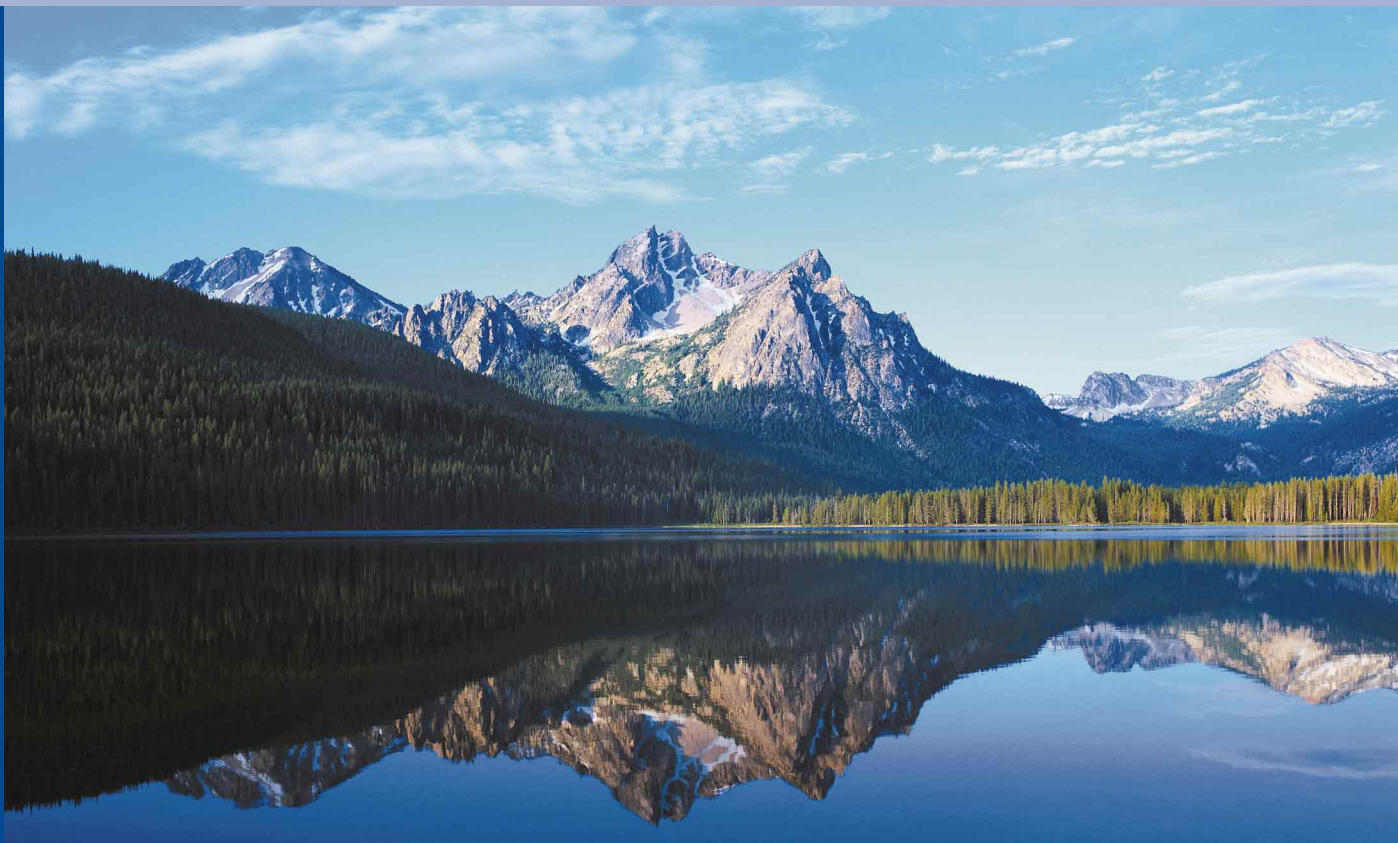


Recycling Today for a Cleaner Tomorrow.



RECYCLING SERVICES AND EQUIPMENT

AIR CYCLE 

Mercury, Fluorescent Lamps, EPA Regulations, and You.



What's in a lamp? A fluorescent lamp consists of a glass shell, a high vacuum, a small amount of liquid mercury and evaporated mercury, some phosphor powder, and the metal end-caps and heated filaments.

Fluorescent light is produced by passing an electric current through mercury vapor, which generates ultraviolet energy. A phosphor coating on the inside of the bulb transforms the ultraviolet energy into visible light. A single four-foot fluorescent tube contains from 5 to 50 milligrams of mercury.

When lamps are sent to landfills, or especially when incineration is used as an alternative disposal method, mercury vapors are released that can travel over 200 miles! It is highly toxic to the human nervous system and particularly poisonous to the kidneys. Once absorbed by the body, mercury is distributed by the blood to all tissues of the human body, and it easily crosses the placental barrier; prenatal exposure can lead to a variety of health problems including a severe form of cerebral palsy.

- Each year, an estimated 600 million fluorescent lamps are disposed of in U.S. landfills amounting to 30,000 pounds of mercury waste.
- The Environmental Protection Agency reports that 187 incinerators nationwide emit approximately 70,000 total pounds of mercury into the environment each year.
- In 1992, mercury-containing lamps were added to the United States' Environmental Protection Agency's (EPA) list of hazardous substances. (The EPA's regulatory threshold of 0.2 mg./liter is usually exceeded by mercury-containing lamps).
- Mercury was number three on the 1997 list of hazardous substances as outlined by the Agency for Toxic Substances and Disease Registry (ATSDR) and the EPA.

Due to the new Federal Environmental Protection Agency's regulations on lamps, which went into effect on January 6th, 2000, most non-residential facilities are now required by law to properly dispose of their lamps. Landfills are increasingly intolerant of lamps from non-residential sources due to the amount of mercury found in each lamp. Lamps later found in landfills are subject to retroactive clean-up costs under CERCLA. Recycling of the lamp components is the recommended method of disposal by the Environmental Protection Agency and helps to minimize facility liability.

Proper packaging of the lamps coupled with the recycling of the lamps will greatly reduce the mercury dilemma and create a much safer environment.



Air Cycle Corporation was founded in 1978 and is based in the Chicago metropolitan area. While Air Cycle currently offers a wide range of recycling services throughout North America, we pride ourselves in our ability to engineer innovative products to help our customers. Through the years, Air Cycle has manufactured a variety of products. Products include "Automatic Air Balance System" control panels for McDonald's restaurants (found in over 3000 locations), electronic lamp ballasts for specialty markets, and advanced coffee dispensing machines. Air Cycle has always provided quality products to meet customer needs.

Through our involvement in the lighting industry, we saw a growing need for equipment to make lamp disposal easy and more efficient. Over the past few years, as legislation was being passed to reduce pollution from irresponsible lamp disposal, Air Cycle worked to design a machine to meet the needs of facilities worldwide. Our goal was to develop a machine that was safe for all facilities, regardless of size.

On March 15, 1999, our Model 55 VRS Standard Bulb Eater® was introduced at the National Plant Engineering Trade Show. At this show, our Standard Bulb Eater® was named one of the 17 "Show Stoppers" out of over 700 exhibitors! Based on this initial success and the attention garnered through a front page acknowledgement by the Wall Street Journal, we focused our energies on developing different ways to service our growing customer base. In response to customers needing to have their lamps recycled (due to new Federal and State EPA regulations) we offer a recycling program throughout North America to not only recycle crushed lamps, but also to recycle intact lamps, batteries, ballasts, and computer hardware.

Mission Statement:

"Ensuring the most comprehensive North American lamp recycling program providing both product and services that exceed the highest standards of compliance, safety, efficiency, and cost."



The Premium Bulb Eater® Model 55 VRS - A System Designed to Safely Minimize Storage & Handling of Lamps.



Our new Model 55 VRS Premium Bulb Eater® (shown below) provides emission control to help create the safest work environment possible, while packaging spent straight fluorescent lamps! The Model 55 VRS-U Premium (shown on the facing page) adds the capability of accepting U-shaped lamps.

The system includes filters designed to capture both particulates and mercury vapor. The unit is equipped with a side-mounted particulate filter unit containing the highest quality H.E.P.A. filter available. This works in conjunction with an activated carbon filter located in the steel canister. The activated carbon filter actively captures and neutralizes the mercury vapor released from the lamps during crushing.

Removable entry tubes accommodate all tube lengths and sizes.

Powerful, UL listed, 1/6 HP motor crushes lamps from 1' to 8' long in roughly one second!

Control panel allows operator to safely monitor and control all processes.

Activated carbon filter captures and neutralizes virtually all of the mercury vapors released during the controlled crushing of lamps.

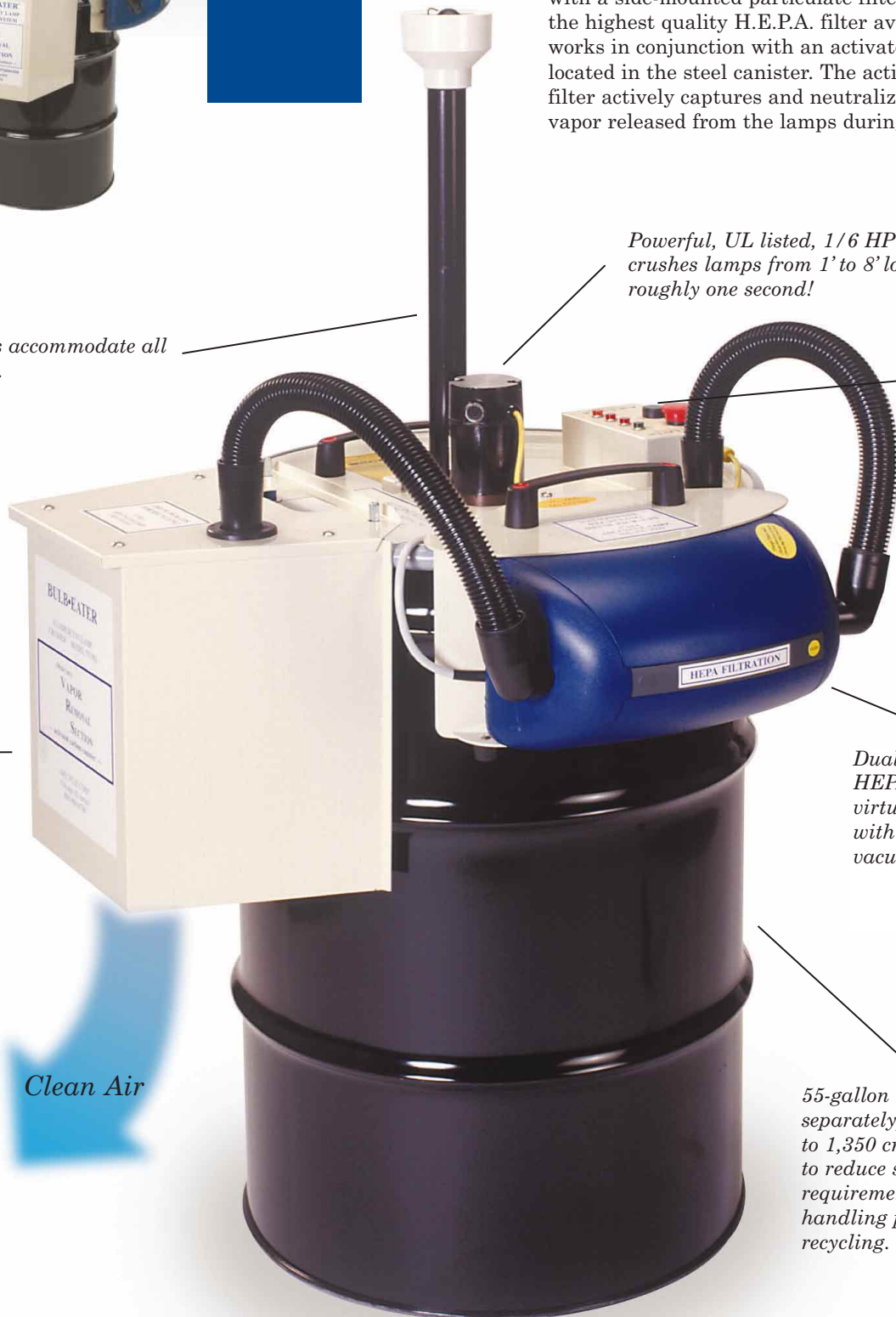
- Full drum shut-off.
- Lid-off shut-off.
- Automatic purge cycle.

Note: A recent air monitoring test indicated "non-detectable" levels of mercury vapor exposure even after crushing 1500 lamps!

Dual-action, replaceable HEPA filter removes virtually all particulates with high capacity vacuum unit.

Clean Air

55-gallon drum (sold separately) will hold up to 1,350 crushed lamps to reduce storage requirements and handling prior to recycling.



Bulb Eater® Features:

- System exceeds both OSHA and ACGIH standards for mercury vapor capture and related operator exposure.
- Crushes standard T12 fluorescent lamps of any length. Removable adapters are available for T5, T8 and T17 diameter lamps.
- Each 55-gallon container holds roughly 875 T12 4' lamps, 1350 T8 4' lamps, and 475 T12 8' lamps.
- This lid-only assembly can be easily moved from drum to drum. (Drums and drum dollies sold separately)

Bulb Eater® Benefits:

- Eliminates storage hassles. 80% reduction in storage space.
- Minimize handling. Our customers report saving over 20 hours of labor per 1,000 lamps.
- Safe work environment. System captures over 99.98% of mercury vapors released.
- Cut recycling costs. By pre-crushing the lamps, facilities are able to save from 10¢ to \$1 per lamp!



Custom wide-stance drum dolly provides effortless transport.



4 sizes of straight lamp entry tubes accommodate ALL sizes of fluorescent lamps.



Premium Bulb Eater® Model 55 VRSU handles BOTH straight and U-shaped lamps. The all-stainless chute is removable for ease of use.



Operator's view of the Bulb Eater®. Logical control panel makes operation simple and safe.



1st Stage

Heavy-duty filter bag captures particulates over 1 micron @ 99% retention.



2nd Stage

Highest rated commercial-grade HEPA filter available - filters to .3 micron @ 99.99% retention.



3rd Stage

Activated carbon filter removes mercury vapors released during crushing.

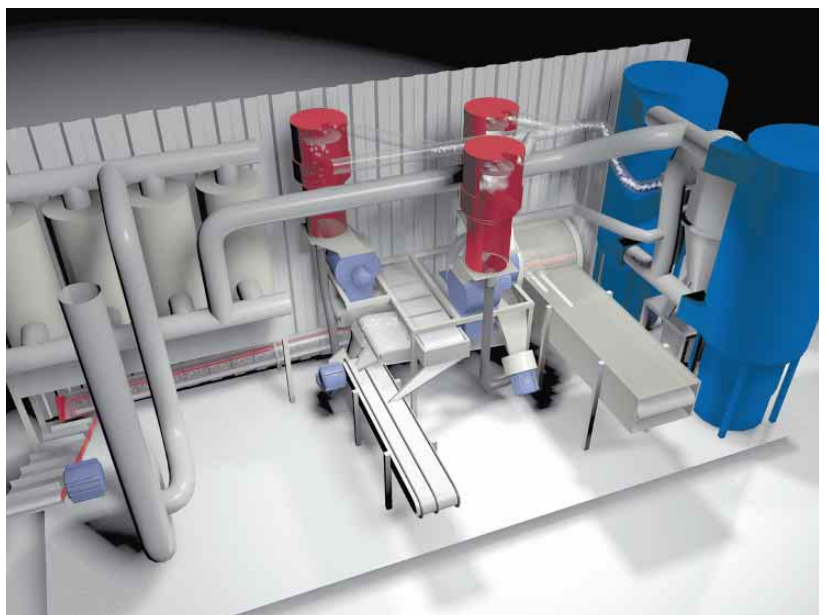
- Lamps
- Ballasts
- Batteries
- Electronics

Air Cycle Corporation offers recycling services and transportation throughout all of North America to assist facilities in properly disposing of lamps, ballasts, batteries, and computer hardware.

The lamps are processed at permitted facilities throughout the United States and Canada. Equipment, such as the MRT Compact Crush and Separation Plant, is used for the recycling of all types and sizes of discarded fluorescent lamps (intact or crushed). These systems separate the lamps into soda lime glass, aluminum end caps, lead glass/ferro metal components and phosphor powder. The phosphor powder is then retorted to capture the mercury.

Air Cycle also offers a ballast-recycling program. PCB, non-PCB, and DEHP lighting ballast can all be recycled. Metal components from the ballast, such as copper and steel, are collected for recovery and reuse. The PCB-containing capacitors and any PCB-contaminated potting material are thermally destroyed at a permitted facility.

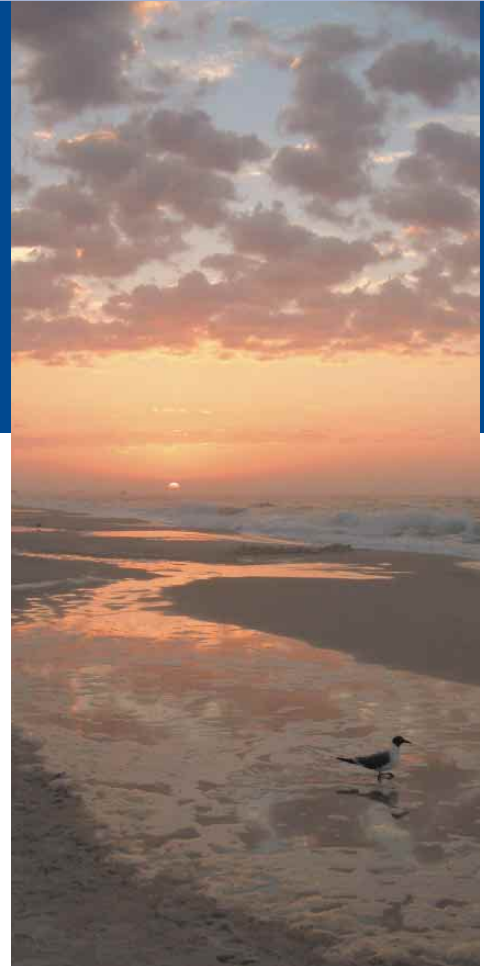
Batteries and electronic waste can also be recycled. All processing is completed under Environmental Protection Agency (EPA) operating guidelines and a certificate of recycling is provided. The e-waste is disassembled to recover components such as lead, mercury, copper, gold, silver, and platinum.



Inside the patented Compact Crush and Separation System.

Did you know?

- The Bulb Eater™ has been seen on the cover of a number of newspapers and magazines (Wall Street Journal, Industrial Equipment News, and Industrial Maintenance and Plant Operation).
- The Bulb Eater™ was also named Product of the Month and Reader's Choice Product of the Year by Today's Facility Manager magazine.
- Air Cycle's recycling services have diverted millions of lamps from landfills.
- It costs roughly \$1 to buy a lamp, \$20 to power a lamp, and less than 50 cents to recycle it.
- Fines have already been levied for improper lamp disposal in excess of \$250,000!
- Overexposure to mercury can cause learning disabilities, impair kidney and immune function and, in extreme cases, lead to loss of sight and hearing.
- Death and illness from mercury poisoning have been documented since the 16th century in Europe. The expression "mad as a hatter" came into the language because hat makers were poisoned by mercury salts used to make felt for fancy hats. They were well known for their symptoms: shaking, stumbling and muttering to themselves.
- A recent air monitoring test showed "non-detectable" levels of mercury vapor exposure even after crushing 1500 lamps with the Bulb Eater® system.
- Air Cycle now offers the ability to order products and services online at www.aircycle.com.



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