ENDOSULFAN

ESF

CAUTIONARY RESPONSE INFORMATION

Common Synonyms			
Chlorthepin Cyclodan Malix Thiodan	Solid crystals or solution Sinks in water.	Brown	Sulfur dioxide

KEEP PEOPLE AWAY. AVOID CONTACT WITH LIQUID AND SOLID.
Avoid inhalation.
Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves).
Notify local health and pollution control agencies.
Protect water intakes.

Fire

Fire data not available for solid, but usually it is dissolved in a combustible liquid.
POISONOUS GASES MAY BE PRODUCED IN FIRE.
Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves).

Exposure

CALL FOR MEDICAL AID.

SOLID OR SOLUTION
POISONOUS IF SWALLOWED OR IF SKIN IS EXPOSED.
Irritating to skin.
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

HARMFUL TO AQUATIC LIFE IN LOW CONCENTRATIONS.
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
Contain
Do not burn

2. CHEMICAL DESIGNATIONS

2.1 CG Compatibility Group: Not listed.
2.2 Formula: $C_9H_6Cl_6O_3S$
2.3 IMO/UN Designation: 6.1/2761
2.4 DOT ID No.: 2761
2.5 CAS Registry No.: 115-29-7
2.6 NAERG Guide No.: 151
2.7 Standard Industrial Trade Classification: 51549

3. HEALTH HAZARDS

3.1 Personal Protective Equipment: Rubber gloves, mask, or respirator.
3.2 Symptoms Following Exposure: Ingestion, inhalation, and skin absorption will induce headache, dizziness, nausea, and vomiting. CNS symptoms: hyperirritability, convulsions, and/or coma. SKIN: In solution in oily media, surfactants, or emulsifiers, may result in skin irritation.
3.3 Treatment of Exposure: Call a doctor. EYES: Wash with water for at least 15 minutes. SKIN: Wash with soap and water. INGESTION: Remove by administration of syrup of ipecac, gastric lavage, and salt-based cathartics. OTHER: Get medical attention. For CNS symptoms phenobarbital may be used.
3.4 TLV-TWA: 0.1 mg/m^3
3.5 TLV-STEL: Not listed.
3.6 TLV-Ceiling: Not listed.
3.7 Toxicity by Ingestion: Grade 4; LD_{50} <50 mg/kg.
3.8 Toxicity by Inhalation: Currently not available.
3.9 Chronic Toxicity: Occasional epileptiform convulsions of grand mal or petit mal type have occurred in workers from skin absorption. Neoplastic effects have been reported.
3.10 Vapor (Gas) Irritant Characteristics: Currently not available
3.11 Liquid or Solid Characteristics: As a solution incorporated in oily media or with surfactants or emulsifiers. Minimum hazard. If spilled on clothing and allowed to remain may cause smarting and reddening of skin.
3.12 Odor Threshold: Currently not available
3.13 IDLH Value: Not listed.
3.14 OSHA PEL-TWA: 0.1 mg/m^3
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: Currently not available
4.2 Flammable Limits in Air: Currently not available
4.3 Fire Extinguishing Agents: Currently not available
4.4 Fire Extinguishing Agents Not to Be Used: Currently not available
4.5 Special Hazards of Combustion Products: Currently not available
4.6 Behavior in Fire: Decomposes to liberate SO_2
4.7 Auto Ignition Temperature: Currently not available
4.8 Electrical Hazards: Currently not available
4.9 Burning Rate: Currently not available
4.10 Adiabatic Flame Temperature: Currently not available
4.11 Stoichometric Air to Fuel Ratio: 40.5 (calc.)
4.12 Flame Temperature: Currently not available
4.13 Combustion Molar Ratio (Reactant to Product): 16.0 (calc.)
4.14 Minimum Oxygen Concentration for Combustion (MOCC): Not listed

5. CHEMICAL REACTIVITY

5.1 Reactivity with Water: Slowly hydrolyzes to give SO_2. Hydrolyzes more rapidly under alkaline conditions.
5.2 Reactivity with Common Materials: No reaction
5.3 Stability During Transport: Stable when dry.
5.4 Neutralizing Agents for Acids and Caustics: Currently not available
5.5 Polymerization: Currently not available
5.6 Inhibitor of Polymerization: Currently not available

6. WATER POLLUTION

6.1 Aquatic Toxicity:
0.0033 and 0.0037 ppm/96-hour/LC_{50}/Fathead minnows and guppy/fresh water
0.013 to 0.0032 ppm/24-hour/LC_{50}/Rainbow trout/fresh water
0.03 to 1.0 ppm/48-hour/LC_{50}/Pogge/salt water
6.2 Waterfowl Toxicity: Oral - LD_{50}, young mallards = 33 mg/kg
Oral - Mallards LD_{50} (5-day) = 900 to 1100 ppm
6.3 Biological Oxygen Demand (BOD): Currently not available
6.4 Food Chain Concentration Potential: Will occur
6.5 GESAMP Hazard Profile:
Bioaccumulation: +
Damage to living resources: 4
Human Oral hazard: 4
Human Contact hazard: II
Reduction of amenities: XXX

7. SHIPPING INFORMATION

7.1 Grades of Purity: 35%, 50% (wettable powders); 17.5%, 35%, 50% (emulsifiable concen- trates); 2 lb/gal; 1%, 2%, 3%, 4%, 5%, and 6% (dusts)
7.2 Storage Temperature: >20°F (miscible)
7.3 Inert Atmosphere: Currently not available
7.4 Venting: Currently not available
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: Poison
8.2 49 CFR Class: 6.1
8.3 49 CFR Package Group: II
8.4 Marine Pollutant: Yes
8.5 NFPA Hazard Classification: Not listed
8.6 EPA Reportable Quantity: 1 pound
8.7 EPA Pollution Category: X
8.8 RCRA Waste Number: P050
8.9 EPA FWPCA List: Yes

9. PHYSICAL & CHEMICAL PROPERTIES

9.1 Physical State at 15° C and 1 atm: Solid
9.2 Molecular Weight: 406.95
9.3 Boiling Point at 1 atm: Currently not available
9.4 Freezing Point: Technical grade: 158° to 212°F = 70° to 100°C = 343.2 to 373.2°K Pure para isomer: 222.8° to 226.4°F = 106° to 108°C = 379.2° to 381.2°K Pure ortho isomer: 406.4° to 410°F = 208° to 210°C = 481.2° to 483.2°K
9.5 Critical Temperature: Currently not available
9.6 Critical Pressure: Currently not available
9.7 Specific Gravity: 1.745 at 20°C
9.8 Liquid Surface Tension: Not pertinent
9.9 Liquid Water Interfacial Tension: Not pertinent
9.10 Vapor (Gas) Specific Gravity: 14.0
9.11 Ratio of Specific Heats of Vapor (Gas): Currently not available
9.12 Latent Heat of Vaporization: Currently not available
9.13 Heat of Combustion: Currently not available
9.14 Heat of Decomposition: Currently not available
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: 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
	NOT PERTINENT		NOT PERTINENT		NOT PERTINENT		NOT PERTINENT

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
	INSOLUBLE	167	0.000		CURRENTLY NOT AVAILABLE		CURRENTLY NOT AVAILABLE