT PROPER RESPIRATORY PROTECTION SHOULD ENTER AN AREA WHERE THERE HAS BEEN A FIRE UNTIL THE AREA HAS BEEN THOROUGHLY VENTILATED AND CHECKED TO BE SURE THE MONOMER CONCENTRATION IS BELOW THE PERMISSIBLE EXPOSURE LIMIT.

TSCA - VINYL CHLORIDE IS ON THE TSCA INVENTORY UNDER CAS NO. 75-01-4.

SARA TITLE III - A) 311/312 CATEGORIES - ACUTE, CHRONIC, FLAMMABILITY, AND SUDDEN PRESSURE RELEASE, B) LISTED IN SECTION 313 UNDER VINYL CHLORIDE, C) NOT LISTED AS AN "EXTREMELY HAZARDOUS SUBSTANCE" IN SECTION 302.

CERCLA - LISTED IN TABLE 302.4 OF 40 CFR PART 302 AS A HAZARDOUS SUBSTANCE WITH A REPORTABLE QUANTITY OF 1 POUND. RELEASES TO AIR, LAND, OR WATER WHICH EXCEED THE RQ MUST BE REPORTED TO THE NATIONAL RESPONSE CENTER, 800-424-8802.

RCRA - WASTE VINYL CHLORIDE AND CONTAMINATED SOILS/MATERIALS FROM SPILL CLEANUP ARE U043 HAZARDOUS WASTE AS PER 40 CFR 261.33 AND MUST BE DISPOSED OF ACCORDINGLY UNDER RCRA.

CALIFORNIA PROP. 65 - THIS PRODUCT IS A CHEMICAL KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

SHINTECH-000677

*** 24-HOUR EMERGENCY ASSISTANCE: (304) 843-1300 ***



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* * VINYL CHLORIDE (VCM)
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REVISIONS MADE TO 4/12/93, 7TH EDITION - DATE, EDITION, ADDED ACGIH TLV
AND PPG IPEL (PAGE 3).

R. KENNETH LEE
MANAGER, PRODUCT SAFETY

SHINTECH-000678

*** 24-HOUR EMERGENCY ASSISTANCE: (304) 843-1300 ***

MATERIAL SAFETY DATA SHEET

MSDS NUMBER : M9192

MSDS DATE : 11-26-90

PRODUCT NAME : VINYL CHLORIDE (MONOMER)

24 HOUR EMERGENCY PHONE: 1-800-733-3665 OR 716-278-7021

I. PRODUCT IDENTIFICATION

HMIS HAZARD RATINGS

HEALTH HAZARD 3* FIRE HAZARD 4 REACTIVITY 2
Based on the National Paint & Coatings Association HMIS rating system.

SARA/TITLE III HAZARD CATEGORIES (See Section X)

Immediate (ACUTE) Health: YES
Delayed (Chronic) Health: YES
Fire Hazard: YES

Reactive Hazard: YES
Sudden Release of Pressure: YES

MANUFACTURER'S: Occidental Chemical Corporation
NAME AND : Customer Service, Occidental Tower, Telephone
ADDRESS : P O Box 809050, Dallas, Texas 75380 (1-800-752-5151)

CHEMICAL NAME: Ethylene, Chloro- CAS NUMBER: 75-01-4

SYNONYMS/COMMON NAMES: VCM, Ethene, Chloro; Monochloroethylene,
Chloroethene

CHEMICAL FORMULA: C2C1H3

DOT PROPER SHIPPING NAME: Vinyl Chloride

DOT HAZARD CLASS: Flammable Gas

DOT I.D. NUMBER: UN 1086

SHINTECH-000679

DOT HAZARDOUS SUBSTANCE: RQ 1#

II. HEALTH HAZARD INFORMATION

EMERGENCY AND FIRST AID PROCEDURES

EYES:

If direct liquid contact occurs, IMMEDIATELY flush eyes with a directed stream of water for at least 15 minutes. Forcibly hold eyelids apart to ensure complete irrigation of all eye and lid tissue. GET IMMEDIATE MEDICAL ATTENTION.

SKIN:

If direct liquid contact occurs, flush with water. If frostbite or burn occurs, do not rub area. GET MEDICAL ATTENTION IMMEDIATELY.

- CAS = Chemical Abstract Service Number ND = No relevant information found or not available
PEL = OSHA Permissible Exposure Limit CORP = Corporate Exposure Limit
TLV = ACGIH Threshold Limit Value, Current * = See Chronic Effects Information NA = Not applicable
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, OR GUARANTY, EXPRESS OR IMPLIED IS MADE REGARDING PERFORMANCE, STABILITY, OR OTHERWISE. This information is not intended to be all-inclusive as to the manner and conditions of use, handling and storage. Other factors 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 as, and nothing herein shall be construed as a recommendation to infringe any existing patents or violate any Federal, State or local laws.

II. HEALTH HAZARD INFORMATION (Continued)

INHALATION:

Remove to fresh air. If breathing is difficult, have trained person administer oxygen. If breathing has stopped, give mouth to mouth resuscitation. GET IMMEDIATE MEDICAL ATTENTION.

INGESTION:

NA

ROUTES OF EXPOSURE

INHALATION:

High concentrations may cause central nervous system depression and kidney/liver damage, as well as affect heart rhythms. Prolonged and repeated exposure may result in changes in the blood system and loss of bone from finger tips.

SKIN:

Direct contact with liquid can result in freeze burns (frostbite).

EYE CONTACT:

Direct contact with liquid can result in eye burns.

INGESTION:

Not a relevant route of exposure.

EFFECTS OF OVEREXPOSURE

ACUTE:

Freeze burns as noted above, early to moderate central nervous system depression may be evidenced by giddiness, headache, dizziness and nausea; in extreme cases, unconsciousness and death may occur.

CHRONIC:

Kidney damage may be evidenced by change in urine output, urine appearance or edema (swelling from fluid retention). Liver damage may be evidenced by loss of appetite, jaundice (yellowish skin color) and sometimes pain in the upper abdomen on the right side.

TOXICOLOGY DATA:

Acute inhalation LC 50 = 150,000 ppm/2 hrs (rat)

Vinyl chloride monomer has been demonstrated to be mutagenic in cultured cell tests, insects and laboratory animals.

MEDICAL LIMITATIONS:

Aggravated Medical Conditions: Pre-existing eye, skin and respiratory disorders may be aggravated by exposure to this product. Impaired kidney and liver function from pre-existing disorders may be aggravated by exposure to this product.

OTHER HEALTH EFFECTS:

Listed as a known human carcinogen by the Occupational Safety and Health Administration, The National Toxicology Testing Program and the International Agency For Research on Cancer. Long-term exposure to vinyl chloride gas has caused cancer in animals. Some production workers have developed liver cancer when exposed for many years to much higher concentrations of vinyl chloride than encountered in plants operating today. In addition, there are reports that VCM may cause other forms of cancer in addition to liver cancer.

III. IMPORTANT COMPONENTS

CAS NUMBER / NAME

75014 Ethene, chloro-

EXPOSURE LIMITS

PEL: See 1910.1017
TLV: 5 ppm; 13 mg/m³; TWA, A1

PERCENTAGE

VOL	ND
WT	99-100

COMMON NAMES:

MONOCHLOROETHYLENE
VINYL CHLORIDE#
VINYL CHLORIDE MONOMER

Listed On (List Legend Below):

02 06 08 11 15 18 21

Chemical name used in the SARA Section 313 List of Toxic Chemicals (40 CFR - Section 372.65) if different from CAS name.

See Section II

All components of this product that are required to be on the TSCA Inventory are listed on the inventory.

LIST LEGEND

2 SARA TOXIC CHEM, SECTION 313	6 NTP "KNOWN HUMAN CARCINOGEN"
8 IARC HUMAN CARCINOGEN, GROUP 1	11 CA PROP 65 - CARCINOGEN
15 PA SPECIAL & ENV HAZ SUBSTANCE	18 NY HAZARDOUS SUBSTANCES
21 NJ SPECIAL HEALTH HAZ SUB	

IV. FIRE AND EXPLOSION DATA

FLASH POINT: -78°C (-108°F) (TOC) AUTOIGNITION TEMPERATURE: 882°F

FLAMMABLE LIMITS IN AIR, % BY VOLUME- UPPER: 33.0
LOWER: 3.6

EXTINGUISHING MEDIA:

Use water fog, foam, dry chemical or carbon dioxide.

SPECIAL FIRE FIGHTING PROCEDURES:

Danger! Extremely flammable; Clear fire area of unprotected personnel and isolate. Do not enter confined fire space without full bunker gear (helmet with face shield, bunker coats, gloves and rubber boots), including a positive pressure NIOSH approved self-contained breathing apparatus. Cool fire exposed containers with water. If possible to do without danger to personnel, stop source of leak.

IV. FIRE AND EXPLOSION DATA (Continued)

UNUSUAL FIRE AND EXPLOSION HAZARD:

For large cargo fires, evacuate all personnel to at least 1/2 mile in all directions due to danger of exploding vessels. Down wind areas may require additional evacuation due to toxic products of combustion. Do not attempt to extinguish large fires. Evacuate the area and notify the fire department. If possible to do without danger to personnel, containers exposed to intense heat from fires should be cooled with water to prevent vapor pressure buildup which could result in container rupture. Container areas exposed to direct flame contact should be cooled with large quantities of water as needed to prevent weakening of container structure.

V. SPECIAL PROTECTION

VENTILATION REQUIREMENTS:

Use explosion-proof ventilation as required to control vapor concentrations.

SPECIFIC PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY:

Avoid breathing vapors, use with adequate ventilation, and follow the OSHA respiratory protection requirements and other mandated actions in 29 CFR 1910.1017.

EYE:

Wear chemical goggles if there is likelihood of contact with eyes.

GLOVES:

Wear chemical resistant gloves such as nitrile or viton.

OTHER CLOTHING AND EQUIPMENT:

Avoid liquid contact with skin and clothing. Wear chemical resistant protective clothing. Emergency shower and eye wash facility should be in close proximity.

MONITORING EXPOSURE

BIOLOGICAL:

See 29 CFR 1910.1017

PERSONAL/AREA:

See 29 CFR 1910.1017

VI. PHYSICAL DATA

BOILING POINT @ 760 mm Hg: 7°F

MELTING POINT: -245°F

VAPOR PRESSURE: 1,210 mm Hg @ 20°C

SPECIFIC GRAVITY (H2O=1): 0.91 at 25°C/25°C

SOLUBILITY IN H2O % BY WT: Slight

VAPOR DENSITY (Air=1): 2.15

APPEARANCE AND ODOR: Colorless gas, "sweet" odor

pH: ND

EVAPORATION RATE (BuAc = 1): >15 This material is a gas at atmospheric pressure and room temperature.

% VOLATILES BY VOL.: 100%

VII. REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY:

Can form shock sensitive peroxides on exposure to air.

INCOMPATIBILITY:

Heat, contact with oxidizing agents, oxygen, air, sunlight and other polymerization catalysts. Copper, aluminum, metal alkyls and alkali metals such as sodium and potassium and their alloys.

HAZARDOUS DECOMPOSITION PRODUCTS:

HCl, CO, phosgene on combustion.

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION:

Heat, contact with oxidizing agents, oxygen, air, sunlight and other polymerization catalysts.

VIII. HANDLING AND STORAGE

HANDLING AND STORAGE PRECAUTIONS:

Keep away from heat, sparks, flames and hot surfaces. The vapors can travel to an ignition source and flash back causing a flash fire.

Avoid contact with liquid and vapors, use with adequate ventilation, and follow the OSHA respiratory protection requirements and other mandated actions in 29 CFR 910.1017. Vinyl chloride containers and regulated areas must have the required signs and labels.

Keep containers closed when not in use.

Bond and ground all containers and equipment to avoid the build up of static electricity and use explosion proof equipment.

Do not cut, drill, grind or weld on or near containers. Empty containers may still contain explosive vapors.

When handling, wear chemical splash goggles, protective clothing, and gloves.

Avoid contact with heat, air, oxygen, oxidizing agents, sunlight, polymerization catalysts, copper, aluminum, metal alkyls and alkali metals. Shock sensitive peroxides can be formed on exposure to air.

Wash thoroughly after handling. Do not eat, drink or smoke in the areas where vinyl chloride is used.

Never enter a pit or tank without following safety procedures - never alone, always with a life line, and always with a positive pressure supply of fresh air and full bunker gear. Vinyl chloride vapors are heavier than air and will tend to collect in low areas. Avoid use in confined spaces.

Areas of poor ventilation could contain concentrations high enough to cause unconsciousness and death.

IX. ENVIRONMENTAL PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS SPILLED OR RELEASED:

Leaks should be stopped. Spills should be contained and allowed to evaporate slowly. Notify the fire department, remove all ignition sources and evacuate unnecessary personnel. Evacuation downwind of the spill may have to be initiated. Disperse any vapor cloud with a sustained spray of water.

Prevent discharge or flushing to streams and sewer systems. People involved in the clean up should have full protective equipment including the NIOSH/MSHA approved positive pressure self contained breathing apparatus.

According to 40 CFR 302 TABLE 302.4 (CERCLA), environmental releases of more than 1 pound of vinyl chloride must be reported to the National Response Center by calling 800-424-8802 (202-426-2675). Releases of over 1 pound must also be reported to the State Emergency Response Commission and the Local Emergency Planning Committee (40 CFR 355.40). In addition, state and local regulations may have additional reporting requirements. Check with the proper state or local authorities.

WASTE DISPOSAL METHOD:

Under EPA - RCRA (40 CFR 261.21), if vinyl chloride becomes a waste material, it would be a hazardous waste; hazardous waste number U043. Refer to latest EPA or state regulations regarding proper disposal.

X. ADDITIONAL INFORMATION

Pursuant to the requirements of the OSHA VCM Standard, 29CFR 1910.1017, certain employees must be afforded appropriate medical surveillance. Pursuant to that standard, signs and labels are also required.

OSHA Standard 29CFR 1910.1200 requires that information be provided to employees regarding the hazards of chemicals by means of a hazard communication program including labeling, material safety data sheets, training and access to written records. We request that you, and it is your legal duty to, make all information in this Material Safety Data Sheet available to your employees.

To aid our customers in complying with regulatory requirements, SARA Title III hazard categories for this product are indicated in Section Title I. If the word "YES" appears next to any category, this product may be reportable by you under the requirements of 40 CFR Part 370. Please consult those regulations for details.

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 PART 372. (See Section III, List Legend 02).

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

Warning: This chemical is known to the State of California to cause cancer.

XI. PREPARATION INFORMATION

For additional Non-Emergency health, safety, or environmental information telephone (716) 286-3081, or write to:
Occidental Chemical Corporation
Product Stewardship Department
360 Rainbow Boulevard South
Niagara Falls, NY 14302

For Emergencies: 24 HOUR EMERGENCY PHONE: 1-800-733-3665

To request an MSDS: 716-286-3400

This MSDS replaces MSDS Number M9192 dated 05/23/89.

WARNING LABEL INFORMATION

Occidental Chemical Corporation
Electrochemicals & Specialty Products
Irving, Texas 75062

In case of CHEMICAL EMERGENCIES - Call (716) 278-7021 (24 hours)

CAS Number: 75-01-4

SIGNAL WORD: DANGER

STATEMENT OF HAZARDS:

EXTREMELY FLAMMABLE GAS UNDER PRESSURE.
LIQUID CONTACT CAN CAUSE BURNS TO EYES AND SKIN
HIGH CONCENTRATIONS MAY CAUSE CENTRAL NERVOUS SYSTEM DEPRESSION AND
KIDNEY/LIVER DAMAGE
CANCER SUSPECT AGENT

PRECAUTIONARY STATEMENTS:

Keep away from heat, sparks, flames and hot surfaces. The vapors can travel to an ignition source and flash back causing a flash fire.

Avoid contact with liquid and vapors, use with adequate ventilation, and follow the OSHA respiratory protection requirements and other mandated actions in 29 CFR 1910.1017. Vinyl chloride containers and regulated areas must have the required signs and labels.

Keep containers closed when not in use.

Bond and ground all containers and equipment to avoid the build up of static electricity and use explosion proof equipment.

Do not cut, drill, grind or weld on or near containers. Empty containers may still contain explosive vapors.

When handling, wear chemical splash goggles, protective clothing, and gloves.

Avoid contact with heat, air, oxygen, oxidizing, agents, sunlight, polymerization catalysts, copper, aluminum, metal alkyls and alkali metals.

Shock sensitive peroxides can be formed on exposure to air.

Wash thoroughly after handling. Do not eat, drink or smoke in areas where vinyl chloride is used.

Never enter a pit or tank without following safety procedures -never alone, always with a life line, and always with a positive pressure supply of fresh air and full bunker gear. Vinyl chloride vapors are heavier than air and will tend to collect in low areas. Avoid use in confined spaces. Areas of poor ventilation could contain concentrations high enough to cause unconsciousness and death.

FIRST AID:

**IN CASE OF CONTACT:
FOR EYES:**

If direct liquid contact occurs. IMMEDIATELY flush eyes with a directed stream of water for at least 15 minutes. Forcibly hold eyelids apart to ensure complete irrigation of all eye and lid tissue. GET IMMEDIATE MEDICAL ATTENTION.

FOR SKIN:

If direct liquid contact occurs, flush with water. If frostbite or burn occurs, do not rub area. GET MEDICAL ATTENTION IMMEDIATELY.

IF INHALED:

Remove to fresh air. If breathing is difficult, have trained person administer oxygen. If breathing has stopped, give mouth to mouth resuscitation. GET IMMEDIATE MEDICAL ATTENTION.

IF SWALLOWED:

NA

WARNING LABEL INFORMATION (Continued)

IN CASE OF: SPILL OR LEAK:

Leaks should be stopped. Spills should be contained and allowed to evaporate slowly. Notify the fire department, remove all ignition sources and evacuate unnecessary personnel. Evacuation downwind of the spill may have to be initiated. Disperse any vapor cloud with a sustained spray of water.

Prevent discharge or flushing to streams and sewer systems. People involved in the clean up should have full protective equipment including a NIOSH/MSHA approved positive pressure self contained breathing apparatus.

According to 40 CFR 302 Table 302.4 (CERCLA), environmental releases of more than 1 pound of vinyl chloride must be reported to the National response Center by calling 800-424-8802 (202-426-2675). Releases of over 1 pound must also be reported to the State Emergency Response Commission and the Local Emergency Planning Committee (40 CFR 355.40). In addition, state and local regulations may have additional reporting requirements. Check with the proper state or local authorities.

FIRE:

Clear area of all unprotected personnel.

Wear full protective equipment.

Cool fire exposed containers with water, if possible to do without danger to personnel.

Use water fog, foam, dry chemical or CO2.

Stop source of leak if possible.

Large cargo fires may require evacuation of all personnel within 1/2 mile in all directions due to explosion danger.

DISPOSAL:

Submit to an approved chemical disposal service for disposal in accordance with government regulations.

INFORMATION REQUIRED BY FEDERAL, STATE OR LOCAL REGULATIONS:

This product contains:

CAS#	NAME
75014	Ethene, chloro-

HMIS RATING SYSTEM: HEALTH 3*	FLAMMABILITY 4	REACTIVITY 2
FOR INDUSTRIAL USE ONLY	LABEL	110M9192

For further information, Request OCC MSDS M9192