

HYDROGEN PEROXIDE

HPO

CAUTIONARY RESPONSE INFORMATION			
Common Synonyms Albone Peroxide Superoxol	Watery liquid	Colorless	Slightly sharp odor Sinks and mixes with water. Irritating vapor is produced.
Evacuate. Keep people away. AVOID CONTACT WITH LIQUID AND VAPOR. Wear chemical protective suit including self-contained breathing apparatus. Call fire department. Notify local health and pollution control agencies. Protect water intakes.			
Fire	Not flammable. May cause fire and explode on contact with combustibles and metals. Containers may explode when heated. Wear chemical protective suit including self-contained breathing apparatus. Flood discharge area with water.		
Exposure	CALL FOR MEDICAL AID. VAPOR Irritating to eyes, nose and throat. Harmful if inhaled. 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	2. CHEMICAL DESIGNATIONS
Dilute and disperse Stop discharge	2.1 CG Compatibility Group: Not listed. 2.2 Formula: H ₂ O ₂ H ₂ O 2.3 IMO/UN Designation: 5.1/2015 2.4 DOT ID No.: 2015 2.5 CAS Registry No.: Currently not available 2.6 NAERG Guide No.: 143 2.7 Standard Industrial Trade Classification: 52491
3. HEALTH HAZARDS	
3.1 Personal Protective Equipment: Protective garments, both outer and inner, made of a woven polyester fabric or of modacrylic or polyvinylidene fabrics; impermeable apron made of polyvinyl chloride or polyethylene film; neoprene gloves and boots; goggles.	
3.2 Symptoms Following Exposure: Although solutions and vapors are nontoxic, they are irritating. Vapor causes discomfort of eyes and nose. Moderately concentrated liquid causes whitening of the skin and severe stinging sensation. In most cases the stinging subsides quickly and the skin gradually returns to normal without any damage. Highly concentrated liquid can cause blistering of skin if left on for any length of time; can also cause eye damage.	
3.3 Treatment of Exposure: Contact should be avoided, but immediate flushing with water will prevent any reaction in case of accidental contact.	
3.4 TLV-TWA: 1 ppm 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: None 3.10 Vapor (Gas) Irritant Characteristics: Vapors cause moderate irritation, such that personnel will find high concentrations unpleasant. The effect is temporary. 3.11 Liquid or Solid Characteristics: Fairly severe skin irritant. May cause pain and second-degree burns after a few minutes' contact. 3.12 Odor Threshold: Currently not available 3.13 IDLH Value: 75 ppm 3.14 OSHA PEL-TWA: 1 ppm 3.15 OSHA PEL-STEL: Not listed. 3.16 OSHA PEL-Ceiling: Not listed. 3.17 EPA AEGL: Not listed	3.5 GESAMP Hazard Profile: Bioaccumulation: 0 Damage to living resources: 2 Human Oral hazard: 0 Human Contact hazard: I Reduction of amenities: 0

4. FIRE HAZARDS		7. SHIPPING INFORMATION								
4.1 Flash Point:	Not flammable but may cause fire and react violently on contact with combustibles and metals.	7.1 Grades of Purity: Common commercial strengths are 27.5%, 35%, 50%, 70%, 90% and 98%. "High Strength" means greater than 52%. Purity: Technical; Mil. Spec.; ACS. The hazard increases with the strength.								
4.2 Flammable Limits in Air:	Not flammable.	7.2 Storage Temperature: Ambient								
4.3 Fire Extinguishing Agents:	Not pertinent	7.3 Inert Atmosphere: No requirement								
4.4 Fire Extinguishing Agents Not to Be Used:	Not pertinent	7.4 Venting: Safety relief or pressure-vacuum								
4.5 Special Hazards of Combustion Products:	Not pertinent	7.5 IMO Pollution Category: C								
4.6 Behavior in Fire:	May explode in fire	7.6 Ship Type: 2 or 3								
4.7 Auto Ignition Temperature:	Not flammable.	7.7 Barge Hull Type: Currently not available								
8. HAZARD CLASSIFICATIONS										
8.1 49 CFR Category:	Oxidizer									
8.2 49 CFR Class:	5.1									
8.3 49 CFR Package Group:	I									
8.4 Marine Pollutant:	No									
8.5 NFPA Hazard Classification:	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center; width: 15%;">Category</th><th style="text-align: center; width: 15%;">Classification</th></tr> </thead> <tbody> <tr> <td style="text-align: center;">Health Hazard (Blue).....</td><td style="text-align: center;">2</td></tr> <tr> <td style="text-align: center;">Flammability (Red).....</td><td style="text-align: center;">0</td></tr> <tr> <td style="text-align: center;">Instability (Yellow).....</td><td style="text-align: center;">3</td></tr> </tbody> </table>		Category	Classification	Health Hazard (Blue).....	2	Flammability (Red).....	0	Instability (Yellow).....	3
Category	Classification									
Health Hazard (Blue).....	2									
Flammability (Red).....	0									
Instability (Yellow).....	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:	Liquid									
9.2 Molecular Weight:	34.01									
9.3 Boiling Point at 1 atm:	257°F = 125°C = 398°K									
9.4 Freezing Point:	-40.5°F = 40.3°C = 232.9°K									
9.5 Critical Temperature:	Not pertinent									
9.6 Critical Pressure:	Not pertinent									
9.7 Specific Gravity:	1.29 at 20°C (liquid)									
9.8 Liquid Surface Tension:	Not pertinent									
9.9 Liquid Water Interfacial Tension:	Not pertinent									
9.10 Vapor (Gas) Specific Gravity:	Not pertinent									
9.11 Ratio of Specific Heats of Vapor (Gas):	1.241									
9.12 Latent Heat of Vaporization:	542 Btu/lb = 301 cal/g = 12.6 X 10 ³ J/kg									
9.13 Heat of Combustion:	Not pertinent									
9.14 Heat of Decomposition:	-1220 Btu/lb = -676 cal/g = -28.3 X 10 ³ J/kg									
9.15 Heat of Solution:	-20.2 Btu/lb = -11.2 cal/g = -4.469 X 10 ³ J/kg									
9.16 Heat of Polymerization:	Not pertinent									
9.17 Heat of Fusion:	8.58 cal/g									
9.18 Limiting Value:	Currently not available									
9.19 Reid Vapor Pressure:	Varies *Physical properties apply to 70% of solution.									

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
34	82.330	52	0.760		N		N
36	82.259	54	0.760		O		O
38	82.190	56	0.760		T		T
40	82.120	58	0.760		P		P
42	82.049	60	0.760		E		E
44	81.980	62	0.760		R		R
46	81.910	64	0.760		T		T
48	81.839	66	0.760		I		I
50	81.770	68	0.760		N		N
52	81.700	70	0.760		E		E
54	81.629	72	0.760		N		N
56	81.570	74	0.760		E		E
58	81.500	76	0.760		N		N
60	81.429	78	0.760		E		E
62	81.360	80	0.760		R		R
64	81.290	82	0.760		T		T
66	81.219	84	0.760		I		I
68	81.150	86	0.760		N		N
70	81.080				E		E
72	81.009				N		N
74	80.940				E		E
76	80.870				R		R
78	80.799				T		T
80	80.730				I		I
82	80.660				N		N
84	80.589				E		E

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
M	40	0.033	40	0.00021	0	0.285	
I	50	0.048	50	0.00030	25	0.291	
S	60	0.071	60	0.00043	50	0.297	
C	70	0.101	70	0.00060	75	0.302	
I	80	0.143	80	0.00084	100	0.308	
B	90	0.200	90	0.00115	125	0.314	
L	100	0.276	100	0.00156	150	0.319	
E	110	0.377	110	0.00209	175	0.324	
	120	0.509	120	0.00278	200	0.329	
	130	0.680	130	0.00365	225	0.334	
	140	0.900	140	0.00475	250	0.339	
	150	1.181	150	0.00613	275	0.343	
	160	1.535	160	0.00785	300	0.347	
	170	1.979	170	0.00996	325	0.352	
	180	2.532	180	0.01254	350	0.356	
	190	3.215	190	0.01568	375	0.360	
					400	0.363	
					425	0.367	
					450	0.371	
					475	0.374	
					500	0.377	
					525	0.380	
					550	0.383	
					575	0.386	
					600	0.388	