

## **INFORMATION ON CFL AND ITS SAFE DISPOSAL**

### **What is mercury, its sources, mercury emissions, and the risks?**

Mercury is an element found naturally in the environment. Mercury emissions in the air can come from both natural and man-made sources. Utility power plants (mainly coal-fired) are the primary man-made source, as mercury that naturally exists in coal is released into the air when coal is burned to make electricity.

Airborne mercury poses a very low risk of exposure. However, when mercury emissions deposit into lakes and oceans, they can transform into a highly toxic form that builds up in fish. Fish consumption is the most common pathway for human exposure to mercury. Pregnant women and young children are most vulnerable to the effects of this type of mercury exposure. However, it is estimated that most people are not exposed to harmful levels of mercury through fish consumption.

### **Why do CFLs contain mercury?**

Mercury is an essential ingredient for most energy efficient lighting products, including CFLs. It is the mercury that excites phosphors in a CFL, causing them to glow and give light. When electric current passes through mercury vapor, the mercury emits ultraviolet energy. When this ultraviolet energy passes through the phosphor coating, it produces light very efficiently. Because mercury is consumed during lamp operation, a certain amount is necessary to produce light and achieve long lamp life.

### **How much mercury does one CFL bulb contain?**

The amount of mercury in the most popular and widely used CFLs is minimal, ranging between 6 mg to 3.5 mg. Though some CFLs contain mercury higher than 6 mg, the Bureau of Indian Standards, Government of India is preparing standards to ensure that minimum qty. of mercury is used in CFLs and other fluorescent Lamps. The 5 mg, is roughly equivalent of the tip of a ballpoint pen.

### **And how much mercury does a thermometer contain?**

By comparison, older home thermometers contain 500 milligrams of mercury and many manual thermostats contain up to 3000 milligrams. It would take between 100 and 665 CFLs to equal those amounts.

### **How is mercury inserted into CFL?**

Mercury can be added to the CFL in two ways. Some manufacturers use liquid mercury, which is less expensive and more difficult to accurately dose. These CFLs may contain a very high quantity of mercury.

Others use amalgam, a small "pill" which is a solid state form of mercury and other elements. Amalgam is inserted through automatic machine and is much easier and more accurate to dose. Such lamps contain much less than 3.5 mg.

### **How safe it is to use CFL in homes?**

CFLs are safe to use in your home. No mercury is released when the bulbs are in use and they pose no danger to you or your family when used properly. It may be risky when a CFL is broken. Please follow suggestions given below:

### **What should be done if a CFL breaks?**

If CFL breaks- carefully sweep up all the fragments, wipe the area with a wet towel, and dispose of all fragments, including the used towel, in a sealed plastic bag. Follow all disposal instructions. If possible, open windows to allow the room to ventilate. Do NOT use a vacuum.

### **How to safely dispose of a CFL when it burns out?**

It is best to recycle your CFL. The Ministry of Environment and Forest has prepared guidelines on safe disposal and recycling of mercury from used lamps. Central Pollution Control Board in association with Lighting Industry will implement the guidelines. Under these guidelines, one of the important factors for action is decided to appoint "Lamp Recycling Units" (LRUs). Very soon burnt CFL and Fluorescent Lamps will be collected from consumers and transported to the LRUs. These LRUs will use very highly sophisticated machinery to retrieve each part of lamp, like mercury, phosphor powder, glass, plastic etc, and sent back to factories for reuse.

For the time being, unbroken CFL bulbs, can be put in a polythene bag and handed over to the garbage collector personally, informing him that the bag contains CFL lamp. It is proposed that Local Municipal authorities should arrange to inform and train the garbage collectors about mercury safe handling. Till the recycling system is put into place, the local civic authority should provide a specified safe dumping place (preferably a concrete well) which will be sealed once full.

### **What steps are being taken to reduce the amount of mercury in CFLs?**

The Bureau of Indian Standards has amended the existing CFL Standard IS15111 by fixing mercury limit to less than 5 mgs in CFLs of less than 26 watts. Industry has taken a further step to reduce it to less than 3.5 mg by end of 2014. This has been made possible by using pill insertion of mercury amalgam. The mercury amalgam in solid form is much

more safer because even when the lamp breaks accidentally, it will not spill or evaporate into the atmosphere and very easy to handle. Because this standard is mandatory, no manufacturer will be allowed to use mercury in CFL more than the prescribed level

### Are CFLs good for the environment?

CFLs are responsible for less mercury than standard incandescent light bulbs, and actually work to prevent mercury from entering our air, where it most affects our health. The highest source of mercury in our air comes from burning fossil fuels such as coal, the most common fuel used in India to produce electricity. A CFL uses 75% less energy than an incandescent light bulb and lasts up to 8 to 10 times longer.

70% of power plants are coal fired and thus burn fossil fuel to produce energy. These power plants will emit 10 mg of mercury to produce the electricity to run an incandescent bulb compared to only 2.4 mg of mercury to run a CFL for the same time.

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### Mercury emissions by light source evaluated over a five-year life

