

The purpose of this fact sheet is to provide some basic information on polychlorinated biphenyls (PCBs) and guidelines for handling PCBs in fluorescent light fixtures. Though the precautionary actions described in this fact sheet may seem extreme, or suggest to some that cleanup of a small PCB spill is personally hazardous, this is not generally so. For example, if you should get a small amount of PCB on your skin during cleanup, it is highly unlikely that you would be harmed. However, given the nature of PCBs and the fact that much is still unknown about the effects of minor exposure, no absolute guarantees or reassurances can be given. For that reason, EPA has chosen to describe a conservative approach which minimizes personal hazard. It is EPA's hope that this information will inform you rather than alarm you.

What are PCBs

PCBs belong to a broad family organic chemicals known as chlorinated hydrocarbons. These are produced by the combination of one or more chlorine atoms and a biphenyl molecule. PCBs range in consistency from heavy oil liquids to waxy solids. Prior to 1979, PCBs were widely used in electrical equipment such as transformers, capacitors, switches and voltage regulators for their "cooling" properties because they do not readily burn or conduct electricity, and only boil at high temperatures. Also, PCBs do not readily react with other chemicals. They were also used in mining equipment, heat transfer and hydraulic systems, carbonless copy paper, pigments and microscopy mounting media.

How Does EPA Regulate PCBs?

EPA regulates PCBs through rules issued pursuant to the Toxic Substances Control Act of 1976. These regulations generally control the use, making, storage, records and disposal of PCBs. There are millions of pieces of equipment in operation in the U.S. which were manufactured prior to these regulations and which contain PCBs.

Small Capacitors in Fluorescent Light Ballast's and Cause for Failure

Light ballast's are the primary electric components of fluorescent light fixtures and are generally located within the fixture under a metal cover plate. The ballast units are generally composed of a transformer to reduce the incoming voltage, a small capacitor (which may contain PCBs) and possibly a thermal cut-off switch and/or safety fuse. These components are surrounded by a tarlike substance that is designed to muffle the noise that is inherent in the operation of the ballast. This substance covers the small capacitor. When a ballast unit fails, excessive heat can be generated which will melt or burn the tar material, creating a characteristic foul odor.



Small Capacitors in Fluorescent Light Ballast's and Cause for Failure (continued)

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In considering causes of ballast failure, some privately conducted tests have indicated that operation of power saving lamps with a standard ballast or standard lamps with a power-saving ballast tends to significantly increase the ballast operating temperature and decrease its normal life span. It appears that ballast's will fail less frequently if standard lamps are used only with standard bulbs and power-saving lamps with power-saving ballast's. Fluorescent lamps should be changed in pairs: new lamps should not be used with old lamps.

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Does Your Fluorescent Light Ballast Contain PCBs

Before EPA banned the manufacturing of **PCBs** in 1978, **PCBs** were used in the manufacturing of fluorescent light ballast's. The use of **PCBs** in ballast's manufactured prior to 1978 is not regulated by EPA. All light ballast's manufactured since 1978 which do not contain **PCBs** should be marked by the manufacturer with the statement "No **PCBs**." **For those ballast's manufactures prior to 1978, or for those ballast's which contain no statement regarding PCB content, you should assume that they do contain PCBs.**

If the ballast does contain **PCBs**, they are located inside the small capacitor. These would be approximately 1 to 1 1/2 ounces of PCB fluid in the capacitor itself. If the ballast fails, the capacitor may break open, allowing the PCB oil to drip out of the fixture. The capacitor does not always leak when the ballast fails, but when it does happen, measures should be taken to limit or avoid personal exposure.

What Should I Do if My Light Ballast Leaks

EPA has these recommendations for anyone with fluorescent light ballast leaking **PCBs**:

1. Vacate the room or area immediately and open any windows to ventilate the room to the outside. If the incident occurred in a room which cannot be vented, the person replacing the failed ballast and cleaning up can reduce exposure by wearing a chemical cartridge respirator equipped with an organic vapor cartridge.
2. Turn off the light fixture at the switch and disconnect electricity at the fuse or breaker box. Let the ballast cool for 20-30 minutes before proceeding.

If the room is fully ventilated, the amount of PCB contaminated particulate matter in the air should decrease significantly enough to make negligible and risk from breathing.

3. Wear rubber gloves that will not absorb **PCBs** (e.g. neoprene, butyl, or nitrile). Further, if you will be working directly under the fixture, consider using additional protective gear such as goggles (or a face shield) and rubber apron to help guard against possible exposure from further leaking or cleanup activities. Exercise caution to avoid personal contamination's (e.g. from touching your face with a contaminated glove).

During the cleanup or removal period, smoking should be prohibited in the area because smoking increases the inhalation rate of contaminated air. In addition, you may be using a flammable solvent in the cleanup.

4. Remove the fluorescent lamp.

5. Recheck that the power is off at the fuse or breaker box. Remove the metal cover over the wiring and ballast unit, loosen the ballast unit by taking out the metal screws which hold it to the end of the fixture; cut the electrical wires going to the ballast and remove the ballast. Note: Wire connectors can be used when installing new ballast.
6. Proceed to clean up leaks using the following guidelines:

PCBs that leak onto nonabsorbent surfaces such as table tops and uncarpeted floors should first be cleaned up by wiping with a rag or paper towel or by scraping with a putty knife if hardened. Avoid smearing the PCB around. This would only contaminate a larger area. Surfaces should then be thoroughly cleaned twice using an appropriate solvent or detergent. Only certain solvents are effective in cleaning up spilled **PCBs**. These include mineral spirits, deodorized kerosene, turpentine and rubbing alcohol. Certain detergents containing trisodium phosphate (such as "Soilex" or "Spic 'n Span") may be used. However, they should be used only at full strength and applied with a damp rag rather than diluted in a bucket. That solution would become contaminated and cannot be legally disposed of in the sewer system. Some of the other effective detergent products (which are commercially available) include "Triton X-1 00" (Rohm-Hass), "Sterox" (Monsanto), and "Power Cleaner 155" (Penetone Corp.). EPA does not endorse these particular products. Other effective products may also be available.

For leaks onto absorbent material such as drapes and carpets, there is no reliable way to clean and decontaminate the material. In the case of rugs and fabrics, the material should be cut away in a six-inch radius around the contaminated point(s). In areas where foot traffic has spread contamination the entire carpet should be disposed of. Proper disposal procedures for all such materials are described in the following section. Associated surfaces, such as flooring under contaminated carpeting, should be thoroughly cleaned with a solvent or detergent as previously described.

7. Contaminated materials (ballast's, rags, contaminated clothing, gloves, drapes, carpets, etc) should be packed into crumpled newspapers or other sorbent materials (sawdust, kitty litter, vermiculite, soil, etc.) and placed in a double thickness plastic bag. After containing the **PCBs**, a disposal facility should be contacted for pickup, manifesting and shipment. The PCB materials will be packed in a drum approved for **PCBs** by the Department of Transportation and finally disposed of at an EPA approved site.

(One might consider discarding the entire light fixture instead of decontaminating the unit. This would eliminate the chance of skin coming into direct contact with the **PCBs** while cleaning inside the light fixture.)

When you are completely through with the cleanup process, and contaminated materials and protective clothing have been packed for disposal, you should wash your hands thoroughly with detergent. Continue to ventilate the room for 24 hours before reuse.

How to Get Rid of Your **PCBs**

Arrangements must be made with a facility for the pick-up, manifesting and shipment of ballast's, PCB-soiled items or fluorescent fixtures containing **PCBs**, to an EPA approved chemical waste processing site. These firms will also perform minor PCB spill cleanups and arrange for the removal of PCB capacitors. If you don't find a nearby facility, please check the telephone yellow pages under waste disposal. If you have further questions, please call EPA's regional office in Chicago at 312/886-6832, Toxic Program Section.

Non-leaking small PCB capacitors (lighting ballast's) are not required to be incinerated. They should be placed in a U.S. DOT approved drum with adequate absorbent, and disposal of in an approved landfill unless regulated under N.R.E.P.A. 451 PA 1994: Part 111 (hazardous waste regulations). NOTE: **PCB's** are not regulated as hazardous waste, however there may be other components in the ballast which would cause it to test out as a hazardous waste.

* this fact sheet has been duplicated and updated from a prior EPA publication

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