

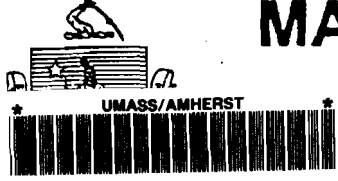
MASS. MA13.2: M41/PCB/976

MATERIAL SAFETY DATA SHEET

GOVERNMENT DOCUMENTS
COLLECTION

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The Commonwealth of Massachusetts

Department of Labor and Industries

Division of Occupational Hygiene

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Substance:

POLYCHLORINATED BIPHENYLS (PCBs)

Date Compiled/Revised 1/86

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SECTION I ***** SUBSTANCE IDENTIFICATION *****

Substance name: Polychlorinated Biphenyls (PCBs)
CAS #: 1336-36-3
Other names on the Massachusetts Substance List: Chlorodiphenyl (42% chlorine) (CAS #: 53469-21-9)
Chlorodiphenyl (54% chlorine) (CAS #: 11097-69-1)

PCBs are a mixture of biphenyls which have varying amounts of chlorine (commonly 42% and 54%).

SECTION II ***** PHYSICAL DATA *****

Appearance: There are several forms of PCBs including: a clear, colorless oily liquid, a light to dark yellow resin or wax and a white or yellow powder.

Boiling Point: 325 - 390C (617 - 734F)
Melting Point: -19 - +10C (-2 - +50F)
Vapor Pressure: .001 - .00006 mmHg
Solubility in H₂O: Insoluble
Specific Gravity: 1.35 - 1.5
Vapor Density: 8.9 - 11.2 (air = 1)
Evaporation Rate: much less than 1 (Butyl Acetate = 1)
Solvent Solubility: Soluble in most common organic solvents.

SECTION III ***** HEALTH HAZARD INFORMATION *****

PCBs are readily absorbed into the body by all routes of exposure, and only slowly eliminated because they are stored in fat tissue. Because PCBs persist in the body for long periods of time, a short term exposure may not only cause immediate health effects, but may contribute to long-term health effects as well.

Since PCBs are secreted in mothers' milk, heavily exposed mothers should consult with their physician as to whether or not to breastfeed. Because PCBs can adversely affect the skin and liver, persons with skin diseases or chronic liver diseases may be at an increased risk of adverse health effects due to PCB exposure.

SECTION III ***** HEALTH HAZARD INFORMATION (cont.) *****

Acute (Short-term) Health Effects

INHALATION: Because of the low vapor pressure, inhalation is not usually a primary hazard unless mists are generated, or unless PCBs are burned or brought in contact with incompatible substances resulting in the generation of toxic/irritating fumes (See Section VII, Storage and Reactivity Information).

Inhalation of PCBs may cause dry, sore throat, coughing, headache, fatigue, nausea, and abdominal pain. High exposure can cause liver damage and jaundice. PCB exposure of pregnant women may produce mutagenic and teratogenic effects (birth defects) in the unborn.

SKIN: Contact with skin may produce a rash, especially in sensitive individuals, and may cause a severe form of acne called "chloracne". PCBs can remove natural fats and oils from skin which may cause drying and cracking.

EYE: There may be a burning sensation, redness and swelling of the eyelids.

INGESTION: Can cause nausea, vomiting, abdominal pain, increased eye discharge, swelling of the upper eyelids, chloracne, pigmentation of the skin, liver damage and jaundice, numbness in the limbs, muscle spasms, and hearing and vision problems.

Chronic (Long-term) Health Effects

Similar health effects can result from long term exposure by inhalation, skin absorption or ingestion. Such health effects include headache, abdominal pain, coughing with sputum expectoration, fatigue, anorexia, numbness of the limbs, swelling of the eyelids, chloracne, pigmentation of the skin, liver damage, jaundice and visual disturbances.

PCBs are considered to be potential human carcinogens based on results in animal studies. Furthermore, chronic skin contact with PCBs has been associated with a higher incidence of skin cancer in humans.

Animal studies have shown that PCB's cause reproductive problems. PCB's are also considered to be potential human reproductive toxins. One incident involving mothers who had ingested PCB's contaminated with other chemical toxins resulted in birth defects in their offspring.

Occupational Exposure Limits:

OSHA Standard PEL

8 hour TWA* exposure	1.0 mg/M ³ skin** (42% chlorine)
8 hour TWA* exposure	0.5 mg/M ³ skin** (54% chlorine)

SECTION III ***** HEALTH HAZARD INFORMATION (cont.) *****ACGIH Recommended Limit

8 hour TWA* exposure	1.0 mg/M ³ skin** (42% chlorine)
STEL***Short Term Exposure Limit	2.0 mg/M ³ (42% chlorine)
8 hour TWA* exposure	0.5 mg/M ³ skin** (54% chlorine)
STEL***Short Term Exposure Limit	1.0 mg/M ³ (54% chlorine)

NIOSH Recommended Limit

10 hour TWA* exposure/day/ 40 hour week	0.001 mg/M ³
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- * Time Weighted Average
- ** Skin absorption of this material may add to the overall exposure. Avoid skin contact.
- *** Short term exposure is defined as a 15 minute time weighted average, that should not be exceeded even if the 8 hour TWA is within the T.L.V.

SECTION IV ***** EMERGENCY and FIRST AID INFORMATION *****

When exposure to PCBs has occurred, the primary objective is to minimize absorption into the blood stream. In the case of inhalation, the affected individual should be moved to fresh air. If skin exposure occurs, immediately remove contaminated clothing, blot remaining material with paper towels and thoroughly wash affected skin area with soap and water. Affected eyes should be thoroughly flushed with water, and petroleum based ophthalmic ointment may be applied to eye. If PCBs are ingested CONSULT A PHYSICIAN. (Note to physician: Remove ingested PCBs by gastric lavage or emesis. Maintain blood pressure and airway. Give oxygen if respiration is depressed. Treat for liver damage.)

Medical attention should be sought especially if ingestion has occurred, or if the individual experiences persistent irritation of affected areas.

SECTION V ***** PROTECTIVE MEASURES *****

Exposure should be minimized to the lowest possible levels by stringent engineering controls. Protective clothing or respiratory equipment should not be used as substitutes for proper work practices.

Engineering Controls: Enclosure of as much as possible of the manufacturing process and an effective local exhaust system are essential for adequate control. Operations using PCBs should be isolated from other work area. Sinks, showers, and eyewash stations should be readily available.

Protective Clothing: To be used in addition to proper engineering controls but not as a substitute. Gloves and aprons made of neoprene, viton or polyethylene are suitable. Chemical safety goggles, face shields with goggles or safety glasses with side shields should be worn to protect eyes.

SECTION V *** PROTECTIVE MEASURES (cont.) *******

Respiratory Protective Equipment: A supplied-air respirator with full facepiece, helmet or hood or a self-contained breathing apparatus with a full facepiece can be used for levels up to 5 mg/M³. At levels above 5 mg/M³, use a Type C supplied-air respirator with a full facepiece operated in pressure-demand or other positive pressure mode, or with a full facepiece helmet, or hood operated in continuous-flow mode. For escape from a contaminated area, a self-contained breathing apparatus or a gas mask with a pesticide canister can be used. For firefighting, use a self-contained breathing apparatus with a full facepiece operated in pressure-demand or other positive pressure mode.

Precautions that should be taken when repairing PCB containing equipment are to avoid any skin contact by wearing gloves and prevent generation and inhalation of mists. If mist formation is unavoidable a respirator should be worn.

SECTION VI *** FIRE and EXPLOSION INFORMATION *******

Flammability: Non-flammable

Flash Point: 176C (349F) - 222C (432F)

Because the flash point is above 37.7C (100F), the National Fire Protection Association classifies this substance as NON-FLAMMABLE, but in a fire situation, PCBs can ignite and/or release toxic decomposition products (See Section VII, Storage and Reactivity Information).

Autoignition Temperature: None up to boiling point

Flammable limits in air, % by volume: Not available

Extinguishant: If PCBs are involved in a fire situation, use water spray or foam, dry chemical or carbon dioxide to extinguish. For larger fires, use water spray, fog or alcohol foam.

Firefighting: Move container from fire area if possible. Do not scatter spilled material with more water than needed for fire control. Dike fire control water for later disposal. (See Section V, Protective Measures)

SECTION VII *** STORAGE and REACTIVITY INFORMATION *******

Storage: Store in a tightly closed container with EPA approved labeling. Do not store with strong oxidizing agents (chlorine, strong acids, etc).

Reactivity: PCBs are nearly inert (very stable) materials with very high chemical and heat stability, however certain conditions should be avoided.

Conditions to avoid: Extreme heat, contact with strong oxidizers such as chlorine, iodine, hydrochloric acid, sulfuric acid, potassium dichromate, nitric acid, perchloric acid, potassium iodate, potassium permanganate, and others.

SECTION VII ***** STORAGE and REACTIVITY INFORMATION (cont.) *****

When PCBs come into contact with a hot surface or flame, thermal decomposition products, such as toxic and/or corrosive vapors of hydrogen chloride, chlorine, carbon monoxide, phenols, aldehydes, and others, may be released.

When PCBs come into contact with strong oxidizers, fire and/or explosion may occur, and hazardous decomposition products may be released.

Other Precautions: PCBs will attack certain plastics, rubber and other coatings, and cause corrosive damage.

SECTION VIII ***** SPILL, LEAK and DISPOSAL PROCEDURES *****

For Occupational Spill: Do not touch spilled material. Stop leak if you can do it without risk of exposure. For small spills, take up with sand or other absorbent material and place into containers for later disposal. For small dry spills, with a shovel place material into clean, dry container and cover. Move containers from spill area. For larger spills, dike far ahead of spill for later disposal. Wear proper personal protective equipment when cleaning up a spill.

For proper disposal information, contact the Massachusetts Department of Environmental Quality Engineering (D.E.Q.E.).

SECTION IX ***** ADDITIONAL INFORMATION *****

Other Synonyms and Trade Names:

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|-------------------------|--------------------|
| Aroclor | Clorextol |
| Asbestol | Inerteen |
| Askarel | Kaneclor |
| Chemko | No-Flamol |
| Chlorinated Biphenyl | Phenoclor |
| Chlorinated Biphenyls | Polychlorobiphenyl |
| Chlorinated Diphenyl | Pyralene |
| Chlorinated Diphenylene | Pyranol |
| Chloro biphenyl | Saf-Ti-Kuhl |
| Chloro 1, 1, biphenyl | Santotherm |
| Clophen | Therminol |

Uses of PCBs: The main properties of PCBs that account for their use in a variety of applications are: low solubility in water, good electric insulating properties, chemical stability, heat stability and flame resistance. The most common uses of PCBs are as electric insulators and heat transfer fluids. Therefore, PCBs are used widely in electrical transformers, capacitors, fluorescent light ballasts and heat transfer systems.

PCBs have also been used as components of hydraulic fluids, lubricating oils, wood preservatives, paints, printing inks, cutting oils, fire retardents and various other products.