



# Waste Minimization: Reducing Mercury Use

## Philips Lighting

◆ Developed the First Fluorescent Lamp Capable of Passing the TCLP Test

◆ Produced Lamps That Contain 80% Less Mercury Than The Industry Average

◆ Avoided Use of 13 Tons of Mercury Per Year

**“The name of the game is not *pass the test*, the name of the game is *use less mercury*.”**

**- Paul Walitsky, Manager of Environmental Affairs for Philips Lighting**

### What Does Philips Lighting Do?

Philips is one of the world's largest electronics companies, making products ranging from compact disc players to light lamps, and security systems to semi-conductors. Philips is one of the top three lighting producers in the world, marketing more than 4,000 types of lamps.

### What Did They Accomplish?

In response to environmental and regulatory concerns, Philips researched and developed the Alto line of low mercury fluorescent lamps. Philips developed the first lamp capable of passing the Toxic Characteristic Leaching Procedure (TCLP) test, designed a method of recycling mercury within each lamp so the lamp would need a smaller supply, developed buffer technology to ensure that the low mercury lamps would have a similar life span to regular lamps, and encouraged the market to buy low mercury lamps by lowering the price on the low mercury lamps and scaling back production on high mercury lamps.

### Environmental Achievements

Over the past ten years, Philips has reduced the mercury content of T-12 fluorescent light lamps from the 1989 industry average of 48.2 mg per lamp to 4.4 mg per lamp in 1999, which is 80% less than the current industry average. Today, 85% of Philips light lamp production is low mercury lamps, reducing mercury use by 13 tons per year.

Philips has won numerous environmental achievement awards from such organizations as the North American Hazardous Materials Management Association and *Popular Science*.

### Regulatory Relief

While Philips has not experienced significant regulatory relief as the result of the low mercury lamps, their customers have. The fluorescent lamps produced in 1990 contained enough mercury to fail the TCLP test, and would therefore be considered toxic hazardous waste and regulated under Resource Conservation and Recovery Act (RCRA) Subtitle C. The new lamps developed by Philips pass the TCLP test and may be disposed of as municipal solid waste.

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### The Implementation Process

Philips had two primary goals: create a lamp that used less mercury, and ensure that the low mercury lamp performance was equal to the regular lamps. Two innovations developed by Philips led to the creation of the low mercury lamps. First, Philips developed a buffer coating to prevent the inside of the glass in the lamp from absorbing cooling mercury when the lamp is turned off. The buffer acts as an “internal mercury recycler” by ensuring that the mercury in the lamp stays in use, where other lamps rely on higher initial doses of mercury to compensate for the mercury absorbed during the life of the lamp.

The second innovation was a glass mercury dosing capsule to produce fluorescent lamps with a standard amount of mercury. Because the new lamps are produced using very little mercury, the amount of mercury must be precise. Too much mercury and the lamp may fail the TCLP test; too little mercury and the lifespan of the lamp may be reduced, or the lamp may not work at all. The dosing capsule enabled Philips to use the minimum amount of mercury required while maintaining high lamp quality.

Many of the machines needed to be retrofitted to manufacture the low mercury lamps. The time and expense needed to make these changes was facilitated by management commitment to low mercury lamp production.

### Economics

Once Philips developed the low mercury lamps, they made a concerted effort to encourage customers to use them. Low mercury lamps are slightly more expensive to produce than regular lamps when the expenses associated with R&D expenses, machinery retrofits, and more expensive lamp bases are accounted for. However, Philips not only lowered the price of the low mercury lamps to make them equal to the price of higher mercury lamps, but also they gradually scaled back or ceased production on many of the higher mercury lamps to encourage consumer use.

Philips did not realize a significant economic benefit from the switch to low mercury on the production side. However, increased sales and reductions in industrial hygiene costs may offset the cost of implementation.

After developing the ALTO line of low-mercury lamps, Philips offered to share the technology and manufacturing process with their competitors in the market to promote the switch to exclusively low-mercury products.

### Hurdles

The low mercury push at Philips was initiated by the president of the company, and had great support from the top down. This level of management commitment smoothed over many of the hurdles that could have stalled the process internally.

“The ALTO lamps installed in just one of our stores will eliminate 48,000 milligrams of mercury from the waste stream with each relamping.”

- Janis Blackwell, Green Manager, Wal-Mart

### Words to the Wise

Management commitment from the top down is vital to any successful waste minimization project. Paul Walitsky, the Manager of Environmental Affairs for Philips Lighting, credits the success of the ALTO line of low mercury bulbs to unwavering commitment by company management to the principle of mercury reduction.



Reducing Toxics in Our Nation's Waste

For more information about the Waste Minimization National Plan, call (800) 424-9346 or check the World Wide Web at <http://www.epa.gov/wastemin>