VINYLIDENE CHLORIDE

VCI

CAUTIONARY RESPONSE INFORMATION

Common Synonyms
1,1-Dichloroethylene
unsym-Dichloroethylene

Watery liquid Colorless Sweet odor

Sinks in water. Flammable, irritating vapor is produced. Boiling point is 89°F.

Keep people away. Avoid contact with liquid and vapor.
Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves).
Shut off ignition sources and call fire department.
Stay upwind and use water spray to ``knock down'' vapor.
Evacuate area in case of large discharge.
Notify local health and pollution control agencies.
Protect water intakes.

Fire

FLAMMABLE.
POISONOUS GAS IS PRODUCED IN FIRE.
Containers may explode in fire.
Flashback along vapor trail may occur.
Vapor may explode if ignited in an enclosed area.
Wear self-contained breathing apparatus.
Combat fires from safe distance or protected location.
Extinguish with dry chemical, foam, or carbon dioxide.
Cool exposed containers with water.

Exposure

CALL FOR MEDICAL AID.

VAPOR
Irritating to eyes, nose, and throat.
If inhaled, will cause dizziness or difficult breathing.
Move to fresh air.
If breathing has stopped, give artificial respiration.
If breathing is difficult, give oxygen.

LIQUID
Will burn skin and eyes.
Harmful if swallowed.
Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk.

Water Pollution

Effect of low concentrations on aquatic life is unknown.
May be dangerous if it enters water intakes.
Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. CORRECTIVE RESPONSE ACTIONS

Stop discharge
Collection Systems: Pump; Dredge
Do not burn

2. CHEMICAL DESIGNATIONS

2.1 CG Compatibility Group: 35; Vinyl halides
2.2 Formula: $CH_2=CCl_2$
2.3 IMO/UN Designation: 3.1/1303
2.4 DOT ID No.: 1303
2.5 CAS Registry No.: 75-35-4
2.6 NAERG Guide No.: 129P
2.7 Standard Industrial Trade Classification: 51138

3. HEALTH HAZARDS

3.1 Personal Protective Equipment: Approved canister or air-supplied mask; goggles or face shield; rubber gloves and boots.
3.2 Symptoms Following Exposure: Vapor can cause dizziness and drunkenness; high levels cause anesthesia. Liquid irritates eyes and skin.
3.3 Treatment of Exposure: INHALATION: if any illness develops, remove person to fresh air promptly, keep warm and quiet, and get medical attention; if breathing stops, start artificial respiration. INGESTION: not likely a problem; no known antidote; treat symptomically. EYES OR SKIN: flush with plenty of water for at least 15 min; get medical attention for eyes; remove contaminated clothing and wash before reuse.
3.4 TLV-TWA: 5 ppm
3.5 TLV-STEL: 20 ppm
3.6 TLV-Ceiling: Not listed.
3.7 Toxicity by Ingestion: Grade 3; Oral LD_{50} = 24 hr = 84 mg/kg (adrenalectomized rat)
3.8 Toxicity by Inhalation: Currently not available.
3.9 Chronic Toxicity: Currently not available
3.10 Vapor (Gas) Irritant Characteristics: Vapors cause moderate irritation such that personnel will find high concentrations unpleasant. The effect istemporary.
3.11 Liquid or Solid Characteristics: Causes smarting of the skin and first-degree burns on short exposure; may cause secondary burns on long exposure.
3.12 Odor Threshold: Currently not available
3.13 IDLH Value: Not listed.
3.14 OSHA PEL-TWA: Not listed.
3.15 OSHA PEL-STEL: Not listed.
3.16 OSHA PEL-Ceiling: Not listed.
3.17 EPA AEGL: Not listed

4. FIRE HAZARDS

4.1 Flash Point: –19°F O.C.
4.2 Flammable Limits in Air: 5.6%-16.0%
4.3 Fire Extinguishing Agents: Foam, carbon dioxide, dry chemical
4.4 Fire Extinguishing Agents Not to Be Used: Water may be ineffective.
4.5 Special Hazards of Combustion Products: Toxic hydrogen chloride and phosgene are generated in fires.
4.6 Behavior in Fire: May explode in fire due to polymerization. Vapor is heavier than air and may travel considerable distance to a source of ignition and flash back.
4.7 Auto Ignition Temperature: 1058°F
4.8 Electrical Hazards: I, D
4.9 Burning Rate: 2.7 mm/min.
4.10 Adiabatic Flame Temperature: Currently not available
4.11 Stoichometric Air to Fuel Ratio: 9.5 (calc.)
4.12 Flame Temperature: Currently not available
4.13 Combustion Molar Ratio (Reactant to Product): 4.0 (calc.)
4.14 Minimum Oxygen Concentration for Combustion (MOCC): N_2 diluent: 15.0%

5. CHEMICAL REACTIVITY

5.1 Reactivity with Water: No reaction
5.2 Reactivity with Common Materials: Copper and aluminum can cause polymerization.
5.3 Stability During Transport: Stable
5.4 Neutralizing Agents for Acids and Caustics: Not pertinent
5.5 Polymerization: Can occur if exposed to sunlight, air, copper, aluminum, heat.
5.6 Inhibitor of Polymerization: 200 ppm methyl ether of hydroquinone; 0.6-0.8% phenol

6. WATER POLLUTION

6.1 Aquatic Toxicity: Currently not available
6.2 Waterfowl Toxicity: Currently not available
6.3 Biological Oxygen Demand (BOD): Currently not available
6.4 Food Chain Concentration Potential: None
6.5 GESAMP Hazard Profile:
Bioaccumulation: 0
Damage to living resources: 1
Human Oral hazard: 2
Human Contact hazard: II
Reduction of amenities: XX

7. SHIPPING INFORMATION

7.1 Grades of Purity: 99%
7.2 Storage Temperature: Ambient
7.3 Inert Atmosphere: Padded
7.4 Venting: Pressure-vacuum
7.5 IMO Pollution Category: D
7.6 Ship Type: 2
7.7 Barge Hull Type: 2

8. HAZARD CLASSIFICATIONS

8.1 49 CFR Category: Flammable liquid
8.2 49 CFR Class: 3
8.3 49 CFR Package Group: I
8.4 Marine Pollutant: Yes
8.5 NFPA Hazard Classification:

Category	Classification
Health Hazard (Blue).....	2
Flammability (Red).....	4
Instability (Yellow).....	2

8.6 EPA Reportable Quantity: 100 pounds
8.7 EPA Pollution Category: B
8.8 RCRA Waste Number: U078/D029
8.9 EPA FWPCA List: Yes

9. PHYSICAL & CHEMICAL PROPERTIES

9.1 Physical State at 15° C and 1 atm: Liquid
9.2 Molecular Weight: 96.95
9.3 Boiling Point at 1 atm: 88.9°F = 31.6°C = 304.8°K
9.4 Freezing Point: –187.6°F = 122.0°C = 151.2°K
9.5 Critical Temperature: Not pertinent
9.6 Critical Pressure: Not pertinent
9.7 Specific Gravity: 1.21 at 20°C (liquid)
9.8 Liquid Surface Tension: 24 dynes/cm = 0.024 N/m at 15°C
9.9 Liquid Water Interfacial Tension: 37 dynes/cm = 0.037 N/m at 22.7°C
9.10 Vapor (Gas) Specific Gravity: 3.3
9.11 Ratio of Specific Heats of Vapor (Gas): Currently not available
9.12 Latent Heat of Vaporization: 130 Btu/lb = 72 cal/g = 3.0 X 10^5 J/kg
9.13 Heat of Combustion: –4860 Btu/lb = –2700 cal/g = –113.0 X 10^5 J/kg
9.14 Heat of Decomposition: Not pertinent
9.15 Heat of Solution: Not pertinent
9.16 Heat of Polymerization: –333 Btu/lb = –185 cal/g = –7.75 X 10^5 J/kg
9.17 Heat of Fusion: Currently not available
9.18 Limiting Value: Currently not available
9.19 Reid Vapor Pressure: 18.3 psia

NOTES

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9.20 SATURATED LIQUID DENSITY		9.21 LIQUID HEAT CAPACITY		9.22 LIQUID THERMAL CONDUCTIVITY		9.23 LIQUID VISCOSITY	
Temperature (degrees F)	Pounds per cubic foot	Temperature (degrees F)	British thermal unit per pound-F	Temperature (degrees F)	British thermal unit inch per hour-square foot-F	Temperature (degrees F)	Centipoise
-20	81.450	0	0.262		N	-20	0.478
-15	81.129	10	0.268		O	-15	0.466
-10	80.799	20	0.273		T	-10	0.455
-5	80.469	30	0.279			-5	0.443
0	80.139	40	0.284		P	0	0.433
5	79.809	50	0.290		E	5	0.423
10	79.480	60	0.295		R	10	0.413
15	79.150	70	0.301		T	15	0.404
20	78.820	80	0.307		I	20	0.395
25	78.490				N	25	0.387
30	78.160				E	30	0.378
35	77.830				N	35	0.371
40	77.500				T	40	0.363
45	77.169					45	0.356
50	76.839					50	0.349
55	76.509					55	0.342
60	76.179					60	0.336
65	75.849					65	0.330
70	75.520					70	0.324
75	75.200					75	0.318
80	74.870					80	0.313
85	74.540					85	0.307

9.24 SOLUBILITY IN WATER		9.25 SATURATED VAPOR PRESSURE		9.26 SATURATED VAPOR DENSITY		9.27 IDEAL GAS HEAT CAPACITY	
Temperature (degrees F)	Pounds per 100 pounds of water	Temperature (degrees F)	Pounds per square inch	Temperature (degrees F)	Pounds per cubic foot	Temperature (degrees F)	British thermal unit per pound-F
68	0.500	40	5.115	40	0.09246	100	0.169
		50	6.473	50	0.11470	120	0.172
		60	8.108	60	0.14090	140	0.175
		70	10.060	70	0.17150	160	0.178
		80	12.360	80	0.20690	180	0.181
		90	15.070	90	0.24760	200	0.184
		100	18.220	100	0.29410	220	0.186
		110	21.870	110	0.34670	240	0.189
		120	26.060	120	0.40600	260	0.192
		130	30.850	130	0.47250	280	0.194
		140	36.290	140	0.54650	300	0.197
		150	42.430	150	0.62860	320	0.199
		160	49.340	160	0.71920	340	0.202
		170	57.070	170	0.81860	360	0.204
		180	65.669	180	0.92720	380	0.206
		190	75.209	190	1.04600	400	0.209
		200	85.750	200	1.17400	420	0.211
		210	97.339	210	1.31300	440	0.213
						460	0.215
						480	0.217
						500	0.219
						520	0.221
						540	0.223
						560	0.225
						580	0.227
						600	0.229