

ENVIRONMENTAL GUIDELINES
FOR SOUND DISPOSAL MANAGEMENT OF
MERCURY IN COMPACT FLOURESCENT LIGHT
BULBS (CFL's)



Ministry of Environment,
Government of Pakistan

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NO. F. 1(3)/2010-Pak-EPA-Dir (PEPC) – In exercise of the powers conferred by section 2 (XVIII) & (XXXIII), 5 (1) (a), (c) & (1), 14, 33, (2) (b) of Pakistan Environmental Protection Act, 1997 (XXXIV of 1997), the Pakistan Environmental Protection Agency, with the approval of the Federal Government, is pleased to notify the following guidelines for proper management of CFLs disposal in accordance with the best practices in vogue to prevent environmental hazards:

PREMBLE

Currently Pakistan is facing energy crisis and at the same time the energy cost is too high. To overcome this situation and to give relieve to common man, effort has been made to introduce Compact Fluorescent Lamp (CFL) accessible.

CFLs also known as energy saving lights, produce light differently and use 20-33% less energy than incandescent lights (normal bulbs). Average life span of CFLs is between 8-15 times more than of incandescent light.

Pakistan intends to move from incandescent lamp to CFL which is more energy efficient and durable. Little more energy is enough for CFLs to turn on but once electricity start flowing they use 75 % less energy than incandescent light bulbs. As they produce 75% less heat so it also cuts energy cost associated with cooling appliances. Following are the types of CFLs:

- (i) Compact Fluorescent Light bulbs (CFLs)
- (ii) Fluorescent Tube Lamps (FTL)
- (iii) Neon Lamps (some use mercury and phosphor powder)
- (iv) High Intensity Discharge (HID) Lamps, including Mercury Vapors, Metal halide and High Pressure Sodium
- (v) Ultraviolet bulbs (often use to disinfect drinking water)

Promotion of CFL in the country will not only have a positive impact on reducing energy cost but also will lead the country towards low carbon economy as is being promoted under United Nation Framework Convention on Climate Change (UNFCCC).

However, CFL contains high volume of Mercury (Hg) vapors which when released in atmosphere have serious environmental and health hazardous. Pakistan is reported to be one of the countries in South Asian region having higher concentration of Hg in air, water and soil, which enters in the food chain and adversely affects the human beings and other living creatures.

To avoid further deterioration on account of health and environmental issues and to provide CFLs to common man, environmental guidelines for sound disposal of CFL has been prepared. It is prudent for all relevant government institutions, departments, regulators, suppliers and manufactures to ensure extensive dissemination of these guidelines in national and regional languages up to the level of union council and town committees.

NOW THEREFORE the Government of Pakistan is pleased to accord approval to the "Guidelines for Disposal of Mercury Compact Fluorescent Lamps (CFL's)" as set out hereinafter :-

1. **Short Title and Commencement:**

- a) These Guidelines shall be called "Guidelines for Disposal of Mercury Compact Fluorescent Lamps (CFL's)".
- b) These Guidelines shall come in force at once.

2. **Definitions:** - In these Guidelines, unless there is anything repugnant to the subject or context :-

- a) "CFLs" shall mean Compact Fluorescent Light Bulbs containing mercury
- b) "Mercury" shall mean mercury which is a neurotoxicant and a chemical element with the symbol "Hg" and atomic number 80 which is used in CFLs approximately 3-4 mg per bulb.
- c) "Manufacturer" shall mean manufacturer of CFLs and shall include supplier, trader, retailers and importer thereof
- d) "EPA" shall mean the Environmental Protection Agency, whether at Federal or Provincial Level.

3. **Handling of Discarded CFLs** --- The local area authorities carrying out municipal functions must install CFLs collection points so as to ensure that the CFLs are separated from the rest of household waste. These Collection Points should be installed in central locations such as local retail shops, post office, bus stop etc so as to ensure that it is convenient for the consumers to return their expired CFLs. The drop-off containers should be positioned in a prominent and easily accessible location that is clearly marked. These collection points should preferably only accept intact CFLs and no breakage should occur during the drop-off or temporary storage process.

4. **Handling at Consumer Level** --- In case of breakage CFLs should be handled carefully, adopting following precautionary measures: -

- a) Evacuate the room instantly as the breakage occurs
- b) Put on rubber gloves, masks, old clothes and remove jewelry during handling to avoid touch and inhalation of mercuric vapors
- c) Vacuum cleaner must be avoided because it would extend the contamination to the other rooms in the house when used again
- d) Must be cleaned with broom or a brush
- e) Seal the debris of broken CFLs in plastic bags to avoid further damage
- f) Place it in a municipal recycling bins that are clearly marked and easily accessible
- g) Plastic containers should be preferred
- h) Segregation of waste must be done at point of generation
- i) CFLs must be replaced when discoloration, distortion, odor, smoke or flames occur
- j) Used CFLs must be returned to retail centers that are authorized by manufacturers

5. **Handling at Manufacturer Level** -- It shall be deemed as corporate social responsibility (CSR) of the manufacturer of CFLs to draw up environmentally safe life cycle for the same and dispose them off by way of environmental friendly mechanism and in consonance with the following guidelines:-

- a) Spoiled CFLs when replaced should be returned to the designated retail centers under an incentive system so that customer's interest may be generated
- b) Used CFLs must be stored in containers not having hard bottom, plastic containers should be preferred to avoid any breakage
- c) Transport CFLs carefully in the recycling units to avoid any damage
- d) The Manufacture shall ensure that proper certified disposal facilities/contractors are available in market.
- e) Appropriate crushing should be done under vacuum extraction which is followed by segregation of glass, phosphor powder and liquid/vaporized mercury.
- f) Mercury vapors are collected and absorbed on an activated carbon pad.

6. **Disposal:**

i. Unacceptable Disposal Options -- The following disposal methods for CFLs are not considered acceptable:

- i. Uncontrolled crushing or breaking of fluorescent lamps
- ii. Incineration - releases the mercury emissions.

ii. Accountable modes of Disposal - The following methods for CFLs disposal are

- i. The crushed material must be stored in storage containers clearly marked
- ii. Plastic containers should be preferred for storage purpose
- iii. Stored materials must be transported to landfills in closed vehicles ensuring no leakage in the way.

7. Monitoring - To ensure proper disposal and monitoring of CFLs by manufacturers, proper well defined procedure shall be enunciated by and under respective EPA. Guidelines regarding auditing and monitoring are set out hereinafter:

I. To make auditing convenient, proper records of total CFLs disposed off, must be maintained

II. Auditing must be both External and Internal as follows:

a. Internal Auditing

- i. Internal audit is comprised of an independent inspection team established by management of the concerned organization to review the internal control system
- ii. Record keeping for CFLs disposal is vital for internal auditing to be done
- iii. These audits like financial audits must be done after an appropriate period of time
- iv. The internal auditors should be properly trained, qualified and experienced to fulfill their responsibilities

- v. They should seek to promote mutual understanding with external auditors or with any review agency.
- vi. Internal auditor should also maintain records of his work to make external auditing convenient.

b. External Auditing

- i. External auditors may be appointed by concerned EPA as deemed necessary.
- ii. External audits should be done by inspecting records maintained by internal auditors.
- iii. In case of any insufficiency found in the record, further details, evidence and documents may be sought in respect thereof.

7. Awareness: — Manufacturers and the relevant EPA shall endeavor to create awareness among consumers regarding harmful impacts of mercury and other contents as a result of improper disposal of CFLs. In this connection, the following modes shall inter alia, be adopted:

- a) Leaflets regarding advantages and disadvantages of the product a customer is buying must be provided.
 - b) Packaging of the product must be marked with special symbols regarding harmful impacts.
 - c) Media campaigns should be derived to aware people to avoid the breakage and the proper replacement time of CFLs.
 - d) Retailers should provide incentive to the consumers for returning an expired CFL in intact form.
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