POLYMETHYLENE POLYPHENYL ISOCYANATE

PPI

CAUTIONARY RESPONSE INFORMATION

Common Synonyms			
PAPI	Liquid	Dark brown	Weak odor
	Sinks in water.		

KEEP PEOPLE AWAY. AVOID CONTACT WITH LIQUID AND VAPOR.
Call fire department.
Notify local health and pollution control agencies.
Protect water intakes.

Fire	Combustible. Containers may explode in fire. Extinguish with dry chemicals or carbon dioxide. Cool exposed containers with water.
Exposure	CALL FOR MEDICAL AID. LIQUID POISONOUS IF SWALLOWED. Irritating to skin and eyes. 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 and have victim induce vomiting. IF SWALLOWED and victim is UNCONSCIOUS OR HAVING CONVULSIONS, do nothing except keep victim warm.
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
Clean shore line

2. CHEMICAL DESIGNATIONS

2.1 CG Compatibility Group: 12; Isocyanate
2.2 Formula: $C_6H_4(NCO)CH_2C_6H_4(NCO)$-and polymer
2.3 IMO/UN Designation: Not listed
2.4 DOT ID No.: Not listed
2.5 CAS Registry No.: Currently not available
2.6 NAERG Guide No.: Not listed
2.7 Standard Industrial Trade Classification: 51489

3. HEALTH HAZARDS

3.1 Personal Protective Equipment: Air-line or organic canister mask; goggles or face shield; rubber gloves and other protective clothing to prevent contact with skin.
3.2 Symptoms Following Exposure: Inhalation causes breathlessness, chest discomfort, and reduced pulmonary function; wheezing, cough, and sputum may also occur. Contact with liquid irritates eyes and skin. Ingestion causes irritation of mouth and stomach.
3.3 Treatment of Exposure: Get medical attention at once following all exposures to this compound. INHALATION: remove victim to fresh air; give artificial respiration if breathing has stopped; oxygen can be given by qualified personnel. EYES: immediately wash with large amounts of water for at least 15 min. SKIN: flush immediately with water, wipe off, treat with 30% isopropyl alcohol (rubbing alcohol), and wash with soap and water. INGESTION: induce vomiting at least 3 times by giving warm salt water (one tablespoon of salt per cup); follow with a quart of milk and a mild carthartic such as milk of magnesia.
3.4 TLV-TWA: Not listed.
3.5 TLV-STEL: Not listed.
3.6 TLV-Ceiling: Not listed.
3.7 Toxicity by Ingestion: Grade 1; LD_{50} = 5 to 15 g/kg
3.8 Toxicity by Inhalation: Currently not available.
3.9 Chronic Toxicity: Currently not available
3.10 Vapor (Gas) Irritant Characteristics: Vapors are moderately irritating such that personnel will not usually tolerate moderate or high concentrations.
3.11 Liquid or Solid Characteristics: Causes smarting of the skin and first-degree burns on short exposure; may cause second-degree 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: 425°F O.C.
4.2 Flammable Limits in Air: Not pertinent
4.3 Fire Extinguishing Agents: Dry chemical or carbon dioxide
4.4 Fire Extinguishing Agents Not to Be Used: Not pertinent
4.5 Special Hazards of Combustion Products: Not pertinent
4.6 Behavior in Fire: Containers may explode.
4.7 Auto Ignition Temperature: Currently not available
4.8 Electrical Hazards: Not pertinent
4.9 Burning Rate: Currently not available
4.10 Adiabatic Flame Temperature: Currently not available
4.11 Stoichometric 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: Reacts slowly, forming heavy scum and liberating carbon dioxide gas. Dangerous pressure can build up if container is sealed.
5.2 Reactivity with Common Materials: No hazardous reaction unless confined and wet.
5.3 Stability During Transport: Stable if kept sealed and dry
5.4 Neutralizing Agents for Acids and Caustics: Not pertinent
5.5 Polymerization: Not pertinent
5.6 Inhibitor of Polymerization: Not pertinent

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: 0
Human Oral hazard: 0
Human Contact hazard: II
Reduction of amenities: XX

7. SHIPPING INFORMATION

7.1 Grades of Purity: 50% methylenebis-phenylisocyanate plus 50% polymer
7.2 Storage Temperature: 35–125°F
7.3 Inert Atmosphere: Low-pressure dry nitrogen
7.4 Venting: Safety relief
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: Not listed
8.2 49 CFR Class: Not pertinent
8.3 49 CFR Package Group: Not listed.
8.4 Marine Pollutant: No
8.5 NFPA Hazard Classification: Not listed
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: 400 (approx.)
9.3 Boiling Point at 1 atm: 392°F = 200°C = 473°K
9.4 Freezing Point: Not pertinent
9.5 Critical Temperature: Not pertinent
9.6 Critical Pressure: Not pertinent
9.7 Specific Gravity: 1.20 at 20°C (liquid)
9.8 Liquid Surface Tension: Currently not available
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): Not pertinent
9.12 Latent Heat of Vaporization: Not pertinent
9.13 Heat of Combustion: (est.) –13,000 Btu/lb = –7,200 cal/g = -300×10^5 J/kg
9.14 Heat of Decomposition: Not pertinent
9.15 Heat of Solution: Not pertinent
9.16 Heat of Polymerization: Not pertinent
9.17 Heat of Fusion: Currently not available
9.18 Limiting Value: Currently not available
9.19 Reid Vapor Pressure: Very low

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	76.089	51	0.400	52	1.048	33	4348.000
36	76.020	52	0.400	54	1.048	34	3918.000
38	75.950	53	0.400	56	1.048	35	3531.000
40	75.879	54	0.400	58	1.048	36	3184.000
42	75.809	55	0.400	60	1.048	37	2872.000
44	75.740	56	0.400	62	1.048	38	2592.000
46	75.669	57	0.400	64	1.048	39	2340.000
48	75.599	58	0.400	66	1.048	40	2113.000
50	75.530	59	0.400	68	1.048	41	1909.000
52	75.459	60	0.400	70	1.048	42	1726.000
54	75.389	61	0.400	72	1.048	43	1560.000
56	75.320	62	0.400	74	1.048	44	1412.000
58	75.250	63	0.400	76	1.048	45	1277.000
60	75.179	64	0.400	78	1.048	46	1157.000
62	75.110	65	0.400	80	1.048	47	1047.000
64	75.049	66	0.400	82	1.048	48	949.000
66	74.980	67	0.400	84	1.048	49	860.199
68	74.910	68	0.400	86	1.048	50	780.000
70	74.839	69	0.400			51	707.500
72	74.770	70	0.400			52	642.000
74	74.700	71	0.400			53	582.799
76	74.629	72	0.400			54	529.299
78	74.559	73	0.400			55	480.799
80	74.490	74	0.400			56	437.000
82	74.419	75	0.400			57	397.299
84	74.349	76	0.400			58	361.299

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	60	0.000	60	0.00000		N
	N	70	0.000	70	0.00000		O
	S	80	0.000	80	0.00000		T
	O	90	0.000	90	0.00000		
	L	100	0.000	100	0.00000		P
	U	110	0.000	110	0.00000		E
	B	120	0.000	120	0.00000		R
	L	130	0.000	130	0.00000		T
	E	140	0.000	140	0.00000		I
		150	0.000	150	0.00000		N
		160	0.000	160	0.00000		E
		170	0.000	170	0.00000		N
		180	0.000	180	0.00000		T
	R	190	0.000	190	0.00000		
	E	200	0.000	200	0.00000		
	A	210	0.000	210	0.00000		
	C						
	T						
	S						