

AIR PRODUCTS

CALVERT CITY PLANT
INTEROFFICE MEMORANDUM

Copy

*Jim O'Connell
Larry F. Green
Ed McWittie
Dwain Harris*

To: W. F. Smith

Date: 20 December 1985

From: H. D. Lockett

Copies:

*For your info - you may
need. WFS*

Re: EMERGENCY TELEPHONE NUMBERS -
HAZARDOUS RAW MATERIAL SUPPLIERS

In reference to your memo of 3 December 1985, attached is a list of companies, contacts and telephone numbers to use for major hazardous raw materials when problems occur.

If you have any questions, please contact me.

H. D. Lockett
H. D. Lockett *kjc*

HDL/kjc

Attachment

AP00045462

EMERGENCY TELEPHONE NUMBERS -
HAZARDOUS RAW MATERIAL SUPPLIERS

ETHYLENE

Norchem 402-633-6214
Two Central Park Plaza (Jan Goodin)
Omaha, NE 68102

Emergency No.'s:
Clarence Hall, Manager: 402-493-3457
Barbara Stoneking: 402-493-7242
Jan Goodin: 712-366-1130

Sun Olin 800-441-7287
P.O. Box 609 (Joe Patton)
Claymont, DE 19703

Emergency No.'s:
Ethylene Unit: 302-792-3173, Frank Ermine
Burley Melton: 302-792-3130

VINYL CHLORIDE

Dow Chemical, U.S.A. 800-258-5500
20 Perimeter Center East 404-394-4141
Atlanta, GA 30346 (Nadine Nist)

Emergency No.'s:
Ramon Lopez, Plaquemine Plant: 504-389-6036
EMERGENCY SERVICE: 517-636-4400

METHANOL

Air Products & Chemicals, Inc. 215-481-8837
P.O. Box 2262 (Cindy Miller)
Allentown, PA 18001

Emergency No.'s:
Cindy Miller: 215-767-6077
Pace Plant: 904-994-5511 (Normal Hours)
904-994-7585 (After Hours)

cont'd...

AP00045463

EMERGENCY TELEPHONE NUMBERS - HAZARDOUS RAW MATERIAL SUPPLIERS - cont'd

METHANOL - cont'd

P. B. & S. Chemical Co.
P.O. Box 908
Paducah, KY 42001

362-8316
(Marilyn Pickering)

Emergency No.'s:
Dale Roberts, Branch Manager: 444-6700
James Presson, Operations Manager: 642-2116
Marilyn Pickering, Office Manager: 443-5571
Jim Wilson, Materials Supervisor: 442-4286

VINYL ACETATE

Celanese Chemical Company
P.O. Box 47440
Dallas, TX 75247-0440

800-527-7860
(Lois Golman)

Emergency No.'s:
Lois Golman: 214-361-1004
Bayport Plant: 713-474-2841, x6172: Jim McGee

Borden, Inc.
180 East Broad Street
Columbus, OH 43215

614-225-4241
(Joe Finan)

Emergency No's:
Joe Finan: 614-258-4138
John Stapleton: 614-891-7561

U.S. Industrial Chemical Co.
P.O. Box 429549
Cincinnati, OH 45249

800-543-5900
(Debbie)

Emergency No.:
800-424-9300

AP00045464

Vinyl Chloride $H_2C=CHCl$

Properties:²⁷

Colorless gas
Sweet mild odor
Boiling point, 7°F
Flash point, -108°F
Vapor density, 2.15

Toxicity:²

Inhalation TC_{LO} (human) 20 ppm, cardiovascular toxic effects.

Vinyl chloride is a liver cancer suspect agent. Liquid vinyl chloride may cause frostbite.²⁷

Handling and Storage:²⁷

In case of leaks, remove all sources of ignition. Persons taking care of a leak or spill should wear a self-contained breathing apparatus. In cases where OSHA limits are exceeded, workers should wear respirators. Eye protection and clothing to protect skin should be worn.

Exposure Potential:

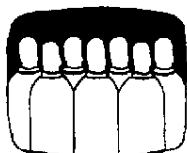
The source for vinyl chloride exposure at the waste treatment plant is the effluent from PVC or Emulsion. Normal conditions are such that subject operators to exposures much less than the action level.

Recommendations for Air Monitoring:

The OSHA Permissible Exposure Limit is 1 ppm for an 8 hour shift and 5 ppm for 15 minutes. Overexposures are subject to "S" type violations. On infrequent occasions, concentrations in the centrifuge room exceed 1 ppm. This area will be scheduled for yearly air monitoring.

GNB:06AUG81

AP00045465



MATHESON GAS PRODUCTS

MATERIAL SAFETY DATA SHEET 097

PRODUCT IDENTIFICATION

MSDS097: VINYL CHLORIDE

D.O.T. SHIPPING NAME: Vinyl Chloride

SYNONYM(S): Chloroethylene, Chloroethene

D.O.T. I.D. NUMBER: UN1086

CHEMICAL FORMULA: C_2H_3Cl or $CH_2=CHCl$

D.O.T. HAZARD CLASS: Flammable Gas

C.A.S. NUMBER: 75-01-4

D.O.T. LABEL(S): Flammable Gas

PHYSICAL DATA

MOLECULAR WEIGHT: 62.499

FREEZING POINT: $-153.7^{\circ}C$; $-244.7^{\circ}F$

BOILING POINT: $-13.8^{\circ}C$; $7.2^{\circ}F$

VAPOR PRESSURE @ $21.1^{\circ}C$: 234 KPa

RELATIVE DENSITY, (AIR=1): 2.21 @ 1 atm, $25^{\circ}C$

SOLUBILITY IN WATER(@ 1 atm and $25^{\circ}C$): 1.07 cm³/1.0 ml water

DESCRIPTION: At room temperature and atmospheric pressure, vinyl chloride is a colorless, highly flammable gas with a pleasant, sweet odor at high concentrations. It is shipped as a liquified gas under its own vapor pressure. Vinyl chloride is inhibited with phenol to prevent polymerization.

FIRE AND EXPLOSION HAZARD DATA

FLAMMABLE LIMITS IN AIR: 3.6 - 22.5 % by volume

AUTO-IGNITION TEMPERATURE: $477^{\circ}C$; $890^{\circ}F$

FIRE FIGHTING PROCEDURES: To extinguish a vinyl chloride fire, stop the flow of gas. If the flow cannot be stopped, let the fire burn itself out while cooling the cylinder and the surroundings using a water spray.

Fire fighters must wear special personal protective suits for fire/chemicals and positive pressure self-contained breathing apparatus. Firefighters turnout gear is inadequate.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

1. Cylinders that are exposed to fire should be removed from the fire area. Extinguish surrounding fire and keep cylinders cool using a water spray applied from the maximum possible distance.
2. Flammable and toxic gases may spread from a spill after the fire is extinguished and be subject to reignition.

HEALTH HAZARD DATA

PERMISSIBLE EXPOSURE LIMITS:

NOTE: vinyl chloride is a known human carcinogen.

ACUTE EFFECTS OF OVEREXPOSURE: Inhalation may cause drowsiness, blurred vision, staggering gait, and tingling and numbness in the feet and hands. In high concentrations vinyl chloride acts as an anesthetic. Contact with liquid vinyl chloride may cause severe irritation and burns.

CHRONIC EFFECTS OF OVEREXPOSURE: Vinyl Chloride is a recognized carcinogen and has caused cancer in man.

ADDITIONAL INFORMATION: Vinyl chloride is listed in the National Toxicology Program's Third Annual Report on Carcinogens (1982).

The International Agency for Research on Cancer has concluded that vinyl chloride is an animal carcinogen (Monograph #7, p291, 1974) and a human carcinogen (Monograph #19, p377, 1974).

FIRST AID INFORMATION

INHALATION: Move victim to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

CONTACT: Immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

NOTE: Skin burns can be treated by the application of magnesium paste (magnesium oxide and glycerine).

REACTIVITY DATA

STABILITY: Inhibited vinyl chloride is stable under normal storage conditions. Avoid exposure to sunlight, heat, air, oxygen, peroxides and other strong oxidizing agents.

INCOMPATIBILITY: Oxidizing materials, active metals, aluminum alloys and organometallics.

HAZARDOUS DECOMPOSITION/OXIDATION PRODUCTS: Hydrogen chloride, phosgene, carbon monoxide.

POLYMERIZATION: May occur. Avoid exposure to oxygen (air), heat, sunlight, moisture, and free-radical initiators or other catalytic materials.

SPILL OR LEAK PROCEDURE

Evacuate the area. Personnel equipped with special personal protective suits for fire/chemicals and positive pressure self-contained breathing apparatus can re-enter the area and attempt to stop the leak.

PRECAUTIONARY INFORMATION

STORAGE RECOMMENDATIONS: Cylinders should be stored and used in dry, well ventilated areas away from sources of heat or ignition. Do not store with oxidizers.

PERSONAL PROTECTIVE EQUIPMENT:

EYE PROTECTION - Face shield and safety glasses or chemical goggles.

RESPIRATORY PROTECTION - Positive pressure self-contained breathing apparatus should be worn if it is suspected that vinyl chloride is in the air.

SKIN PROTECTION - As a minimum, impervious gloves should be worn when handling lines and equipment containing vinyl chloride.

BEFORE USING THE GAS:

1. Secure the cylinder to prevent it from falling or being knocked over.
2. Install check valves or traps to prevent suckback to the cylinder.
3. Leak check the lines and equipment.
4. Have positive pressure self-contained breathing apparatus, eyewash stations and safety showers readily available.
5. Have an emergency plan covering steps to be taken in the event of an accidental release.

* * * *

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IN CASE OF EMERGENCY CALL THE NEAREST MATHESON LOCATION

Cucamonga, CA (714) 987-4611, Newark, CA (415) 793-2559, Morrow, GA (404) 961-7891,
Joliet, IL (815) 727-4848, Gloucester, MA (617) 283-7706, East Rutherford, NJ (201) 933-2400, Twinsburg,
OH (216) 425-4406, La Porte, TX (713) 471-2544

Vinyl Chloride

Properties:⁵

Colorless gas
Sweet mild odor
Boiling point, 7°F
Flash point, -108°F
Vapor density, 2.15
LEL, 3.6%

Toxicity:²

Vinyl chloride is a liver cancer suspect agent. Liquid vinyl chloride may cause frost bite.
Oral LD₅₀ (rat), 500 mg/kg
Chronic exposure has shown liver injury in rats and rabbits.

Handling and Storage:

In case of leaks, remove all sources of ignition. When OSHA limits are exceeded, workers should wear respirators.

Use:

Distribution personnel unload incoming railcars of VCl. When all equipment is working properly, exposure is nil.

Recommendation for Air Monitoring:

Exposure limits
OSHA, 8 hr., 1 ppm
OSHA, 15 min., 5 ppm
ACGIH, 8 hr., 5 ppm

Past monitoring results
August, 1982, equipment not working properly (leaky valve), two 15 minute samples, 35 ppm
August, 1982, equipment working properly, two 15 minute samples, 0.33 ppm

GNB:15SEP82

AP00045468

Vinyl Chloride

Properties:⁵⁹

Colorless gas
Sweet mild odor
Boiling point, 7°F
Flash point, 108°F
Vapor density, 2.15
LEL, 3.6%
Odor threshold, 1000 ppm

Toxicity:

Liquid can cause frostbite.
It is a liver cancer-suspect agent.
Very high concentrations produce symptoms similar to alcohol intoxication.

Handling and Storage:⁵⁹

In case of leaks, remove all sources of ignition. Persons taking care of a leak or spill should wear a self-contained breathing apparatus. In cases where OSHA limits are exceeded, workers should wear respirators. Eye protection and clothing to protect skin should be worn.

Use in Plant:

Vinyl chloride is used as a raw material in two of the products manufactured at the emulsion plant. It is supplied by the PVC plant with transfer to reactors being accomplished with pumps and flow indicator meters. The operation is automated except for manually turning valves and starting the pump. Several thousand pounds are charged for each batch of A-728 and EVC1. Leaky valves, seals, or pumps are sources for exposure.

Recommendations for Air Monitoring:

Exposure Limits:

OSHA, 8 hr., 1 ppm ("S" violations)
OSHA, 15 min., 5 ppm
ACGIH, 8 hr., 5 ppm

Post Monitoring Results:

1978, 47 personnel, 0.28 ppm
1979, 8 personnel, 0.22 ppm
1980, 36 personnel, 0.28 ppm
1980, 1 personnel, 57 ppm
1981, 6 personnel, 0.55 ppm
1981, 2 Area (near leak), 58 ppm
1981, other areas in plant, .29 ppm
1981, many areas VC1 is non-detectable
1982, 5 personnel, 0.67 ppm
1982, 1 personnel, 22 ppm (near leak)

All personnel samples are those operators most likely to be exposed.

Air monitoring scheduled quarterly.

GNB:14APR82

AP00045469



MATHESON GAS PRODUCTS

MATERIAL SAFETY DATA SHEET 097

PRODUCT IDENTIFICATION

MSDS097: VINYL CHLORIDE
SYNONYM(S): Chloroethylene, Chloroethene
CHEMICAL FORMULA: C_2H_3Cl or $CH_2=CHCl$
C.A.S. NUMBER: 75-01-4

D.O.T. SHIPPING NAME: Vinyl Chloride
D.O.T. I.D. NUMBER: UN1085
D.O.T. HAZARD CLASS: Flammable Gas
D.O.T. LABEL(S): Flammable Gas

RECEIVED
JAN 13 10 34 AM '85
PURCHASING CO.

PHYSICAL DATA

MOLECULAR WEIGHT: 62.499
FREEZING POINT: $-153.7^{\circ}C$; $-244.7^{\circ}F$
BOILING POINT: $-13.8^{\circ}C$; $7.2^{\circ}F$
VAPOR PRESSURE @ $21.1^{\circ}C$: 234 KPa
RELATIVE DENSITY, (AIR=1): 2.21 @ 1 atm, $25^{\circ}C$
SOLUBILITY IN WATER @ 1 atm and $25^{\circ}C$: 1.07 cm³/1.0 ml water

DESCRIPTION: At room temperature and atmospheric pressure, vinyl chloride is a colorless, highly flammable gas with a pleasant, sweet odor at high concentrations. It is shipped as a liquified gas under its own vapor pressure. Vinyl chloride is inhibited with phenol to prevent polymerization.

FIRE AND EXPLOSION HAZARD DATA

FLAMMABLE LIMITS IN AIR: 4 - 22% by volume

AUTO-IGNITION TEMPERATURE: $472^{\circ}C$; $882^{\circ}F$

FIRE FIGHTING PROCEDURES: To extinguish a vinyl chloride fire stop the flow of gas. If the flow cannot be stopped, let the fire burn itself out while cooling the cylinder and the surroundings using a water spray.

Fire fighters must wear special personal protective suits for fire/chemicals and positive pressure self-contained breathing apparatus. Firefighters' turnout gear is inadequate.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

1. Cylinders that are exposed to fire may rupture with violent force. Extinguish surrounding fire and keep cylinders cool using a water spray applied from the maximum possible distance.
2. Flammable and toxic gases may spread from a spill after the fire is extinguished and be subject to reignition.

HEALTH HAZARD DATA

PERMISSIBLE EXPOSURE LIMITS:

OSHA TWA: 1 ppm
OSHA CEILING LIMIT: 5 ppm (15 minute period)
ACGIH TWA: 5 ppm

NOTE: vinyl chloride is a recognized carcinogen.

ACUTE EFFECTS OF OVEREXPOSURE: Inhalation may cause drowsiness, blurred vision, staggering gait, and tingling and numbness in the feet and hands. In high concentrations vinyl chloride acts as an anesthetic. Contact with liquid vinyl chloride may cause severe irritation and burns.

CHRONIC EFFECTS OF OVEREXPOSURE: Vinyl Chloride is a recognized carcinogen and has caused cancer in man.

ADDITIONAL INFORMATION: Vinyl chloride is listed in the National Toxicology Program's Third Annual Report on Carcinogens (1982).

The International Agency for Research on Cancer has concluded that vinyl chloride is an animal carcinogen (Monograph #7, p291, 1974) and a human carcinogen (Monograph #19, p377, 1974).

FIRST AID INFORMATION

INHALATION: Move victim to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

CONTACT: Immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

NOTE: Skin burns can be treated by the application of magnesium paste (magnesium oxide and glycerine).

REACTIVITY DATA

STABILITY: Inhibited vinyl chloride is stable under normal storage conditions. Avoid exposure to sunlight, heat, air, oxygen, peroxides and other strong oxidizing agents.

INCOMPATIBILITY: Oxidizing materials, active metals, aluminum alloys and organometallics.

HAZARDOUS DECOMPOSITION/OXIDATION PRODUCTS: Hydrogen chloride, phosgene, carbon monoxide.

POLYMERIZATION: May occur. Avoid exposure to oxygen(air), heat, sunlight, moisture, and free-radical initiators or other catalytic materials.

SPILL OR LEAK PROCEDURE

Evacuate the area. Personnel equipped with special personal protective suits for fire/chemicals and positive pressure self-contained breathing apparatus can re-enter the area and attempt to stop the leak.

PRECAUTIONARY INFORMATION

STORAGE RECOMMENDATIONS: Cylinders should be stored and used in dry, well ventilated areas away from sources of heat or ignition. Do not store with oxidizers.

PERSONAL PROTECTIVE EQUIPMENT:

EYE PROTECTION - Face shield and safety glasses or chemical goggles.

RESPIRATORY PROTECTION - Positive pressure self-contained breathing apparatus should be worn if it is suspected that vinyl chloride is in the air.

SKIN PROTECTION - As a minimum, impervious gloves should be worn when handling lines and equipment containing vinyl chloride.

BEFORE USING THE GAS:

1. Secure the cylinder to prevent it from falling or being knocked over.
2. Install check valves or traps to prevent suckback to the cylinder.
3. Leak check the lines and equipment.
4. Have positive pressure self-contained breathing apparatus, eyewash stations and safety showers readily available.
5. Have an emergency plan covering steps to be taken in the event of an accidental release.

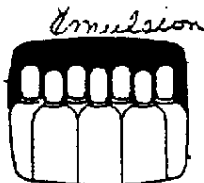
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MATHESON GAS PRODUCTS

MATERIAL SAFETY DATA SHEET 097

PRODUCT IDENTIFICATION

MSDS097: VINYL CHLORIDE
SYNONYM(S): Chloroethylene, Chloroethene
CHEMICAL FORMULA: C_2H_3Cl or $CH_2=CHCl$
C.A.S. NUMBER: 75-01-4

D.O.T. SHIPPING NAME: Vinyl Chloride
D.O.T. I.D. NUMBER: UN1086
D.O.T. HAZARD CLASS: Flammable Gas
D.O.T. LABEL(S): Flammable Gas

RECEIVED
JAN 13 10 34 AM '85
PURCHASING CO.

PHYSICAL DATA

MOLECULAR WEIGHT: 62.499
FREEZING POINT: $-153.7^{\circ}C$; $-244.7^{\circ}F$
BOILING POINT: $-13.8^{\circ}C$; $7.2^{\circ}F$
VAPOR PRESSURE @ $21.1^{\circ}C$: 234 KPa
RELATIVE DENSITY, (AIR=1): 2.21 @ 1 atm, $25^{\circ}C$
SOLUBILITY IN WATER(@ 1 atm and $25^{\circ}C$): 1.07 cm³/1.0 ml water

DESCRIPTION: At room temperature and atmospheric pressure, vinyl chloride is a colorless, highly flammable gas with a pleasant, sweet odor at high concentrations. It is shipped as a liquified gas under its own vapor pressure. Vinyl chloride is inhibited with phenol to prevent polymerization.

FIRE AND EXPLOSION HAZARD DATA

FLAMMABLE LIMITS IN AIR: 4 - 22% by volume

AUTO-IGNITION TEMPERATURE: $472^{\circ}C$; $882^{\circ}F$

FIRE FIGHTING PROCEDURES: To extinguish a vinyl chloride fire stop the flow of gas. If the flow cannot be stopped, let the fire burn itself out while cooling the cylinder and the surroundings using a water spray.

Fire fighters must wear special personal protective suits for fire/chemicals and positive pressure self-contained breathing apparatus. Firefighters' turnout gear is inadequate.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

1. Cylinders that are exposed to fire may rupture with violent force. Extinguish surrounding fire and keep cylinders cool using a water spray applied from the maximum possible distance.
2. Flammable and toxic gases may spread from a spill after the fire is extinguished and be subject to reignition.

HEALTH HAZARD DATA

PERMISSIBLE EXPOSURE LIMITS:

OSHA TWA: 1 ppm
OSHA CEILING LIMIT: 5 ppm (15 minute period)
ACGIH TWA: 5 ppm

NOTE: vinyl chloride is a recognized carcinogen.

ACUTE EFFECTS OF OVEREXPOSURE: Inhalation may cause drowsiness, blurred vision, staggering gait, and tingling and numbness in the feet and hands. In high concentrations vinyl chloride acts as an anesthetic. Contact with liquid vinyl chloride may cause severe irritation and burns.

CHRONIC EFFECTS OF OVEREXPOSURE: Vinyl Chloride is a recognized carcinogen and has caused cancer in man.

ADDITIONAL INFORMATION: Vinyl chloride is listed in the National Toxicology Program's Third Annual Report on Carcinogens(1982).

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CONTACT: Immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

NOTE: Skin burns can be treated by the application of magnesium paste (magnesium oxide and glycerine).

REACTIVITY DATA

STABILITY: Inhibited vinyl chloride is stable under normal storage conditions. Avoid exposure to sunlight, heat, air, oxygen, peroxides and other strong oxidizing agents.

INCOMPATIBILITY: Oxidizing materials, active metals, aluminum alloys and organometallics.

HAZARDOUS DECOMPOSITION/OXIDATION PRODUCTS: Hydrogen chloride, phosgene, carbon monoxide.

POLYMERIZATION: May occur. Avoid exposure to oxygen(air), heat, sunlight, moisture, and free-radical initiators or other catalytic materials.

SPILL OR LEAK PROCEDURE

Evacuate the area. Personnel equipped with special personal protective suits for fire/chemicals and positive pressure self-contained breathing apparatus can re-enter the area and attempt to stop the leak.

PRECAUTIONARY INFORMATION

STORAGE RECOMMENDATIONS: Cylinders should be stored and used in dry, well ventilated areas away from sources of heat or ignition. Do not store with oxidizers.

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EYE PROTECTION - Face shield and safety glasses or chemical goggles.

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BEFORE USING THE GAS:

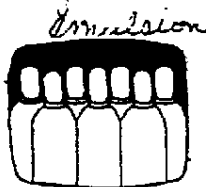
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The International Agency for Research on Cancer has concluded that vinyl chloride is an animal carcinogen (Monograph #7,p291,1974) and a human carcinogen (Monograph #19,p377,1974).

FIRST AID INFORMATION

INHALATION: Move victim to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

CONTACT: Immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

NOTE: Skin burns can be treated by the application of magnesium paste (magnesium oxide and glycerine).

REACTIVITY DATA

STABILITY: Inhibited vinyl chloride is stable under normal storage conditions. Avoid exposure to sunlight, heat, air, oxygen, peroxides and other strong oxidizing agents.

INCOMPATIBILITY: Oxidizing materials, active metals, aluminum alloys and organometallics.

HAZARDOUS DECOMPOSITION/OXIDATION PRODUCTS: Hydrogen chloride, phosgene, carbon monoxide.

POLYMERIZATION: May occur. Avoid exposure to oxygen(air), heat, sunlight, moisture, and free-radical initiators or other catalytic materials.

SPILL OR LEAK PROCEDURE

Evacuate the area. Personnel equipped with special personal protective suits for fire/chemicals and positive pressure self-contained breathing apparatus can re-enter the area and attempt to stop the leak.

PRECAUTIONARY INFORMATION

STORAGE RECOMMENDATIONS: Cylinders should be stored and used in dry, well ventilated areas away from sources of heat or ignition. Do not store with oxidizers.

PERSONAL PROTECTIVE EQUIPMENT:

EYE PROTECTION - Face shield and safety glasses or chemical goggles.

RESPIRATORY PROTECTION - Positive pressure self-contained breathing apparatus should be worn if it is suspected that vinyl chloride is in the air.

SKIN PROTECTION - As a minimum, impervious gloves should be worn when handling lines and equipment containing vinyl chloride.

BEFORE USING THE GAS:

1. Secure the cylinder to prevent it from falling or being knocked over.
2. Install check valves or traps to prevent suckback to the cylinder.
3. Leak check the lines and equipment.
4. Have positive pressure self-contained breathing apparatus, eyewash stations and safety showers readily available.
5. Have an emergency plan covering steps to be taken in the event of an accidental release.

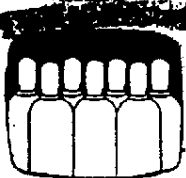
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IN CASE OF EMERGENCY CALL THE NEAREST MATHESON LOCATION

Cucamonga, CA (714) 987-4611, Newark, CA (415) 793-2559, Morrow, GA (404) 961-7891,
Joliet, IL (815) 727-4848, Gloucester, MA (617) 283-7700, East Rutherford, NJ (201) 933-2400, Twinsburg,
OH (216) 425-4406, La Porte, TX (713) 471-2544



MATHESON GAS PRODUCTS

MATERIAL SAFETY DATA SHEET 097

PRODUCT IDENTIFICATION

MSDS097: VINYL CHLORIDE

SYNONYM(S): Chloroethylene, Chloroethene

CHEMICAL FORMULA: C_2H_3Cl or $CH_2=CHCl$

C.A.S. NUMBER: 75-01-4

D.O.T. SHIPPING NAME: Vinyl Chloride

D.O.T. I.D. NUMBER: UN1086

D.O.T. HAZARD CLASS: Flammable Gas

D.O.T. LABEL(S): Flammable Gas

RECEIVED
JAN 13 10 34 AM '86
DURHAM, N.C.

PHYSICAL DATA

MOLECULAR WEIGHT: 62.499

FREEZING POINT: $-153.7^{\circ}C$; $-244.7^{\circ}F$

BOILING POINT: $-13.8^{\circ}C$; $7.2^{\circ}F$

VAPOR PRESSURE @ $21.1^{\circ}C$: 234 KPa

RELATIVE DENSITY, (AIR=1): 2.21 @ 1 atm, $25^{\circ}C$

SOLUBILITY IN WATER(@ 1 atm and $25^{\circ}C$): 1.07 cm³/1.0 ml water

DESCRIPTION: At room temperature and atmospheric pressure, vinyl chloride is a colorless, highly flammable gas with a pleasant, sweet odor at high concentrations. It is shipped as a liquified gas under its own vapor pressure. Vinyl chloride is inhibited with phenol to prevent polymerization.

FIRE AND EXPLOSION HAZARD DATA

FLAMMABLE LIMITS IN AIR: 4 - 22% by volume

AUTO-IGNITION TEMPERATURE: $472^{\circ}C$; $882^{\circ}F$

FIRE FIGHTING PROCEDURES: To extinguish a vinyl chloride fire stop the flow of gas. If the flow cannot be stopped, let the fire burn itself out while cooling the cylinder and the surroundings using a water spray.

Fire fighters must wear special personal protective suits for fire/chemicals and positive pressure self-contained breathing apparatus. Firefighters' turnout gear is inadequate.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

1. Cylinders that are exposed to fire may rupture with violent force. Extinguish surrounding fire and keep cylinders cool using a water spray applied from the maximum possible distance.
2. Flammable and toxic gases may spread from a spill after the fire is extinguished and be subject to reignition.

HEALTH HAZARD DATA

PERMISSIBLE EXPOSURE LIMITS:

OSHA TWA: 1 ppm
OSHA CEILING LIMIT: 5 ppm (15 minute period)
ACGIH TWA: 5 ppm

NOTE: vinyl chloride is a recognized carcinogen.

ACUTE EFFECTS OF OVEREXPOSURE: Inhalation may cause drowsiness, blurred vision, staggering gait, and tingling and numbness in the feet and hands. In high concentrations vinyl chloride acts as an anesthetic. Contact with liquid vinyl chloride may cause severe irritation and burns.

CHRONIC EFFECTS OF OVEREXPOSURE: Vinyl Chloride is a recognized carcinogen and has caused cancer in men.

ADDITIONAL INFORMATION: Vinyl chloride is listed in the National Toxicology Program's Third Annual Report on Carcinogens(1982).

The International Agency for Research on Cancer has concluded that vinyl chloride is an animal carcinogen (Monograph #7, p291, 1974) and a human carcinogen (Monograph #19, p377, 1974).

FIRST AID INFORMATION

INHALATION: Move victim to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

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INCOMPATIBILITY: Oxidizing materials, active metals, aluminum alloys and organometallics.

HAZARDOUS DECOMPOSITION/OXIDATION PRODUCTS: Hydrogen chloride, phosgene, carbon monoxide.

POLYMERIZATION: May occur. Avoid exposure to oxygen(air), heat, sunlight, moisture, and free-radical initiators or other catalytic materials.

SPILL OR LEAK PROCEDURE

Evacuate the area. Personnel equipped with special personal protective suits for fire/chemicals and positive pressure self-contained breathing apparatus can re-enter the area and attempt to stop the leak.

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SKIN PROTECTION - As a minimum, impervious gloves should be worn when handling lines and equipment containing vinyl chloride.

BEFORE USING THE GAS:

1. Secure the cylinder to prevent it from falling or being knocked over.
2. Install check valves or traps to prevent suckback to the cylinder.
3. Leak check the lines and equipment.
4. Have positive pressure self-contained breathing apparatus, eyewash stations and safety showers readily available.
5. Have an emergency plan covering steps to be taken in the event of an accidental release.

* * * * *

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Joliet, IL (815) 727-4848, Gloucester, MA (617) 283-7700, East Rutherford, NJ (201) 933-2400, Twinsburg,
OH (216) 425-4406, La Porte, TX (713) 471-2544

Vinyl Chloride $\text{H}_2\text{C}=\text{CHCl}$

Properties:⁵

Colorless gas
Sweet mild odor
Boiling point, 7°F
Flash point, -108°F
Vapor density, 2.15

Toxicity:²

Inhalation TC_{LO} (human) 20 ppm, cardiovascular toxic effects.

Vinyl chloride is a liver cancer suspect agent. Liquid vinyl chloride may cause frostbite.⁵

Handling and Storage:⁵

In case of leaks, remove all sources of ignition. Persons taking care of a leak or spill should wear a self-contained breathing apparatus. In cases where OSHA limits are exceeded, workers should wear respirators. Eye protection and clothing to protect skin should be worn.

Recommendations for Air Monitoring:

The source for vinyl chloride in the warehouse is residual monomer in PVC. It has been the experience of most fabricators of PVC resins that exposure to working personnel does not exceed the action level (0.5 ppm) when normal ventilation procedures are followed.⁵ Ventilation in the warehouse is such that exposure should be very low.

The OSHA Permissible Exposure Limit for vinyl chloride is 1 ppm for an 8-hour shift with overexposures subject to "S" type violations. Various areas in the warehouse will be scheduled for yearly air monitoring.

GNB:30APR81

AP00045478

Vinyl Chloride $H_2C=CHCl$

Properties:²⁷

Colorless gas
Sweet mild odor
Boiling point, 7°F
Flash point, -108°F
Vapor density, 2.15

Toxicity:²

Inhalation TC_{LO} (human) 20 ppm, cardiovascular toxic effects.

Vinyl chloride is a liver cancer suspect agent. Liquid vinyl chloride may cause frostbite.²⁷

Handling and Storage:²⁷

In case of leaks, remove all sources of ignition. Persons taking care of a leak or spill should wear a self-contained breathing apparatus. In cases where OSHA limits are exceeded, workers should wear respirators. Eye protection and clothing to protect skin should be worn.

Exposure Potential:

The source for vinyl chloride exposure at the waste treatment plant is the effluent from PVC or Emulsion. Normal conditions are such that subject operators to exposures much less than the action level.

Recommendations for Air Monitoring:

The OSHA Permissible Exposure Limit is 1 ppm for an 8 hour shift and 5 ppm for 15 minutes. Overexposures are subject to "S" type violations. On infrequent occasions, concentrations in the centrifuge room exceed 1 ppm. This area will be scheduled for yearly air monitoring.

GNB:06AUG81

AP00045479

Vinyl Chloride $\text{H}_2\text{C}=\text{CHCl}$

Properties:⁵⁹

Colorless gas
Sweet mild odor
Boiling point, 7°F
Flash point, -108°F
Vapor density, 2.15

Toxicity:²

Inhalation TC_{L0} (human) 20 ppm, cardiovascular toxic effects.

Vinyl chloride is a liver cancer suspect agent. Liquid vinyl chloride may cause frostbite.⁵⁹

Handling and Storage:⁵⁹

In case of leaks, remove all sources of ignition. Persons taking care of a leak or spill should wear a self-contained breathing apparatus. In cases where OSHA limits are exceeded, workers should wear respirators. Eye protection and clothing to protect skin should be worn.

Use in Plant:

Vinyl chloride is used as a raw material in two of the products manufactured at the emulsion plant. It is supplied by the PVC plant with transfer to reactors being accomplished with pumps and flow indicator meters. This operation is automated except for manually turning valves and starting the pump. Several thousand pounds are charged for each batch of A-728 and EVCl. Leaky valves, seals, or pumps are sources for exposure.

Recommendations for Air Monitoring:

The OSHA Permissible Exposure Limit for vinyl chloride is 1 ppm for an 8-hour shift with overexposures subject to "S" type violations. The results of over 80 samples taken since March, 1978, indicate average exposures are well below the action level (1/2 TLV). The samples also indicate that (although infrequent) at times the 1 ppm limit is exceeded. Air sampling will be scheduled on a quarterly basis.

GNB:13MAR81

AP00045480



PPG INDUSTRIES, INC. / ONE GATEWAY CENTER / PITTSBURGH, PENNSYLVANIA 15222

October 29, 1973

The toxicity section of Vinyl Chloride Bulletin 115A, attached, contains later recommendations than appear in the manual, "Vinyl Chloride Monomer Handling and Properties," form A-994-115, currently being revised.

Although the threshold limit value (TLV) of 200 ppm, which appears on page 7 of the handling and properties manual, agrees with the latest recommendation of the American Conference of Governmental Industrial Hygienists, PPG Industries now recommends a value of 50 ppm until ongoing toxicological studies are concluded.

Zeb G. Bell, Jr., Sc.D.
Director Environmental Control
Industrial Chemical Division

AP00045481

Specification for polymer grades:

Appearance	clear, free of suspended matter
Color	colorless, water-white
Acidity, as HCl, maximum ppm	5
Iron, as Fe, maximum ppm	0.5
Nonvolatile residue, maximum weight %	0.05
Water, maximum ppm	100
Sulfur, as SO ₂ , maximum ppm	3
Acetaldehyde, maximum ppm	5
Acetylene, maximum* ppm	2

* This maximum is an industry standard; however, the PPG product contains no detectable amount of acetylene.

USES

Most vinyl chloride is polymerized to polyvinyl chloride (PVC) or copolymerized with other monomers such as PPG's vinylidene chloride. Vinyl chloride monomer should not be used as an aerosol propellant.

TOXICITY

Uninhibited monomer is not absorbed through the skin, but the liquid may cause frostbite because it evaporates so fast. If an inhibitor is included, it may cause local skin burns.

Studies are currently being made on possible health hazards that may be associated with exposure to the vapor. Until these studies are completed, PPG recommends that vapor concentrations in work areas should not exceed 50 ppm as a time-weighted average atmospheric concentration for an 8-hour day to avoid possible adverse health effects on workmen. Inhalation of high vapor concentrations can cause dizziness and anesthesia. Therefore, during periods of exposure to high vapor concentration, workmen should use self-contained or air-supplied breathing apparatus. More toxicity information appears on Page 7 of the PPG Manual, "Vinyl Chloride Monomer Handling and Properties," form A-994-115.

HANDLING AND STORAGE

Aluminum and its alloys must not be used in equipment to store or handle vinyl chloride because explosive aluminum chloroalkyls can be formed. PPG's vinyl chloride is made from ethylene and contains no detectable amount of acetylene. Vinyl chloride made from acetylene

by an older process contains traces of acetylene that could react explosively with copper or its alloys to form copper acetylides. It is not safe to use such vinyl chloride in processing equipment containing copper or brass.

Exposure of vinyl chloride to oxygen and air results, after a time, in polymer formation. This can cause problems in equipment used for storage and transfer of monomer.

The nitrogen supply for use with vinyl chloride should have a maximum oxygen content of 10 ppm. In the vapor phase of a vinyl chloride storage tank, the oxygen content should not exceed 1,000 ppm.

More information appears in Chemical Safety Data Sheet SD-56, "Vinyl Chloride," published by the Manufacturing Chemists Association, 1825 Connecticut Avenue, N.W., Washington, D.C. 20009.

Fire hazard

Vinyl chloride vapor is extremely flammable. Its explosive limits are between 3.6 and 33% by volume in air. Proper ventilation and the elimination of ignition sources are mandatory in areas where vapor concentrations may reach a flammable level. When a tank car is unloaded, both the car tank and the unloading pump should be electrically grounded.

The major products of combustion include toxic and corrosive hydrogen chloride as well as carbon monoxide, and less than 10 ppm of phosgene. Only in the very near vicinity of a vinyl chloride monomer fire could detectable amounts of phosgene be present.

Carbon dioxide or dry chemical agents extinguish small fires effectively, but no extinguisher is known for large fires. Streams of water cannot extinguish a liquid vinyl chloride fire because the monomer does not mix with water and will float on top. Water may be sprayed to cool equipment. If the source of the vinyl chloride monomer leak has not been closed off, do not attempt to extinguish a large fire because hot metal can re-ignite an unburned vapor cloud. No one without proper protective respiratory equipment should enter an area where there has been a fire until the area has been adequately ventilated.

Unloading tank cars

If tank car valves are defective or leaky, do not unload. Telephone the PPG Chemicals plant at Lake Charles, Louisiana, 318-882-1200. Information on unloading tank cars and trucks appears in the PPG manual, "Vinyl Chloride Monomer Handling and Properties, form A-994-115."

Warning: Air should never be permitted to enter vinyl chloride tank cars or other containers during or after unloading. Close and seal all openings. Leave at least 10 psig of vinyl chloride vapor pressure in empty tank car being returned.

PACKAGING AND SHIPPING

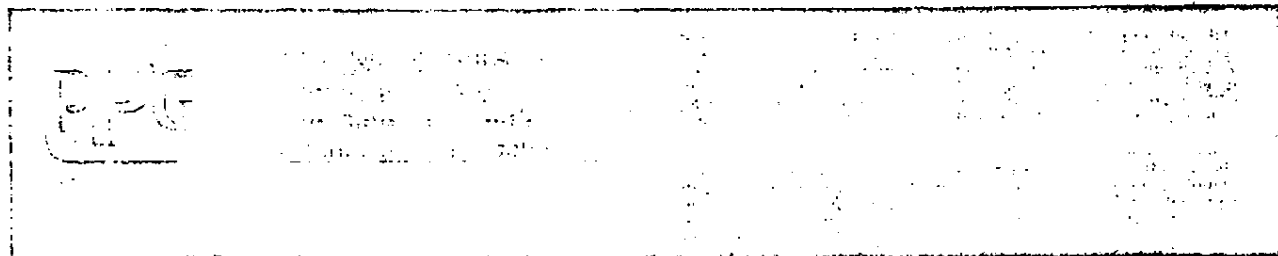
PPG Industries delivers vinyl chloride by ship, barge, tank car and tank truck. There are 3 shipping points: Lake Charles, Louisiana; Guayanilla, Puerto Rico; and Paulsboro, New Jersey.

PPG maintains a fleet of tank cars for vinyl chloride service. All cars are equipped for top unloading. There are three car sizes: 100,000-pound, 180,000-pound and 220,000-pound net weight. Tank trucks hold up to 40,000 pounds. Ships and barges hold up to several million pounds.

SAMPLES AND SERVICE

Samples of vinyl chloride are available on special request in returnable laboratory-size steel cylinders holding 5 pounds or in cylinders holding 200 pounds.

The technical service staff of PPG Industries Chemical Division is available for consulting on handling, storage and use.



A-1000-115 2M 1073

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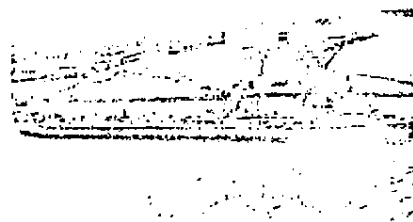
AP00045482

In keeping with its position as a leading producer of vinyl chloride monomer for the merchant market only, PPG Industries expanded its Lake Charles, Louisiana, vinyl chloride plant in 1969. The Guayanilla, Puerto Rico plant, built in 1971, greatly increased PPG's capacity for making vinyl chloride monomer.

A new large tanker, the S.S. Puerto Rican, transports refrigerated vinyl chloride monomer to a newly built terminal at Paulsboro, New Jersey, where it is stored under refrigeration.



At the PPG plant in Guayanilla, Puerto Rico, the company's modern 34,000-ton chemical tanker, S.S. Puerto Rican, receives a load of vinyl chloride monomer.



At the Paulsboro, New Jersey terminal, the S.S. Puerto Rican's load of vinyl chloride monomer is transferred to the refrigerated storage tanks in the background.

PPG produces vinyl chloride monomer by the oxychlorination of ethylene and holds more than 400 domestic and foreign patents on this process.

Uninhibited VCM is quite stable and can be routinely shipped, handled and stored provided proper procedures, outlined below, are followed. To prevent polymerization in transit or storage, it is essential that the monomer be protected at all times from contact with air, oxygen, moisture, catalytic impurities, and light.

PPG normally supplies VCM uninhibited. The use of uninhibited VCM eliminates the need for subsequent processing to remove the inhibitor. If required, suitable inhibitors will be added.

More information appears in the PPG manual, "Vinyl Chloride Monomer Handling and Properties," form A-994-115.

GRADES

PPG Industries produces polymer-grade vinyl chloride monomer.

PROPERTIES

Chemical Names:

Vinyl chloride; vinyl chloride monomer; chloroethylene;

chloroethene

Chemical Formula:

CH_2CHCl

Molecular Weight:

62.5

Description:

At ordinary temperatures and pressures, vinyl chloride is a colorless gas with a mild, sweet odor. But as supplied in tank cars and trucks under pressure, it is a liquid. Vinyl chloride is highly volatile and its vapor is extremely flammable.

Boiling Point, °C

-13.8

Autoignition Temperature, °C

472

°F

+7.0

°F

882

Freezing Point, °C

-153.7

Liquid Density at 60°F

0.9192

°F

-245

Vapor Density, air = 1

2.15

Flash Point, open cup, °C

-78

Vapor Pressure, psia at 0°C

25.1

°F

-108.4

20°C

49.2

40°C

87.6

Explosive Limits, volume %

3.6 to 33

Solubility, water in monomer,

in air at 25°C (77°F)

3.6 to 33

at 25°C (77°F), weight %

0.11

Solubility: Vinyl chloride is relatively insoluble in water but soluble in most organic solvents.

Reactivity: Vinyl chloride polymerizes exothermically in the presence of light, air, oxygen or catalysts. Heat alone will not initiate polymerization. Vinyl chloride is thermally stable to quite high temperatures. Although peroxide formation due to air exposure is a slow reaction, certain peroxide products are shock-sensitive. Vinyl chloride is noncorrosive to metals when dry at normal temperatures, but water and elevated temperatures accelerate corrosion. The double bond behaves as in other unsaturated compounds. The chlorine atom is relatively inactive and is more stable than in saturated or allylic compounds.

AP00045483