

**Section 1. Material Identification**

Vinyl Chloride (C₂H₃Cl) Description: Derived from ethylene dichloride and alcoholic potassium, by reaction of acetylene and hydrogen chloride (as gas or liquids), or by oxychlorination where ethylene reacts with hydrochloric acid and oxygen. Inhibitors such as butyl catechol, hydroquinone, or phenol are added to prevent polymerization. Used in the plastics industry for the production of polyvinyl chloride resins, in organic synthesis and formerly as a refrigerant, extraction solvent, and propellant (banned in 1974 because of its carcinogenic activity).

Other Designations: CAS No. 75-01-4, chloroethylene, chloroethene, ethylene monochloride, Trovidur, VC, VCM.

Manufacturer: Contact your supplier or distributor. Consult latest *Chemical Week Buyers' Guide*⁽⁷³⁾ for a suppliers list.

Cautions: Vinyl chloride is a confirmed human carcinogen. Vapor inhalation leads to central nervous system (CNS) depression. The liquid can cause frostbite. It is a flammable gas at room temperature and polymerizes on exposure to air or sunlight. Avoid exposure to VC through engineering controls and wearing PPE

R	2	NFPA
I	4	
S	4	
K	4	

HMIS
H 3*
F 4
R 2
PPE - Sec. 8
* Chronic effects

Section 2. Ingredients and Occupational Exposure Limits

Vinyl Chloride, ca 98 to 99%. Impurities include water, acetaldehyde, hydrogen chloride, hydrogen peroxide, methyl chloride, butane, 1,3-butadiene, chlorophene, diacetylene, vinyl acetylene, and propene.

1991 OSHA PELs

8-hr TWA: 1 ppm

Ceiling: 5 ppm; OSHA-X

1992-93 ACGIH TLV

TWA: 5 ppm (13 mg/m³)

TLV-A1

1990 NIOSH REL

NIOSH-X

1990 DFG (Germany) TRK*

Existing Installations: 3 ppm

MAK-A1

1985-86 Toxicity Data†

Man, inhalation, TC₅₀: Intermittent exposure to 200 ppm for 14 yr caused liver tumors.

Man, inhalation, TC₅₀: 30 mg/m³/5 yr caused spermatogenesis.

Human, inhalation, TC: Continuous exposure to 300 mg/m³ for an undetermined number of weeks caused blood tumors.

Rat, oral, LD₅₀: 500 mg/kg; toxic effects not yet reviewed

* TRK (technical exposure limit) is used in place of MAK when a material is a carcinogen. Unlike an MAK below which no adverse effects are expected, the TRK is a limit set below which adverse effects may still occur. This is based on the theory that 1 molecule of a carcinogenic substance may still produce a tumor. The TRK is set to allow for an acceptable risk (for example, 1 tumor in 1 million persons may be an acceptable risk).

† See NIOSH, RTECS (KU9625000), for additional mutation, reproductive, tumorigenic, and toxicity data.

Section 3. Physical Data

Boiling Point: 7 °F (-13.9 °C)

Freezing Point: -245 °F (-159.7 °C)

Molecular Weight: 62.5

Specific Gravity: 0.9106 at 68 °F (20 °C)

Ionization Potential: 9.99 eV

Refraction Index: 1.370 at 20 °C/D

Surface Tension: 23.1 dyne/cm at -4 °F (-20 °C)

Odor Threshold: 2000 to 5000 ppm*

Vapor Density (Air = 1): 2.155

Water Solubility: Slightly soluble, 0.1% at 77 °F (25 °C)

Other Solubilities: alcohol, benzene, carbon tetrachloride, ether, hydrocarbon and oils.

Vapor Pressure: 2530 mm Hg at 68 °F (20 °C), 400 mm Hg at -18.4 °F (-28 °C)

Critical Temperature: 304.7 °F (151.5 °C)

Critical Pressure: 56.8 atm

Viscosity: 0.01072 cP at 68 °F (20 °C), gas; 0.28 cP at -4 °F (-20 °C), liquid

Appearance and Odor: A gas at room temperature. Usually found as a compressed/cooled liquid. The colorless liquid forms a vapor with a pleasant ethereal odor.

*The actual vapor concentration that can be detected by humans has not been adequately determined and varies from one individual to another, from impurities, and probably from exposure duration. The odor threshold is not an accurate warning of exposure.

Section 4. Fire and Explosion Data

Flash Point: -108.4 °F (-78 °C) OC

Autoignition Temperature: 882 °F (472 °C)

LEL: 3.6% v/v

UEL: 33% v/v

Extinguishing Media: For small fires, use dry chemical or carbon dioxide. For large fires, use water spray, fog, or regular foam. **Unusual Fire or Explosion Hazards:** Large fires can be practically inextinguishable. Vapors may travel to an ignition source and flash back. VC may polymerize in cylinders or tank cars and explode in heat of fire. Vapors pose an explosion hazard indoors, outdoors, and in sewers. VC decomposes in fire to hydrogen chloride, carbon monoxide, carbon dioxide, and phosgene. Burning rate = 4.3 mm/min. **Special Fire-fighting Procedures:** Because fire may produce toxic thermal decomposition products, wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in pressure-demand or positive-pressure mode. Stop gas leak if possible. Let tank, tank car, or tank truck burn unless leak can be stopped. For massive fire in cargo area, use monitor nozzles or unmanned hose holders; if this is impossible, withdraw from area and let fire burn. Withdraw immediately if you hear a rising sound from venting safety device or notice any tank discoloration due to fire. *Do not* release runoff from fire control methods to sewers or waterways.

Section 5. Reactivity Data

Stability/Polymerization: Long term exposure to air may result in formation of peroxides which initiates explosive polymerization of the chloride. VC can polymerize on exposure to light or in presence of a catalyst. **Chemical Incompatibilities:** VC can explode on contact with oxide of nitrogen, may liberate hydrogen chloride on exposure to strong alkalis, and is incompatible with copper, oxidizers, aluminum, and peroxides. In the presence of moisture, VC attacks iron and steel. **Conditions to Avoid:** Exposure to sunlight, air, heat, and incompatibles. **Hazardous Products of Decomposition:** Thermal oxidative decomposition of vinyl chloride can produce carbon oxides, and chloride gas.

Section 6. Health Hazard Data

Carcinogenicity: Vinyl chloride is listed as a carcinogen by the IARC (Class 1, *sufficient human evidence*),⁽¹⁶⁴⁾ NTP (Class 1, *sufficient human evidence*),⁽¹⁶⁹⁾ NIOSH (Class X, *carcinogen defined without further categorization*),⁽¹⁶³⁾ ACGIH (TLV-A1, *confirmed human carcinogen*),⁽¹⁶³⁾ DFG (MAK-A1, *capable of inducing malignant tumors in humans*),⁽¹⁶³⁾ and OSHA (Class X, *carcinogen defined without further categorization*).⁽¹⁶⁴⁾ Liver tumors (angiosarcomas) are confirmed from VC exposure. Other tumors of the CNS, respiratory system, blood, and lymphatic system have occurred from exposure to the polyvinyl chloride manufacture process but VC itself may not be the causative agent. **Summary of Risks:** Vapor inhalation causes varying degrees of CNS depression with noticeable anesthetic effects at levels of 1% (10,000 ppm). Studies have shown loss of libido and sperm in men exposed to VC and in Russian studies, 77% of exposed women experienced ovarian dysfunction, benign uterine growths, and prolapsed genital organs. However, no teratogenic effects have been seen in offspring of exposed workers.

Continue on next page

Section 6. Health Hazard Data, continued

It appears that metabolism is necessary before many of VC's toxic effects occur. Some vinyl chloride is exhaled unchanged but most is metabolized to chloroacetaldehyde. Skin absorption may occur if liquid is confined on skin but absorbed amount would be small. It is possible that the phenol inhibitor may be absorbed as well. The compressed liquid can cause frostbite. Vapors are severely irritating to the eyes. Chronic exposure can cause cancer and a triad of syndromes known as *vinyl chloride disease*. Medical Conditions Aggravated by Long-Term Exposure: Liver, cardiac, pulmonary, and connective tissue disorders. Target Organs: Liver, CNS, respiratory and lymphatic systems, bone, and connective tissue of the skin. Primary Entry Routes: Inhalation, skin/eye contact. Acute Effects: CNS effects include fatigue, headache, vertigo, ataxia, euphoria, visual disturbances, dulling of auditory cues, numbness and tingling in the extremities, narcosis, unconsciousness, and death due to respiratory failure. Respiratory problems include dyspnea, asthma, and pneumoconiosis. Chronic Effects: Repeated exposure has led to liver cancer, confirmed because of the otherwise rarity of its type (angiosarcoma). Tumors in other organs have occurred in the polyvinyl chloride industry but agents other than VC may be responsible; authorities are still debating this issue. A triad of other effects are associated with VC exposure. Acro-osteolysis is associated with hand cleaning of polymerization vessels and characterized by dissolution of bone in the hands, especially when associated with resorption. Raynaud's Phenomenon is a vascular disorder marked by recurrent spasm of the capillaries and especially those of the fingers and toes on exposure to cold. This is usually accompanied by pain and in severe cases may progress to local gangrene. Sclerodermaous skin changes (affecting the dorsal hands and distal forearms) are seen and described as a slowly progressive disease marked by deposition of fibrous connective tissue in the skin. The skin becomes thickened and raised nodules appear. Arthralgias (pain in one or more joints) and blood changes with decreased platelet number and capillary abnormalities may also occur.

FIRST AID Eyes: Do not allow victim to rub or keep eyes tightly shut. Gently lift eyelids and flush immediately and continuously with flooding amounts of water until transported to an emergency medical facility. Consult a physician immediately. Skin: Quickly remove contaminated clothing. Rinse with flooding amounts of water for at least 15 min. Wash exposed area with soap and water. For reddened or blistered skin, consult a physician. For frostbite, immerse affected area in 107.6 °F (42 °C) water until completely rewarmed. Do not use dry heat. Inhalation: Remove exposed person to fresh air and support breathing as needed. Ingestion: Unlikely! VC is a gas above 7 °F (-14°C). Note to Physicians: Endotracheal intubation may be required if significant CNS or respiratory depression occurs. Diagnostic test: thiodiglycolic acid in urine (normally < 2 mg/g creatinine).

Section 7. Spill, Leak, and Disposal Procedures

Spill/Leak: Notify safety personnel, isolate and ventilate area, deny entry, and stay upwind. If possible without risk, stop gas flow. Shut off ignition sources. Report any release > 1 lb. Follow applicable OSHA regulations (29 CFR 1910.120). **Environmental Transport:** VC reacts with hydroxyl radicals in the troposphere with a half-life of 1.2 days. The half-life = a few hr in photochemical smog. Reaction products in the air include chloroacetaldehyde, hydrogen chloride, chloroethylene, epoxide, formaldehyde, formyl chloride, formic acid, and carbon monoxide. In soil, VC rapidly volatilizes. What does not evaporate will be highly mobile and may leach into groundwater. In water, VC is not expected to hydrolyze, bioconcentrate, or absorb to sediment. It will rapidly volatilize with an estimated half-life of 0.805 hr for evaporation from a river 1 meter deep with a current of 3 meter/sec and a wind velocity of 3 meter/sec. In waters containing photosensitizers such as humic acid, photodegradation will be rapid. **Soil Absorption/Mobility:** From an estimated solubility of 2,700 ppm, a Koc of 56 is established for VC which indicates high soil mobility and potential to leach into groundwater. **Disposal:** Dilute any waste compressed liquid to a 1% solution and remove phenol inhibitor as sodium. Pour onto vermiculite, sodium bicarbonate, or a sand & soda ash mixture (90/10). Add slaked lime if fluoride is present. Mix in paper boxes, place in incinerator, cover with scrap wood and paper, and ignite with excelsior train. Another method is to dissolve waste in a flammable solvent and spray in incinerator firebox equipped with an afterburner and alkali scrubber. Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable Federal, state, and local regulations.

EPA Designations

Listed as a RCRA Hazardous Waste (40 CFR 261.33): No. U043

SARA Extremely Hazardous Substance (40 CFR 355), TPQ: Not listed

Listed as a SARA Toxic Chemical (40 CFR 372.65)

Listed as a CERCLA Hazardous Substance* (40 CFR 302.4): Final Reportable Quantity (RQ), 1 lb (0.454 kg) [* per CWA, Sec. 307 (a); CAA, Sec. 112, & RCRA, Sec. 3001]

OSHA Designations

Listed as an Air Contaminant (29 CFR 1910.1000, Table Z-1-A)

Section 8. Special Protection Data

Goggles: Wear protective eyeglasses or chemical safety goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133). Because contact lens use in industry is controversial, establish your own policy. **Respirator:** Seek professional advice prior to respirator selection and use. Follow OSHA (29 CFR 1910.134) and, if necessary, wear a MSHA/NIOSH-approved respirator. According to NIOSH⁽¹⁴⁸⁾, for any detectable concentration use a SCBA or supplied-air respirator with a full facepiece operated in pressure-demand or other positive pressure mode. See 29 CFR 1910.1017 for detailed OSHA respirator recommendations. For emergency or nonroutine operations (cleaning spills, reactor vessels, or storage tanks), wear an SCBA. **Warning! Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.** If respirators are used, OSHA requires a written respiratory protection program that includes at least: medical certification, training, fit-testing, periodic environmental monitoring, maintenance, inspection, cleaning, and convenient, sanitary storage areas. **Other:** Wear chemically protective gloves, boots, aprons, and gauntlets made of Viton or chlorinated polyethylene to prevent skin contact. **Ventilation:** Provide general and local exhaust ventilation systems to maintain airborne concentrations below the OSHA PEL's (Sec. 2). Local exhaust ventilation is preferred because it prevents contaminant dispersion into the work area by controlling it at its source.⁽¹⁰³⁾ **Safety Stations:** Make available in the work area emergency eyewash stations, safety/quick-drench showers, and washing facilities. **Contaminated Equipment:** Separate work clothes from street clothes, launder before reuse and clean PPE. **Comments:** Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

Section 9. Special Precautions and Comments

Storage Requirements: Store in a cool, dry, well-ventilated area in clearly labeled containers. Outside or detached storage is preferred. Large amounts should be stored in steel containers under pressure. Keep separate from incompatibles (Sec. 5). Venting, under pressure should be safety relief. At atm, venting should be pressure vacuum. Regularly monitor inhibitor levels. To avoid static sparks, electrically ground and bond all equipment used with VC. Avoid open flames, spark formation and electric discharges around VC. **Engineering Controls:** To reduce potential health hazards, use sufficient dilution or local exhaust ventilation to control airborne contaminants and to maintain concentrations at the lowest practical level. Install Class 1, Group D electrical equipment. **Administrative Controls:** Inform VC exposed personnel of hazards associated with its use. Preplacement and periodic medical exams of workers exposed above the action level is mandatory under OSHA 29 CFR (1910.1017). Monitor for liver cancer, scleroderma, pneumonitis, clotting abnormalities, and acro-osteolysis.

Transportation Data (49 CFR 172.101)

DOT Shipping Name: Vinyl Chloride

DOT Hazard Class: 2.1

ID No.: UN1086

DOT Packing Group: --

DOT Label: Flammable Gas

Special Provisions (172.102): B44

Packaging Authorizations

a) Exceptions: 173.306

b) Non-bulk Packaging: 173.304

c) Bulk Packaging: 173.314 & 173.315

Quantity Limitations

a) Passenger Aircraft or Railcar: Forbidden

b) Cargo Aircraft Only: 150 kg

Vessel Stowage Requirements

a) Vessel Stowage: B

b) Other: 40

CTL03167

MSDS Collection References: 26, 73, 100, 101, 103, 124, 126, 127, 132, 133, 136, 140, 148, 149, 153, 159, 162, 163, 164, 167, 168, 171, 174, 175

Prepared by: M Gannon, BA; Industrial Hygiene Review: PA Roy, MPH, CIH; Medical Review: AC Darlington, MPH, MD

Copyright © 1992 by Gossium Publishing Corporation. Any commercial use or reproduction without the publisher's permission is prohibited. Judgments as to the suitability of information here in for the purchaser's purposes are necessarily the purchaser's responsibility. Although reasonable care has been taken in the preparation of such information, Gossium Publishing Corporation extends no warranties, makes no representations, and assumes no responsibility as to the accuracy or suitability of such information for application to the purchaser's intended purpose or for consequences of its use.

**Genium Publishing Corporation**

1145 Catalyn Street
Schenectady, NY 12303-1836 USA
(518) 377-8854

Material Safety Data Sheets Collection:

Sheet No. 701
Polyvinyl Chloride

Issued: 4/90

Section 1. Material Identification**31**

Polyvinyl Chloride (PVC) Description: Produced by polymerization of vinyl chloride in the presence of initiators such as 0.1 to 0.5% benzoyl peroxide. Used as a rubber substitute, floor covering, and imitation leather; in tubing, electric wire, cable coverings, pliable thin sheeting, film finishes for textiles, nonflammable upholstery, synthetic turf, sealant liners for ponds and reservoirs, plastisols and organosols, adhesives and bonding agents, belting, shoe soles, gaskets, raincoats, and containers for cosmetics, toiletries, household chemicals. PVC tubing is used in items requiring clear, flexible tubing such as catheters and parts of dialysis devices. PVC may be molded into electric insulators, water pipes, handles, and various recreation items.

Other Designations: CAS No. 9002-86-2; (C₂H₃Cl)_n; chloroethylene polymer; PVC; vinyl chloride homopolymer; Rhovyl; Nip; Fibravyl; Envilon; Thermovyl; Crinovyl; Isohyl; Retractyl.

Manufacturer: Contact your supplier or distributor. Consult the latest *Chemicalweek Buyers' Guide*^(TM) for a suppliers list.

R 1
I -
S 2
K -

Genium

HMIS
H 2
F 0
R 0
PPG*
* Sec. 8

Section 2. Ingredients and Occupational Exposure Limits

Polyvinyl chloride, ca 100%

OSHA PEL
None established

ACGIH TLV, 1989-90
None established

NIOSH REL, 1987
None established

Toxicity Data*

Rat, oral, TD₀₁: 210 g/kg ingested over a continuous 30-week exposure showed PVC is an equivocal tumorigenic agent, with tumors found on the lungs, thorax, skin, and appendages
Rat, implant, TD₀₁: 75 mg/kg implanted showed effects of an equivocal tumorigenic agent, with tumors developing at the application site

* Monitor NIOSH, RTECS (KV0350000), for future data.

Section 3. Physical Data

Molecular Weight: 60,000 to 150,000*

Water Solubility: Insoluble

Appearance and Odor: White powder; odorless.

* Since PVC has polymers with molecular weights ranging from 60,000 to 150,000, its physical properties vary with molecular weight. Consult your manufacturer or supplier to ascertain the exact information applicable to your purchased PVC.

Section 4. Fire and Explosion Data

Flash Point: None reported

Autoignition Temperature: None reported

LEL: None reported

UEL: None reported

Extinguishing Media: Use large quantities of water to fight polyvinyl chloride fires.

Unusual Fire or Explosion Hazards: Finished foam resins burn readily. If freshly manufactured foam resins are not allowed to cool thoroughly before stacking in bulk, they may ignite spontaneously. While burning, most foam resins spread the fire with their drippings. An explosion hazard exists during vinyl chloride's polymerization.

Special Fire-fighting Procedures: Since fire produces toxic fumes, wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in the pressure-demand or positive-pressure mode. Be aware of runoff from fire control methods. Do not release to sewers or waterways.

Section 5. Reactivity Data

Stability/Polymerization: PVC is stable at room temperature in closed containers under normal storage and handling conditions. However, even at ordinary temperatures, polyvinyl chloride may undergo slow dehalogenation with evolution of hydrogen chloride. Hazardous polymerization can occur. Use stabilizers to prevent discoloration from exposure to heat or light.

Chemical Incompatibilities: Reacts violently with fluorine (F₂).

Conditions to Avoid: Heat.

Hazardous Products of Decomposition: Thermal oxidative decomposition of polyvinyl chloride can produce toxic fumes of carbon monoxide (CO), hydrochloric acid (HCl), and phosgene (CCl₂O). Phosgene is not irritating at first, but may cause fatal pulmonary edema or pneumonia. Inhalation of high concentrations causes choking, painful breathing, coughing, and bloody expectorant (*MSDS Collection*, No. 66).

Section 6. Health Hazard Data

Carcinogenicity: Neither the NTP, IARC, nor OSHA lists polyvinyl chloride as a carcinogen.

Summary of Risks: Chronic inhalation of polyvinyl chloride causes pulmonary damage, abnormal liver functions, and blood effects. Prolonged or repeated skin contact causes irritation and allergic dermatitis. "Meat wrapper's asthma" (conjunctivitis, rhinitis, bronchoconstriction) has resulted from cutting PVC film with a hot knife. Applying heat to PVC initiates thermal degradation (pyrolysis) and production of toxic gases such as hydrogen chloride, ethyl chloride, etc. PVC's toxicity may result from the other compounds associated with it. Fresh PVC can contain small amounts of toxic and carcinogenic vinyl chloride.

Medical Conditions Aggravated by Long-Term Exposure: In plants that make PVC from monomeric vinyl chloride, several cases of angiosarcoma (rare malignant tumor) of the liver among long-time workers are reported. After 20+ years of PVC dust exposure, cases of dyspnea (shortness of breath) are also reported.

Target Organs: Eyes, skin, respiratory tract, lungs, liver, blood.

Primary Entry Routes: Inhalation.

Acute Effects: Direct contact with the skin and eyes causes allergic dermatitis and conjunctivitis, respectively.

Chronic Effects: Chronic inhalation causes fibrotic lung changes, alterations in the respiratory organs, and rhinitis.

FIRST AID

Eyes: Flush immediately, including under the eyelids, gently but thoroughly with flooding amounts of running water for at least 15 min.

Skin: Quickly remove contaminated clothing. After rinsing affected skin with flooding amounts of water, wash it with soap and water.

Inhalation: Remove exposed person to fresh air and support breathing as needed.

Ingestion: Never give anything by mouth to an unconscious or convulsing person. If ingested, have a conscious person drink 1 to 2 glasses of water, then induce repeated vomiting until vomit is clear.

After first aid, get appropriate in-plant, paramedic, or community medical support.

Section 7. Spill, Leak, and Disposal Procedures

Spill/Leak: Notify safety personnel, remove all heat and ignition sources, provide adequate ventilation, and evacuate all unnecessary personnel. Cleanup personnel should protect against dust inhalation and skin and eye contact. With nonsparking tools, scoop spilled powder into appropriate disposal containers. Follow applicable OSHA regulations (29 CFR 1910.120).

Disposal: Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable Federal, state, and local regulations.

EPA Designations

RCRA Hazardous Waste (40 CFR 261.33): Not listed

CERCLA Hazardous Substance (40 CFR 302.4): Not listed

SARA Extremely Hazardous Substance (40 CFR 355): Not listed

SARA Toxic Chemical (40 CFR 372.65): Not listed

OSHA Designations

Air Contaminant (29 CFR 1910.1000, Subpart Z): Not listed

Section 8. Special Protection Data

Goggles: Wear protective eyeglasses or chemical safety goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133).

Respirator: Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, wear a NIOSH-approved respirator. For emergency or nonroutine operations (cleaning spills, reactor vessels, or storage tanks), wear an SCBA.

Warning: Air-purifying respirators do *not* protect workers in oxygen-deficient atmospheres.

Other: Wear impervious gloves, boots, aprons, and gauntlets to prevent skin contact.

Ventilation: Provide general and local explosion-proof ventilation systems to maintain airborne concentrations that promote worker safety and productivity. Local exhaust ventilation is preferred since it prevents contaminant dispersion into the work area by controlling it at its source.⁽¹⁰⁹⁾

Safety Stations: Make available in the work area emergency eyewash stations, safety/quick-drench showers, and washing facilities.

Contaminated Equipment: Never wear contact lenses in the work area: soft lenses may absorb, and all lenses concentrate, irritants. Remove this material from your shoes and equipment. Launder contaminated clothing before wearing.

Comments: Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

Section 9. Special Precautions and Comments

Storage Requirements: Store in closed containers in a well-ventilated, cool area equipped with an above-average density of sprinkler heads. Maintain this material's temperature below its critical value. Keep storage area free of paper, textile, and other combustible materials.

Engineering Controls: Adequate ventilation and appropriate personal protective gear is essential. Preclude from exposure those with respiratory disease. Since vinyl chloride is explosive during polymerization, tanks should be guarded by wire netting. All engineering systems should be of maximum explosion-proof design, electrically grounded, and bonded. In addition, remote controls and alarms should be installed to detect any leakage of vinyl chloride into the air.

Transportation Data (49 CFR 172.101, .102): Not listed

CTL031680

MSDS Collection References: 1, 73, 89, 100, 101, 103, 123, 124, 126, 127, 136

Prepared by: MJ Allison, BS; **Industrial Hygiene Review:** DJ Wilson, CIH; **Medical Review:** W Silverman, MD

F5

Copyright © 1990 by Gennum Publishing Corporation. Any commercial use or reproduction without the publisher's permission is prohibited. Judgments as to the suitability of information herein for the purchaser's purposes are necessarily the purchaser's responsibility. Although reasonable care has been taken in the preparation of such information, Gennum Publishing Corporation extends no warranties, makes no representations, and assumes no responsibility as to the accuracy or suitability of such information for application to the purchaser's intended purpose or for consequences of its use.