

TRICRESYL PHOSPHATE (<1% ORTHO ISOMER)

TCP

CAUTIONARY RESPONSE INFORMATION				4. FIRE HAZARDS	7. SHIPPING INFORMATION
Common Synonyms TCP Tri-p-cresyl phosphate Tri-p-tolyl phosphate	Liquid	Colorless	Odorless	<p>4.1 Flash Point: 410°F C.C.</p> <p>4.2 Flammable Limits in Air: Currently not available</p> <p>4.3 Fire Extinguishing Agents: Foam, dry chemical, or carbon dioxide</p> <p>4.4 Fire Extinguishing Agents Not to Be Used: Water or foam may cause frothing.</p> <p>4.5 Special Hazards of Combustion Products: Not pertinent</p> <p>4.6 Behavior in Fire: Not pertinent</p> <p>4.7 Auto Ignition Temperature: Currently not available</p> <p>4.8 Electrical Hazards: Not pertinent</p> <p>4.9 Burning Rate: Currently not available</p> <p>4.10 Adiabatic Flame Temperature: Currently not available</p> <p>4.11 Stoichiometric Air to Fuel Ratio: 123.8 (calc.)</p> <p>4.12 Flame Temperature: Currently not available</p> <p>4.13 Combustion Molar Ratio (Reactant to Product): 32.0 (calc.)</p> <p>4.14 Minimum Oxygen Concentration for Combustion (MOCC): Not listed</p>	<p>7.1 Grades of Purity: Consists primarily of the para isomer, but several commercial grades may contain a significant proportion of tri-orthocresyl phosphate. Latter is considerably more toxic than the para-isomer if ingested.</p> <p>7.2 Storage Temperature: Ambient</p> <p>7.3 Inert Atmosphere: No requirement</p> <p>7.4 Venting: Open (flame arrester)</p> <p>7.5 IMO Pollution Category: A</p> <p>7.6 Ship Type: 1</p> <p>7.7 Barge Hull Type: Currently not available</p>
<p>Call fire department. Keep people away. Avoid contact with liquid and vapor. Notify local health and pollution control agencies. Protect water intakes.</p>				<p>8. HAZARD CLASSIFICATIONS</p> <p>8.1 49 CFR Category: Not listed</p> <p>8.2 49 CFR Class: Not pertinent</p> <p>8.3 49 CFR Package Group: Not listed.</p> <p>8.4 Marine Pollutant: Yes</p> <p>8.5 NFPA Hazard Classification: Not listed</p> <p>8.6 EPA Reportable Quantity: Not listed.</p> <p>8.7 EPA Pollution Category: Not listed.</p> <p>8.8 RCRA Waste Number: Not listed</p> <p>8.9 EPA FWPCA List: Not listed</p>	
Fire	<p>Combustible. Extinguish with dry chemical, foam, or carbon dioxide. Water may be ineffective on fire. Cool exposed containers with water.</p>				<p>9. PHYSICAL & CHEMICAL PROPERTIES</p> <p>9.1 Physical State at 15° C and 1 atm: Liquid</p> <p>9.2 Molecular Weight: 368</p> <p>9.3 Boiling Point at 1 atm: 770°F = 410°C = 683°K</p> <p>9.4 Freezing Point: -27°F = -33°C = 240°K</p> <p>9.5 Critical Temperature: Not pertinent</p> <p>9.6 Critical Pressure: Not pertinent</p> <p>9.7 Specific Gravity: 1.16 at 20°C (liquid)</p> <p>9.8 Liquid Surface Tension: 44 dynes/cm = 0.044 N/m at 25°C</p> <p>9.9 Liquid Water Interfacial Tension: Currently not available</p> <p>9.10 Vapor (Gas) Specific Gravity: Not pertinent</p> <p>9.11 Ratio of Specific Heats of Vapor (Gas): Not pertinent</p> <p>9.12 Latent Heat of Vaporization: (est.) 80.0 Btu/lb = 44.5 cal/g = 1.86 X 10⁵ J/kg</p> <p>9.13 Heat of Combustion: Not pertinent</p> <p>9.14 Heat of Decomposition: Not pertinent</p> <p>9.15 Heat of Solution: Not pertinent</p> <p>9.16 Heat of Polymerization: Not pertinent</p> <p>9.17 Heat of Fusion: Currently not available</p> <p>9.18 Limiting Value: Currently not available</p> <p>9.19 Reid Vapor Pressure: Currently not available</p>
Exposure	<p>LIQUID Harmful if swallowed. IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk.</p>				<p>5. CHEMICAL REACTIVITY</p> <p>5.1 Reactivity with Water: No reaction</p> <p>5.2 Reactivity with Common Materials: No reaction</p> <p>5.3 Stability During Transport: Stable</p> <p>5.4 Neutralizing Agents for Acids and Caustics: Not pertinent</p> <p>5.5 Polymerization: Not pertinent</p> <p>5.6 Inhibitor of Polymerization: Not pertinent</p>
Water Pollution	<p>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.</p>				<p>6. WATER POLLUTION</p> <p>6.1 Aquatic Toxicity: Currently not available</p> <p>6.2 Waterfowl Toxicity: Currently not available</p> <p>6.3 Biological Oxygen Demand (BOD): Currently not available</p> <p>6.4 Food Chain Concentration Potential: None</p> <p>6.5 GESAMP Hazard Profile: Bioaccumulation: + Damage to living resources: 4 Human Oral hazard: 1 Human Contact hazard: II Reduction of amenities: XXX</p>
1. CORRECTIVE RESPONSE ACTIONS	<p>Stop discharge Contain Collection Systems: Pump</p>				<p>NOTES</p>
2. CHEMICAL DESIGNATIONS	<p>2.1 CG Compatibility Group: Not listed.</p> <p>2.2 Formula: (p-C₆H₅C₆H₄O)₃PO</p> <p>2.3 IMO/UN Designation: Not listed</p> <p>2.4 DOT ID No.: Not listed.</p> <p>2.5 CAS Registry No.: 1330-78-5</p> <p>2.6 NAERG Guide No.: 151</p> <p>2.7 Standard Industrial Trade Classification: 51631</p>				
3. HEALTH HAZARDS	<p>3.1 Personal Protective Equipment: Goggles or face shield.</p> <p>3.2 Symptoms Following Exposure: Vapors may irritate eyes, but only at high temperatures. Ingestion of liquid may cause severe damage to central nervous system and death if significant amounts of the toxic ortho-isomer are present.</p> <p>3.3 Treatment of Exposure: INGESTION: induce vomiting and call a doctor. EYES: flush with water for at least 15 min. SKIN: wipe off, wash with soap and water.</p> <p>3.4 TLV-TWA: Not listed.</p> <p>3.5 TLV-STEL: Not listed.</p> <p>3.6 TLV-Ceiling: Not listed.</p> <p>3.7 Toxicity by Ingestion: Grade 2; LD₅₀ = 0.5 to 5 g/kg (chicken LD₅₀ > 2 g/kg)</p> <p>3.8 Toxicity by Inhalation: Currently not available.</p> <p>3.9 Chronic Toxicity: Currently not available</p> <p>3.10 Vapor (Gas) Irritancy Characteristics: Vapors cause a slight smarting of the eyes or respiratory system if present in high concentrations. The effect is temporary. The compound is non-volatile for all practical purposes.</p> <p>3.11 Liquid or Solid Characteristics: No appreciable hazard. Practically harmless to the skin.</p> <p>3.12 Odor Threshold: Odorless</p> <p>3.13 IDLH Value: Not listed.</p> <p>3.14 OSHA PEL-TWA: Not listed.</p> <p>3.15 OSHA PEL-STEL: Not listed.</p> <p>3.16 OSHA PEL-Ceiling: Not listed.</p> <p>3.17 EPA AEGL: Not listed</p>				

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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
34	73.589	42	0.380		N	70	102,200
36	73.520	44	0.380		O	72	94,740
38	73.450	46	0.380		T	74	87,919
40	73.379	48	0.380			76	81,629
42	73.309	50	0.380		P	78	75,839
44	73.240	52	0.380		E	80	70,490
46	73.169	54	0.380		R	82	65,559
48	73.099	56	0.380		T	84	61,010
50	73.030	58	0.380		I	86	56,800
52	72.969	60	0.380		N	88	52,910
54	72.900	62	0.380		E	90	49,310
56	72.830	64	0.380		N	92	45,580
58	72.759	66	0.380		T	94	42,900
60	72.690	68	0.380			96	40,040
62	72.620	70	0.380			98	37,390
64	72.549	72	0.380			100	34,940
66	72.480	74	0.380			102	32,660
68	72.410	76	0.380			104	30,540
70	72.339	78	0.380				
72	72.270	80	0.380				
74	72.200	82	0.380				
76	72.129	84	0.380				
		86	0.380				

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
77	0.000	310	0.019	310	0.00085		N
		320	0.026	320	0.00116		O
		330	0.036	330	0.00156		T
		340	0.049	340	0.00209		
		350	0.066	350	0.00278		P
		360	0.088	360	0.00366		E
		370	0.116	370	0.00479		R
		380	0.152	380	0.00623		T
		390	0.199	390	0.00803		I
		400	0.258	400	0.01030		N
		410	0.333	410	0.01312		O
		420	0.426	420	0.01661		T
		430	0.543	430	0.02092		
		440	0.687	440	0.02618		P
		450	0.865	450	0.03260		E
		460	1.083	460	0.04038		R
		470	1.349	470	0.04976		T
		480	1.673	480	0.06103		I
		490	2.064	490	0.07449		N
		500	2.534	500	0.09052		O
		510	3.098	510	0.10950		T
		520	3.770	520	0.13190		
		530	4.569	530	0.15830		P
		540	5.515	540	0.18910		E
		550	6.631	550	0.22510		R
		560	7.942	560	0.26700		T