

TETRAFLUOROETHYLENE

TFE

CAUTIONARY RESPONSE INFORMATION

Common Synonyms Teflon monomer	Compressed Gas Colorless Odorless or faint odor
Visible vapor cloud is produced.	
<p>Keep people away. Shut off ignition sources, call fire department. Stay upwind. Use water spray to "knock down" vapor. Evacuate area in case of large discharge. Notify local health and pollution control agencies. Avoid contact with vapor.</p>	
Fire	<p>FLAMMABLE. POISONOUS GASES ARE PRODUCED IN FIRE. Containers may explode in fire. Flashback along vapor trail may occur. Vapor may explode if ignited in an enclosed area. Wear goggles and self-contained breathing apparatus. Let fire burn. Stop flow of gas if possible. Cool exposed containers and protect men effecting shutoff with water.</p>
Exposure	<p>Call for medical aid. VAPOR Irritating to eyes, nose and throat. Move victim to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen.</p>
Water Pollution	Not harmful to aquatic life.

1. CORRECTIVE RESPONSE ACTIONS Stop discharge	2. CHEMICAL DESIGNATIONS <p>2.1 CG Compatibility Group: Not listed. 2.2 Formula: F₂C=CF₂ 2.3 IMO/UN Designation: 2/1081 2.4 DOT ID No.: 1081 2.5 CAS Registry No.: Currently not available 2.6 NAERG Guide No.: 116P 2.7 Standard Industrial Trade Classification: 51137</p>
3. HEALTH HAZARDS	
<p>3.1 Personal Protective Equipment: Self-contained breathing apparatus for high gas concentrations 3.2 Symptoms Following Exposure: Inhalation causes irritation of respiratory system. Contact with eyes causes slight irritation. 3.3 Treatment of Exposure: INHALATION: remove victim from exposure; if breathing is difficult, give artificial respiration and call physician. 3.4 TLV-TWA: Not listed. 3.5 TLV-STEL: Not listed. 3.6 TLV-Ceiling: Not listed. 3.7 Toxicity by Ingestion: Currently not available. 3.8 Toxicity by Inhalation: Currently not available. 3.9 Chronic Toxicity: Causes possible impairment of immunological defense system in rats 3.10 Vapor (Gas) Irritant Characteristics: Currently not available 3.11 Liquid or Solid Characteristics: Currently not available 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</p>	

4. FIRE HAZARDS

- 4.1 **Flash Point:** Not pertinent
 4.2 **Flammable Limits in Air:** 10%-50%
 4.3 **Fire Extinguishing Agents:** Let fire burn; stop flow of gas; cool containers with water.
 4.4 **Fire Extinguishing Agents Not to Be Used:** Not pertinent
 4.5 **Special Hazards of Combustion**
Products: When burned in air, gas forms toxic carbonyl fluoride and hydrogen fluoride.
 4.6 **Behavior in Fire:** Vapor is heavier than air and may travel considerable distance to a source of ignition and flash back. Containers may explode.
 4.7 **Auto Ignition Temperature:** 370°F
 4.8 **Electrical Hazards:** C₂F₄-air mixtures produced explosions which propagated through the smallest clearance in the standard test conducted by Underwriters Laboratories. It does not meet any group classification.
 4.9 **Burning Rate:** Not pertinent
 4.10 **Adiabatic Flame Temperature:** Currently not available
 4.11 **Stoichiometric Air to Fuel Ratio:** Not pertinent.
 4.12 **Flame Temperature:** Currently not available
 4.13 **Combustion Molar Ratio (Reactant to Product):** Not pertinent.
 4.14 **Minimum Oxygen Concentration for Combustion (MOCC):** Not listed

5. CHEMICAL REACTIVITY

- 5.1 **Reactivity with Water:** No reaction
 5.2 **Reactivity with Common Materials:** No reaction
 5.3 **Stability During Transport:** Stable
 5.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent
 5.5 **Polymerization:** Can polymerize in the absence of inhibitor, especially when heated or in presence of oxygen.
 5.6 **Inhibitor of Polymerization:** d-limonene; pinene; tetrahydronaphthalene; 1-octene; methyl methacrylate

6. WATER POLLUTION

- 6.1 **Aquatic Toxicity:** None
 6.2 **Waterfowl Toxicity:** None
 6.3 **Biological Oxygen Demand (BOD):** None
 6.4 **Food Chain Concentration Potential:** None
 6.5 **GESAMP Hazard Profile:** Not listed

7. SHIPPING INFORMATION

- 7.1 **Grades of Purity:** 98+%
 7.2 **Storage Temperature:** Cool ambient
 7.3 **Inert Atmosphere:** No requirement
 7.4 **Venting:** Safety relief
 7.5 **IMO Pollution Category:** Currently not available
 7.6 **Ship Type:** Currently not available
 7.7 **Barge Hull Type:** Currently not available

8. HAZARD CLASSIFICATIONS

- 8.1 **49 CFR Category:** Flammable gas
 8.2 **49 CFR Class:** 2.1
 8.3 **49 CFR Package Group:** Not pertinent.
 8.4 **Marine Pollutant:** No
 8.5 **NFPA Hazard Classification:**
- | Category | Classification |
|----------------------|----------------|
| Health Hazard (Blue) | 2 3 |
| Flammability (Red) | 4 4 |
| Instability (Yellow) | 3 3 |
- 8.6 **EPA Reportable Quantity:** Not listed.
 8.7 **EPA Pollution Category:** Not listed.
 8.8 **RCRA Waste Number:** Not listed
 8.9 **EPA FWPCA List:** Not listed

9. PHYSICAL & CHEMICAL PROPERTIES

- 9.1 **Physical State at 15° C and 1 atm:** Gas
 9.2 **Molecular Weight:** 100.0
 9.3 **Boiling Point at 1 atm:** -105°F = -76°C = 197°K
 9.4 **Freezing Point:** -224°F = -142°C = 131°K
 9.5 **Critical Temperature:** (est.) 92°F = 33°C = 306°K
 9.6 **Critical Pressure:** (est.) 573 psia = 38.9 atm = 3.95 MN/m²
 9.7 **Specific Gravity:** Not pertinent
 9.8 **Liquid Surface Tension:** Not pertinent
 9.9 **Liquid Water Interfacial Tension:** Not pertinent
 9.10 **Vapor (Gas) Specific Gravity:** 3.45
 9.11 **Ratio of Specific Heats of Vapor (Gas):** (est.) 1.1261
 9.12 **Latent Heat of Vaporization:** Not pertinent
 9.13 **Heat of Combustion:** (est.) -4,000 Btu/lb = -2,000 cal/g = -90 X 10³ J/kg
 9.14 **Heat of Decomposition:** Not pertinent
 9.15 **Heat of Solution:** Not pertinent
 9.16 **Heat of Polymerization:** -450 Btu/lb = -250 cal/g = -10.5 X 10³ J/kg
 9.17 **Heat of Fusion:** Currently not available
 9.18 **Limiting Value:** Currently not available
 9.19 **Reid Vapor Pressure:** Currently not available

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
	N O T P E R T I N E N T		N O T P E R T I N E N T		N O T P E R T I N E N T		N O T P E R T I N E N T

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
	I N S O L U B I L I T Y	-100	17.290	-100	0.44790	0	0.166
		-95	19.860	-95	0.50730	20	0.169
		-90	22.720	-90	0.57270	40	0.173
		-85	25.910	-85	0.64420	60	0.176
		-80	29.440	-80	0.72230	80	0.179
		-75	33.340	-75	0.80730	100	0.183
		-70	37.630	-70	0.89960	120	0.186
		-65	42.350	-65	0.99950	140	0.189
		-60	47.510	-60	1.10700	160	0.192
		-55	53.160	-55	1.22400	180	0.195
		-50	59.310	-50	1.34900	200	0.198
		-45	66.009	-45	1.48300	220	0.201
		-40	73.270	-40	1.62600	240	0.204
		-35	81.120	-35	1.78000	260	0.207
		-30	89.610	-30	1.94300	280	0.209
		-25	98.759	-25	2.11700	300	0.212
		-20	108.599	-20	2.30100	320	0.215
		-15	119.200	-15	2.49700	340	0.217
		-10	130.500	-10	2.70400	360	0.220
		-5	142.599	-5	2.92200	380	0.222
		0	155.599	0	3.15300	400	0.225
		5	169.400	5	3.39600	420	0.227
		10	184.099	10	3.65100	440	0.229
		15	199.699	15	3.91900		
		20	216.299	20	4.20000		
		25	233.799	25	4.49400		